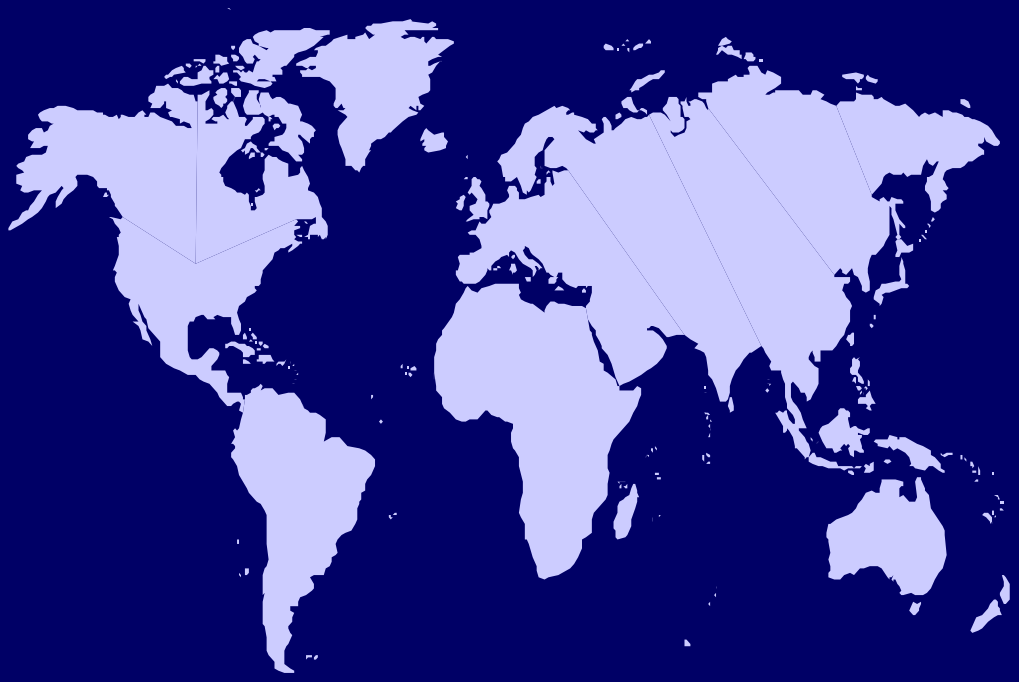
The ISAAC Story

The International Study of Asthma and Allergies in Childhood



The ISAAC Story
ISBN: 978-0-473-20211-8

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Suggested citation: Asher MI, Strachan DP, Pearce N, García-Marcos L (Eds). *The ISAAC Story: The International Study of Asthma and Allergies in Childhood*. Auckland, New Zealand: The International Study of Asthma and Allergies in Childhood 2011.

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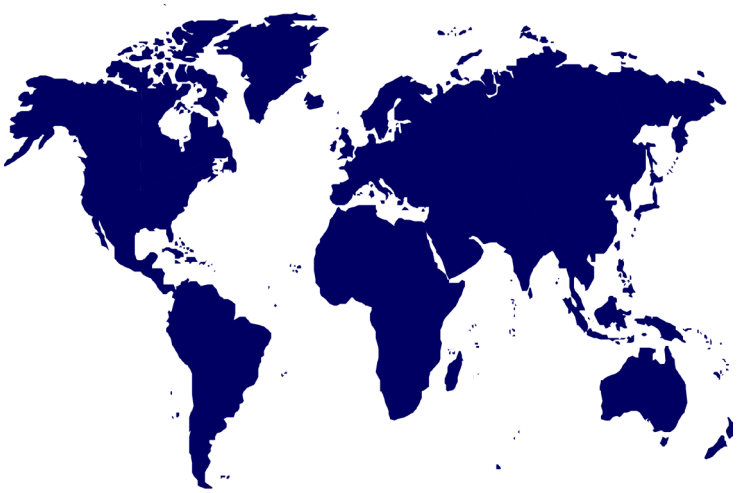

M. Innes Asher, David P. Strachan, Neil Pearce & Luis García-Marcos, Eds.

Acknowledgements

Funding of ISAAC Phase One

ISAAC was open to any collaborator who agreed to adhere to the protocol. Countries in which there was little existing information about asthma, rhinoconjunctivitis and eczema were particularly encouraged to participate. Each centre was responsible for obtaining its own funding. There were many field workers and funding agencies who supported data collection and national, regional and international meetings, including the meetings of the ISAAC Steering Committee. Unfortunately, these are too numerous to mention and are acknowledged elsewhere in local publications.

The ISAAC International Data Centre was funded by:

- The Health Research Council of New Zealand,
- The Asthma and Respiratory Foundation of New Zealand,
- The National Child Health Research Foundation,
- The Hawke's Bay Medical Research Foundation,
- The Waikato Medical Research Foundation,
- Glaxo Wellcome New Zealand
- Astra New Zealand.

Glaxo Wellcome International Medical Affairs funded the regional co-ordinating centres.

Funding of ISAAC Phase Two

The coordination and central laboratory analyses of the European centres were funded by the Fifth Framework Programme of European Commission (QLK4-CT-1999-01288).
The following bodies funded the local studies.

Spain: (Almeria, Cartagena, Madrid, Valencia)
Fondo de Investigacion Sanitaria (grant code 00/1092E).

Turkey: (Ankara)
Scientific and Technical Research Council of Turkey (grant code SPAG-2237),
Treatment and Research Foundation of Turkey for Allergy, Asthma and Immunology,
The Research foundation of Hacettepe University, Faculty of Medicine.

Greece: (Athens, Thessaloniki)
The Thorax Foundation Research Center.

France: (Créteil)
French Institute of Health and Medical Research (Institut National de la Santé et de la Recherche Médicale (INSERM), grant code IDS 337/4D001D and 737/69480),
Ministère de l'Emploi et de la Solidarité (grant code 227/7HL02D),
Mutuelle Générale de l'Education Nationale (grant code 257/8PL01F),
Agence de l'Environnement et de la Maitrise de l'Energie ADEME/PRIMEQUAL 96 (grant code FJ012B).

Germany: (Dresden, Munich, Ulm)
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Rudolf and Clothilde Eberhardt-Foundation (Ulm).

Italy: (Rome)
Lazio Regional Health Authority.

New Zealand: (Hastings)
Health Research Council of New Zealand,
Asthma and Respiratory Foundation of New Zealand,
Hawkes Bay Medical Research Foundation.

Sweden: (Linköping, Östersund)
The Swedish Foundation for Health Care Sciences and Allergy Research.

India: (Mumbai)
Jaslok Hospital & Research Centre.

West Bank: (Ramallah)
Al-Quds University, Directorate General for International Cooperation and Belgian Technical Cooperation.

The Netherlands: (Utrecht)
Dutch Ministries of the Environment, of Health and of Transport.

UK: (West Sussex)
South Thames National Health Service Regional and Development project SPGS.

The centres in Mumbai, Ankara, Kintampo (Ghana), Riga (Latvia), Tallinn (Estonia), Tblisi (Georgia) and Tirana (Albania) were supported, at least in part, by European members of the ISAAC Steering Committee.

Funding Organisations

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Funding of ISAAC Phase Three

As with ISAAC Phase One, ISAAC Phase Three was open to any collaborator who agreed to adhere to the protocol and each centre was requested to provide it's own funding. The programme was funded by the many funding bodies throughout the world that supported the individual ISAAC centres and collaborators and their meetings. In New Zealand ISAAC was funded by:

- The Health Research Council of New Zealand,
- The Asthma and Respiratory Foundation of New Zealand,
- The Child Health Research Foundation,
- The Hawke's Bay Medical Research Foundation,
- The Waikato Medical Research Foundation,
- Glaxo Wellcome New Zealand,
- The NZ Lottery Board
- Astra Zeneca New Zealand.

Travel grants were awarded by the Auckland Medical Research Foundation and the Maurice & Phyllis Paykel Trust.
Glaxo Wellcome International Medical Affairs supported the regional coordination and the ISAAC International Data Centre.
The ISAAC International Data Centre is currently funded grants from the BUPA Foundation, The Auckland Medical Research Foundation and The New Zealand Lotteries Commission.

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Bandung, Indonesia
Bangalore, India
Bangkok, Thailand
Barbados, Barbados
Barcelona, Spain
Bari, Italy
Barranquilla, Colombia
Bay of Plenty, New Zealand
Beijing, China
Beirut, Lebanon
Belgrade, Serbia And Montenegro
Belo Horizonte, Brasil
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Bikaner, India
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Córdoba, Argentina
Cosenza, Italy
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Islamabad, Pakistan
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Itajaí, Brasil
Jaipur, India
Jalalabat, Kyrgyzstan
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Krakow (1993), Poland
Kraków (1995), Poland
Kuopio County, Finland
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Melbourne, Australia
Mérida, Mexico
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Muar, Malaysia
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Mumbai (18), India
Mumbai (29), India
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Nakorn Pathom, Thailand
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Nelson, New Zealand
Netherlands, Netherlands
Netherlands (Utrecht), Netherlands
Neuquén, Argentina
New Delhi (7), India
Neyveli, India
Nis, Serbia And Montenegro
Niue Island, Niue
North east and Yorkshire, United Kingdom
North Gaza, Palestine
North Thames, United Kingdom
North West, United Kingdom
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Nova Iguaçu, Brasil
Novi Sad, Serbia And Montenegro
Novosibirsk, Russia
Nuku alofa, Tonga
Orissa, India
Östersund, Sweden
Palermo, Italy
Pamplona, Spain
Panevezys, Lithuania
Passo Fundo, Brasil
Paysandú, Uruguay
Perth, Australia
Pessac, France
Pichincha, Ecuador
Pimpri, India
Podgorica, Serbia And Montenegro
Polokwane, South Africa
Polynesie Francaise, French Polynesia
Port-Gentil, Gabon
Portimao, Portugal
Porto, Portugal
Porto Alegre, Brasil
Poznan, Poland
Provincial Korea, South Korea
Pune, India
Punta Arenas, Chile
Quito, Ecuador
Rabat, Morocco
Ramallah, Palestine
Rarotonga, Cook Islands
Rasht, Iran
Rasta Peth, India
Recife, Brasil
Rep. Of Ireland, Republic Of Ireland
Reunion Island, Reunion Island
Reykjavik, Iceland
Riga, Latvia
Rijeka, Croatia
Roma, Italy
Rosario, Argentina
Rosario City, Argentina
Rural Kharkiv, Ukraine
Rural Latvia, Latvia
Rural Santa Maria, Brasil
Salta, Argentina
Salvador, Brasil
Salzburg, Austria
Samarkand, Uzbekistan
San Pedro Sula, Honduras
San Salvador, El Salvador
San Sebastián, Spain
Santa Cruz, Bolivia
Santa Maria, Brasil
Santo Andre, Brasil
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São Paulo West, Brasil
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Saskatoon, Canada
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Seattle, Usa
Semarang, Indonesia
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Shanghai, China
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South Thames, United Kingdom
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Szeged, Hungary
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Tallinn, Estonia
Taoyuan, Taiwan
Tartous, Syria
Tashkent, Uzbekistan
Tbilisi, Georgia
Tehran, Iran
Thessaloniki, Greece
Tibet, China
Tiranë, Albania
Tobago, Trinidad And Tobago
Tochigi, Japan
Tokelau, Tokelau
Toluca, Mexico
Tong Zhou, China
Torino, Italy
Trent, United Kingdom
Trento, Italy
Tromsø, Norway
Turku and Pori County, Finland
Urban Cote d Ivoire, Cote D'Ivoire
Urfahr-Umgebung, Austria
Uruguaiana, Brasil
Valdivia, Chile
Valencia, Spain
Valladolid, Spain
Vancouver, Canada

Centres cont.

Verona, Italy
Villahermosa, Mexico
Viterbo, Italy
Vitória da Conquista, Brasil
Wales, United Kingdom
Wellington, New Zealand
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Yaounde, Cameroon
Zanjan, Iran

Appendices

The ISAAC Story

1.96 million children

306 research centres

105 countries

53 languages

>500 publications

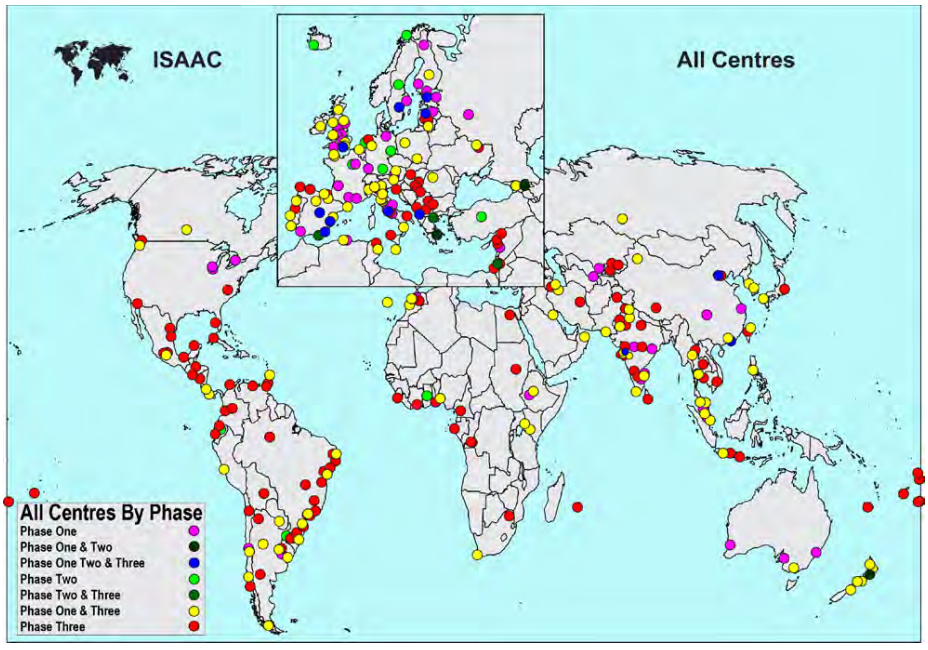
>20 years of research

Welcome to the ISAAC Story, a website presentation of the history and findings of the International Study of Asthma and Allergies in Childhood. The story can be explored online through the menus on this website.

This is the story of a unique global collaboration, sustained over more than twenty years through the enthusiasm of contributing research groups, the generosity of numerous funding agencies, and the goodwill of parents and children, schools, hospitals and universities around the world. We take this opportunity to thank all of them most sincerely for their invaluable contributions to ISAAC.

Few scientific studies can claim a place in the Guinness Book of World Records. ISAAC is one of them. Detailed information about the results from ISAAC and access to ISAAC datasets can be found at the ISAAC website.

The ISAAC Story is dedicated to the memory of Stephan Weiland, a founder member of the consortium, who led the development of ISAAC Phase Two until his untimely death in March 2007.



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Stephan WEILAND	1997-2007

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In Memoriam of Professor Dr Med Stephan Weiland

Professor Dr Med Stephan KM Weiland, 25 December 1958 to 19 March 2007. Professor of Epidemiology, Head of the Institute of Epidemiology, University of Ulm, Coordinator of Phase Two of the International Study of Asthma and Allergies in Childhood (ISAAC) and Executive member of the ISAAC Steering Committee.

Stephan, our much loved friend and colleague, died suddenly and unexpectedly on the 19th March 2007. Stephan was one of the founding members of ISAAC and made an enormous contribution to the scientific development of the study through his long service on the ISAAC Executive and as Phase Two Coordinator. Indeed, without Stephan's leadership, stamina and diplomatic skills, there would probably have been no ISAAC Phase Two. Above all, he cared about people and dedicated his life to health prevention and health promotion, especially asthma and allergies in children.

Stephan was born and grew up in North-West Germany. He went to medical school in Cologne (1978-1985) and obtained his MD degree in 1987. During this time he became interested in the prevention of disease at a population level. This took him to McGill University in Montreal where he graduated in 1989 with a Masters degree in Epidemiology. He then joined the University of Bochum as assistant professor where he developed an interest in environmental and occupational epidemiology. He was a key individual in the archetypal studies that uncovered unexpected differences in the prevalence of asthma between Western Germany and the recently liberated and heavily polluted East. He moved with Professor Ulrich Keil's department to Münster in 1993, and four years later was promoted to Associate Professor. In 2002, Stephan moved to Ulm, in southern Germany, to take up the Chair of Epidemiology and set up a new Institute of Epidemiology. This took him closer to the mountains which he had loved since he was a young boy. He was an active hiker, climber and skier and enjoyed these outdoor activities whenever he was able to escape from his heavy workload and responsibilities.

Stephan was an outstanding unit director, an internationally respected scientist and an integral member of the ISAAC Steering Committee. Stephan promoted the idea that the ISAAC partnership should be used to investigate specific factors predisposing to asthma, and led the formation of ISAAC Phase Two with that aim. His coordination of 33 ISAAC Phase Two centres in 22 countries and his leadership of a successful application to European Union Fifth Framework Programme led to the establishment of the ISAAC Phase Two Data Centre in Ulm under his direction. Shortly before he died, Stephan received the good news that the first of a series of papers from Phase Two had been accepted for publication, showing how the relationship between atopy and asthma differs between centres in affluent and less affluent countries. A number of papers have followed, due to the research momentum he established in Ulm.

Stephan's welcoming smile, warm compassion and lively sense of humour will be greatly missed, but always remembered – he will be forever part of ISAAC. To us we have lost a great friend and collaborator. To Epidemiology, we have lost a great scientist. Our hearts go out to his family.

The ISAAC Steering Committee

The ISAAC Story

ISAAC's Beginnings

The International Study of Asthma and Allergies in Childhood is a unique worldwide epidemiological research programme established in 1991 to investigate asthma, rhinitis and eczema in children due to considerable concern that these conditions were increasing in western and developing countries, and that the causes of this increase were unknown.

ISAAC developed from a merging of two multinational collaborative projects each investigating variations in childhood asthma at the population level. These were an initiative from Auckland, New Zealand to conduct an international comparative study of asthma severity, and an initiative from Bochum, Germany to conduct an international study to monitor time trends and determinants of the prevalence of asthma and allergies in children.

This section charts the development of ISAAC from its early origins to its current global coverage and organisational structure. This history is summarised chronologically in a timeline and embellished with personal memories of some of the founder members of the consortium.

Here we present the global perspective on the ISAAC Story. More detail on the history within each region and study centre may be found under "Centres".

ISAAC Milestones

1991 Launch of ISAAC
1993 First publication
1994 Core questions
1995 Global coverage
1997 Phase 1 papers
1998 Phase 2 modules
1999 Phase 3 planned
2001 Phase 3 modules
2004 Guinness record
2006 Time trend paper
2008 Phase 3B maps
2011 500th publication

Rationale for ISAAC

At the time that ISAAC was conceived, in the early 1990s, most previous research had looked at the reasons why some individuals rather than others develop asthma and allergic conditions such as allergic rhinitis and eczema. A major risk factor was a family history of atopic disease, but various environmental factors had been also considered important in the expression of disease. Such studies within populations had shed little light on the reasons why the occurrence of atopic disease varies from population to population.

Factors affecting the prevalence of disease at a population level may be different to those that determine which individuals within a population were at greatest risk. In addition, between populations the relationship between the three atopic conditions may be different. It was therefore considered likely that "ecological" (between-population) analyses might reveal further important determinants of asthma, allergic rhinitis and eczema. There was also widespread concern that these conditions were increasing in both developed and developing countries, but there was a lack of information on the burden of allergic diseases in many parts of the world.

One obstacle to the investigation of population differences (and of trends) had been the lack of a suitable and generally accepted method of measuring the prevalence and severity of asthma and other atopic diseases in children which could be used worldwide. Another obstacle was the absence of a coordinated research programme to obtain and analyse comparative data. The International Study of Asthma and Allergies in Childhood (ISAAC) programme was developed in 1991 to address these issues.

Aims of ISAAC

ISAAC, the International Study of Asthma and Allergies in Childhood, was formed in 1991 to facilitate research into asthma, allergic rhinitis and eczema by promoting a standardised methodology able to be used in diverse locations around the world. From an early stage, it was conceived as comprising three phases:
The aims of ISAAC Phase One were:

1. To describe the prevalence and severity of asthma, rhinitis and eczema in children living in different centres and to make comparisons within and between countries;
2. To obtain baseline measures for assessment of future trends in the prevalence and severity of these diseases; and
3. To provide a framework for further aetiological research into lifestyle, environmental, genetic and medical care factors affecting these diseases.

The aims of ISAAC Phase Two were:

1. To describe the prevalence of 'objective' markers of asthma and allergies in children living in different centres, and to make comparisons within and between centres.
2. To assess the relation between the prevalence of 'objective' markers of asthma and allergies and the prevalence of symptoms of these conditions in children living in different centres.
3. To estimate to what extent the variation in the prevalence and severity of asthma and allergies in children between centres can be explained by differences in known or suspected risk factors or by differences in disease management.
4. To explore new aetiological hypotheses regarding the development of asthma and allergies in children.

The aims of ISAAC Phase Three were:

1. To examine time trends in the prevalence of asthma, allergic rhinoconjunctivitis and atopic eczema in centres and countries which participated in ISAAC Phase One.
2. To describe the prevalence and severity of asthma, allergic rhinoconjunctivitis and atopic eczema in centres and countries which did not participate in Phase One.
3. To examine hypotheses at an individual level which have been suggested by the findings of Phase One, subsequent ecological analyses and recent advances in knowledge.

Subsequently, ISAAC Phase Four was conceived as the development and expansion of the scope of website resources for ISAAC collaborators, especially those in low and middle income countries. It included the addition of management plans and other resources that are useful for managing asthma, eczema, and rhinitis.

Origins of ISAAC

ISAAC developed from a merging of two multinational collaborative projects each investigating variations in childhood asthma at the population level. These were an initiative from Auckland, New Zealand to conduct an international comparative study of asthma severity, and an initiative from Bochum, Germany to conduct an international study to monitor time trends and determinants of the prevalence of asthma and allergies in children. This section of the ISAAC Story collates the recollections of founder members of the consortium about the early development of ISAAC as a global study.

Asthma epidemiology in the 1980s

(Michael Burr)

There is a long history of surveys of childhood asthma in various countries. When the findings of these surveys were compared, it was clear that reported asthma prevalence showed considerable geographical variation. Until relatively recently, each survey used its own methods, so that it was unclear whether the reported differences in prevalence could be attributable to variations in aspects of the methodology, e.g. the way children were selected, local diagnostic criteria, the way questionnaires were administered, the wording of the questions, and the conduct of challenge tests. But a comparison of surveys that used fairly similar methods suggested that the prevalence of childhood asthma was higher in New Zealand than in the United Kingdom.

The first survey planned to compare the prevalence in different countries was perhaps the study of Tokelau Islanders in New Zealand and Tokelau. In 1975-1976 surveys of asthma were conducted among Tokelauan children living in New Zealand and Tokelau, using the same methods (questionnaire and physical examination). Asthma, rhinitis and eczema were all substantially more common in New Zealand than in Tokelau; the differences were ascribed to environmental rather than genetic factors in that both groups of children were of predominantly Tokelauan descent.

In the early 1980s there was growing concern about a sudden rise in asthma mortality in New Zealand during the previous decade. This had not occurred in Australia, Canada, USA or England and Wales; furthermore, hospital admissions for asthma and sales per capita of asthma drugs had also increased disproportionately in New Zealand. The question obviously arose as to whether asthma prevalence was also higher in New Zealand. So in 1985 Innes Asher and others conducted a survey in Auckland, NZ, following the same protocol that had been used three years earlier in two areas of Australia. In each country the subjects were mostly 8 or 9 years old, and the survey employed a respiratory questionnaire and bronchial challenge with histamine. The prevalence of respiratory symptoms and bronchial hyperresponsiveness was similar in Auckland and inland New South Wales but lower in coastal New South Wales than in the other two sites.

The Auckland data were also compared with the findings of a survey in Croydon, England, which had been conducted in 1978. The prevalence of wheeze in the last month, the last 12 months and over the whole lifetime was significantly higher in Auckland than in Croydon; some uncertainty about the conclusions was expressed, however, in that neither the procedure nor the questions were identical, and during the 7-year interval between the surveys the prevalence in Croydon might have changed.

In order to compare asthma prevalence in several countries using the same protocol in each case, a survey was conducted in defined areas of Wales, New Zealand, Sweden and South Africa in 1988-1990. A questionnaire was completed by the parents of 12-year-old children asking about a history of asthma and respiratory symptoms, and the children performed a simple exercise challenge test. Asthma prevalence (determined by various criteria) was highest in New Zealand and lowest in Sweden; asthma mortality in children showed a similar pattern. Thus this study strengthened the evidence for real international differences in asthma prevalence, the disease being particularly common in New Zealand.

Interest in possible geographical variations in asthma was not confined to the disease in children. There was less information about asthma prevalence in adults, and valid comparisons between different areas were impossible because of the lack of any standardised methodology. During the 1980s, to rectify this situation, the International Union against Tuberculosis and Lung Disease began to develop standard methods for studying the epidemiology of asthma, including a questionnaire that would be suitable for large-scale surveys. In 1988 the European Commission funded a study that became known as the European Community Respiratory Health Survey (ECRHS), which would use this questionnaire and various tests to investigate asthma prevalence in people aged 20-44 years. The survey was conducted during the early 1990s in many countries; although it was primarily based in Europe, a few other areas participated, including four centres in New Zealand, where asthma prevalence was again found to be particularly high. Subsequent cross-fertilisation between ECRHS and ISAAC has occurred, including the enlisting of centres in one of these surveys leading to recruitment for the other.

Meanwhile, the development of a questionnaire for use in international surveys of children was stimulated by contact between investigators in Auckland and Bochum, Germany. The ensuing discussions led to a survey in New Zealand, Germany, England and Australia in 1991 that used the ISAAC protocol and was the forerunner of the main ISAAC study. Various indices of asthma (including the use of a video questionnaire) showed a higher prevalence in the Australasian centres than in Germany.

Thus New Zealand has played a prominent part throughout the development of international studies of asthma, arising out of concern about asthma mortality and morbidity in that country. It is entirely appropriate that the ISAAC International Data Centre should be located there.

The ISAAC Story

The origins of ISAAC: a German perspective

(Ulrich Keil)

At the beginning of 1987 I had started to build up an Institute of Epidemiology and Social Medicine at the Medical Faculty of the University of Bochum. In 1987 the Federal Ministry of Research and Technology (BMBF)in Bonn approached a number of German epidemiologists to develop a manual for the planning and execution of epidemiological studies in the area of asthma and allergic diseases. They reported that a comprehensive research program would soon be announced to shed more light on the aetiology and medical care of asthma and allergies.

In light of the BMBF`s experience with the German Cardiovascular Prevention Study (Deutsche Herzkreislaufpräventionsstudie, DHP) in the 1980's, which had cost a hundred million Deutsche Mark but had produced only meagre scientific output, the responsible people at the BMBF wanted to make sure that the envisaged nationwide research program for asthma and allergies should perform better. This is why they called on a number of leading epidemiologists in Germany to develop the above mentioned Manual.

Eight epidemiologists gathered in 1987 in Bochum and other sites in Germany and started developing the requested manual, resulting in a paper published in 1988 by "Berger J, Bergmann KE, Greiser E, Keil U, Lehmacher W, Schäfer H, Schwartz FW, Wichmann HE. Manual für die Planung und Durchführung epidemiologischer Studien auf dem Gebiet allergischer Krankheiten" was published in the journal Allergologie (Allergologie 1988;11:479-92). This manual was meant to be adhered to when studies in the field of asthma and allergies were being planned and developed, and research proposals being written.

My involvement in the writing of this manual in the years 1987 to 1988 acquainted me with the field of asthma and allergic disease epidemiology, which I had touched only sporadically, previously. Before, during and after the publication of this manual I had worked in the field of cardiovascular epidemiology and prevention and in the field of occupational epidemiology, and have continued to do so since.

In 1989 Stephan Weiland applied for a job at my institute in Bochum. He was a young physician from Cologne who had just returned from McGill University in Montreal with a Master of Science degree in epidemiology, but no practical experience in epidemiology. He expressed an interest in pediatric epidemiology and this coincided with the BMBF`s official announcement of a comprehensive research program on asthma and allergic diseases and a request for proposals.

Stephan started working at my institute in January 1990 and we decided to apply for a research grant from this BMBF program. As we were rather ignorant about asthma and allergies we decided to travel to London and see Ross Anderson and David Strachan at St George's Hospital Medical School. We received a warm welcome by Ross and David, who put aside. a full working day for us and informed us about all they knew about asthma and allergic disease epidemiology. (Bonnie Sibbald informed us about the epidemiology of rhinitis). Coming from the German university system we were quite surprised how well we strangers from Germany were treated.

On our return to Bochum we were full of new ideas and had a good feeling that we might be successful in developing a grant proposal. One request of the BMBF program was that we should get together with other research groups in Germany and develop a collaborative research program. Following this line we contacted a number of interested colleagues in Germany but our major interest was to stay in close contact with international groups. From Ross and David we had learned about research initiatives in Auckland, New Zealand, and from my 1986 sabbatical in Chapel Hill, North Carolina, I knew Neil Pearce from Wellington and his interest in asthma research.

In light of my 10 year experience with the World Health organisation`s MONICA (Monitoring trends and determinants in cardiovascular disease) project we planned for an international workshop with the title " Monitoring Trends of Asthma and Allergies". This workshop took place in Bochum on December 2-5, 1990 and was funded by the BMBF. The research groups from London, Auckland, Wellington and Bochum and additional groups from Germany were well represented. Stephan Weiland wrote the minutes of this workshop and they formed the basis for further developing our ideas and planning for the next international workshop with the title " Monitoring Trends of Asthma and Allergies in Childhood" which again took place in Bochum one year later, namely from December 8-11, 1991. This time the Institute of Social Medicine and Epidemiology of the Ruhr Universität Bochum funded the workshop which was instrumental in choosing the target population, namely children and adolescents, discussing the study design and protocol and the data collection instruments, thus laying the foundation for the worldwide International Study of Asthma and Allergies in Childhood (ISAAC).

I have very good memories of those two December workshops in Bochum, not only because of the wining and dining, but also because participants were very open and positive and because there were excellent presentations and a lot of fruitful discussion which helped producing the ISAAC protocol (Manual) with the written and video questionnaires in 1992.

In the same year a pilot study was started, comprising populations of 12-15 year olds in Wellington (New Zealand), Adelaide and Sydney (Australia), West Sussex (England) and Bochum (Germany). The results of this pilot study were published in 1993 in the European Respiratory Journal under the title "Self-reported prevalence of asthma symptoms in children in Australia, England, Germany and New Zealand: An international comparison using the ISAAC written and video questionnaires." Eur Resp J 1993;6:1455-1461. A year later the pilot study data from Bochum served for another paper with the topic "Self-reported wheezing and allergic rhinitis in children and traffic density on street of Residence", published in Ann Epidemiol 1994;4:243-247.

In the beginning of 1993 I moved from the Ruhr Universität Bochum to the University of Münster and again built up an Institute of Epidemiology and Social Medicine. Stephan Weiland followed me to Münster, enabling us to continue our work with ISAAC. For ISAAC Phase One we established two study regions in Germany, one in the city of Münster (northwestern part of Germany) and one in Greifswald, which lies in the northeastern part of the country. The irony of the ISAAC story is that we started out in Bochum to develop a research proposal for the

BMBF to receive funding for a collaborative asthma study in Germany. However, our international contacts and the two workshops in Bochum helped to pave the way for the worldwide ISAAC Study; the original intention tostart a Verbundprojekt in Germany (Collaborative asthma study in Germany) materialised only in the mid 1990's, when we established study sites and regions in Dresden and Munich, loosely connected also to the study in Leipzig. The Verbundprojekt targeted 10 year olds and unlike ISAAC Phases I and III incorporated clinical measurements and blood samples, thus helping to create ISAAC Phase II.

The origins of ISAAC: a New Zealand perspective

(Innes Asher)

Origins of ISAAC - New Zealand perspectives

New Zealand started focusing on asthma in earnest in 1979 when it became apparent that a new epidemic of asthma deaths had arisen in 1977, affecting New Zealand more than any other country. This stimulated a range of programmes of research exploring the reasons for this epidemic starting with a prospective national asthma mortality study which confirmed the epidemic. A focus on admission to hospital for asthma found that these were increasing dramatically in New Zealand, Australia, The United Kingdom, Canada and USA and the highest rates were in New Zealand children.

Although deaths from asthma among children are relatively uncommon, the escalating admission rate combined with anecdotal reports of increasing severity, awakened a great deal of interest in finding out more about the prevalence and severity of asthma in New Zealand children, and comparisons with other countries. There had been a few previous childhood asthma prevalence studies in New Zealand, and none used identical methods, so comparison between centres and over time were limited. This led to the design of a study of asthma prevalence in children using standardised methods in centres across countries - Auckland, New Zealand and Belmont and Wagga Wagga, New South Wales, Australia - one of the first international comparison of asthma prevalence using standardised methods. The prevalence of current wheezing and bronchial hyper-responsiveness (using an abbreviated histamine challenge) did not differ between Auckland and Wagga Wagga, but the rates were lower in Belmont.

The finding of little difference in prevalence of asthma between New Zealand and Australia, combined with continuing concern about the possibility of a higher prevalence of severe asthma in New Zealand led our interest in developing a study to explore international differences in severity of asthma in children using standardised methods. Hospital admission rates were available for some English -language countries and showed international differences, but that may have reflected variations in provision or use of health services. Both hospital admissions and mortality rates could not be interpreted easily without better information on prevalence and severity.

During 1990 I contacted centres in Australia, Canada and the United Kingdom about collaborating on an international study of the severity of asthma in children. The concept was to use the "core protocol" approach to the asthma questionnaire developed by Ed Mitchell, Colin Robertson and Ross Anderson in London 1988. The concept of simple but standardised tools designed for widespread use (and based on questionnaires, rather than measures such as bronchial hyperactivity) was accepted, and the questionnaire was further developed. By 15 September 1990 investigators in eighteen centres in five countries were committed in principle to the project: Australia: Melbourne, Sydney, Perth; Canada: Gainesville, Seattle, Tucson; New Zealand: Auckland, Christchurch, Dunedin, Hastings, Nelson, Wellington; United Kingdom: Cardiff, Edinburgh, London, Southampton; USA: Hamilton and Saskatoon.

We were awarded a grant from the Health Research Council of New Zealand (HRCNZ) on 29 November 1991 to compare the prevalence and severity of childhood asthma in two age-groups of children both between countries and within New Zealand (by area and ethnic group). This covered fieldwork in Auckland, Wellington and Christchurch, a full-time data manager, and secretarial and computing support. The funding remained conditional upon at least one other centre outside New Zealand obtaining funds for a similar survey in their own centre. (On 1 April 1992 David Strachan of The Department of Public Health Sciences St Georges Hospital wrote confirming they had funding for a centre in southern England). The HRCNZ funding was activated on 1 July 1992 and did not extend to future studies to assess time trends, nor to detailed investigation (by case-control studies) of aetiological and medical care factors (genetic, cigarette smoke, aeroallergens, pollution, infections, drug use, preventive care, management of acute attacks). Some concerns had been expressed by the Health Research Council about the validity of questionnaire-based- measures, including their reproducibility, correlation with BHR and validation between centres, particularly where translation was involved. There were also issues relating to the choice of centres within each country and the statistical effects of cluster sampling by school.

At about the same time Ulrich Keil and Stephan Weiland were developing ideas for epidemiological studies of asthma and allergic disease in Germany, including baseline surveys for future assessment of time trends. During the first Bochum meeting in December 1990, international comparisons were also discussed and a similar conclusion was reached about the desirability of a core protocol. The original Auckland proposal had focused on asthma, whereas the German interest also included allergies. At the same time Julian Crane and Neil Pearce introduced the idea of a video questionnaire to overcome cultural and linguistic barriers in ascertaining the prevalence of respiratory symptoms. In March 1991, the Bochum and Wellington groups met with Innes Asher in Auckland and the two proposals were merged. This was welcomed by all parties.

By the time of the Bochum meeting in December 1991 there were fewer than 30 centres in the world where the prevalence of asthma in children had been studied at all, and most had used different methodology.

The origins of ISAAC: a United Kingdom perspective

(Ross Anderson)

During 1990, an informal meeting was held at St George's Hospital Medical School, London, between ourselves and Colin Robertson. We discussed ideas for developing an asthma questionnaire which would include measures of severity which were relevant in children. Colin's interest and expertise related to the long standing follow-up study of wheezy children in Melbourne originated by Howard Williams in the 1960s. We drew on ideas from the surveys that had been completed in Croydon, south London, during 1978 and which we planned to repeat in 1991 to obtain information on time trends in our area. Specifically, the question about wheeze that caused difficulty with speaking had been validated in terms of hospital admissions for asthma in Croydon.

Later in 1990, Ulrich Keil and Stephan Weiland contacted us "out of the blue" requesting a meeting. They had made a day trip from Bochum to St George's and explained that there was a desire by the German Government for research into allergy and Ulrich was seeking expert advice on methods.

Ross had already had some contacts with a number of the Auckland and Wellington investigators. Neil had visited St George's to talk about the fenoterol studies. Innes had been to the UK with the results of her children's survey and in 1988 Ross had been a visiting lecturer at the annual Boehringer respiratory symposium. Thus, there was already the basis for collaboration between St George's and New Zealand.

At the end of 1990 was the first meeting organised by Ulrich at Bochum. Attending from St George's were Ross Anderson, David Strachan and Bonnie Sibbald. The meeting included several classic dialogues and debates between epidemiologists and clinicians over methods (diagnostic accuracy versus unbiased ascertainment; the need to consider allergic disease not just asthma) and beginnings of understanding that factors affecting prevalence in populations may be different from risk factors within populations. The meeting had difficulty in agreeing on details of questionnaires. Just as the discussion seemed to be going nowhere, David produced from his briefcase the draft questionnaire that had been developed between the St George's group and Colin earlier in the year. This put something on the table and helped to focus the discussions, at least concerning asthma.

Eventually the epidemiologists "won" on the principle of using symptoms (manifestational criteria) rather than doctor diagnosis for international comparisons. However, at this stage, we had very little independent validation of the specific questions. There was a natural tendency to promote questions that we had used in our own surveys. Examples which were eventually included in ISAAC instruments are the difficulty in speech question (Croydon), the frequency of attacks question (Auckland) and the video questionnaire (Wellington).

In retrospect, we think that one of the greatest mistakes was not to include, as core, some non-asthma respiratory questions such as cough and phlegm. This would have made the questionnaire a general respiratory one, not just an enquiry about asthma symptoms. (Within ISAAC UK Phase One, carried out in 1995, we added questions on cough and phlegm which proved interesting in relation to indoor environmental risk factors.) Indeed, there is still no general respiratory equivalent to the ISAAC asthma questionnaire, as has become apparent recently while Ross has been reviewing the air pollution literature for developing countries. The range of questionnaires used in published studies is considerable, which makes international comparisons and meta-analysis problematic.

The ISAAC Story

The origins of Phase Two surveys in Germany

(Erika von Mutius)

At the end of the 1980's, epidemiological studies were scarce in Germany. The prevalence of asthma and atopy was unknown, and risk factors have not been investigated in German populations. A colleague of mine, Thomas Nicolai and I designed a cross-sectional survey, enrolling all children in primary schools in Munich and the rural area around Munich. Since the potential adverse effects of air pollution were a major theme in these days, we wanted to compare prevalence rates between urban and rural areas. We designed questionnaires according to our clinical history taking approach and asked the children to perform spirometry and cold air challenges as well as to undergo skin prick tests as objective markers of disease. We had started the fieldwork in September 1989.

Then, in November 1989 the Berlin wall fell. Thomas Nicolai and I had always argued that West Germany was just not polluted enough to show adverse effects on asthma but that studies on pollution levels such as those encountered in the GDR would prove that there was indeed an effect. Such studies had been politically impossible until this time. With the sudden opening of the German border we thought that there was an opportunity. Through various contacts that were difficult to establish we found colleagues in East Germany, i.e. Hans-Heinrich Thielemann in Halle and Christian Fritzsch in Leipzig. These were wonderful people full of excitement and optimism for a better future and were willing to conduct the first East/West German study without any funding. We copied questionnaires in Munich, collected all our lung function equipment from the Munich survey and transported it to Leipzig. A colleague from North Germany, Professor Helgo Magnussen sponsored a cold air challenge device, and we instructed the colleagues in Leipzig to perform exactly the same study as in Munich, with the exception of skin prick testing which we could not afford. The statistical team at GSF in Munich entered the data and performed the statistical analyses. We were rather incredulous when we saw the results, which indicated less asthma and hay fever in polluted Leipzig as compared to Munich. In fact, we discussed whether the data needed to be re-entered.

Meanwhile, Stephan Weiland had appeared on my scene. Stephan had trained in epidemiology at McGill and upon his return he had a dream. Like the big cardiovascular MONICA study he wanted to establish a large survey for asthma. Ulrich Keil had contacts with David Strachan and Ross Anderson in London and Neil Pearce in Wellington, New Zealand. Stephan invited them to Bochum for a meeting - the first meeting of what would become ISAAC, the International Study of Asthma and Allergies in Childhood. This meeting on a grey December day in 1990 at the University of Bochum was decisive. ISAAC was born! At this first ISAAC meeting I met Fernando Martinez who had come as a substitute for Ben Burrows from Tucson, Arizona, USA.

Later I showed Stephan our first East/West German findings from Leipzig. He immediately understood the impact and offered to help write the paper as he was fluent in English after his fellowship whereas I was struggling with this foreign language. Stephan also strongly recommended that I should leave for a fellowship to the US or Canada. Given that Fernando was the only American I knew and that he had impressed me at the first ISAAC meeting, I asked him if I could come for a fellowship to work with him. At the second ISAAC meeting one year later he confirmed that I would become his first fellow. Meanwhile, the political landscape in Germany was strongly in favour of collaborative studies between East and West Germany. Stephan and I applied for a second survey in Halle and Leipzig, East Germany, to include skin prick testing to corroborate the questionnaire data. The first ISAAC phase II study was performed in Halle, East Germany, and Munich, West Germany. In the ISAAC phase II study we corroborated the findings of the first study using skin prick tests and hypertonic saline challenges as the ISAAC protocol had recommended. We had also developed a large and comprehensive questionnaire, inquiring about the ISAAC core questions for outcome definitions and a number of environmental exposures. This questionnaire was then used for the further development of the ISAAC Phase II questionnaire.

The ISAAC Toolbox

Early in the development of the ISAAC study it became apparent that there were no widely accepted tools for international surveys of asthma prevalence in children. Although many questionnaires and measurement tools had been used successfully for epidemiological studies within a single centre, they were often heavily dependent upon the local patterns of clinical diagnosis and were therefore poorly suited for international comparisons. From the beginning, therefore, ISAAC developed its own epidemiological instruments, initially for asthma, but soon extending to questionnaires for other allergic conditions, and to objective measurements of bronchial hyperresponsiveness, allergic sensitisation and atopic eczema. This section charts the development of these tools, which are now widely used both within ISAAC and by other investigators.

The written questionnaire for asthma and wheezing

(David Strachan, Ross Anderson, Colin Robertson)

During 1990, an informal meeting was held at St George's Hospital Medical School, London, between Ross Anderson, David Strachan and Colin Robertson. We discussed ideas for developing an asthma questionnaire which would include measures of severity which were relevant in children. Colin's interest and expertise related to the long standing follow-up study of wheezy children in Melbourne originated by Howard Williams in the 1960s. We drew on ideas from the surveys that had been completed in Croydon, south London, during 1978 and which we planned to repeat in 1991 toobtain information on time trends in our area.

Two key concepts guided the development of specific questions. Firstly, the principle of using symptoms rather than diagnosis for international comparisons, and secondly, the recognition that there were several dimensions to asthma severity: frequency of attacks, intensity of attacks, and persistence of symptoms. Thus, a child could have only one or two attacks in a year, but if these were intense enough to result in admission to hospital, that would be considered severe. On the other hand, a child might be persistently troubled by wheezing but they or their parent might not recognise discrete episodes or attacks of symptoms.

At this stage, we had very little independent validation of specific questions, so there was a natural tendency to promote questions that we had used in our own surveys. Frequency of attacks of wheezing had been used in surveys in Auckland, and speech-limiting wheeze and sleep disturbance due to wheezing had been included in the Croydon surveys. The question about wheeze that caused difficulty with speaking had been validated in terms of its correlation with hospital admissions for asthma among 8-9-year-olds in Croydon.

It is important to note that the questions were selected because of prior experience with their use in English-speaking populations, with children mainly of primary-school age and with responses by the parent rather than by the child. Their adoption within the ISAAC core questionnaires led to their use in teenage children (self-reporting their own symptoms) and translation into many languages. Uncertainties about how reliably the written questions would perform in a different age group and in different languages and cultures led to the interest in developing a video questionnaire for administration alongside the written one. This is described in the next section.

The video questionnaire for asthma and wheezing

(Julian Crane)

The idea for the video questionnaire and for using video sequences in questionnaires came from my early research in the Tokelau Atolls. We conducted a couple of surveys in Tokelau on 2 out of the 3 atolls and during development of the questionnaires and their translation and back translation from English to Tokelauan and Tokelauan to English I was struck by problems around the term wheezing. It turned out, as in other languages, that the term for wheezing also had many other meanings in Tokelauan including shortness of breath and coughing. This led to quite a lot of difficulty of questionnaire preparation.

When I was actually in Tokelau we conducted our surveys through the schools and as Tokelauan was an entirely oral language and in fact while we were on the atolls was in the process of having its first grammar developed by a Norwegian linguistic anthropological group of researchers (that's another story), it was evident that in the school environment there were relatively few books but video tape recorders and many video recordings and indeed amongst the general, few books in anyone's houses but many videos and it was clear that much of the information that Tokelauans collected and learnt came from video recordings. That first gave me the idea that a recording showing wheezing with a good soundtrack might be useful.

We thus started to film asthmatic adults and children initially in the wards and in outpatients and occasionally in Accident and Emergency and started to develop sequences which included exercise, nocturnal coughing and wheezing and then more severe cases and then as you know we developed an initial version in which we did some validation work.

This was a group effort to validate the questions both against the written questions that had been developed for ISAAC and also against airway hyper responsiveness to methacholine. This process was actually led by Robyn Shaw, whom I am sure you will know, now a paediatrician at the Hutt Hospital, who was working with us as a Research Fellow at the time and I think she incorporated some of this into her MD thesis as well as the publications.

We undertook the validation here in schools and subsequently published that. Other people have of course validated various other aspects of the video questionnaire along the way. The video questionnaire, I think, at some stage won the TSANZ poster prize with some confusion as to whether it was a poster or an audiovisual presentation as we presented it on video screens at the poster site.

Subsequently when it was begun to be thought about to use it internationally there were issues of, for example having men and women exercising together which wouldn't be acceptable in the Islamic community and also that it was very European 'white' based. That led us to ask for sequences from various people. We received one from India, some from Chris Lai in Hong Kong and others and put together the final series of sequences that were used in the ISAAC study although as you know the European ISAAC was used first and then later we used the international version with the first sequence retained throughout all videos.

A number of groups around the world have used the video often in conjunction with the written ISAAC questionnaire and I did make two attempts to have funded a much wider development of the video concept given that I think using audiovisual presentation of symptoms could actually be very valuable in many different circumstances where the visual and or audio presentation might be most useful. For example, breathlessness I thought would be one, possibly distinguishing fits and faints and also in the assessment of sleep apnoea and snoring amongst others, however we never managed to achieve funding for this. I think this was a shame as video questionnaires would have been very useful for international studies.

The ISAAC video has been an interesting exercise and has provided some additional novelty in relation to the ISAAC studies.

Asthma alone, or asthma and allergies?

(David Strachan)

Originally, the Auckland proposal had focused mainly on asthma, whereas the German group had been asked by their Federal Ministry to develop a study of time trends and determinants of asthma and allergic disorders. A broader perspective was also considered to be relevant to the Auckland grant application, since allergen sensitisation, indoor allergen exposure and infant eczema were putative determinants of asthma occurrence and severity. At the second Bochum meeting, in December 1991, the aims of ISAAC were agreed to include studies of the prevalence and severity of asthma, allergic rhinitis and atopic eczema.

The challenge was to develop, within a tight timescale, questionnaire measures of allergic rhinitis and atopic eczema that were similar in style and length to those that had been piloted successfully for wheeze and asthma. The UK group (Ross Anderson, Bonnie Sibbald and David Strachan, with substantial advisory input from Hywel Williams, who later joined the Steering Committee) had prepared, in advance of the December 1991 workshop, draft questionnaires based on preliminary analysis of a national case control study in Britain to determine a minimum list of reliable criteria (symptoms and signs) for eczema. These followed the conventions set by the asthma questionnaires, by following the same time periods for enquiring about symptoms and by placing questions about diagnostic labels (hay fever and eczema) after enquiry about the relevant symptoms and severity measures.

Development of the rhinitis questionnaire

(David Strachan and Bonnie Sibbald)

Bonnie Sibbald, who was working at that time as an epidemiologist with Ross Anderson and David Strachan at St George's, London, had completed a population survey of rhinitis symptoms in south west London, with follow-up interviews and skin prick tests to define seasonal and perennial rhinitis and their relationship to aeroallergen sensitisation. The combination of rhinitis symptoms (sneezing, blocked or runny nose) with itching or watering of the eyes had the best predictive value for skin prick test positivity, and the questionnaire was therefore developed to include all these symptoms.

This was a study of adult respondents and some concerns were expressed about the generalizability of the results to children. However, at that time there was no comparable study of rhinoconjunctivitis in younger children, and it was felt that results for adults could be applied with caution at least to the teenage group. Two further issues which were resolved by discussion at the 1991 workshop were related to seasonality and severity of symptoms.

Whereas hay fever or other forms of seasonal allergic rhinitis have a characteristic monthly pattern within any given country, it was clear that for international comparisons it would be difficult to refer to a specific season without loss of standardisation in the questionnaire. Therefore, it was decided to enquire about the occurrence of rhinitis symptoms in each of the 12 months of the year, and leave the task of defining seasonality to the statistical analysts. In practice, little use has been made of the seasonality responses in the main ISAAC papers, partly because of concerns that they may be biased by the month of fieldwork, and partly because many of the centres who eventually took part in ISAAC were from tropical countries. On reflection, perhaps more use could be made of these data.

As there were no widely accepted measures of severity of rhinitis (allergic or otherwise), there was a lively discussion at the 1991 workshop about how to assess this. Neither sleep disturbance nor night waking were felt to be appropriate, and school absence due to allergic rhinitis was considered to be rare and probably culture-dependent. There was some debate about whether quality of life measures should be included at all, but in the end, it was agreed that a single question on interference with daily activities was justified as a simple severity marker. It was recognised, however, that there were no supporting data, in either adults or children, to validate this choice.

Development of the eczema questionnaire

(David Strachan and Hywel Williams)

Hywel Williams, a trainee dermatologist, who was working at that time as a Wellcome Trust Clinical Epidemiology Fellow at St Thomas's Hospital in London, did not attend the 1991 workshop but had been in close liaison with David Strachan over the preceding year as they collaborated on analysis of eczema data from 1958 British birth cohort study. Hywel was planning to do a study to look at the differences between eczema prevalence between London-born Afro-Caribbean children and those living in Kingston, Jamaica, as the main focus of his PhD, but found a complete absence of valid diagnostic criteria that could be used for epidemiological studies. Prior attempts at developing diagnostic criteria for eczema, such as the Hanifin and Rajka criteria, were based on empirical grounds by a group of experts working in secondary care settings. Whilst many of the proposed criteria had good face validity, many were poorly defined (eg tendency towards infections) and some were uncommon (keratoconus), and trying to determine the presence or absence of 33 minor features in an epidemiological survey was going to be quite impractical. It was this topic that was to become to the main focus of Hywel's PhD. He set up a UK working party of 16 leading dermatologists to try and identify a minimum list of reliable discriminators for diagnosing a typical case of eczema. The aim was to develop a much smaller list of diagnostic features that could be reliably ascertained by trained nurses in epidemiological studies, rather than criteria that were the exclusive domain of clinician experts in an outpatient setting.

The UK Working Party study included direct inspection of the skin among its diagnostic criteria, and although many aspects of skin examination were tested for in the national case control study, it became clear at an early stage that historical features such as a history of involvement of the skin creases was just as, if not more important than physical signs. Thus, the combination of itchy rash with flexural involvement had both high sensitivity and specificity for atopic eczema in the age range planned for ISAAC, and the specificity could be improved if the age at onset was less than 5 years. Although the age range of this UK study was wider than that proposed for ISAAC, this was the most relevant information available to guide the construction of an ISAAC questionnaire for eczema. The age at onset question was only included for the younger age group (parentally completed questionnaires), as it was considered unreasonable for teenagers to recall the age at which they had first suffered from itchy rash. Although the questions contained in the final set of UK diagnostic criteria for atopic eczema that appeared in1994 were not identical to those used in ISAAC, they were very similar. Around that time, empirical questions for another epidemiological study - the Avon Longitudinal Study of Parents and Children (ALSPAC) had been suggested by Dr. Clive Archer (a dermatologist at Bristol with an interest in eczema) in discussion with Hywel Williams, which included an element of chronicity of flexural symptoms. The establishment of the ALSPAC questionnaire at around the same time influenced the inclusion of the phrase "which was coming and going for at least six months" in relation to an itchy rash.

German allergologists and dermatologists who were present at the 1991 meeting were concerned that there were multiple expressions for "eczema" in German and therefore that translation might prove to be a problem. However, this argued in favour of standardising on a symptom-based definition. There was also concern that scabies could be a common cause of itchy rash in developing countries and had not been included in the UK case control study, a point that was subsequently partially addressed in later validation studies.

Night waking, which had been agreed as a measure of severity for wheezing and asthma, was a natural choice of severity marker for eczema given the frequent sleep disturbance to child and family due to scratching at night. In addition, a single question was included to enquire whether the itchy rash had ever cleared completely in the last year as a possible indicator of less severe or more transient eczema. However, this second question has not been used widely in ISAAC publications, which tend to concentrate on sleep disturbance as a measure of eczema severity.

The 1991 workshop also discussed briefly the development of a skin examination module for inclusion in objective surveys of atopic eczema. Subsequently, the development of the ISAAC Phase Two skin examination protocol followed closely the recommendations of the UK Working Party and further validation work by Hywel Williams, who joined the ISAAC Steering Committee in 1992.

In retrospect, it is reassuring to note the results of ISAAC Phase Two surveys have shown a high correlation between the prevalence of eczema determined by ISAAC core questionnaire and by skin examination, at least in 9-11-year-old children. This suggests that the idea of measuring eczema by questionnaire alone, which was controversial in the early 1990s, has a sound epidemiological basis.

Bronchial responsiveness

(Innes Asher)

In Phase Two objective measures related to asthma and allergies were developed. In December 1991 it was decided to have a module on bronchial responsiveness. At this time several methods were being used, and there were pros and cons to each. In December 1993 an ISAAC Airway Responsiveness Satellite Workshop was held in Auckland, New Zealand to choose a method for Phase Two.

Attendees at the workshop were Sandra Anderson (Sydney), Innes Asher (Auckland), Tadd Clayton (Auckland), Julian Crane (Wellington), Philippa Ellwood (Auckland), Ed Mitchell (Auckland), Philip Pattemore (Christchurch), Jenny Peat (Sydney), Colin Robertson (Melbourne), Robyn Shaw (Wellington), Alistair Stewart (Auckland), Erika von Mutius (Munich). Apologies were received from Pierre Ernst (Quebec), Michelle Haby (Sydney), Alison Leversha (Auckland), David Strachan (London).

The meeting developed criteria on which to judge challenge tests. The greatest priority was given to ease of standardisation between centres, countries and cultures, reproducibility, safety, specificity, and availability of dose response information. Of a lesser priority were acceptance by parents, feasibility in all participating countries, costs, co-operation by children, state of knowledge concerning tests, and legality in participating countries.

The methods considered were cold air, PEFR variability, exercise challenge, hyperosmolar challenge, methacholine, and histamine.

Cold air challenge (-15 degrees C), 5% CO2 did not result in a dose-response, and equipment costs were high. Isocapnic hyperventilation was replacing this kind of test, but still no dose response.

Histamine was illegal for use with humans in Australia. There were probably insurmountable regulatory obstacles to the use of histamine and methacholine in New Zealand, USA and Germany.

PEFR variability had a number of disadvantages relating to effort, and use of asthma drugs.

Exercise challenge. There is a large experience with this test, which met most of the criteria. However the response to exercise challenge would be altered by variations in ambient humidity It is the absolute water content of the air that is the concern, given that a water content of >10mg/L will eliminate the exercise response.

The hyperosmolar challenge using hypertonic saline. This acts by rapidly altering the osmolarity of the airway surface liquid which causes mast cells to degranulate.A good test for current asthma. In school studies in Melbourne this test compared well with an exercise test. The ultrasonic nebulisation was not ideal, as time consuming and a bit cumbersome.

There was considerable discussion on the pros and cons of each method as a tool for ISAAC. The preferred option recommended was hypertonic (4.5%) saline challenge. The exercise test according to the Haby method was 'highly recommended'. If histamine or methacholine challenges were to be used for ISAAC then the Yan method was preferred.

Post script 2011: In future epidemiological studies dry powder mannitol would be a consideration – it is an hyperosmolar challenge which is safe and reliable, with individual capsules for dry powder inhalation. The only equipment needed is a laptop spirometer, the dry powder device and the capsules.

Measuring eczema by questionnaire and examination

(Hywel Williams)

Whilst questionnaires were attractive in their ease of application and low cost for making broad prevalence comparisons involving many thousands of children across many countries, concerns arose about the complete reliance on questionnaires due to potential problems in translating or understanding the concepts contained in the questions. Whilst many elements of the questions had been shown to have reasonable sensitivity and specificity when validated in UK community settings, it was possible that their performance was less good in other countries, where other itchy conditions such as scabies was more prevalent in the ages studied. ISAAC Phase Two, with its child contact module, therefore provided an ideal opportunity to examine the skin in a standardised manner.

One of the advantages of skin disease is that it is immediately visible - it is either present or not present, although visible eczema at one point in time in a condition that classically comes and goes will only provide a point prevalence which is typically lower than a 1-year period prevalence. By the time the ISAAC Phase Two modules were being developed, the UK Working Party's refinement of the Hanifin and Rajka diagnostic criteria for atopic eczema was completed in terms of development and community validation. The UK criteria included the one physical sign of "visible flexural dermatitis" which had been carefully constructed to only include those flexural sites that were helpful discriminators from other skin diseases such as contact dermatitis or lichen planus or scabies.

For the first time ever, a photographic protocol defining what eczema looks like, which sites could be deemed as being flexural at different ages, and what size or pattern of involvement could be deemed as a positive response was developed. The visible flexural dermatitis protocol was shown to be a reliable tool when used by trained nurses, and a set of training photographs and a set of quality control photographs were also developed for use in the public domain. Given concerns about the validity of questionnaire-ascertained eczema, it could be argued that the visible flexural dermatitis protocol used in ISAAC Phase Two offers the most objective method for standardising the eczema phenotype for a host of scientific studies given its freedom form language and or interpretation bias.

Development of Phase Two modules

(David Strachan)

The concept of developing objective tests for asthma and allergy was discussed in outline at the first Bochum workshop (December 1990) and at the second workshop, one year later, it was decided that a series of self-contained “modules” would be desirable. Bronchial hyper-responsiveness, serum IgE, skin prick tests, skin examination, and a questionnaire about medications & health services were discussed at this time. The following year, at the Steering Committee in London, the list was extended to include supplementary questionnaires about risk factors and other respiratory symptoms.

Work on the modules continued through 1993 to 1995, including a special workshop on bronchial responsiveness testing, described in a separate section. As much of the attention within ISAAC at this time was on the expansion of Phase One, the main stimulus to finalise the measurement protocols came from the Germans (Stephan Weiland and Erika von Mutius) who planned comparative studies of 9-11-year-old children in former West Germany (Munich) and former East Germany (Leipzig and Dresden) starting in 1995.

Although the risk factor questionnaire underwent some changes after the German fieldwork, the protocols were essentially fixed at this time, and after their successful implementation in Germany the modules were printed as a bound volume in 1998. The measurement modules were summarised in the Phase Two methods paper, published in 2004. By the time of that publication, 30 centres in 22 centres had used combinations of the modules and contributed data to the ISAAC Phase Two Data Centre, which moved with Stephan Weiland from Münster to Ulm in 2002.

The Phase Three risk factor questionnaire

(Ed Mitchell)

The aim of the Phase Three risk factor questionnaire (often referred to as the "Environmental questionnaire") was to achieve individual level data which would be novel because of the scope of the questions and the scope of Phase Three. A list of variables of potential interest was developed in June 2000. This list included variables that could not be obtained by questionnaire, but were included to ensure that the item was explicitly considered. The main focus of the questionnaire was on the 6-7 year age group (completed by parents) with a briefer version for the 13-14 year age group (self completed).

The list of variables and the potential questions was discussed at the ISAAC Steering Committee meeting in October 2000 in Auckland. It was decided that a core questionnaire would be developed. Each question was developed to address a specific hypothesis. This was led by Ed Mitchell with Neil Pearce, Ross Anderson and Colin Robertson.

A month later the document "Environmental Questionnaire Instructions and Hypotheses" was produced for each age group (view 6-7 year document | view 13-14 year Document). The format was to provide a referenced argument for the specific hypothesis, the source of the question used (in many cases the question was developed by the Steering Committee), and a brief outline of the analysis (key outcome variable and potential confounders).

The questionnaire was produced in record time and was used by some centres early in the following year.

The Development of ISAAC

ISAAC started as a collaboration between mainly European and Australasian investigators but rapidly expanded during the mid-1990s to become a network covering all six inhabited continents (we have yet to recruit a regional co-ordinator for Antarctica!). This section charts the development of this worldwide consortium and ends with some reflections on the place of ISAAC in the world of the 21st century.

The globalisation of ISAAC

(Neil Pearce)

Although ISAAC was started by research groups based in New Zealand, the United Kingdom and Germany, it was recognised from the start that it was important that the study be conducted on a truly global basis. The major contribution of epidemiology to the study of chronic diseases such as cancer and cardiovascular disease has arisen from studies at the population level, including analyses of patterns of disease prevalence and incidence across demographic groups, geographic areas and across time periods ("person, place and time"). For example, it was in the 1950s that it was first realised that colorectal cancer rates were high in Europe and low in Africa and this gave rise to hypotheses about the roles of fruit and vegetable intake and dietary fibre; similarly, it was realised that liver cancer rates were high in Asia, and this led to the discovery of hepatitis B as the major risk factor for liver cancer worldwide; more recently, international and regional comparisons in cervical cancer rates gave rise to the hypothesis that an infectious agent may play a role, eventually leading to the discovery of human papilloma virus (HPV) as the major risk factor for cervical cancer.

In contrast, prior to the ISAAC study, such standardised international comparisons had not been done for asthma - with the exception of the European Community Respiratory Health Survey, which had mainly been done in Europe. In fact, a huge amount of funding had already been spent on studying the "known" causes of asthma in affluent countries (e.g. air pollution, allergen exposure), but little was known about whether such risk factors were important globally. It was therefore decided, from the outset, to make ISAAC into a truly global study. This required that the study used simple inexpensive validated methods that could used anywhere in the world – a requirement which led to the splitting of the study into Phase I (which could be done anywhere) and Phase II (which would only be done in selected centres and countries). It also required that the ISAAC Steering Committee be truly global, and this was achieved by creating positions for Regional Coordinators.

The recruitment of Phase One regional co-ordinators

(David Strachan)

At the time of the London Steering Committee meeting in December 1992, ISAAC officially consisted of only 4 centres from 2 countries. Just two years later, 107 centres from 42 countries had been recruited, and by the end of 1995, the Auckland Data Centre had received Phase One data from 110 centres. This remarkable expansion and successful completion of fieldwork relied critically upon the identification of able and willing regional co-ordinators around the globe. It was they who put the "I" into "ISAAC"!

The 1993 Steering Committee meeting was held in Geneva and followed by a meeting with representatives of the World Health organisation who had expressed an interest in ISAAC. This early interest from WHO led to the definition of ISAAC regions along the lines of WHO regions. However, in retrospect, it was not these official channels so much as personal contacts which led to the establishment of an effective network of regional co-ordinators (and, later, national co-ordinators) within ISAAC. In particular, during a period of sabbatical leave during 1993-4, Richard Beasley played a key role in promoting the concept of ISAAC outside of Europe and Australasia.

By the time of the 1994 Steering Committee meeting, the basic framework of ISAAC regional co-ordinators had been established, with attendance by:
Gabriel Anabwani (Africa: 4 countries, 4 centres participating in Phase One)
Bengt Björkstén (Northern & Eastern Europe: 5 countries, 5 centres)
Chris Lai (Asia-Pacific: 10 countries, 19 centres)
Fernando Martinez (North America: 2 countries, 3 centres)
Steve Montefort (Eastern Mediterranean: 5 countries, 6 centres).
The original ISAAC partners were represented by: Innes Asher (Oceania: 2 countries, 10 centres) and Ulrich Keil (Western Europe: 6 countries, 32 centres).

The following year, Javier Mallol (Latin America: 8 countries, 8 centres) was able to attend the Steering Committee meeting in Barcelona, and there was welcome news that Jayant Shah had recruited 21 Phase One centres in India. Jayant Shah was unable to attend the Steering Committee meeting in person until the October 2000 meeting in Auckland, by which time co-ordination of the African region had been split between Anglophone Africa (Joseph Odhiambo) and Francophone Africa (Nadia Aït-Khaled).

The network of regional co-ordinators remained remarkably constant throughout the last 15 years of ISAAC, and this organisational stability no doubt contributed to the smooth and successful implementation of Phase Three, both in the original Phase One centres and in new locations. In recognition of the expansion of ISAAC outside of Australia and New Zealand to Pacific island nations, Sunia Foliaki was appointed regional co-ordinator for Oceania, replacing Innes Asher, for Phase Three.

The globalisation of ISAAC Phase Two

(David Strachan)

In contrast to Phase One, where globalisation was driven by the enthusiasm of regional co-ordinators, recruitment of Phase Two study centres followed a less structured approach. The original concept of Phase Two was to study in greater depth centres with diverse prevalences of asthma or allergy, as defined at Phase One, but this aim was never fully realised. Principally, this reflects the greater demands, both financially and logistically, involved in completing Phase Two fieldwork.

In the late 1990s, as the methods of Phase Two had been finalised, it appeared that it might become very largely a European study, and a small European Union Framework Programme 4 grant was awarded to create a "network of excellence" among the ISAAC centres in Europe. This later bore fruit in the form of a more substantive EU FP5 grant which supported the centralised analysis of data, serum IgE, dust and DNA from EU centres in Phase Two.

Phase Two fieldwork in many lower-income countries was supported by a partnership with another centre in a higher-income country. Examples include Albania, Ecuador and Ghana (partners with the UK), Estonia and Latvia (partners with Sweden), and centres on mainland China (partners with Hong Kong), These partnerships allowed some transfer of knowledge and expertise, and contributed to standardisation of methods across study centres.

In retrospect, the original plan to select Phase Two centres on purely scientific criteria based on the Phase One findings was perhaps too optimistic. As it turned out, there is considerable heterogeneity of asthma/allergy prevalence across the centres that were included and this has led to more informative between-centre analyses of symptom combinations and risk factor associations.

The incomplete overlap between the network of Phase Two centres and those involved in Phases One and Three has limited the extent to which the results from Phase Two can supplement and inform the Phase Three comparisons. Nevertheless, Phase Two has achieved its original aspiration to perform objective tests of asthma and allergy in diverse populations around the world.

ISAAC in the context of other European initiatives

(Bert Brunekreef)

As with any good story, the ISAAC story must be one that's rich, multifaceted and having all sorts of twists and turns. I'll add a few of my own.

When ISAAC got started in the Bochum workshops, we had just completed a few fairly large respiratory symptom questionnaire studies among primary school children in the Netherlands. I say 'we' because there were two parallel activities, one based in the University of Wageningen where I was at the time focused on environmental determinants of respiratory disease in children – and one led by Bert Rijcken in Groningen, which was more focused on the use that school health services might have from respiratory symptom questionnaires in their daily practice. When we got invited to the second Bochum workshop, none of us could go but we sent a junior colleague, Bernard Groot, to find out what was going on at the time. We then decided we were unlikely to get funding for yet another series of symptom questionnaires, and that we better wait for an opportunity to join a phase two study if that was ever going to happen. Fairly soon after that, Bert (the other Bert….) made the brave decision to leave science to become an artist, and we in Wageningen became more and more involved in studies of outdoor air pollution.

I think it was in 1992 that I met a young German epidemiologist, Stephan Weiland, at the annual conference of the International Society of Environmental Epidemiology in Cuernavaca, and we got to talk about the interesting work that he had been doing on proximity to traffic and respiratory problems in kids. A few years later I was giving a speech on air pollution at our National Institute of Public Health and the Environment in which I briefly quoted one or two of those traffic studies. In the break, a man working for the province of South Holland came up to me and asked whether I was interested to do a study on proximity to freeways and respiratory health in children. Hs argument was that more and more homes and schools were being built near freeways (yes, it's a small country, and space is precious….). We got some talented students involved in what was really a pilot study, but we did manage to include objective measures of air pollution exposure and respiratory health, and we found a fairly striking relationship between truck traffic density on the nearest freeway and lung function in the children we tested. That study stimulated our government to fund a much larger study on the topic, at a time when in Germany, the first ever ISAAC Phase two study had just gotten underway. I felt that the time was now right to try and jump on the ISAAC train and I contacted Erika von Mutius and Stephan to ask them whether they would be willing to let us use their protocols and apply those in our Dutch studies. Both were extremely helpful, and after a few visits to Muenster where Stephan and Ulrich Keil had moved at the time we were ready to launch our own ISAAC II study, focused on the role of traffic pollution in explaining variations in respiratory health among school kids.

Meanwhile, a concerted action had been launched in Europe led by David Strachan, and aimed at further cementing collaboration of ISAAC centers in Europe, including some work on serology and mite allergen determinations which we had going at the time. (For those of you not from the EU, the EU has a staggering variety of funding instruments, and 'concerted actions' are primarily meant to allow research groups to get together to discuss areas of mutual interest, without funding actual research). If my memory does not fail me too much, this action laid the ground work for a successful application for the ISAAC Phase II study which was coordinated by Stephan between 1999 and 2003 or so. We were privileged to be part of that effort with contributions from our own study population, and from our lab doing dust allergen and endotoxin analyses for all partners, and the harvesting from that seminal effort continues to this very day.

Then in 2003, Stephan asked me whether I would be willing to become part of the ISAAC steering committee, and I was truly honored to accept. It took me a while to actually get to the meetings but since 2005 I've missed only one, and they have been very enjoyable experiences indeed.

The ISAAC Story

In 2006 and 2007, we were getting ready in Europe to propose a large scale study of the effects of long term exposure to air pollution on a variety of health outcomes, and Stephan was an enthusiastic and active member of the preparatory team to get this up and running. We met in early March 2007 in Barcelona to hammer out the last details of the proposal, and I will always remember with great sadness the day, just a few weeks later, that Gudrun Weinmayr called me in tears to tell me that Stephan had suddenly died. I couldn't believe it. He was extremely fit, running marathons, and less than a year earlier I had accompanied him on a one hour plus jog at a meeting in (I believe) Salzburg which we both were attending. It just did not (and does not) feel right that somebody so talented and vibrant would all of a sudden be taken away from us and (more importantly) from his wife and small children.

But then life, including ISAAC's life, goes on. ISAAC made it to no less than 20 years, and to a great many achievements for science and society. I am extremely grateful to be part of it, and to have been able to make a few modest contributions.

January 2011, Auckland – Kuala Lumpur, Bert Brunekreef

ISAAC in the 21st century

(Carsten Flohr)

We joined the ISAAC Steering Committee only a few years ago to complement its expertise, at a time when the study was already well under way. At its outset, the world of allergy and its needs was very different from what is required now. Even simple prevalence data was scant. There was also a lack of validated and standardised tools that could be used in large population-based surveys, and there certainly was no world map of the burden of allergic disease. All of this was already delivered in Phase One. In Phases Two and Three we have been able to look at individual risk factors of allergic disease (Phases Two and Three) as well as providing further prevalence data to look at trends (Phase Three). Part of this work is still underway.

Apart from its sheer size, the strength of the ISAAC data set is that it provides information on risk factors in developing countries, where allergic diseases have been only occasionally studied rare commodities until recently. As more and more populations adopt a western lifestyle in the 21st century, especially in urban centres of less affluent nations, ISAAC can make a contribution to the identification of key risk factors that drive allergic disease with the ultimate promise to aid disease prevention. For instance, we will seek to find the main environmental risk factors that explain the significant prevalence differences between ISAAC study centres. Another important area of interest is the impact of climate on allergic disease, and for this ISAAC prevalence data could be used in combination with satellite information. Furthermore, we need to study the lifestyle ingredients responsible for urban-rural prevalence and severity gradients as well as the influence of diet (mother and child), obesity, indoor and outdoor pollution. A lot more remains to be done!

(Gary Wong)

I have been involved in the ISAAC work ever since Phase I started many years ago. It has been one of the most wonderful research endeavors that I have been involved through out my career. The achievements from the ISAAC work are clearly great examples of the results generated by collaborators who truly worked together for their common goals.

Behind this massive collaboration, one of the important driving forces to push things forward is the ISAAC Steering Committee. Members are from different parts of the world and each of them provides his or her unique expertise such that appropriate and important research questions are generated. More importantly, they would challenge each other regarding how these questions should be answered with what sort of methodologies and analyses.

I had the opportunities to join a couple of Steering Committee meetings as an observer such as the ones in Kenya and Tonga. I finally came face-to-face to the people with their names on many papers that I have read. In most instances, meetings are not my favourite activities, but the ISAAC steering committee meetings are different. There are honest exchanges of opinion and all members have one common goal in mind that is to ask the right questions to reveal the truth. From the genuine discussion during these meetings, one could feel the passion of each member for the work they were involved in. I was thrilled to have the opportunity to join this big family when I was invited to become one of the members in this Committee.

The ISAAC research network has provided answers to many of the questions that the research community has asked in the past 2 decades. Now, we have a lot more data with regards to the global variations and trends of asthma and allergies in childhood. What are the next important research questions in asthma and allergies? How can such large collaborative network help to answer some of these questions? These will be the biggest challenges for the ISAAC Steering Committee in the 21st century.

The global context of ISAAC in the 21st century

ISAAC has been the subject of positive editorial comment in the International Journal of Tuberculosis and Lung Disease, the leading voice of respiratory disease in developing countries, for its unique role in fostering research and critical thinking[1]. They state "ISAAC is a model that should be followed by all those of us who are committed to improving public health in low-income countries." ISAAC uses a simple framework which enables standard measures and comparisons across geographic, cultural and linguistic boundaries which means it can be carried out relatively inexpensively, making it particularly suitable for use in developing countries and allowing "truly global participation". This inclusive and encouraging approach has resulted in ISAAC becoming the largest study of its kind.

As stated by the Commission on Health Research for Development, ". . .for the world's most vulnerable people, the benefits of research offer a potential for change that has gone largely untapped". Such research is essential to improve public health globally and equitably. A major barrier to achieving this is a lack of confidence of health care workers to involve themselves in research. ISAAC has addressed this obstacle and produced a body of knowledge that informs policy. The World Allergy organisation has reported that "studies such as ISAAC are a major step toward overcoming barriers to the worldwide diagnosis and treatment of asthma"[2].

ISAAC has established worldwide networks with organisations concerned with health in developing countries such as The International Union against Tuberculosis and Lung Disease (IUATLD) and the World Health Organisation (WHO). The ISAAC program is the only global study of paediatric asthma and allergy currently in existence and there is a clear and vital need for it to continue. ISAAC findings are cited by any organisation involved in monitoring and preventing CRD's and are used to inform global health initiatives which include WHO, and its NGO the Global Alliance against Chronic Respiratory Diseases (GARD). ISAAC publications are included in the "GARD Basket", a package of information, offered to countries by WHO to assist policy decisions relating to CRD's[3].

1. Enarson D. Fostering a spirit of critical thinking: the ISAAC story. Int J Tuberc Lung Dis 2005;9:1.
2. Pawankar R, Baena-Cagnani CE, Bousquet J, et al. State of World Allergy Report 2008: Allergy and Chronic Respiratory Diseases. World Allergy Organisation Journal. 2008(Supplement 1):s4-s17.
3. World Health Organisation. Global Alliance against chronic respiratory diseases (GARD) basket: a package of information, surveillance tools and guidelines, to be offered as a service to countries. Geneva: World Health Organisation; 2008

The ISAAC Story

ISAAC International Data Centres

The success of ISAAC as a worldwide initiative has depended upon efficient co-ordination and communication. It has also benefitted greatly from central collation of data for checking and statistical analysis. This section includes reflections from the ISAAC International Data Centre team in Auckland, New Zealand who played these roles for Phases One and Three, and from the ISAAC Phase Two International Co-ordinating and Data Centre in Ulm, Germany.

Phase One and Three (Auckland)

(Tadd Clayton)

The ISAAC data centre in Auckland (now known as the ISAAC International Data Centre [IIDC]) was established in 1992-3 with the appointments of Philippa Ellwood and Tadd Clayton in the Department of Paediatrics. The main tasks in the early years of the IIDC were to carry out the quality assurance checks of the data submitted by the Phase One centres, and to review the study methodology used by each centre to identify any cases where centres had failed to follow the ISAAC protocol. Philippa also had an important role in carrying out the data collection for the Auckland Phase One centre and providing support to the field workers in the other New Zealand Phase One centres.

Following the completion of these tasks for most Phase One centres, the IIDC had an important role in the analysis of Phase One data, preparation of data tables, maps and graphs, and preparation of papers for publication. The IIDC also had a similar important role in the preparation of the Phase One ecological analysis papers.

From 1999 the IIDC began to again receive data from the ISAAC Phase Three centres. Similar data and methodology checks were carried out for the Phase Three data. The greater participation in Phase Three meant that these checks did take a longer period than for Phase One and the preparation of publications presenting the Phase Three data did not begin until 2005. Since then the data centre has again been working to analyse and present the Phase Three data. Phase Three also included an environmental questionnaire and there has been a significant further effort required to analyse and present that data.

Phase Two (Ulm)

(Gudrun Weinmayr)

In 2001 I listened to the talk given by Stephan Weiland in the course of his application to the Chair of Epidemiology in Ulm - without the slightest idea that the project he presented would become my main research interest for the years to come. In fact I was at the very beginning of transforming a zoologist into a Master of Public Health i.e. in my first year of the 2-year-course in Ulm. The first implication for us was that we would have a new professor in epidemiology who finally arrived in the end of 2001. In my second year, in February 2002, I joined the data centre in Ulm and got very soon to love the work in this international study appreciating deeply this worldwide diversity.

My knowledge of asthma and allergies – and of epidemiology - still had to develop. This first phase in Ulm was characterised by the moving from Münster to Ulm and the build-up of the department where on arrival just two technical staff were present. In Münster, Peter Rzehak and others had already developed a detailed coding and data transfer manual as well as a data check routine including the corresponding SAS-programs. The first centres had already sent their data but the main bulk was still to come. All this was moved to Ulm and for us, the Ulm-staff, in the beginning looked like, as you say in German, a “book with 7 Seals” - a riddle wrapped up in an enigma. The magical crystal ball was the “backup of Bernd’s Computer” where supposedly everything was to be found – if you just knew where… Peter introduced me to all this work that was completely new to me and together we continued and were joined in July by our new secretary Clarissa Schönle and in October 2002 by data manager Claudia Pilz (now Dentler) and my fellow student Gisela Büchele. With her extensive past experience in biometry she had developed during her Master’s thesis the procedure on how to analyse the ISAAC bronchial hyperreactivity (BHR) data. She joined us as the BHR-expert additionally bringing in also a strong experience in data management.

In Autumn 2002, organised by Clarissa, we held the ISAAC Phase Two Meeting with representatives from all study centres. It was a very informative and productive meeting and at the same time the exciting opportunity to get to meet all these people you just previously knew from e-mail exchange.

It took about another two years of solid and devoted work to compile the international data set and bring it into a form that could be reliably used for data analysis. In parallel, we had been developing statistical analysis tools to deal with the complexities of the data set, in particular the weighting procedures to take account of the stratified sub-sample used in Phase Two, and to incorporate all these particularities into SAS-Macros to allow the efficient analyses of the numerous centres.

So in 2004 just in time for the final report for the part of the project that had received funding from the EU, we could finally do the first analyses. With these first results we convened the first Meeting of the Phase Two Publication Group which at the time consisted of Stephan Weiland, Erika von Mutius, Bengt Björkstén, Bert Brunekreef, Bill Cookson, Francesco Forastiere and David Strachan. On this Meeting the outline of the publications to follow was developed. Work started with the publication round looking at the association of atopy with the disease outcome – the asthma paper being the first one to be developed fully but also being fuelled at the same time by discussion on the other papers – in collaboration with Hywell Williams and Carsten Flohr, at the time Hywell’s PhD-student, for the eczema paper and with Francesco Forastiere for the rhinitis paper.

Auckland Data Centre

Ulm Data Centre

This was the time when we realised the full importance of the nonatopic part of disease and as well the concomitant variation of the association atopy-disease in the international context that seems to be in part related to the state of affluence of the country.

In the mean-time changes occurred at the data centre: Claudia and Peter left in 2004/2005 and we were joined by Andrea Kleiner for data management, programming and performing statistical analysis and by Gabriele Nagel, a MPH with a medical background who had previously worked with EPIC.

Analyses continued, mainly with the three above papers, the corresponding paper for BHR, and Gabriele starting to look at the influence of breastfeeding on asthma. Also initiated were the Genetics analyses with mainly Jill Cantelmo and Miriam Moffat to be joined later on by Jon Genuneit, a medical doctor that had joined a already during his training in Ulm - initially for his medical doctors thesis.

In February 2007 we got the good news that the asthma paper had been accepted by the AJRCCM – news that, very unusually, were celebrated in the library with a glass of Champagne and reflected all the "heartblood" as you sayin German, i.e. the high amount of passion and thought, that Stephan Weiland had devoted to this first scientific output of Phase Two. It was only a month later, after having read the first draft of the Rhinits paper, that he died completely unexpectedly on 19th of March. This shock deeply hit the whole department missing in addition to his excellent scientific guidance his enthusiastic and humane nature.

It left us with the desire to do our very best to continue this central piece of his work in his sense. In this endeavour we were wonderfully supported by the group and in particular by David Strachan who took over the role as Phase Two Coordinator. This helped us markedly not to only complete the work already started with Stephan Weiland but also to embark for new endeavours such as the round of overview papers sparked by Erika von Mutius during a discussion with David and the group in Ulm.

Communications within ISAAC

(Philippa Ellwood)

When ISAAC began in 1991, the Auckland centre was one of the first centres to commit to participate in ISAAC and undertake data collection. In 1992, I was appointed as ISAAC research assistant, responsible for the Phase One fieldwork in the Auckland region, which led to overseeing the national data collection for the six New Zealand centres. In 1993, Auckland was established as the ISAAC International Data Centre (IIDC) and appointed Tadd Clayton as Data Manager. In 1993 my responsibilities were expanded to become the IIDC Research Manager which involved coordinating the international centres and ensuring the fieldwork followed protocol. This involved an enormous amount of communication with the centres.

In Phase One the principle method of communication with the Principal Investigators was by fax machine. It is amusing now to reflect on the amount of time spent standing beside the fax machine sending the centre report to collaborators, almost holding one's breath in case the fax failed to send, (which it did on frequent occasions) and having to start all over again. Tadd also was an 'avid' user of the fax machine for his communications regarding the Phase One data checking and had similar experiences. When receiving documents back from the centres we would at times find pages missing due to failed fax attempts from the centres, which was as frustrating to the collaborators as to us in Auckland. As the fieldwork in Auckland was being undertaken I decided to document the methodology used to approach the schools and how it was undertaken in the schools. It became apparent that this information would be useful for other fieldworkers and these guidelines were subsequently circulated to the centres and made available from the ISAAC website (http://isaac.auckland.ac.nz/phases/phaseone/fieldguide/young.html). These have become a useful tool in assisting centres to follow the ISAAC protocol.

For Phase Three, the use of email had gained popularity and communicating with the centre Principal Investigators and collaborators became a lot less difficult. The centre report had been evaluated and was simplified for ease of understanding. This made it a lengthier document, so having email as the predominant mode of document transfer made life for the IIDC much easier (and less breath holding!).

The experience that Tadd and I have had communicating with the Phase One and Three Principal Investigators and collaborators has simply been a privilege. We have built up an amazing rapport with so many people, from so many different ethnically diverse communities. Due to the stability of the Data Manager and Research Manager, this rapport strengthened over time. With the ISAAC English language questionnaire having being translated into 53 languages, it would not be uncommon for misunderstandings to regularly occur. Although these did happen at times, usually about what the IIDC actually required, these were rare and very easily sorted out. It is humbling to have English as our primary language and have collaborators with English as a second language so enthusiastically embrace our language and have the determination to undertake the ISAAC fieldwork in their centre and to adhere to our documentation written in English. The international success of ISAAC is a tribute to the entire ISAAC worldwide collaboration.

(Tadd Clayton)

My communications with researchers were always concerning the checking of the data for its integrity, consistency and use of valid values. I prepared a report for each researcher on each version of their data which encouraged them to address as many of the unexpected features of their data as possible. The researchers responded to my reports, either providing a new revised version of the data, corrections for me to apply to the data or a statement that no further improvements were possible.

I would like to thank all of the researchers and the members of their teams who I have been in contact with throughout Phase One and Phase Three. Everyone has been extremely helpful and enthusiastic, as well as being patient with the occasional communication difficulty.

ISAAC Diary

ISAAC Timeline Milestones

Year	Month	Phase One	Phase Two	Phase Three	Other	World/Other events
1989						Fall of Berlin wall
1990	Dec	6-7 yr and 13-14 yr age gps decided Core methods: written questionnaire on asthma, rhinitis and eczema Video questionnaire on asthma likely Pilot study underway	Idea of lung function in 9-10 yr olds		First meeting	ECRHS began
1991					Name of The International Study on Asthma and Allergies in Childhood (ISAAC) suggested by Bonnie Sibbald in a London café, and adopted by the founders	
	March				Ulrich Keil, Neil Pearce and Innes Asher meet in Auckland Merged the German and New Zealand initiatives	
	Aug					First website put online at CERN (the first webpage had been developed several months earlier)
	Dec	Aims, written and video questionnaires agreed Sample size 3000, unit school Decision to have Steering Committee (Auckland, Bochum, London, Tucson , Wellington) and Data Centre, but each centre owning own data, and find its own funding Decision to publicise ISAAC, and publish ISAAC ISAAC Manual and brochure planned	Phase Two modules concept agreed Develop modules for BHR, serum IgE, skin prick tests, skin examination, medications & health services			Dissolution of Soviet union
1992	Dec	ISAAC Phase One Manual printed 90% participation of children the goal Coding manual prepared Brochure produced Announcement in Lancet 2 countries, 4 centres Contact WHO Avoid competing with European Paediatric Asthma Study (EPAS) Decision to try and engage some centres in all WHO regions Develop translation guidelines Central coordinating, library and data analysis centre in Auckland Regional coordinating centres National coordinating centres Need registration form Innes Asher appointed Chair with Ross Anderson Deputy Chair In preference use electronic mail (fax and email) Bimonthly newsletter Annual Steering Committee meeting Central funding required ISAAC now 2 countries, 4 centres Study to continue to run on a cooperative basis	Further development of modules for BHR, serum IgE, skin prick tests, skin examination, medications & health services, risk factors indoor and outdoor, other respiratory symptoms			
1993	April				First ISAAC newsletter	
	August	Phase One coding and data transfer manual printed				

Year	Month	Phase One	Phase Two	Phase Three	Other	World/Other events
	Oct	European Paediatric Asthma Study (EPAS) will join ISAAC Regional coordinators assigned in all developing country regions North America lukewarm because lack of central funding Registration document agreed Centre questionnaire developed Enlarged Steering Committee - original steering committee plus Regional coordinators plus Phase Two module leaders Executive formed Four levels – The Steering Committee, Regional coordinators, National coordinators, participating centres ISAAC regions decided Coordinating Dta Centre Auckland International version of the video developed, and the preferred version Translation guidelines formalised Coding and Data transfer manual Completed Data collection completed Data collection completed in 4 countries, 13 centres ISAAC Field work guide written by Philippa Ellwood				
	Nov	Pilot study published in ERJ				
	Dec	Second edition of Phase One manual printed	ISAAC satellite workshop on the airway reactivity module in Auckland, New Zealand Preferred option hypertonic saline Methacholine and histamine unacceptable as availability and ethical issues rule them out in many countries Exercise challenge not feasible as water content of atmosphere too high in many countries			
1994	Oct	42 Countries 107 centres recruited, collecting data North Am 2 countries 3 centres W Europe 6 countries 32 centres Asia-Pac 10 countries 19 centres Latin Am 8 countries 8 centres Franco Afr 1 country 1 centre Anglo Afr 3 countries 3 centres India 1 countries 21 centres East Medit 5 countries 6 centres N &East Europe 5 countries 5 centres Oceania 2 countries 10 centres Funding from Glaxo International Double entry of data Stop encouraging recruitment of centres, but accept them Clean data set by 1 Dec 1995 to be included in initial Phase One publications	Decided age group 9-11 yr olds Modules on blood spots, aeroallergen measurement Structure for Phase Two decided David Strachan Chair of Phase Two implementation committee			
1995	March	Phase One rationale and methods paper published in ERJ				
	Sept	Data received from 36 centres in 18 countries Data checking and management decided Double entry of data essential Epi info package for ISAAC created Approach to ecological analyses of Phase One being developed Authorship approach decided ISAAC at ERS – Erika von Mutius gave a presentation 20 Sept 1995 First collaborators meeting at ERS 1995	Phase Two centres to be identified by 1996 Phase Two modules being finalised German Phase Two studies begin			
	Dec	Data received in Auckland from 110 centres				

The ISAAC Story

Year	Month	Phase One	Phase Two	Phase Three	Other	World/Other events
1996	Sept	Centre report developed Participation rates of <80% (13-14yr) and 70% (6-7yr) decided Independent back translations required Published maps to be in colour and to include enlargement of Europe ISAAC region formerly known as EasternEurope/ Baltics will now be referred to as 'Northern and Eastern Europe', Scandanavian centre will be grouped with Western Europe	Confirmed hypertonic saline for BHR		ISAAC session at ERS	
1997	Sept					Domain name google com registered
	Sept	Data from 48 additional centres received A small number of centres need to be excluded Authorship guidelines refined further ISAAC Executive will be representation of 4 founding groups and at least one regional coordinator Three subcommittees of the Steering Committee – Phase two, Phase Three and Data and publications Ecological analyses planned in detail	Munster and Munich will coordinated Phase Two Stephan Weiland will be the contact person Hypertonic saline – children not required to inhale 23 ml of saline			
	Nov	First Phase One worldwide paper published				
						ECRHS2 began
1998	May		ISAAC Phase Two Manual printed		ISAAC website being developed	
	Sept	Several ecological analysis papers drafted		Phase Three is to assess trends in prevalence Other centres not in Phase One will be distinct Data collection 2000 -2002 Same methods as Phase One Slide sets for SC and collabrators	First ISAAC collaborators meeting	
1999						First publication describing low prevalence of allergy among children of farmers (Braun-Fahrländer)
	Jan	First 4 Phase One worldwide papers published				
	March		Phase Two training seminar in Münster			
	Oct		At least 1000 subjects	Grant received from Glaxo Wellcome Objectives broadened to three aims Add environmental questionnaire Regional coordinators confirmed Advertise Phase Three Clean data to be received by Dec 2002		
2000	July			ISAAC Phase Three Manual printed		
	Sept			$NZ500,000 received from GlaxoWellcome for Phase Three	Comparison with ECRHS published	
	Oct	Decision to put ISAAC Phase One summary data on website	Genetic analyses to be discussed	Environmental questionnaire piloted Expressions of interest in Phase Three176 from 83 countries (47 new centres)	ISAAC letterhead with names of all Steering Committee	
2001	Feb	First Ecological analysis paper published				
	Sept		EU funding for 15 centres in Europe Genetics analysis agreement developed 25 centres in Europe 11 centres in 8 other countries Data centre in Münster	EOI 226 centres from 99 countries (91 new centres) 123 registrations Deadline for clean data 30 November 2002 ISAAC Publication policy notified to journals	ISAAC will continue beyond Phases Two and three	
2002	Sept		Phase Two Steering Group formed Data centre moved to Ulm	226 registrations from 89 countries Publication plan and writing groups finalised for time trend and world map papers	Principle of 'no survey without service' – principle for Phase Four	

The ISAAC Story

Year	Month	Phase One	Phase Two	Phase Three	Other	World/Other events
	Nov 2002—Jul 2003					Severe acute respiratory syndrome (SARS) pandemic 774 deaths among 8096 cases
2003	Nov			226 registrations from 89 countries Data at IIDC 218 centres Translations subcommittee formed Data deadline from Phase Three A centres delayed to 31 Dec 2003 Phase Three B mid 2004		
2004	Sept		Phase Two rationale and methods paper published in ERJ		ISAAC symposium at ERS Glasgow, with ECRHS	
	Nov			286 registrations from 107 countries	Phase Four will be an interventions study Proceed with plans for Phase Five 2010—2012 Infant wheeze study EISL initiated by Javier Mallol	
2005	Jan			Phase Three rationale and methods paper published in Int J Tuberc Lung Dis		
	Oct					Nobel Prize for Physiology or Medicine awarded jointly to Robin Warren and Barry Marshall for discovery of Helicobacter pylori infection as a cause of peptic ulceration
	Nov			Data centre will not accept any more centres	Link to Asthma Drug facility established ISAAC Monograph planned	
2006						Mutations in the filaggrin gene identified as a risk factor for eczema GABRIEL study begins
	Sept			First time trends paper published		
	Nov				Phase Four is about education and advocacy	
2007	19 March				Stephan Weiland died unexpectedly	
	June		First Phase Two results paper published			
	Sept			Tables of first EQ results compiled		
2008	Jan				Redevelopment of ISAAC website	
	Sept			First EQ paper published		
	Oct				ISAAC Monograph will be web-based	
2009	Feb			First world map paper published		
	June					H1N1 influenza ("swine flu") declared a pandemic by the WHO
	Nov				ISAAC will finish in Dec 2012 if no funding for Phase Five ISAAC Monograph renamed ISAAC Story	
2010		Last Phase One worldwide paper published Phase One individual level data on website to PIs only		ISAAC summary data on website		
	May				ATS ISAAC presentation on global disparities in asthma	
	Dec				ISAAC Story being written	First EISL publications
2011	Jan				ISAAC 20 year Symposium in Auckland	

ISAAC Diary

ISAAC Timeline - Steering Committee meetings

Year	Month	Location	Activity	Who
1990	December 2-5	Bochum, Germany	International Workshop on Monitoring Trends of Asthma and Allergies	Anderson, Behrendt, Bergmann, Burr, Crane, Epstein, Frischer, Heilmaier, Hurd, Keil, Krämer, Martinez, von Mutius, Nowak, Pearce, Ring, Sibbald, Strachan, Wahn, Weiland, Wichmann
1991	December 8-11	Bochum, Germany	Second International Workshop on Monitoring Trends of Asthma and Allergies in Childhood	Anderson, Asher, Bergmann, Crane, Gergen, Groot, Habbick, Heilmaier, Hurd, Keil, Martinez, Pearce, Ring, Robertson, Sibbald, Strachan, von Mutius, Wahn, Weiland
1992	December 6-8	London, United Kingdom	Third International Workshop on ISAAC (Steering Committee meeting)	Anderson, Asher, Bauman, Beasley, Burr, Crane, Ernst, Hurwitz, Keil, Kremer, Landau, Langridge, Martinez, Pearce, Peat, Robertson, Schafer, Sibbald, Silverman, Strachan, Taylor, von Mutius, Warner, Weiland, Williams
1993	October 3-4	Geneva, Switzerland	Fourth International Workshop on ISAAC (Steering Committee meeting)	Anderson, Asher, Beasley, Martinez, Pearce, Strachan, Weiland WHO: Stober, Kjellstrom
1994	October 5-6	Nice, France	Fifth International Workshop on ISAAC (Steering Committee meeting)	Anabwani, Anderson, Asher, Beasley, Björkstén, Burr, Crane, Keil, Lai, Martinez, Montefort, Robertson, Stewart, Strachan, von Mutius, Weiland, Williams IIDC: Clayton NC: Charpin Other: Cropp, Persky
1995	September 15-16	Barcelona, Spain	Sixth International Workshop on ISAAC (Steering Committee meeting)	Anabwani, Anderson, Asher, Beasley, Björkstén, Keil, Lai, Mallol, Montefort, Pearce, Robertson Stewart, Strachan, von Mutius, Weiland, Williams IIDC: Clayton NC: Garcia-Marcos
1996	September 6-7	Stockholm, Sweden	Seventh International Workshop on ISAAC (Steering Committee meeting)	Anderson, Asher, Beasley, Björkstén, Crane, Keil, Lai, Martinez, Mitchell, Montefort, Pearce, Robertson, Stewart, Strachan, von Mutius, Weiland, Williams IIDC: Clayton, Ellwood
1997	September 19-20	Berlin, Germany	Eighth International Workshop on ISAAC (Steering Committee meeting)	Anabwani, Anderson, Asher, Beasley, Björkstén, Burr, Keil, Lai, Mallol, Martinez, Mitchell, Montefort, Pearce, Stewart, Strachan, von Mutius, Weiland, Williams IIDC: Clayton, Ellwood
1998	September 18-19	Geneva, Switzerland	Nineth International Workshop on ISAAC (Steering Committee meeting)	Anderson, Asher, Beasley, Björkstén, Burr, Keil, Lai, Mallol, Mitchell, Montefort, Pearce, Robertson, Stewart, Strachan, von Mutius, Weiland IIDC: Ellwood Observers: Weber, Mégevand, Rylander
1999	October 8-9	Madrid, Spain	Tenth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled Anderson, Asher, Beasley, Björkstén, Burr, Crane, Lai, Mitchell, Pearce, Robertson, Stewart, Strachan, von Mutius, Weiland, Williams IIDC: Ellwood NC: Garcia-Marcos
2000	October 13-14	Auckland, New Zealand	Eleveneth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Anderson, Asher, Beasley, Björkstén, Burr, Crane, Lai, Mallol, Mitchell, Montefort, Odhiambo, Pearce, Robertson, Shah, Stewart, Strachan, von Mutius, Weiland IIDC: Clayton, Ellwood, Williams
2001	September 20-21	Gozo, Malta	Twelfth International Workshop on ISAAC (Steering Committee meeting)	Anderson, Asher, Björkstén, Cookson, Crane, Keil, Lai, Mallol, Mitchell, Montefort, Odhiambo, Pearce, Stewart, Strachan, von Mutius, Weiland, Williams IIDC: Clayton, Ellwood Phase Two DC: Rzehak
2002	September 12-13	Stockholm, Sweden	Thirteenth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Anderson, Asher, Beasley, Björkstén, Cookson, Crane, Foliaki, Keil, Lai, Mallol, Mitchell, Montefort, Odhiambo, Pearce, Robertson, Stewart,von Mutius, Weiland, Williams IIDC: Ellwood Phase Two DC: Rzehak NC: Nilsson
2003	November 27-28	Lake Navaisha, Kenya	Fourteenth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Anderson, Asher, Björkstén, Keil, Mitchell, Odhiambo, Pearce, Robertson, Stewart, Strachan, Weiland, Williams, Wong IIDC: Clayton Phase Two DC: Rzehak
2004	November 13-14	Nuku'alofa,Tonga	Fifteenth International Workshop on ISAAC (Steering Committee meeting)	Asher, Björkstén, Crane, Ellwood, Foliaki, Keil, Lai, Mitchell, Pearce, Robertson, Stewart, Strachan, Weiland, Williams, Wong IIDC: Clayton, Milne
2005	November 7-8	Hong Kong, SAR China	Sixteenth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Asher, Beasley, Björkstén, Brunekreef, Crane, Ellwood, Foliaki, Lai, Mitchell, Montefort, Odhiambo, Pearce, Robertson, Stewart, Strachan, von Mutius, Weiland, Williams IIDC: Clayton Observer: Garcia-Marcos, Wong
2006	November 23-24	Santiago, Chile	Seventeenth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Anderson, Asher, Brunekreef, Ellwood, Foliaki, Garcia-Marcos, Mallol, Mitchell, Pearce, Robertson, Stewart, Strachan, Weiland, Williams IIDC: Clayton
2007	September 12-13	Munster, Germany	Eighteenth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Anderson, Asher, Björkstén, Brunekreef, Crane, Ellwood, Garcia-Marcos, Keil, Lai, Mallol, Mitchell, Odhiambo, Pearce, Robertson, Stewart, Strachan, von Mutius, Weinmayr, Williams, Wong IIDC: Clayton
2008	October 9-10	Casablanca, Morocco	Nineteenth International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Asher, Beasley, Crane, Ellwood, Flohr, Garcia-Marcos, Lai, Mitchell, Montefort, Odhiambo, Pearce, Robertson, Stewart, Strachan, Weinmayr, Williams, Wong IIDC: Clayton
2009	November 26-27	Mérida, Mexico	Twentieth International Workshop on ISAAC (Steering Committee meeting)	Asher, Brunekreef, Ellwood, Flohr, Foliaki, Garcia-Marcos, Mallol, Pearce, Robertson, Stewart, Strachan, Weinmayr, Williams IIDC: Clayton
2011	Jan 25-26	Auckland, New Zealand	Twenty-first International Workshop on ISAAC (Steering Committee meeting)	Aït-Khaled, Asher, Beasley, Brunekreef, Crane, Ellwood, Foliaki, Garcia-Marcos, Lai, Mallol, Mitchell, Montefort, Odhiambo, Pearce, Robertson, Stewart, Strachan, Weinmayr, Williams IIDC: Clayton, Ellwood E

The ISAAC Story

ISAAC Resources

Phase One Manual
Phase One Data Manual
Video Questionnaire
Phase Two Modules
Phase Two Data Manual
Phase Two Skin Exam Manual
Phase Three Manual
Phase Three EQ Data Manual
Phase Three Environmental Questionnaire 6-7
Phase Three Environmental Questionnaire 13-14
Phase Four Website

All of the above resources are available on the ISAAC website at http://isaac.auckland.ac.nz/resources/tools.php

Phase One methods

Asher MI, Keil U, Anderson HR, Beasley R, Crane J, Martinez F, Mitchell EA, Pearce N, Sibbald B, Stewart AW, Strachan D, Weiland SK, Williams HC. *International study of asthma and allergies in childhood (ISAAC): rationale and methods*. Eur Respir J 1995; 8: 483-91.

ISAAC Methodology

ISAAC Phase One was an international multi-centre cross-sectional study involving two age groups of school children, 13-14 year olds (adolescents) and 6-7 year olds (children). Schools were randomly selected from a defined geographical area. Written questionnaires on asthma, rhinitis and eczema symptoms (translated from English) were completed by the adolescents at school, and at home by the parents of the children. An asthma symptoms video questionnaire for the adolescents was optional.

ISAAC Phase Two involved more intensive studies in a smaller number of selected centres. Children aged 9-11 years were examined for flexural dermatitis, underwent skin prick tests for atopy, bronchial responsiveness to hypertonic saline, blood sampling and storage for serum IgE and genetic analyses, and additional questionnaires were completed by their parents.

ISAAC Phase Three, a repeat of Phase One after at least five years, examined variations in time trends of childhood asthma, rhinoconjunctivitis and eczema around the world, and expanded the world maps of these conditions. Additional questions on risk factors were included in an “environmental questionnaire”.

ISAAC Phase Four is the development and expansion of the scope of the ISAAC website as a resource for ISAAC collaborators. It includes the addition of management plans that are useful for managing asthma, eczema, and rhinitis.

ISAAC methods and field manuals are freely available for use in other surveys, provided they adhere to the ISAAC publication policy on the ISAAC website (http://isaac.auckland.ac.nz/publications/publicationspolicy.html) and reference the use of the ISAAC tools appropriately.

Phase One Methodology

ISAAC Phase One was a multi-centre multi-country cross sectional study involving 2 age groups of school children, 13-14 year old (adolescents) and 6-7 year old.(children) Schools were randomly selected from a defined geographical area. Written questionnaires on asthma, rhinitis and eczema symptoms (translated from English) were completed by the adolescents at school, and at home by the parents of the children. An asthma symptoms video questionnaire for the adolescents was optional. A sample size of 3000 per age group was used to give sufficient power (90% at a 1% significance level), and a high participation rate was a requirement. In Phase One over 700,000 children were involved. Field work was conducted in the majority of centres between 1994 and 1995. Data was then sent to the International Data Centre in Auckland, New Zealand, where the methodology was checked and the data analysed.

Phase One used simple core written questionnaires for two age groups, and was completed in 156 collaborating centres in 56 countries with a total of 721,601 children participating. In the 13-14 year age group 155 centres from 56 countries participated, of which 99 centres completed a video questionnaire. For the 6-7 year age group there were 91 collaborating centres in 38 countries. ISAAC Phase One demonstrated a large variation in the prevalence of asthma symptoms in children throughout the world including hitherto unstudied populations. It is likely that environmental factors were responsible for the major differences between countries. The results provided a framework for studies between populations in contrasting environments to pursue new clues about the aetiology of asthma. Ecological studies were undertaken using the Phase One data to develop hypotheses about environmental factors.

Fuller details of Phase One are published in thePhase One Manual and in a paper in the European Respiratory Journal.

The ISAAC Story

Phase Two Methodology

ISAAC Phase Two involved more intensive studies in a smaller number of selected centres. It began in 1998 and involved 30 centres in 22 countries with 53,383 children participating. Phase Two was designed to investigate the relative importance of hypotheses of interest that arose from the Phase One results. Phase Two enabled internationally standardised comparisons of disease and relevant risk factors using the modules developed by ISAAC collaborators. The sample sizes were smaller than those recommended for Phase One to reflect the more intensive sampling procedures. A sample size of 1000 children per centre was recommended, and the more expensive and invasive tests could optionally be restricted to a stratified sample, comprising a sample of 100 wheezy children and 100 non-wheezy children.

Phase Two measured features of asthma, rhinoconjunctivitis and eczema which were not measured in Phase One. Additional standardised questions about cough, and the medical care of asthma, rhinitis and eczema were also developed. In addition there was a management and a "risk factor" questionnaire. Standardised protocols were also developed for child contact instruments including physical examination of the skin for flexural dermatitis and airway responsiveness testing using hypertonic saline aerosol challenge, skin prick tests for atopy, total and specific serum IgE, and storage of blood samples for genetic analyses and gene-environment interactions and endotoxin and house dust mite antigen measurement in the homes. The bronchial hyperresponsiveness measurement and skin examination were used to see whether these measures showed the same distribution internationally as the questionnaire results for wheeze and atopic eczema. Measures of atopy (using allergen skin tests and IgE measurements) were used to investigate whether variations in symptoms of asthma, rhinoconjunctivitis and eczema are reflected in variations in atopy. Some Phase Two centres also contributed DNA samples which were analysed for both within ISAAC, and as part of a larger asthma genetics consortium, GABRIEL.

ISAAC Phase Two was undertaken in 19 centres from 13 European countries: Albania, Estonia, France, Germany (2 centres), Greece (2 centres), Iceland, Italy, Latvia, Netherlands, Norway, Spain (4 centres), Sweden (2 centres) and the United Kingdom. The 11 centres outside Europe are in 9 countries: Brazil, China (3 centres), Ecuador, Georgia, Ghana, India, New Zealand, Turkey and Palestine.

Fuller details of Phase Two are published in the Phase Two Manual and in a paper in the European Respiratory Journal.

Phase Three Methodology

ISAAC Phase Three, a repeat of Phase One after at least five years, examined variations in time trends of childhood asthma, rhinoconjunctivitis and eczema around the world, and expanded the world maps of these conditions. New centres which did not do Phase One were included in the enlarged worldwide prevalence maps, and a risk factor questionnaire was added, permitting analysis of associations between the three diseases and a range of biomedical, environmental and lifestyle factors.

Phase Three was completed in 237 collaborating centres in 98 countries with a total of 1,187,496 children participating. In the 13-14 year age group 233 centres from 97 countries participated. For the 6-7 year age group there were 144 collaborating centres in 61 countries. The design of Phase Three corresponded to the Phase One study design. The same sampling frame, method of selecting schools and method of selecting children within schools was used.

The Phase Three field work was conducted during 2001-2. The time period between Phase One and Phase Three data collection was designed to be at least five years. This was chosen to be short enough to detect changes in centres where environmental changes may occur rapidly, as in low prevalence countries such as Greece and China, but not too short for centres where environmental changes may occur more slowly, as in high prevalence countries such as New Zealand and USA. 85% of centres conducted Phase Three 6-8 years after Phase One.

The risk factor questionnaire asked questions about diet, height, weight, heating and cooking fuels, exercise, pets, family size and birth order, socioeconomic status, immigration and tobacco smoke exposure. It was an optional component of the study design, so it was not completed in all centres.

Fuller details of Phase Three are published in the Phase Three Manual and in a paper in the International Journal of Tuberculosis and Lung Disease.

Phase Two methods

Weiland SK, Björkstén B, Brunekreef B, Cookson WO, von Mutius E, Strachan DP, and the ISAAC Phase Two Study Group. *Phase II of the International Study of Asthma and Allergies in Childhood (ISAAC II): rationale and methods.* Eur Respir J 2004; 24(3): 406-12.

Weiland SK, von Mutius E, Keil U, on behalf of the ISAAC Steering Committee. *The International Study of Asthma and Allergies in Childhood (ISAAC): rational methods and outlook.* Allergologie 1999; 22(5):275-282.

von Mutius E, Weiland SK, Keil U and the ISAAC Steering Committee. *The International Study of Asthma and Allergies in Childhood (ISAAC): study design and methods of phase II.* Allergologie 1999; 22(5):283-288.

Phase Three methods

Ellwood P, Asher MI, Beasley R, Clayton TO, Stewart AW, and the ISAAC Steering Committee. *The International Study of Asthma and Allergies in Childhood (ISAAC): Phase Three rationale and methods.* Int J Tuberc Lung Dis 2005; 9(1): 10-6.

Centre Reports

The Centre Report Documents can be viewed at http://isaac.auckland.ac.nz/phases/phasethree/centre report/centrereport.html

Quality Assurance

In ISAAC Phases One and Three, tools were developed to assist the ISAAC International Data Centre (IIDC) Research Manager to undertake quality assurance processes.

In ISAAC Phase One, to enable centre methodology to be checked, the Steering Committee developed a five page centre report . This was sent to the Principal Investigators (PI's) when they submitted their centre data to the IIDC which they completed and sent back. This documented aspects of the fieldwork and centre methodology, which were considered important to record and enabled checks to be made against aspects of the data. Close communication with the PI's was vital whilst undertaking the checks.

When the ISAAC Phase One data and methodology checks had been completed, the centre report was evaluated by several Steering Committee members to ensure it was suitable for use in Phase Three, particularly for those with English as a second language. The evaluation identified that some areas of the report were difficult to interpret. Subsequently the report was redesigned for use in Phase Three. The Phase Three centre report retained the same information but simplified the questions and in some cases a single question was changed and became several questions to ensure its meaning would be understood. Collaborators found this new Phase Three centre report an easier document to complete .

In addition, this report was sent to the PI's at the time they registered, so that they could complete it when the fieldwork was being undertaken rather than completing it retrospectively as in Phase One. For the centres that were new to Phase Three, the centre report enabled checks to be made against the data as in Phase One. For the Phase Three centres that had also completed Phase One, the Phase Three centre report was checked against the Phase One centre report to ensure PI's had used the same methodology as in Phase One. All deviations between Phase One and Three were documented and these were categorised: major deviations (centres excluded from the analyses); minor deviations (deviations identified by the use of footnotes in the published tables) and; very minor deviations (deviations accepted and not identified in the publication tables).

This information has been collated and a manuscript on "The challenge in replicating the methodology between Phase One and Three of ISAAC" will be submitted for publication in April 2011. From the 112 centre reports for the adolescent group (13-14 year olds) and 70 for the children (6-7 year olds) that were submitted, six centres for the adolescent group and four for the children had major deviations and were excluded. There were 35 minor deviations for the adolescents and 20 for the children which were identified in the publications by the use of a footnote and there were 92 very minor deviation for the adolescents and 51 for the children that were accepted and not identified. We also found that a change in PI between phases did not adversely affect the methodology (odds ratios 0.80 [95% CI 0.36, 1.81] for adolescents and 0.91 [95% CI 0.32, 2.62] for children).

We concluded that with attention to detail and careful recording of methodology, repeated, cross-sectional, epidemiological multicentre studies using the same methodology such as Phases One and Three in ISAAC are feasible and can be achieved throughout the world by people with diverse cultural backgrounds and research experience. The IIDC is very appreciative of the commitment of the ISAAC collaboration to their attention to detail which has produced such a high standard of methodology in Phase One and Phase Three.

Consent & Confidentiality

At the outset of ISAAC Phase One, a great deal of importance was placed on protecting the identity of the participants and deciding on the most appropriate method of obtaining consent. As well as maintaining confidentiality of the information given by the participants a high response rate was expected (= 80% for adolescents and =70% for children). In Phase One most centres had an ethics committee that viewed and approved the protocol prior to starting the study. Those centres that did not have an ethics committee used some other authorisation, such as the Ministry of Education to approve the study.

Although identifying information was obtained from the participants, this demographic information was only used to ensure participant details were correct and was checked against the school records for accuracy. The questions asked for the participant's name and school name, their age, date of birth, gender, home address, ethnicity and the date the questionnaire was completed. When these details had been certified correct the participant became identified by a unique ID number by centre number, school number, and participant number. These numbers were entered into the computer with the answers to the core questions on the symptom prevalence of asthma, rhinitis and eczema, providing total anonymity of participants.

Because of this anonymity and due to the innocuous nature of the questions asking about the symptom prevalence of asthma, rhinitis and eczema, most ethics committees approved the use of passive consent. This approach was also the recommended approach by the ISAAC Steering Committee. This involved, for the adolescent group, sending an information letter home to the parents informing them about the study and requesting they contact the

Consent & Confidentiality cont.

researcher/s if they or the adolescent did not wish to participate. If they did not contact the researcher it was assumed they would take part in the study. For the children, the questionnaire was sent home to parents/guardians with the information letter requesting them to complete it and return it to school. Some ethics committees requested active consent from parents/guardians which involved getting parents/guardians to give written consent prior to the study taking place in the schools for the adolescents and for the children, prior to sending the questionnaire home for completion.

In Phase Three we found that some ethics committees had made a huge shift in their approach to how consent was obtained in research and developed new policies for using active consent for all types of research, whether it was clinical trials, or epidemiological surveys. This had an adverse effect on the response rates in some schools and participants, resulting in exclusions from Phase Three. This has been documented in a publication [Ellwood 2010](above right). We found that a higher response rate in questionnaire-based epidemiological studies is more likely if parents are not required to give active consent. This was more evident in the English language centres that had been used to the passive consent approach for this type of study. It also raises questions about the ethics of using active consent when it is not strictly necessary, which can lead to low response rates and exclusion, thus wasting valuable research funding and denying the involvement of those parents/adolescents that wish to participate.

Data Management

(Tadd Clayton)

ISAAC is a unique international study which has been extremely fortunate to receive enthusiastic support from many researchers (and their research teams) throughout the world. Use of the same research design and tools (e.g. questionnaires) by all participating centres has been essential so that the results from the centres can be compared and any differences can be considered to reflect true differences in prevalence, rather than be attributed to differences in methodology. The ISAAC Phase One Manual, Phase One Coding and Data Transfer Manual, Phase Three Manual and Phase Three Environmental Questionnaire Coding and Data Transfer Document provided detailed instructions regarding how to carry out an ISAAC study, and how to prepare the data for transfer to the ISAAC International Data Centre (IIDC).

However, as ISAAC Phase One and Phase Three data has been contributed by many researchers who naturally have very varied training and research experience, it was important for the IIDC to carry out quality assurance checks on the data and assess how well each centre had followed the ISAAC protocol. My role at the IIDC was to receive the Phase One and Phase Three data from the participating centres, carry out a range of quality assurance checks on the data and communicate with the researchers with the aim of achieving the best quality possible final data set for each centre. For most centres there was at least one revised version of the data and in some cases several revisions were necessary. The checks carried out on the data included checks for consistency of date of birth, age and date of interview, checks for invalid values, and checks for unexpected patterns of results.

Checks for consistency

The ISAAC Phase One and Phase Three questionnaires included questions about the date the questionnaire was completed (date of interview), date of birth and current age of the child or adolescent. It was thus possible to generate a calculated age (using the date of birth and date of interview) and compare this with the age provided by the parent or adolescent. In many cases where there were differences between the age and the calculated age, the researchers were able to consult school records to identify appropriate corrections.

Checks for invalid values

The Phase One Coding and Data Transfer Manual (hyperlink), Phase Three Manual (hyperlink) and Phase Three Environmental Questionnaire Coding and Data Transfer Document (hyperlink) provide detailed information concerning what codes or values are valid for each question. In cases where unexpected values were present, the researcher was asked to review the original questionnaire and identify the appropriate correction.

Phase Three Consent

Ellwood P, Asher MI, Stewart AW and the ISAAC Phase III Study Group. *The impact of the method of consent on response rates in the ISAAC time trends study.* Int J Tuberc Lung Dis. 2010 Aug;14(8):1059-65.

Checks for unexpected patterns

The ISAAC Phase One and Phase Three core questionnaires use a "stem" and "branch" structure where it is intended that the participant would only answer some questions if they provided a positive response to the previous questions. An example of this is the first two questions of the asthma symptoms questionnaire:

1. Has your child / Have you ever had wheezing or whistling in the chest at any time in the past? Yes/No
   IF YOU HAVE ANSWERED "NO" PLEASE SKIP TO QUESTION 6
2. Has your child / Have you had wheezing or whistling in the chest in the past 12 months? Yes/No

If all parents or adolescents correctly followed the instruction between these questions, there would be no respondents who answered "No" for question 1 and "Yes" for question 2. After all, how can someone have wheezing in the last 12 months but not have wheezing at any time in their life? However, in practice we found that the data sets from nearly all centres have some children or adolescents where there are responses which appear to be inconsistent. For example, in Auckland, New Zealand for Phase Three there are approximately 5% of children and 10% of adolescents who have at least one case of responses which appear to be inconsistent.

Given that some parents and adolescents will provide responses which appear to be inconsistent, we had to decide what (if anything) to do about these cases. It is very easy to manipulate data using modern statistical analysis software and we could easily recode the data so that question 2 is set to missing. In other words, we would assume that the answer to question 1 ("No") is correct and that the response to question 2 should be blank as suggested by the instruction between the questions. However, in this example there are two questions and it is easily possible (perhaps equally as likely) that it is question 2 which is correct and question 1 which is incorrect. The ISAAC Steering Committee decided that there is not enough information to accurately decide which response is incorrect and that to recode the data based on the assumption that the first response is correct would run the risk of introducing bias into the data. The data was therefore left unchanged and cases where the responses appear to be inconsistent were accepted. This did not cause any problems for ISAAC analyses where the focus was on the prevalence of individual symptoms and the common denominator for prevalence calculations was the total number of participants.

However some of the data sent to the IIDC did not include any cases of response which appeared to be inconsistent. This suggested that the data may have been modified to remove the inconsistencies between responses before it was sent to the IIDC. For these centres we asked the researcher whether the data had been modified and whether it was possible for them to submit a copy of the data without the modification. Some centres were able to provide unmodified data while others were not, usually because the changes had been made during the data entry process. Several centres were identified as having modified the data to remove apparent inconsistencies in the data tables for Phase One and Phase Three publications.

Transfer of data

The IIDC has been receiving data files and other electronic files from researchers and colleagues since 1993 and there have been many changes in technology during that time. Most Phase One data files were sent to the IIDC by post on 3½ inch diskette although a few centres did use CD-ROMs and some even used 5¼ inch floppy disks. Email was not in common use at the time and it was very rare to receive data files as attachments to messages. By the time of Phase Three, email was available for nearly all of the researchers and it was much more common for to receive data by email although I did still receive some data by post on CD-ROM.

The Phase One Coding and Data Transfer Manual, Phase Three Manual and Phase Three Environmental Questionnaire Coding and Data Transfer Document provided very clear, detailed instructions regarding how ISAAC data should be prepared for transfer to the IIDC. The time and effort put into these documents proved to be very worthwhile and I would particularly like to acknowledge the efforts of Alistair Stewart who lead the development of the Phase One Coding and Data Transfer Manual which was the model for the subsequent documents. Nearly all the data files received by the IIDC used the structure and codes we specified. In only a few cases was it necessary to ask the researcher to send a further copy of the data, generally because there had been some damage to the files in transit. While most data used the expected structure there were occasionally some challenges in reading the data. Perhaps the most interesting challenge I encountered was to identify a way to convert dates from the Persian calendar to the Gregorian calendar.

For Phase One, most data was sent to the IIDC as text format data files as specified in the Coding and Data Transfer Manual although a few researchers did choose to use other formats such as Excel spreadsheet files or DBASE database files. For Phase Three, Excel files were much more common, and other formats such as SPSS and Access were also used on occasion. We were fortunate that the software resources available to us through The University of Auckland were sufficient to read all file formats we received throughout Phase One and Phase Three.

Statistical Analyses

Statistical methods used in ISAAC: Phase One

The two age groups (6 & 7 years and 13 & 14 years) were analysed separately. Symptom prevalences in each centre were calculated by dividing the number of positive responses to each question by the number of completed questionnaires for the written and video questionnaires separately. Thus, apparent inconsistencies between responses to the stem and branch questions were accepted and not recoded. Country and regional level prevalence estimates were calculated in the same manner. All the positive responses within the country (or region) were divided by the number of completed questionnaires from the same geographical area.

The main variables reported are defined as:

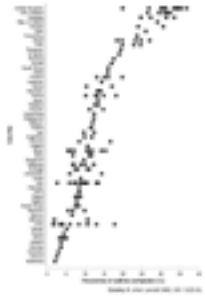
- Wheeze: "Have you/your child had wheezing or whistling in the chest in the last 12 months?"
- Severe wheeze: "Have you/your child had wheezing or whistling in the chest in the last 12 months?" and one of "4 or more attacks of wheeze" or "sleep been disturbed due to wheezing on average once or more per week" or "had wheezing severe enough to limit speech to only one or two words at a time between breaths".
- Reported asthma: "Have you/your child ever had asthma?"
- Rhinoconjunctivitis: "In the past 12 months, have you had a problem with sneezing, or a runny, or a blocked nose when you DID NOT have a cold or the flu? If yes: in the past 12 months, has this nose problem been accompanied by itchy-watery eyes?"
- Hay Fever ever: "Have you/your child ever had hayfever?"
- Eczema: "Have you ever had an itchy rash which was coming and going for at least 6 months? If yes: Have you had this itchy rash at any time in the last 12 months? If yes: Has this itchy rash at any time affected any of the following places: the folds of the elbows, behind the knees, in front of the ankles, under the buttocks, or around the neck, ears, or eyes?"
- Reported eczema: "Have you/your child ever had eczema?"

In centres where a random sample of schools was taken, the effect of cluster sampling by schools was examined calculating the design effects [Rao 1992]. The effects of cluster sampling were generally small but have been incorporated in analyses involving tests of significance.

Basic descriptive summaries of the data were compiled by centre and country, in both age groups, along with Spearman correlations between variables. These summaries have often been displayed as ranked plots (see example right). A variety of analytic methods have been used in papers, some are described below.

The within-country and between-country variances were estimated using a generalised linear mixed model in which country, and centre within country, are random effects [Wolfinger 1993]. With this model, the ratio of the 95% CI of prevalences (between country to within country) were calculated.

Ranked Plot



Statistical methods used in ISAAC: Phase Two

Definitions for the key outcome variables in Phase Two followed the conventions set in Phase One. Sample sizes in most of the Phase Two centres were smaller than in Phase One, typically in the region of 1000 children, so clustering at the level of school within centres was not considered in the analysis.

An important feature of the Phase Two design was the restriction of more expensive or invasive measurements to a subsample of children within each centre, selected according to history of wheezing in the last year. This stratified sampling design required statistical analyses for many of the variables to be weighted (using "survey weights" inversely proportional to the sampling fractions for wheezers and non-wheezers). The SAS procedures SURVEYREG and SURVEYLOGISTIC were used for this purpose (in Stata, svy: commands perform the same survey-weighted analysis).

The general approach adopted for Phase Two data analysis was to fit separate models for each centre and then pool the resulting regression coefficients in a random-effects meta-analysis. The random-effects pooling allowed for possible heterogeneity of risk factor associations between centres. In many analyses, a separate pooling within two groups of centres (more affluent, and less affluent, defined by national GNI per capita) proved to be informative.

This two-step approach to analysis of risk factor associations in Phase Two contrasts with the single-step approach adopted in Phase Three, where a fixed-effect pooling of regression coefficients was implemented along with random centre-level intercepts, using PROC GLIMMIX in SAS. Such a single-step approach could not be implemented for many of the outcomes in Phase Two, since the necessary survey-weighted regression cannot be combined

with the multi-level model structure within PROC GLIMMIX.

However, for Phase Two outcomes which were ascertained on all subjects, multi-level models were developed in SAS (PROC GLIMMIX) and Stata (xtmelogit) to explore random effects both for intercepts (ie. centre-level prevalences) and slopes (ie. risk factor associations).

Statistical methods used in ISAAC: Phase Three prevalence maps and time trend analyses

The approaches used for global comparisons of prevalence in Phase Three followed those adopted in Phase One. However, for analysis of time trends between Phase One and Phase Three a number of additional statistical issues arose:

- Whether to use absolute or relative change in prevalence: the former was chosen.
- Calculation of change per year to address the variable time period between studies.
- Use of mean prevalence (average of Phase One and Phase Three), rather than Phase One prevalence, to assess change in relation to prevalence. This followed the approach of Bland and Altman which avoids the problem of "regression to the mean" leading to a spurious correlation between initial level of a measurement and change over time.
- Adjustment for the cluster sample design by adjustment to the effective sample size of the prevalence estimates. Since most centres selected a sample of schools and then studied all children of the eligible age within those schools, there is a theoretical "design effect" due to the greater correlation of asthma and allergy prevalence within schools than between schools. This "design effect" was accounted for in analyses which involved significance tests by decreasing the sample size of each prevalence estimate by a factor derived for each outcome, centre, age-group and ISAAC phase, representing the effective sample size, relative to the actual sample size, adjusting for clustering at the school level. In most centres, the effect of this adjustment was small.
- Tolerance of minor differences in fieldwork procedures between Phase One and Phase Three. This is discussed in greater detail under "Quality Assurance"

Statistical methods used in ISAAC: Phase Three risk factor analyses

Outcome definition and assessment of within-centre clustering followed the conventions set in the prevalence comparisons. For each outcome, centre and age-group, a single design-effect-adjustment variable was generated, representing the effective sample size for that age-group, centre and outcome. This set of design-effect adjustment factors was derived before merging in the risk factor (EQ) data, so it is a common set for all Phase Three risk factor analyses.

Centres with fewer than 500 children (except for centres representing a complete census of the population), and centres with more than 30% missing data for the risk factor and covariates of interest, were excluded from the analysis. Frequency tabulations of the outcome, risk factor of interest, and specified individual-level covariates were prepared for each centre and combined into a single dataset for each outcome and age group. The frequency counts were then adjusted downwards in proportion to the design-effect adjustment factors for the outcome in question, for each centre and age group.

These design-effect-adjusted frequency tabulations provided the input for SAS DATA/PROC... (conversion procedure to individual-level data? – equivalent procedure in Stata is "expand") and were analysed in PROC GLIMMIX specifying random intercepts at the centre level, but common slopes for the individual-level risk factors and covariates. Region, language and GNI per capita were included as standard centre-level covariates. Sex was always included as an individual-level covariate. Analyses were performed for all centres combined, for subgroups of centres defined by region, language and GNI, and for boys and girls separately. Additional individual-level covariates and interactions were included in the models, as appropriate for specific risk factor analyses.

Statistical methods used in ISAAC: Centre-level differences adjusted for individual-level risk factors

Two approaches have been used for investigating between-centre differences in prevalence, adjusting for individual-level risk factors. The first approach is analogous to direct standardisation of routine statistics such as national mortality rates. The second applies multi-level modelling techniques to evaluate simultaneously the associations at the individual and the centre level.

Direct standardisation:

1. Separate regression models are fitted for each study centre, to obtain centre-specific slopes for each explanatory (x-)variable. Since the main outcomes of interest are dichotomous, our outcome (y-)variable is logit(p) where p is the proportion of "cases" (affected individuals). Thus, the parameter estimates from these centre-specific models are in the form of log-odds-ratios and the linear predictions derived from them ("xb" in SAS/Stata terminology) are in the form of log-prevalence-odds: ln[p/(1-p)].
2. For each centre, a prediction (xb) and its standard error (stdp) is derived at the level of each explanatory variable which correponds to its mean in the global (all-centres) dataset. (This is analogous to directly standardising centre-specific death rates for each age-sex group by applying them to a global distribution of age and sex).
3. The standardised (risk-factor-adjusted) prevalence logodds for each centre, and their corresponding variances, can then be considered as units in a conventional meta-analysis, deriving measures of heterogeneity including Cochran's Q and Higgins I^2. They can also be used as the outcome variable in ecological analyses of disease prevalence at the centre level.

Multi-level modelling:

1. All centres are modelled in a single dataset with an categorical indicator variable for each centre and centre-level covariates (such as language, or GNI per capita) match-merged by centre.
2. Multi-level modelling procedures such as PROC GLIMMIX in SAS, and xtmelogit in Stata, offer options for analysing either the centre-level intercepts, or the centre-specific risk factor associations (regression slopes), or both, as “random effects” (ie. drawn from a hypothetical distribution of intercepts or slopes, with the usual assumption being that this distribution is Gaussian).
3. The approach used in Phase Three risk factor analyses specified random intercepts and common slopes. This is equivalent to a fixed-effect (inverse-variance-weighted) pooling of the risk factor associations across study centres.
4. The approach used in exploratory Phase Two analyses specifies random intercepts and random slopes.
5. The two-step meta-analytical approach used in standard Phase Two publications is broadly equivalent to fixed centre-level intercepts and random slopes.

Statistical methods used in ISAAC: Ecological analyses at the centre level

A series of ISAAC papers were based on ecological data (data gleaned from external sources). These papers correlated the prevalence rates observed in ISAAC centres or countries with information available elsewhere. An example was the relationship of the prevalence levels to the per capita gross national product (GNP) for each of the countries. The GNP information came from the World Bank website. We assumed a linear relationship between the prevalence of the various symptom measures in each country and the GNP of that country. The data were modelled using a generalised linear mixed model that allowed each centre to be considered as if randomly selected from within its country (not a very good assumption in some cases). The model used a binomial error but assumed the identity link so there was a simple linear association between the outcome measure and the ecological variable. All ecological analyses (subsequent to the one in which GNP was the focus) included GNP in the model as a potential confounder.

References

Rao JNK, Scott AJ. A simple method for the analysis of clustered binary data. Biometrics 1992; 48: 577-585.
Wolfinger R, O'Connell M. Generalized linear mixed models: a pseudo-likelihood approach. J Statist Comput Simul 1993; 48: 233-243.

Map of all ISAAC Centres

Original Phase One Synthesis Map

Standardised Phase One Synthesis Map

Graphs & Maps

(Tadd Clayton)

Maps

Beginning in 1993, the ISAAC International Data Centre (IIDC) received data from 156 Phase One centres which were located throughout the world. By 1996 the ISAAC Steering Committee was beginning to prepare publications presenting the large amount of Phase One data from these centres and was considering how the data from so many centres could be presented in a way which provided a useful illustration of global patterns. After some discussion, the Steering Committee chose to use maps of the world with each centre represented by a symbol to indicate prevalence of symptoms.

Once the decision to use maps was made, it was my task as IIDC Data Manager to develop the style of the maps and prepare each map based on the data we had received. My early attempts to prepare maps used SAS which is a very comprehensive statistical analysis package which also includes a component for graphical presentation of data (SAS/Graph). The main advantages of SAS were that it was licensed by the University of Auckland and was thus free for us to use, and that it already included a library of maps. In theory, once I had generated coordinates for each ISAAC centre, I would have been able to use SAS programs to quickly generate each map in an automated manner. However, in practice I found that SAS was difficult to use as there was no way to manually edit the maps.

We decided to instead use a manual method of preparing the maps and purchased Corel Draw 7, a drawing program which would allow fine editing of the maps, and a collection of electronic maps in Adobe Illustrator format (the MapArt collection from Cartesia Software). The main drawback of this approach is that each symbol for the ISAAC centres had to be located manually, although this task did only have to be carried out once as subsequent maps could be based on the first one.

The base map we used is a Mercator projection with Europe and Africa occupying the central part of the map. We certainly cannot be accused of any favouritism towards our own country – this projection places a distorted New Zealand at the extreme lower right of the maps! The base map was modified to remove unnecessary grid lines and names, and to include an enlarged inset section for Europe where there were a large number of centres to plot in a comparatively small area. The location of each centre on the map was identified with the invaluable assistance of the Times Comprehensive Atlas of the World which not only includes many wonderful maps, but also an extremely comprehensive index of towns, cities and regions.

The Steering Committee agreed on a colour scheme for the maps, appropriate colours and shapes for the symbols, and appropriate cut-off values to define prevalence categories. We chose to use strong colours (blue, green, yellow and red illustrating low to high prevalence) and distinctive shapes (square, circle, diamond and star) for the symbols so that the maps would be readable when reproduced in both colour and monochrome (black and white). Each centre was assigned to a prevalence category based on their Phase One results and the appropriate symbol was placed into position on the map.

The maps presented in the ISAAC Phase One worldwide papers were well received and the Steering Committee chose to continue the use of maps in the Phase Three publications. The only major change for Phase Three was to use different shapes for the symbols (triangle, square and inverted triangle) to illustrate changes for the time trends maps.

While the overall layout and colours used for the maps have remained generally consistent, there have been some changes over time. The Phase One maps prepared for the papers used comparatively small symbols which were appropriate for the printed page but were difficult to see when the maps were used in PowerPoint presentations. Additional versions of those maps were prepared with symbols doubled in size to address this problem (see examples right). The larger symbols were exclusively used in all the Phase Three maps. The Phase One and Phase Three maps also used a subtly different colour scheme for the ocean and land which can be attributed to a change in software between the phases (a change from Corel Draw 7 to Adobe Illustrator CS2). The maps presented on this page have been standardised to use the same colours and symbol sizes.

Please see the appendices for the full selection of maps and graphs. Full size versions are available at http://isaac.auckland.ac nz/story/methods/methods/maps.php

The ISAAC Story

ISAAC Findings

In many areas of the world, ISAAC Phases One and Three provided the first population-based assessment of the prevalence and severity of asthma and allergic diseases among children. ISAAC Phase Three produced the first internationally comparable estimates of direction and magnitude of change in symptoms of asthma, rhinoconjunctivitis and atopic eczema.

In ISAAC Phases Two and Three, symptoms and objective measures of asthma and allergy have been related to individual exposure to environmental factors and to genetic markers. Ecological analyses have also been conducted, relating prevalence of these conditions to characteristics of the populations living in each of the study centres.

Details of all ISAAC publications can be found on the ISAAC website, (http://isaac.auckland.ac.nz) together with a search facility to identify publications by title, author, year, ISAAC phase or location. The location may be global, regional, national or local (single centre).

In this section we focus upon the findings of worldwide comparisons, and their global impact. Details of other publications may be found on the regional, national and centre pages under "Centres".

Overview of Global Findings

When ISAAC began two decades ago the understandings of asthma, rhinitis and eczema in populations were seriously limited by the small number of countries in which standardised research methods had been used. This was mainly confined to various English-speaking countries - mainly Australia, Canada, New Zealand, UK and USA - and although a great deal of research was also being done in continental European countries, the methods used were generally not standardised across countries, and there had been little comparable work in other parts of the world. At that time new work on asthma and allergies from Erika Von Mutius in East and West Germany demonstrated the value of asthma research going beyond English-language countries and including environments of greater contrast using standardised methods.

The research breakthroughs that ISAAC has made include:

- measuring for the first time the symptom prevalence and severity of asthma, rhinitis and eczema in very large numbers of centres and countries in the world; this in turn has led to new global research questions, and informed public health policy
- demonstrating that asthma, rhinitis and eczema symptoms have increased substantially over the last 15 years, especially in younger children
- illustrating that asthma, rhinitis and eczema are important non-communicable diseases in non-affluent (developing) as well as affluent (developed) countries in the world
- providing new information about environmental and genetic factors which could potentially affect the symptom prevalence of asthma, rhinitis and eczema
- demonstrating how weak the link is between atopy (allergy) and symptoms of asthma, rhinitis and eczema, especially in non-affluent countries
- engagement of a global network of researchers in collaboration

The extent of the new understandings from ISAAC are presented here by posing questions which are then answered by the ISAAC global findings

Question

Is it possible to perform standardised questionnaire-based studies of asthma, rhinitis and eczema and achieve high participation rates in large numbers of countries in all regions of the world in many different languages?

ISAAC findings

Yes, ISAAC has shown that it is possible. In ISAAC Phase One 156 centres in 56 countries completed the research to the required standard with high participation rates[Asher 1998], [Strachan 1997], [Williams 1999], [Beasley 1998]. The majority of these centres had never undertaken epidemiological research before. In Phase Three two thirds of those centres repeated the study [Asher 2006], [Pearce 2007], [Björkstén 2008], [Williams 2008]. and a further 128 centres in 64 countries (34 new ISAAC countries) completed ISAAC for the first time [Lai 2009], [Aït-Khaled 2009], [Odhiambo 2009]

Question

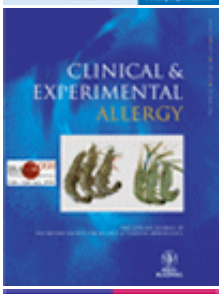
Were translations of written questionnaires valid?

ISAAC findings

In Phase One questionnaires were translated from English into another language in 81% of centres, and in Phase Three in 87% of centres. Most (86%) centres translated the questions correctly [Ellwood 2009]. When asthma symptom prevalence determined by written questionnaire was compared with a video asthma questionnaire [Asher 1998] the overall

Cumulative total of ISAAC publications

Year	Papers	Citations
1993	1	0
1994	5	0
1995	9	8
1996	17	16
1997	44	56
1998	71	164
1999	104	333
2000	128	561
2001	150	882
2002	179	1,231
2003	199	1,648
2004	240	2,048
2005	298	2,541
2006	329	3,183
2007	376	3,900
2008	418	4,782
2009	453	5,728
2010	500	6,538



pattern of international differences was similar. Thus it appears that ISAAC translations were valid.

Question

Does the method of consent matter for simple questionnaire surveys?

ISAAC findings

ISAAC has shown that it may do. We found that the requirement for active consent for population school-based questionnaire studies can impact negatively on response rates, particularly in English language centres, thus adversely affecting the validity of the data. Ethics committees need to consider this issue carefully [Ellwood 2010]

Question

Are asthma, rhinitis and eczema diseases of only high income 'developed' western countries?

ISAAC findings

ISAAC found that this is not true. ISAAC Phase One found that symptoms of asthma, rhinitis and eczema were more common in some high income western countries such as UK, New Zealand, Australia, but not as high in others such as Spain [Asher 1998], [Strachan 1997], [Williams 1999]. Moreover some low and middle income countries had prevalence values for symptoms of asthma, rhinitis and eczema which were at the same level as some high income western countries. There were striking variations in the prevalence of symptoms of asthma and allergic disease throughout the world (more than 20 fold between centres [Beasley 1998])

Question

Are asthma, rhinitis and eczema rare in developing countries?

ISAAC findings

Although ISAAC Phase One found that the prevalence of symptoms of asthma, rhinitis and eczema are on the whole lower in developing countries, some developing countries have particularly high levels of these conditions and proportionately more severe symptoms. [Asher 1998], [Strachan 1997], [Williams 1999], [Beasley 1998]. In the larger Phase Three study this finding was more obvious [Lai 2009], [Aït-Khaled 2009], [Odhiambo 2009] Asthma, rhinitis and eczema are thus not rare in developing countries.

Question

How do the ISAAC questionnaires perform compared with 'objective' markers of asthma and allergy?

ISAAC findings

ISAAC Phase Two found these relationships were variable. At the level of whole populations, prevalences of examined and reported flexural dermatitis matched well, offering reassurance that ISAAC questionnaire-derived prevalence data for eczema are sufficiently precise for comparisons between populations[Flohr 2009]. In contrast, high rates of bronchial responsiveness to inhaled hypertonic saline challenge were not confined to centres with high prevalences of asthma symptoms, nor to affluent countries, and did not parallel the worldwide variation of wheeze. [Buchele 2010]. Analysis of the inter-relationships of skin prick tests, total and allergen-specific IgE in Phase Two centres with diverse living conditions found no support for down regulation of local inflammatory responsiveness [Weinmayr 2010].

Question

Is it possible to study eczema by questionnaire, and is eczema important?

ISAAC findings

ISAAC studied eczema by questionnaire using core questions validated against skin examination to define the prevalence of symptoms of eczema in Phase One in 156 centres in 56 countries[Williams 1999]. In Phase Two, prevalences of examined and reported flexural dermatitis matched well, offering reassurance that ISAAC questionnaire-derived prevalence data for eczema are sufficiently precise for comparisons between populations [Flohr 2009]. Phase Three found that the prevalence of eczema symptoms was increasing in many centres[Williams 2008], was a common health problem for children throughout the world, and is a disease of developing as well as developed countries[Odhiambo 2009]. So it is possible to study eczema by questionnaire, and eczema is important.

Question

Is rhinitis common but unimportant?

ISAAC findings

Symptoms of rhinoconjunctivitis (rhinitis with itchy-watery eyes) were common in centres in several regions [Strachan 1997], [Aït-Khaled 2009]. Severe rhinoconjunctivitis symptoms were found mainly in the centres from middle and low income countries, particularly in Africa and Latin America. [Aït-Khaled 2009], illustrating that this condition is important, and can cause significant morbidity.

Question

Is asthma is becoming more and more common in western countries?

ISAAC findings

The Phase Three time trends analyses have helped to answer this question [Pearce 2007] While asthma has become more common in some high prevalence centres in western countries, in many cases the prevalence in Phase Three was similar to Phase One or even decreased. At the same time in many developing countries an increase in the prevalence of

symptoms was found more commonly than a decrease. The rise in prevalence of symptoms in many centres in countries with high populations suggests that the world burden is increasing. Paradoxically at the same time the global disparities are decreasing.

Question

Is asthma more severe in affluent than non-affluent countries?

ISAAC findings

In ISAAC Phase Three the most comprehensive examination of this question was undertaken in 237 centers from 98 countries. Symptoms of severe asthma were defined as those with current wheeze who, according to the written questionnaire, in the past 12 months, have had >4 attacks of wheeze, or >1 night per week sleep disturbance from wheeze, or wheeze affecting speech. The highest proportions of severe wheezers among current wheezers were found in non-affluent countries, not in affluent countries. [Lai 2009]. We have also established that there are consistently positive associations between asthma symptom prevalence, admissions and mortality [Anderson 2008].

Question

Will genetics explain differences in rates of asthma?

ISAAC findings

The large world wide variations in asthma prevalence found in ISAAC Phase One, including between people of similar genetic origin living in different environments, led us to believe that environmental factors rather than genetic factors were the cause of these large variations. [Asher 1998]. Genetic influences were explored directly in Phase Two with the analyses of 55 candidate single nucleotide proteins (SNPs) [Genuneit 2009]. Significant associations with wheeze were detected in only four genes, *and* variants of only two of thesewere also related to allergen-specific immunoglobin E (IgE). There were also highly significant associations between *SPINK5* variants and visible eczema and between *IL13* variants and total IgE. These findings suggest that, despite the biological plausibility of IgE-related mechanisms in asthma, genetic evidence for this pathway is sparse. This conclusion was borne out by the larger collaborative analysis conducted by the GABRIEL consortium [Moffatt 2010], of which ISAAC is a partner.

Question

Do asthma, rhinitis and eczema really have an allergic basis?

ISAAC findings

It has long been believed that allergies were the cause of asthma, rhinitis and eczema symptoms. However in ISAAC Phase Two a very weak relationship was found between allergy (atopy) and asthma[Weinmayr 2007], rhinoconjunctivitis [Weinmayr 2008], and eczema [Flohr 2008]. The association of atopy with each of these diseases was stronger in more affluent centres than in less affluent centres. In Phase One we also found that most children with one of these conditions had no symptoms of the other two [Beasley 1998]. There has been an increasing trend to separate allergic and non-allergic forms of these conditions [World Allergy Organisation 2003], and to avoid these qualifiers where the situation is unclear. Reflecting this change in thinking, the ISAAC worldwide papers have gradually dropped the term ‘allergic’ and ‘atopic’ in defining asthma, rhinitis, and eczema. In summary ISAAC has found that there is less commonly an allergic basis for asthma, rhinitis and eczema than previously thought, especially in non-affluent countries.

Question

If allergen exposure were prevented, then would asthma and rhinitis disappear?

ISAAC findings

The previous paragraph recounts how ISAAC identified that the association between allergy in populations and asthma and rhinitis is very weak. In our Phase One ecological study of pollens we found that the higher the pollen counts the less common were rhinitis symptoms [Burr 2003], and there was no effect on asthma symptoms. Thus preventing allergen exposure would not make asthma and rhinitis disappear.

Question

Does air pollution cause asthma?

ISAAC findings

There was no positive association between centre particulate air pollution and asthma shown in the Phase One ecological studies [Anderson 2010], with the relationship being slightly inverse. However in Phase Three high truck traffic exposure in the street where children lived was associated with more asthma symptoms[Brunekreef 2009]. This suggests that air pollution is not a causative factor for prevalence differences in asthma between populations, but may be for individuals within the populations. Further research is needed to explore this relationship further.

Question

Does diet influence asthma and allergies?

ISAAC findings

The Phase One ecological study found that populations who consume more plant based foods such as cereals, rice and vegetables have lower asthma, rhinitis and eczema symptom prevalence[Ellwood 2001] whereas in a European analysis dietary trans fatty acids were a risk factor for asthma, rhinitis and eczema [Weiland 1999]. In PhaseTwo potentially protective effects were found from fruit, vegetables, fish and a mediterranean diet, but children who ate burgers were more likely to have symptoms [Nagel 2010]. Breastfeeding was associated with protection against non-atopic wheeze, which was particularly evident in non-affluent countries [Nagel 2009]. A recent ecological analysis of Phase Three

suggested sugar consumption could be a risk factor [Thornley 2010]. Clearly further studies of diet, asthma, rhinitis andeczema are needed.

Question

What other environmental factors are important?

ISAAC findings

A number of other environmental factors were explored in the Phase One ecological analyses, suggesting hypotheses that are worthy of further exploration [Asher 2010]. There was a possible risk from higher country economic development (gross national product) [Stewart 2001].The ecological findings for smoking were mixed with women smoking being a risk, but a potential protective effect of men smoking [Mitchell 2001]. Subsequent analyses at the individual level showed that both maternal and paternal smoking was associated with increased risk of asthma symptoms (unpublished). The 2001 finding is an example of the "ecological fallacy". Good news for immunisation programmes was the finding of a possible protective effect from DTP & measles immunisation [Anderson 2001]. In support of the hygiene hypothesis TB notifications had a possible protective effect [Von Mutius 2000], [Shirtcliffe 2002], whereas the picture with antibiotic sales was not clear [Foliaki 2004], but in Phase Three at an individual level antibiotic use in the first year of life was found to be a risk factor [Foliaki 2009]. There were mixed associations of symptom prevalence with climate, but overall little effect [Weiland 2004]. Paracetamol sales were found to be associated with asthma in children and adults. [Newson 2000] This was explored further in the Phase Three at an individual level where paracetamol use was found to be a risk factor for wheezing in children and adolescents [Beasley 2008], [Beasley 2011] which needs to be explored further in a randomised controlled trial. In Phase Two asthma and current wheeze were more common in homes with lower endotoxin levels, and there was a less consistent inverse association of endotoxin levels with allergic sensitisation [Gehring 2008].

For a complete list of ISAAC publications see appendices or go to
http://isaac.auckland.ac nz/publications/publicationsintro html

World Wide Publications

ISAAC PhaseOne Publications (worldwide)

1.0 Preliminary Papers

1.1 ISAAC.*ISAAC Manual (2nd Edition).*Auckland/Münster.December 1993.

1.2 Pearce N, Weiland S, Keil U, Langridge P, Anderson HR, Strachan D, Bauman A, Young L, Gluyas P, Ruffin D, Crane J, Beasley R.*Self-reported prevalence of asthma symptoms in children in Australia, England, Germany and New Zealand an international comparison using the ISAAC protocol.*Eur Respir J 1993; 6: 1455-61.

1.3 Asher MI, Keil U, Anderson HR, Beasley R, Crane J, Martinez F, Mitchell EA, Pearce N, Sibbald B, Stewart AW, Strachan D, Weiland SK, Williams HC.*International study of asthma and allergies in childhood (ISAAC) rationale and methods.*Eur Respir J 1995; 8: 483-91.

2.0 Main Findings

2.1 Strachan D, Sibbald B, Weiland S, Aït-Khaled N, Anabwani G, Anderson HR, Asher MI, Beasley R, Björkstén B, Burr M, Clayton T, Crane J, Ellwood P, Keil U, Lai C, Mallol J, Martinez F, Mitchell E, Montefort S, Pearce N, Robertson C, Shah J, Stewart A, von Mutius E, Williams H.*Worldwide Variations in prevalence of symptoms of allergic rhinoconjunctivitis in children the International Study of Asthma and Allergies in Childhood (ISAAC).*Pediatr Allergy Immunol 1997; 8(4): 161-76.

2.2 The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee.*Worldwide variation in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema ISAAC.*Lancet 1998; 351(9111): 1225-32.

2.3 Williams H, Robertson C, Stewart A, Aït-Khaled N, Anabwani G, Anderson HR, Asher MI, Beasley R, Björkstén B, Burr M, Clayton T, Crane J, Ellwood P, Keil U, Lai C, Mallol J, Martinez F, Mitchell E, Montefort S, Pearce N, Shah J, Sibbald B, Strachan D, von Mutius E, Weiland S.*Worldwide variations in the prevalence of symptoms of atopic eczema in the international study of asthma and allergies in childhood.*J Allergy Clin Immunol 1999; 103(1 Pt 1): 125-38.

2.4 The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee.*Worldwide variations in the prevalence of asthma symptoms the International Study of Asthma and Allergies in Childhood (ISAAC).*Eur Respir J 1998; 12(2): 315-335.

3.0 Other Overview Papers

3.1 Asher MI, Weiland SK, on behalf of the ISAAC Steering Committee.*The International Study of Asthma and Allergies in Childhood (ISAAC).*Clin Exp Allergy 1998; 28 Suppl 5: 52-66.

3.2 Beasley R, Ellwood P, Asher I.*International patterns of the prevalence of pediatric asthma the ISAAC program.*Pediatr Clin North Am 2003; 50(3): 539-53.Copyright© Elsevier 2003.

3.3 Lai C, Pearce N.*The contribution of ISAAC to the understanding of asthma.*Leukotriene Res & Clin Rev 2001; 2: 1-4.

3.4 Mallol J, Asher MI, Williams H, Clayton T, Beasley R on behalf of the ISAAC Steering Committee.*ISAAC findings in children aged 14 years an overview.*Allergy Clin Immunol Int 1999; 11: 176-82.

3.5 von Mutius E.*Epidemiology of asthma ISAAC--International Study of Asthma and Allergies in Childhood.*Pediatr Allergy Immunol 1996; 7(9 Suppl): 54-6.

4.0 Ecological Analyses

4.1 Anderson HR, Gupta R, Kapetanakis V, Asher MI, Clayton T, Robertson CF, Strachan DP, and the ISAAC Steering Committee.*International correlations between indicators of prevalence, hospital admissions and mortality for asthma in children.*Int J Epidemiol 2008; 37(3):573-82.

4.2 Anderson HR, Poloniecki JD, Strachan DP, Beasley R, Björkstén B, Asher MI, and the ISAAC Phase One Study Group.*Immunization and symptoms of atopic disease in children Results from the International Study of Asthma and Allergies in Childhood.*Am J Publ Health 2001; 91(7): 1126-9.

4.3 Burr ML, Emberlin JC, Treu R, Cheng S, Pearce NE, and the ISAAC Phase One Study Group.*Pollen counts in relation to the prevalence of allergic rhinoconjunctivitis, asthma and atopic eczema in the International Study of Asthma and Allergies in Childhood (ISAAC).*Clin Exp Allergy 2003; 33(12): 1675-80.

4.4 Ellwood P, Asher MI, Björkstén B, Burr M, Pearce N, Robertson CF, and the ISAAC Phase One Study Group.*Diet and asthma, allergic rhinoconjunctivitis and atopic eczema symptom prevalence An ecological analysis of the International Study of Asthma and Allergies in Childhood (ISAAC) data.*Eur Respir J 2001; 17(3): 436-443.

4.5 Foliaki S, Kildegaard Nielsen S, Björkstén B, von Mutius E, Cheng S, Pearce N, and the ISAAC Phase One Study Group.*Antibiotic sales and the prevalence of symptoms of asthma, rhinitis, and eczema The International Study of Asthma and Allergies in Childhood (ISAAC).*Int J Epidemiol 2004; 33(3): 558-63.

4.6 Mitchell EA, Stewart AW, on behalf of the ISAAC Phase One Study Group.*The ecological relationship of tobacco smoking to the prevalence of symptoms of asthma and other atopic diseases in children The International Study of Asthma and Allergies in Childhood (ISAAC).*Eur J Epidemiol 2001; 17(7): 667-73.

4.7 Shirtcliffe P, Weatherall M, Beasley R, on behalf of the ISAAC Phase One Study Group.*An inverse correlation between estimated tuberculosis notification rates and asthma symptoms.*Respirology 2002; 7(2): 153-5.

4.8 Stewart AW, Mitchell EA, Pearce N, Strachan DP, Weiland SK, on behalf of the ISAAC Steering Committee.*The relationship of per capita gross national product to the prevalence of symptoms of asthma and other atopic diseases in children (ISAAC).*Int J Epidemiol 2001; 30: 173-9.

4.9 von Mutius E, Pearce N, Beasley R, Cheng S, von Ehrenstein O, Björkstén B, Weiland S, on behalf of the ISAAC Steering Committee.*International patterns of tuberculosis and the prevalence of symptoms of asthma, rhinitis and eczema.*Thorax 2000; 55(6): 449-453.

4.1 Weiland SK, von Mutius E, Hüsing A, Asher MI, on behalf of the ISAAC Steering Committee.*Intake of trans fatty acids and prevalence of childhood asthma and allergies in Europe.*Lancet 1999; 353(9169): 2040-1.

4.11 Weiland SK, Hüsing A, Strachan D, Rzehak P, Pearce N, and the ISAAC Phase One Study Group.*Climate and the prevalence of symptoms of asthma, allergic rhinitis and atopic eczema in children.*Occup Environ Med 2004; 61(7): 609-15.

4.12 Anderson HR, Ruggles R, Pandey KD, Kapetenakis V, Brunekreef B, Lai CKW, Strachan DP, Weiland SK, and the ISAAC Phase One Study Group. *Ambient particulate pollution and the world-wide prevalence of asthma, rhinoconjunctivitis and eczema in children Phase One of the International Study of Asthma and Allergies in Childhood (ISAAC).*Occup Environ Med 2010; 67(5): 293-300. doi:10.1136/oem.2009.048785. epub: 9 October 2009.

4.13 Asher MI, Stewart AW, Mallol J, Montefort M, Lai CKW, Aït-Khaled N, Odhiambo J, and the ISAAC Phase One Study Group.*Which population level environmental factors are associated with asthma, rhinoconjunctivitis and eczema? A review of the ecological analyses of ISAAC Phase One.*Respiratory Research. 2010; 11(8):

5.0 Other Papers

5.1 Crane J, Mallol J, Beasley R, Stewart A, Asher MI, on behalf of the ISAAC Phase One Study Group.*Agreement between written and video questions for comparing asthma symptoms in ISAAC.*Eur Respir J 2003; 21(3): 455-61.

5.2 Pearce N, Sunyer J, Cheng S, Chinn S, Björkstén B, Burr M, Keil U, Anderson HR, Burney P, on behalf of the ISAAC Steering Committee and the European Community Respiratory Health Survey.*Comparison of asthma prevalence in the ISAAC and the ECRHS.*Eur Respir J 2000; 16(3): 420-6.

ISAAC PhaseTwo Publications (worldwide)

1.0 Preliminary Papers

1.1 ISAAC.*ISAAC Phase II Modules.*Münster, Germany.May 1998.

1.2 von Mutius E, Weiland SK, Keil U and the ISAAC Steering Committee.*The International Study of Asthma and Allergies in Childhood (ISAAC) study design and methods of phase II.*Allergologie 1999; 22(5):283-288.

1.3 Weiland SK, von Mutius E, Keil U, on behalf of the ISAAC Steering Committee.*The International Study of Asthma and Allergies in Childhood (ISAAC) rational methods and outlook.*Allergologie 1999; 22(5):275-282.

1.4 Weiland SK, Björkstén B, Brunekreef B, Cookson WO, von Mutius E, Strachan DP, and the ISAAC Phase Two Study Group.*Phase II of the International Study of Asthma and Allergies in Childhood (ISAAC II) rationale and methods.*Eur Respir J 2004; 24(3): 406-12.

2.0 Main Findings

2.1 Weinmayr G, Weiland SK, Björkstén B, Brunekreef B, Büchele G, Cookson WO, García-Marcos L, Gotua M, Gratziou C, van Hage M, von Mutius E, Riikjärv MA, Rzehak P, Stein RT, Strachan DP, Tsanakas J, Wickens K, Wong GW, and the ISAAC Phase Two Study Group.*Atopic sensitization and the international variation of asthma symptom prevalence in children.*Am J Respir Crit Care Med 2007; 176(6): 565-74.

2.2 Flohr C, Weiland SK, Weinmayr G, Björkstén B, Bråbäck L, Brunekreef B, Büchele G, Clausen M, Cookson WOC, von Mutius E, Strachan DP, Williams HC, and the ISAAC Phase Two Study Group.*The role of atopic sensitization in flexural eczema Findings from the International Study of Asthma and Allergies in Childhood Phase Two.*J Allergy Clin Immunol 2008; 121(1): 141-7.

2.3 Weinmayr G, Forastiere F, Weiland SK, Rzehak P, Abramidze T, Annesi-Maesano I, Björkstén B, Brunekreef B, Büchele G, Cookson WO, von Mutius E, Pistelli R, Strachan DP, and the ISAAC Phase Two Study Group.*International variation in prevalence of rhinitis and its relation with sensitization to perennial and seasonal allergens.*Eur Respir J 2008; 32: 1250–1261.

2.4 Gehring U, Strikwold M, Schram-Bijkerk D, Weinmayr G, Genuneit J, Nagel G, Wickens K, Siebers R, Crane J, Doekes G, Di Domenicantonio R, Nilsson L, Priftanji A, Sandin A, El-Sharif N, Strachan D, van Hage M, von Mutius E, Brunekreef B, and the ISAAC Phase Two Study Group.*Asthma and allergic symptoms in relation to house dust endotoxin Phase Two of the International Study on Asthma and Allergies in Childhood (ISAAC II).*Clin Exp Allergy 2008; 38: 1911–1920.

2.5 Flohr C, Weinmayr G, Weiland SK (deceased), Addo-Yobo E, Annesi-Maesano I, Björkstén B, Bråbäck L, Büchele G, Chico M, Cooper P, Clausen M, El-Sharif N, Martínez Gimeno A, Mathur RS, von Mutius E, Morales Suárez-Varela MM, Pearce N, Svabe V, Wong GWK, Yu M, Zhong NS, Williams HC and the ISAAC Phase Two Study Group.*How well do questionnaires perform compared with physical examination in detecting flexural eczema? Findings from the International Study of Asthma and Allergies in Childhood (ISAAC) Phase Two.*Br J Dermatol 2009; 161(4): 846-853. Epub 27 May.

2.6 Nagel G, Büchele G, Weinmayr G, Björkstén B, Chen Y-Z, Wang H, Nystad W, Saraçlar Y, Bråbäck L, Batllés-Garrido J, García-Hernández G, Weiland SK, and the ISAAC Phase Two Study Group.*Effect of Breastfeeding on Asthma, Lung function, and Bronchial Hyperreactivity in ISAAC-Phase-Two.*Eur Respir J.2009; 33: 993–1002; Epub 2009 Jan22.

2.7 Genuneit J, Cantelmo JL, Weinmayr G, Wong GWK, Cooper PJ, Riikjärv MA, Gotua M, Kabesch M, von Mutius E, Forastiere F, Crane J, Nystad W, El Sharif N, Batllés-Garrido J, García-Marcos L, García-Hernández G, Morales Suárez-Varela MM, Nilsson L, Bråbäck L, Saraçlar Y, Weiland SK, Cookson WOC, Strachan DP, Moffatt MF, ISAAC Phase Two Study Group.*A multi-centre study of candidate genes for wheeze and allergy. The International Study of Asthma and Allergies in Childhood Phase Two.*Clin Exp Allergy 2009 Dec; 39(12): 1875-1888

2.8 Weinmayr G, Genuneit J, Nagel G, Björkstén B, van Hage M, Priftanji A, Cooper P, Rijkjärv M-A, von Mutius E, Tsanakas J, Forastiere F, Doekes G, Garrido JB, Morales Suárez-Varela MM, Bråbäck L, Strachan DP, the ISAAC Phase Two Study Group.*International variations in associations of allergic markers and diseases in children ISAAC Phase Two.*Allergy 2010; 65(6): 766–775. epub 21 Dec 2009. DOI:10.1111/j.1398-9995.2009.02283.x

2.9 Nagel G, Weinmayr G, Kleiner A, García-Marcos, Strachan DP, the ISAAC Phase Two Study Group.*Effect of diet on asthma and allergic sensitisation in the International Study on Allergies and Asthma in Childhood (ISAAC) Phase Two.*Thorax 2010; 65(6): 516-522 doi:10.1136/thx.2009.128256

2.1 Büchele G, Genuneit J, Weinmayr G, Björkstén B, Gehring U, von Mutius E, Priftanji A, Stein RT, Addo-Yobo EO, Priftis KN, Shah JR, Forastiere F, Svabe V, Crane J, Nystad W, García-Marcos L, Saraçlar Y, El-Sharif N, Strachan DP and the ISAAC Phase Two Study Group*International Variations in Bronchial Responsiveness in Children Findings From ISAAC Phase Two*Pediatr Pulmonol 2010; 45(8): 796–806

ISAAC PhaseThree Publications (worldwide)

1.0 Preliminary Papers

1.1 Ellwood P, Asher MI, Beasley R, Clayton TO, Stewart AW, on behalf of the ISAAC Steering Committee and the ISAAC Phase Three Study Group.*ISAAC Phase Three Manual.*Auckland.July 2000.ISBN 0-473-06910-5.

1.2 Ellwood P, Asher MI, Beasley R, Clayton TO, Stewart AW, and the ISAAC Steering Committee.*The International Study of Asthma and Allergies in Childhood (ISAAC) Phase Three rationale and methods.*Int J Tuberc Lung Dis 2005; 9(1): 10-6.

2.0 Main Findings

2.1 Asher MI, Montefort S, Björkstén B, Lai CKW, Strachan DP, Weiland SK, Williams H, and the ISAAC Phase Three Study Group.*Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood ISAAC Phases One and Three repeat multicountry cross-sectional surveys.*Lancet 2006; 368(9537): 733-743.

2.2 Pearce N, Aït-Khaled N, Beasley R, Mallol J, Keil U, Mitchell E, Robertson C, and the ISAAC Phase Three Study Group.*Worldwide trends in the prevalence of asthma symptoms Phase III of the International Study of Asthma and Allergies in Childhood (ISAAC).*Thorax 2007; 62(9): 758-66.

2.3 Björkstén B, Clayton T, Ellwood P, Stewart A, Strachan D, and the ISAAC Phase Three Study Group.*Worldwide time trends for symptoms of rhinitis and conjunctivitis Phase III of the International Study of Asthma and Allergies in Childhood.*Pediatr Allergy Immunol 2008; 19(2): 110-24.

2.4 Williams H, Stewart A, von Mutius E, Cookson B, Anderson HR, and the ISAAC Phase One and Three Study groups.*Is eczema really on the increase worldwide?*J Allergy Clin Immunol 2008; 121(4): 947-54.

2.5 Aït-Khaled N, Pearce N, Anderson HR, Ellwood P, Montefort S, Shah J, and the ISAAC Phase Three Study Group.*Global map of the prevalence of symptoms of rhinoconjunctivitis in children The International Study of Asthma and Allergies in Childhood (ISAAC) Phase Three.*Allergy 2009; 64: 123–148.

2.6 Lai CKW, Beasley R, Crane J, Foliaki S, Shah J, Weiland S, and the ISAAC Phase Three Study Group.*Global variation in the prevalence and severity of asthma symptoms Phase Three of the International Study of Asthma and Allergies in Childhood (ISAAC).*Thorax 2009; 64: 476–483.Epub Feb 2009.

2.7 Odhiambo J, Williams H, Clayton T, Robertson C, Asher MI, and the ISAAC Phase Three Study group.*Global variations in prevalence of eczema symptoms in children from ISAAC Phase Three*J Allergy Clin Immunol. Dec 2009;124(6):1251-8.

3.0 Environmental Questionnaire Analyses

3.1 Beasley R, Clayton T, Crane J, von Mutius E, Lai CKW, Montefort S, Stewart A, for the ISAAC Phase Three Study Group.*Association between paracetamol use in infancy and childhood, and risk of asthma, rhinoconjunctivitis, and eczema in children aged 6-7 years analysis from Phase Three of the ISAAC programme.*Lancet 2008; 372(9643): 1039-48.

3.2 Brunekreef B, Stewart AW, Anderson HR, Lai CKW, Pearce NE, and the Phase Three Study Group.*Self Reported Truck Traffic on the Street of Residence and Symptoms of Asthma and Allergic Disease A Global Relationship in ISAAC Phase Three.*Environ Health Perspect 2009; 117(11): 1791-98. Epub July 2009.

3.3 Foliaki S, Pearce N, Björkstén B, Mallol J, Montefort S, von Mutius E and the ISAAC Phase Three Study Group.*Antibiotic use in infancy and risk of symptoms of asthma, rhinoconjunctivitis and eczema in 6 to 7 year old children ISAAC Phase Three.*J Allergy Clin Immunol 2009;124(5):982-9.

3.4 Beasley RW, Clayton TO, Crane J, Lai CKW, Montefort SR, von Mutius E, Stewart AW, and the ISAAC Phase Three Study Group.*Acetaminophen Use and Risk of Asthma, Rhinoconjunctivitis and Eczema in Adolescents ISAAC Phase Three*Am J Resp Crit Care Med. 2011; 183(2): 171-178. epub 13 August 2010

3.5 Björkstén B, Aït-Khaled N, Asher MI, Clayton TO, Robertson C, the ISAAC Phase Three Study Group*Global analysis of breast feeding and risk of symptoms of asthma, rhinoconjunctivitis and eczema in 6—7 year old children ISAAC Phase Three.*Allergol Immunopathol (Madr); 2011. doi:10.1016/j.aller.2011.02.005 Epub ahead of print

4.0 Other papers

4.1 Ellwood P, Williams H, Aït-Khaled N, Björkstén B, Robertson C, and the ISAAC Phase III Study Group.*Translation of questions The International Study of Asthma and Allergies in Childhood (ISAAC) experience.*Int J Tuberc Lung Dis.September 2009; 13(9): 1174-1182.

4.2 Ellwood P, Asher MI, Stewart AW and the ISAAC Phase III Study Group*The impact of the method of consent on response rates in the ISAAC time trends study.*Int J Tuberc Lung Dis. 2010 Aug;14(8):1059-65.

4.3 Flohr C.*What can we learn about eczema from the International Study of Asthma and Allergies in Childhood (ISAAC)?*Allergologie 2010; 33(6): 242–250

Phase One Prevalence

At the time of ISAAC Phase One there were few countries in the world where anything was known about the prevalence of asthma, rhinitis and eczema, and even less about their severity. Little was known about the effects of gender. Almost all the studies to that date had been undertaken in affluent, high income, developed countries, mostly Australia, Canada, New Zealand, UK and USA.

The new key scientific findings from Phase One were the description of the prevalence and severity of asthma [Asher 1998], rhinitis [Strachan 1997] and eczema [Williams 1999] in two age groups (6-7 yr olds, 13-14 yr olds), in 156 centres from 56 countries, most of whom had never undertaken research of this nature before. There were striking variations in the prevalence of symptoms of asthma, rhinitis and eczema throughout the world (more than 20 fold between centres [Beasley 1998], both within and between countries inhabited by similar ethnic groups, suggesting that environmental factors may be critical in determining disease expression.

The relationship of the three conditions was examined. Most symptomatic children had symptoms of only one disorder in the last year, which indicates that risk factors different from atopic sensitisation may be important in the development of these three conditions [Beasley 1998].

Asthma

The prevalence of wheeze in the last 12 months ranged from 2.1-32.2% in the older age group and 4.1-32.1% in the younger age group and was particularly high in English speaking countries and Latin America. A video questionnaire completed in the older age group in 99 centres (42 countries) showed a similar pattern. While the high prevalence centres for asthma symptoms were mainly in developed countries, there were some (for example Costa Rica, Peru) which also had high rates. There were some large differences in prevalence between people of similar genetic origin living in different environments (for example Hong Kong and Guangzhou, China). The prevalence of asthma symptoms was greater in males in the younger age group and a mixed picture in the older age group, but on average females had slightly higher prevalence than males [Asher 1998]. We concluded that environmental factors were the cause of these large variations.

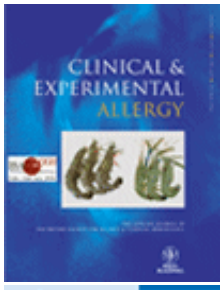
There are extensive data on the prevalence of childhood asthma world-wide but the relationships between asthma symptom prevalence, mortality and hospital admissions had not been investigated. This was done with Phase One written questionnaire, and Phase Three time trends centres - 12-month period prevalence of asthma symptoms by parental report in both age groups in 60 countries. The prevalence values of any wheeze and severe wheeze were correlated with national data on mortality and hospital admissions for asthma in 5–14 year olds. All correlations with prevalence were positive. Thus the prevalence of asthma symptoms in children obtained from local questionnaire studies may provide a guide to estimate the incidence of severe episodes of asthma in countries with incomplete data on hospital [Anderson 2008].

Rhinitis

While the initial ISAAC approach to nasal symptoms had been to use them to define allergic rhinitis, all the ISAAC papers focused in particular on rhinitis with itchy-watery eyes (rhinoconjunctivitis) as being the symptom combination most closely relating to objective indicators of allergic sensitisation in European children.[Strachan 1997]. The prevalence of rhinoconjunctivitis in the past year varied across centres from 0.8 to 14.9% in 6-7 yr olds, and from 1.4 to 39.7% in 13-14 year olds. In centres of higher prevalence there was great variation in the proportion of rhinoconjunctivitis labeled as hay fever. The lowest prevalences were found in parts of eastern Europe and south and central Asia.

Eczema

At the time of ISAAC Phase One there had been only one between country study comparing atopic dermatitis in three countries in Northern Europe. In ISAAC the prevalence range for symptoms of eczema was from less than 2% in Iran to over 16% in Japan and Sweden in the 6 to 7 year age range and less than 1% in Albania to over 17% in Nigeria for the 13 to 14 year age range. Higher prevalences of eczema symptoms were reported in Australasia and Northern Europe, and lower prevalences were reported in Eastern and Central Europe and Asia. Similar patterns were seen for symptoms of severe eczema [Williams 1999]. Thus eczema is a common health problem for children and adolescents throughout the world. Studies that include objective skin examinations have since been completed in ISAAC Phase Two[Flohr 2009] confirming these findings.



Phase One Ecological Analyses

Ecological analyses were undertaken with ISAAC Phase One data to explore factors that may have contributed to the large variations found in Phase One [Asher 2010]. Symptom prevalence of all three conditions was positively associated with GNP, trans fatty acids, paracetamol, and women smoking, and inversely associated with food of plant origin, pollen, immunisations, tuberculosis notifications, air pollution, and men smoking. The magnitude of these associations was small, but consistent in direction between conditions. There were mixed associations of climate and antibiotic sales with symptom prevalence. The potential causality of these associations warrant further investigation. Factors which prevent the development of these conditions, or where there is an absence of a positive correlation at a population level may be as important from the policy viewpoint as a focus on the positive risk factors.

Economic factors

Early reports of asthma prevalence found high prevalences in affluent countries, and there were anecdotal reports of low prevalences in non-affluent countries. This led us to explore the relationship between gross national product (GNP) and symptoms, and we found this was weakly positive [Stewart 2001]. However caution should be used in interpreting the findings because of the great inequalities in income distribution within almost all countries in developing regions of the world. GNP represents the total economic activity of the country, reflecting mean wealth rather than median wealth, not distribution of wealth within a country. All other ecological analyses were adjusted for GNP

Air pollution

There is extensive evidence from individual level studies that air pollution may aggravate existing asthma. However does air pollution influence the proportion of children in a population who have asthma symptoms? We found a weak inverse relationship between modelled city-level particulate air pollution (PM10) and symptoms of the three conditions, even after controlling for GNP which has a strong inverse association with air pollution [Anderson 2010]. Meta-analyses of data from countries with multiple centres found some evidence of weak positive associations. These findings are in line with other, more limited ecological evidence which suggest that community levels of particulate air pollution do not explain variations in prevalence between communities.

Antibiotics

The hygiene hypothesis postulates that growing up in a more hygienic environment with less microbial exposure may enhance atopic (TH2) immune responses, whereas microbial pressure would drive the response of the immune system—which is known to be skewed in an atopic TH2 direction during fetal and perinatal life—in a TH1 direction and away from its tendency to develop atopic immune responses. This would protect against atopy and allergic (but not nonallergic) asthma. A corollary of the hygiene hypothesis is that antibiotic use may increase the risk of asthma by reducing the protective effect of microbial exposure, for example, through disruption of the normal gut microbiota. This was explored in Phase One [Foliaki 2004] in 28 countries using country antibiotic sales. The relationships between symptom prevalence and antibiotic exposure was not clear cut: a mixture of weak inverse and positive effects were found between symptom prevalences and total antibiotic sales and broad spectrum antibiotic sales. This analysis suggested that even if there was a potential causal association of antibiotic use with asthma risk, it did not appear to explain the world wide differences between countries.

Climate

As climate affects whole populations, ecological studies are ideally suited to examine the relationship between prevalence of diseases and climatic conditions between populations. In the worldwide analyses few significant associations were seen [Weiland 2004]. As the world becomes more affected by climate change there may be some regions such as Western Europe where prevalence of disease is affected by potentially modifiable factors including humidity and temperature, but at a global level our ecological analyses showed little effect.

Diet

Dietary patterns have changed rapidly with modernisation or westernisation, and the associated move away from plant-based foods and addition of man-made fats might affect symptom prevalence. No associations were found for meat, and milk, but there was a pattern of inverse association between plant-based food and symptoms of the three conditions [Ellwood 2001]. The analysis in European countries of *trans* fatty acids found a positive association, suggesting that man-made fats may be a factor in the prevalence of the three conditions [Weiland 2000]. Thus dietary influences on the three conditions require further investigation.

Immunisation

There had been mixed reports about whether immunisation had no effect on these three diseases, or was potentially a risk factor related to the hygiene hypotheses. Country level analyses showed no associations [Anderson 2010]. The more powerful centre-level analyses showed small inverse relationships between DTP and measles in the older age group only,

with no associations with BCG. In view of earlier reports that immunisation might be a risk factor for asthma, this mainly null result is reassuring for population immunisation programmes, given their importance for child health.

Pollen

Pollen commonly triggers hay fever. On the other hand studies have found that the symptom prevalence of hay fever and asthma tends to be lower in rural than in urban areas, and lowest among people living on farms, where there is likely to be higher pollen exposure. In the Phase One ecological analysis exposure to allergenic pollen was assessed by exposures around the dates of early life [Burr 2003]. It did not appear to increase the risk of acquiring symptoms of respiratory allergy, and may even give some protection. but this has not been consistently found outside Europe and USA, and was not studied in our analyses. The degree of consistency in the inverse associations suggests the possibility of a protective effect of pollen on allergy.

Tobacco

Given the strong relationship between tobacco exposure and asthma symptoms at an individual level, we examined this at a centre and country level in Phase One. A mixed picture emerged for tobacco with no association observed between country tobacco consumption and symptoms [Mitchell 2001]. However there was generally a positive relationship between women smoking, yet an inverse association between men smoking and the three conditions. This analysis indicated that the well established individual level association between parental cigarette smoking and asthma did not account for the international differences in asthma prevalence.

Tuberculosis

There had been interest in whether the lack of exposure to infections such as tuberculosis increasing the risk of atopic disorders. We found inverse associations between asthma symptom prevalence and estimated TB incidence [Von Mutius 2000] and actual TB notifications rates [Shirtcliffe 2002], supporting other evidence that exposure to *Mycobacterium tuberculosis* may reduce the risk of developing asthma through induction of Th1 type immune responses. The implications of this relationship in the changing incidence of worldwide distributions of tuberculosis disease need further study.

Phase Two Findings

The inclusion of objective markers of allergic sensitisation, bronchial responsiveness and flexural dermatitis in ISAAC Phase Two enabled the description of international variations in disease prevalence beyond the level measured in Phase One by core questionnaires. Markers of disease have also been related to individual exposure to environmental factors and genetic markers.

The role of allergic sensitisation in disease

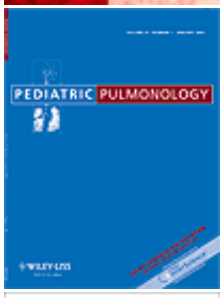
The first set of Phase Two publications investigated the role of atopy (as measured by positive allergen skin prick tests) in asthma [Weinmayr 2007], rhinoconjunctivitis [Weinmayr 2008] and eczema [Flohr 2008]. At the level of individual children, the association of atopy with each of these diseases was stronger in more affluent centres than in less affluent centres. At the level of whole populations (centres), however, the correlation between the prevalence of atopy and the prevalence of symptoms for each disease was weak or non-existent.

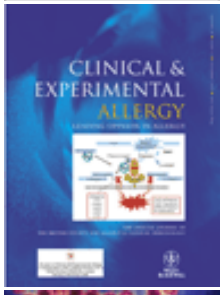
Thus, international variations in the prevalence of atopy did not explain much of the between-centre variations in disease prevalence, whereas within centres, a highly variable proportion of symptoms of asthma, rhinoconjunctivitis or eczema was statistically attributable to atopy: this proportion being greater in more affluent centres than in less affluent centres. These findings, across diverse study centres worldwide, suggest that much asthma, rhinoconjunctivitis and eczema has a non-allergic basis, especially in developing countries.

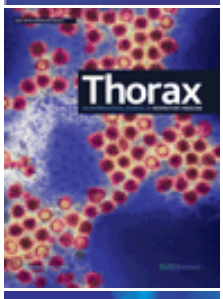
Objective markers v questionnaire measures

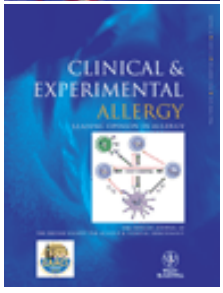
A second set of papers addressed the correlations between objective markers and the corresponding questionnaire measures of disease. At the level of whole populations, the correlation between prevalences of examined and reported flexural dermatitis was high, offering reassurance that ISAAC questionnaire-derived prevalence data for eczema are sufficiently precise for comparisons between populations [Flohr 2009].

In contrast, high rates of bronchial responsiveness to inhaled hypertonic saline challenge were not confined to centres with high prevalences of asthma symptoms, nor to affluent countries. At the individual level, the association between wheeze and BHR differed across centres but this heterogeneity could be largely explained by a stronger association with wheeze in atopic children than in non-atopic children [Buchele 2010]. “Downregulation” of local inflammatory responsiveness had previously been proposed to explain a low prevalence of positive skin prick tests (SPTs) in less affluent countries. Analyses of the inter-relationships of SPTs, total and allergen-specific IgE in Phase Two centres with diverse living conditions found no support for this hypothesis [Weinmayr 2010].









Environmental and lifestyle risk factors

A third set of papers investigated known or suspected risk factors for asthma or allergy. Endotoxin (bacterial products) has been suggested as both a trigger of asthma and a protective factor against allergic sensitisation. Living room floor dust was collected and analysed for endotoxin in six centres from Albania, Italy, New Zealand, Sweden and the United Kingdom. Asthma and current wheeze were more common in homes with lower endotoxin levels, and there was a less consistent inverse association of endotoxin levels with allergic sensitisation [Gehring 2008].

Breastfeeding was associated with less wheeze both in affluent and nonaffluent countries, but this relationship was mainly due to non-atopic wheeze. Breastfeeding was not associated with atopic wheeze or with objective measures of allergy [Nagel 2009].

More frequent consumption of fruit, vegetables and fish was associated with a lower prevalence of wheeze and asthma, whereas high burger consumption was associated with higher lifetime asthma prevalence. None of the food items studied was associated with allergic sensitisation. Except for fruit juice and fruit consumption, no associations were found with atopic wheeze. These results support previous suggestions that adherence to the 'Mediterranean diet' may provide some protection against wheeze and asthma in childhood [Nagel 2010].

Genetic risk factors

Early genetic studies within Phase Two focused on 55 candidate single nucleotide polymorphisms (SNPs) in 14 genes that had been associated with asthma or allergy in the published literature up to 2003 [Genuneit 2009]. Significant associations with wheeze were detected in only four genes *(IL4R, TLR4, MS4A2, TLR9)*. Variants in *IL4R* and *TLR4* were also related to allergen-specific IgE, while polymorphisms in *FCER1B* (*MS4A2*) and *TLR9* were not. There were also highly significant associations between *SPINK5* variants and visible eczema (but not IgE levels) and between *IL13* variants and total IgE. Heterogeneity of these genetic effects across centres was rare, despite differences in allele frequencies.

These findings suggest that, despite the biological plausibility of IgE-related mechanisms in asthma, genetic evidence of this pathway is sparse. This conclusion was borne out by the larger collaborative analysis conducted by the GABRIEL consortium [Moffatt 2010], of which ISAAC is a partner. Studies of possible interactions between genetic variants and non-genetic risk factors are currently being pursued as part of the GABRIEL work programme.

Phase Three Time Trends

Until ISAAC Phase Three, only 5 centres in the world had previously conducted collaborative time trends studies in all 3 conditions using standardised methods. While a number of other centres had used standardised methods to study asthma trends over time, different centres had used different methods so the findings were not comparable between centres. Most centres who undertook ISAAC Phase One repeated the study after at least five years, reflecting the large worldwide interest in time trends of prevalence. For most centres it was the first opportunity to obtain time trends information. The time trends results in 2 age groups from 104 centres in 55 countries provided very helpful new information on the direction and magnitude of change in [Asher 2006]. In many regions with developing countries, an increase in the prevalence of symptoms was found more commonly than a decrease in the prevalence of symptoms for all 3 conditions. In centres where symptom prevalence had previously been low, it mostly increased, and where it had been high it mostly decreased or did not change. The rise in prevalence of symptoms in many centres in countries with high populations suggests that the world burden is increasing. Paradoxically at the same time the global disparities are decreasing.

Asthma time trends

Following reports from English language countries in the 1990s of increases in asthma prevalence from the 1980s, continuing increases in prevalence had been expected. However ISAAC found that in most high prevalence countries, particularly the English language countries, the prevalence of asthma symptoms changed little between Phase One and Phase Three, and even declined in some cases [Pearce 2007]. In contrast, a number of countries that had high or intermediate levels of symptom prevalence in Phase One showed significant increases in prevalence in Phase Three. Examples include Latin American countries such as Costa Rica, Panama, Mexico, Argentina and Chile, and Eastern European countries such as the Ukraine and Romania. Other countries with significant increases in symptom prevalence included Barbados, Tunisia, Morocco and Algeria. With the exception of India, all of the countries with very low symptom prevalence rates in Phase One reported increases in prevalence in Phase Three. The overall percentage of children and adolescents reported to have ever had asthma increased significantly, possibly reflecting greater awareness of this condition and/or changes in diagnostic practice. The increases in asthma symptom prevalence in locations of high population density such as Africa, Latin America and parts of Asia indicate that the global burden of asthma is continuing to rise, and at the same time the global prevalence differences are lessening.

Rhinitis time trends

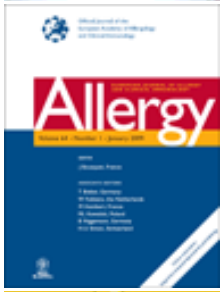
Before ISAAC Phase Three there had been little study of changes in rhinitis or hayfever over time. In the 13- to 14-yr age group 106 centres in 56 countries and in the 6- to 7-yr age group 66 centres in 37 countries studied, a slight worldwide increase in rhinoconjunctivitis prevalence was observed, but the variations were large among the centres and there was no consistent regional pattern [Björkstén 2008] . Prevalence increases in the older children exceeding 1% per year were recorded in 13 centres, including 3 of 9 centres in Africa, 2 of 15 in Asia-Pacific, 1 of 8 in India, 3 of 15 in Latin America, 3 of 9 in Eastern Europe and 1 of 34 in Western and Northern Europe. Decreasing rhinoconjunctivitis prevalence of similar magnitude was only seen in four centres. The changes were less pronounced in the 6- to 7-yr-old children and only in one centre did any change exceed 1% per year. The decrease in highest prevalence rates in ISAAC Phase I suggests that the prevalence has peaked in those regions. An increase was recorded in several centres, mostly in low and mid-income countries. The increases were more pronounced in the older age group, suggesting that environmental influences on the development of allergy may not be limited to early childhood rhinoconjunctivitis

Eczema time trends

At the time of ISAAC Phase Three it was unclear whether eczema prevalence was truly increasing worldwide. In 13 to 14 year old children from 105 centres from 55 countries and 6 to 7 year old children in 64 centers from 35 countries annual prevalence changes in relation to average prevalence across Phase One and Three were generally small and differed in direction according to the age of the participants and world region [Williams 2008]. For 13 to 14 year olds, eczema symptom prevalence decreased in some previously high prevalence centress from the developed world, such as the United Kingdom and New Zealand, whereas centers with previously high prevalence rates from developing countries continued to increase. In the children 6 to 7 years old, most centers showed an increase in current eczema symptoms. Similar patterns to these were present for severe eczema at both ages. Thus the epidemic of eczema seems to be leveling or decreasing in some countries with previously high prevalence rates. The picture elsewhere is mixed, with many formerly low-prevalence developing countries experiencing substantial increases, especially in the younger age group.

Time Trend Publications

The ISAAC Story



Phase Three World Maps

In Phase Three ISAAC "mapped" the prevalence of asthma, rhinoconjunctivitis and eczema, conducted between 2000 and 2003.

Asthma

Further study of the global prevalence and severity of asthma symptoms was undertaken in ISAAC Phase Three, involving adolescents from 233 centres in 97 countries, and children from 144 centres in 61 countries [Lai 2009]. As in ISAAC Phase One, wide variations in prevalence were found around the world. The prevalence of wheeze in the past 12 months in adolescents varied from 32.6% in Wellington (New Zealand) to 0.8% in Tibet (China), and in children from 37.6% in Costa Rica to 2.4% in Jodhpur (India). The prevalence of symptoms of severe asthma (defined as =4 attacks of wheeze, or =1 night per week sleep disturbance from wheeze, or wheeze affecting speech in the past 12 months) varied from 16% in Costa Rica to 0.1% in Pune (India) in adolescents, and from 20.3% to 0% in the same two centres in children. Ecological economic analyses revealed a significant trend towards a higher prevalence of current wheeze in centres in higher income countries in both age groups, but this trend was reversed for the prevalence of severe symptoms among current wheezers, especially in the older age group. Thus wide variations exist in the symptom prevalence of childhood asthma worldwide. Although asthma symptoms tend to be more prevalent in more affluent countries, they appear to be more severe in less affluent countries.

Rhinitis

Further study of the global prevalence and severity of rhinitis symptoms was undertaken in ISAAC Phase Three, involving children from 236 centres in 98 countries [Aït-Khaled 2009]. The average overall prevalence of current rhinoconjunctivitis symptoms was 14.6% for the 13- to 14-year old children (range 1.0–45%). Variation in the prevalence of severe rhinoconjunctivitis symptoms was observed between centres (range 0.0–5.1%) and regions (range 0.4% in western Europe to 2.3% in Africa), with the highest prevalence being observed mainly in the centres from middle and low income countries, particularly in Africa and Latin America. Co-morbidity with asthma and eczema varied from 1.6% in the Indian sub-continent to 4.7% in North America. For 6- to 7-year old children, the average prevalence of rhinoconjunctivitis symptoms was 8.5%, and large variations in symptom prevalence were also observed between regions, countries and centres. Thus wide global variations exist in the prevalence of current rhinoconjunctivitis symptoms, being higher in high *vs* low income countries, but the prevalence of severe symptoms was greater in less affluent countries. Co-morbidity with asthma is high particularly in Africa, North America and Oceania. This global map of symptom prevalence is of clinical importance for health professionals.

Eczema

Further study of the global prevalence and severity of rhinitis symptoms was undertaken in ISAAC Phase Three, involving children from 236 centres in 98 countries [Odhiambo 2009]. Current eczema was defined as an itchy flexural rash in the past 12 months and was considered severe eczema if associated with 1 or more nights per week of sleep disturbance. For the age group 6 to 7 years, data on 385,853 participants from 143 centers in 60 countries showed that the prevalence of current eczema ranged from 0.9% in India to 22.5% in Ecuador, with new data showing high values in Asia and Latin America. For the age group 13 to 14 years, data on 663,256 participants from 230 centers in 96 countries showed prevalence values ranging from 0.2% in China to 24.6% in Columbia with the highest values in Africa and Latin America. Current eczema was lower for boys than girls (odds ratio, 0.94 and 0.72 at ages 6 to 7 years and 13 to 14 years, respectively). Thus ISAAC Phase Three provided comprehensive global data on the prevalence of eczema symptoms that is essential for public health planning. New data reveal that eczema is a disease of developing as well as developed countries

Phase Three Risk Factors

In Phase Three risk factors have been explored using the environmental questionnaire. Many themes have been explored. Those which have been published are summarised below.

Paracetamol (Acetaminophen)

Previous reports suggested that exposure to paracetamol during intrauterine life, childhood, and adult life may increase the risk of developing asthma. In ISAAC Phase Three in 6-7-year-old children from 73 centres in 31 countries[Beasley 2008] the use of paracetamol for fever in the first year of life was associated with an increased risk of asthma symptoms when aged 6 -7 years (OR 1.46 [95% CI 1.36 - 1.56]). Current use of paracetamol was associated with a dose-dependent increased risk of asthma symptoms (1.61 [1.46 - 1.77] and 3.23 [2.91 - 3.60] for medium and high use *vs* no use, respectively). Use of paracetamol was similarly associated with the risk of severe asthma symptoms, with population-attributable risks between 22% and 38%. Paracetamol use, both in the first year of life and in children aged 6 - 7 years, was also associated with an increased risk of symptoms of rhinoconjunctivitis and eczema. In the analysis of adolescents from 113 centers in 50 countries the recent use of paracetamol was associated with an exposure-dependent increased risk of current asthma symptoms (OR, 1.43 [95%CI 1.33 - 1.53] and 2.51 [95% CI 2.33 - 2.70] for medium and high versus no use, respectively). Paracetamol use was also associated with an exposure-dependent increased risk of current symptoms of rhinoconjunctivitis and eczema [Beasley 2011]. While these findings might indicate causation, they could be as a result of either reverse causation, for example if paracetamol were prescribed because of respiratory symptoms; or they could be a result of confounding by indication, for example if paracetamol were prescribed for chest infections, which were in turn associated with subsequent respiratory disease. Further research is needed, including randomised controlled trials, into the long-term effects of paracetamol in childhood.

Antibiotics

The hygiene hypothesis postulates that growing up in a more hygienic environment with less microbial exposure may enhance atopic (TH2) immune responses, whereas microbial pressure would drive the response of the immune system - which is known to be skewed in an atopic TH2 direction during fetal and perinatal life - in a TH1 direction and away from its tendency to develop atopic immune responses. This would protect against atopy and allergic (but not nonallergic) asthma. A corollary of the hygiene hypothesis is that antibiotic use may increase the risk of asthma by reducing the protective effect of microbial exposure, for example, through disruption of the normal gut microbiota This was explored in Phase Three [Foliaki 2009] in a total of 71 centers in 29 countries. Reported use of antibiotics in the first year of life was associated with an increased risk of current asthma symptoms (wheezing in the previous 12 months) with an OR adjusted for risk factors of 1.70 (95% CI, 1.60-1.80) when adjusted for other risk factors for asthma. Similar associations were observed for severe asthma symptoms (OR, 1.82; 95% CI, 1.67-1.98), and asthma ever (OR, 1.94; 95% CI, 1.83-2.06). Use of antibiotics in the first year of life was also associated, but less strongly, with increased risks of current symptoms of rhinoconjunctivitis (OR, 1.56; 95% CI, 1.46-1.66) and eczema (OR, 1.58; 95% CI, 1.33-1.51). This association between antibiotic use in the first year of life and current symptoms of asthma, rhinoconjunctivitis, and eczema in children 6 and 7 years old requires further research to determine whether the observed associations are causal or are a result of of reverse causation, for example if antibiotics were prescribed because of respiratory symptoms; or they could be a result of confounding by indication, for example if antibiotics were prescribed for chest infections, which were in turn associated with subsequent respiratory disease.

Truck traffic exposure

Associations between traffic pollution on the street of residence and a range of respiratory and allergic outcomes in children have been reported in developed countries, but little has been known about such associations in developing countries. In Phase Three frequency of truck traffic on the street of residence was positively associated with the prevalence of symptoms of asthma, rhinoconjunctivitis, and eczema with an exposure - response relationship[Brunekreef 2009]. Odds ratios for “current wheeze” and “almost the whole day” versus “never” truck traffic were 1.35 (95% CI, 1.23 - 1.49) for 13- to 14-year-olds and 1.35 (195% CI,.22 - 1.48) for 6- to 7-year-olds. These findings that higher exposure to self-reported truck traffic on the street of residence is associated with increased reports of symptoms of asthma, rhinitis, and eczema in many locations in the world require further investigation in view of increasing exposure of the world’s children to traffic.

Ellwood P, Asher MI, Stewart AW and the ISAAC Phase III Study Group *The impact of the method of consent on response rates in the ISAAC time trends study.* Int J Tuberc Lung Dis. 2010 Aug;14(8):1059-65.

View Abstract | View Journal page | View Editorial

Ellwood P, Williams H, Aït-Khaled N, Björkstén B, Robertson C, and the ISAAC Phase III Study Group. *Translation of questions The International Study of Asthma and Allergies in Childhood (ISAAC) experience.* Int J Tuberc Lung Dis.September 2009; 13(9): 1174-1182.

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Methodological Studies

Translations

As ISAAC has used many languages and translations, a systematic analysis of the ISAAC Phase Three translations was undertaken [Ellwood 2009]. In Phase Three 53 language translations were developed which followed standardised guidelines, including back-translating the questionnaires into English to check their accuracy and meaning. Serious deviations for one or more questions were found in seven translations for the adolescents (14%) and in three translations for the children (7%) resulting in exclusion of the data for those questions from the final data set. Thus translations of questionnaires should follow a consistent protocol in global epidemiological research. Cultural norms need to be considered when evaluating back translations into English, as disease labels are not available in every language, nor are they understood in the same way. Deviations from literal translations of English should be permitted if the intent of the original meaning is retained.

Consent

The relationships between achieved response rates and method of consent for 13–14 and 6–7-year-olds were examined between phases and between English and non-English language centres [Ellwood 2010]. We found that the requirement for active consent for population school-based questionnaire studies can impact negatively on response rates, particularly English language centres, thus adversely affecting the validity of the data. Ethics committees need to carefully consider the usefulness of the use of passive consent in epidemiological studies to obtain high response rates from participants.

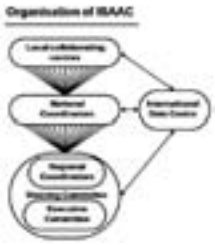
Replication of Methodology

Centre reports were completed by Principal Investigators in Phases One and Three which enabled a detailed checking process to be undertaken on the methodology. For the Phase Three Time Trends centres all deviations between Phase One and Three were documented and were categorised: major deviations (centres excluded from the analyses); minor deviations (deviations identified by the use of footnotes in the published tables) and; very minor deviations (deviations accepted and not identified in the publication tables). This information has been collated and a manuscript on “The challenge in replicating the methodology between Phase One and Three of ISAAC” will be submitted for publication in April 2011.

We concluded that with attention to detail and careful recording of methodology, repeated, cross-sectional, epidemiological multicentre studies using the same methodology such as Phases One and Three in ISAAC are feasible and can be achieved throughout the world by people with diverse cultural backgrounds and research experience

The ISAAC Story

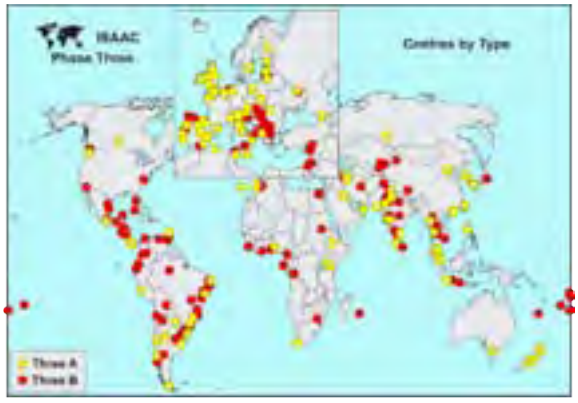
ISAAC Centres



The ISAAC collaboration has involved 306 research centres in 105 countries, which were grouped for organisational purposes into 9 regions. In addition to the regional co-ordinators, who are members of the ISAAC Steering Committee, many countries had a national ISAAC co-ordinator. The international Steering Committee which comprises of 26 scientists including clinicians, some from developing countries, oversees all aspects of the programme. Many of the Steering Committee members also have positions on or are advisors to other international bodies.

The Steering Committee meets yearly and the ISAAC Executive has a monthly telephone conference. As can be seen from the diagram, decisions from the Steering Committee are then passed from the Regional Coordinators to the National Coordinators, and then to the individual research centres. The International Data Centre receives data from the centres, as well as advising at all levels on methodology or other aspects of the programme.

This section of the ISAAC Story documents the contribution of each centre to the success of the worldwide initiative, and includes reflections and recollections of centre investigators, national co-ordinators and regional co-ordinators.



The ISAAC Story

Regional Publications

The following publications used ISAAC data from the Africa region:

Aït-Khaled N, Odhiambo J, Pearce N, Adjoh KS, Annesi-Maesano I, Benhabyles B, Bouhayad Z, Bahati E, Camara L, Catteau C, Asma El S, Esamai FO, Hypolite IE, Melaku K, Musa OA, Ng'ang'a L, Onadeko BO, Saad O, Jerray M, Kayembe JM, Koffi NB, Khaldi F, Kuaban C, Voyi K, M'Boussa J, Sow O, Tijani O, Zar HJ. *Prevalence of symptoms of asthma, rhinitis and eczema in 13- to 14-year-old children in Africa the International Study of Asthma and Allergies in Childhood Phase III.* Allergy 2007; 62(3), 247-258.

Africa Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
Algeria	2		1
Cameroon			1
Congo			1
Cote d'Ivoire			1
Ethiopia	2		1
Gabon			1
Ghana		1	
Kenya	2		2
Morocco	3		4
Nigeria	1		1
République de Guinée			1
Republique Democratique du Congo			1
Reunion Island			1
South Africa	1		2
Sudan			1
Togo			1
Tunisia	1		2
Total	**12**	**1**	**22**

Regional Coordinator:
Professor Gabriel Anabwani

Department of Paediatrics
Princess Marina Hospital
P.O. Box 258

Botswana

Roles:

Regional Coordinator:
Professor Nadia Aït-Khaled

Head of Asthma Division
Union Internationale Contre la Tuberculose et les Maladies Respiratoires
68, Boulevard Saint-Michel

France

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Africa

Regional Coordinator:
Dr Joseph A Odhiambo

Centre for Respiratory Diseases Research,
Kenya Medical Research Institute (KEMRI)
P O Box 606
00621 Village Market
Kenya

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Africa
- Phase One Principal Investigator for Nairobi

Anglophone Africa

Regional Coordinator, Joseph Odhiambo

Background:

In Africa, especially sub Saharan Africa, the dominant burdens of poverty-related diseases such as acute respiratory infections, malaria, tuberculosis, HIV and malnutrition have over-shadowed equally economically devastating burdens of allergic disorders such as asthma, rhinitis and eczema. Due to earlier perceptions that these disorders were rare in Africa, epidemiological studies to test the hypothesis that parasitic and other infections prevalent in the continent are protective of asthma have been considered

Africa
Asia-Pacific
Eastern Mediterranean
Indian Sub-Continent
Latin America
North America
Northern and Eastern Europe
Oceania
Western Europe

The ISAAC Story

Africa is made up of some 50 countries which contribute to vast diversities in race, culture, languages and socio-economic levels. The continent has a population of 680,000,000 people and this contributes to about 10% of the world population. Based on her colonial history, African countries are broadly divided into English-speaking (Anglophone) and French-speaking (Francophone) groups but there are also pockets of Portuguese speaking groups in the south and largely Arab-speaking or Arabophone groups in the north. About 15 countries speak English.

The International Study of Asthma and Allergies in Childhood (ISAAC) was formed 20 years ago to facilitate research into asthma, allergic rhinoconjunctivitis and atopic eczema using standardised epidemiological tools and approaches between centers in different countries worldwide, including those in Africa. Out of 56 countries and 156 centers that participated in ISAAC Phase One worldwide, Anglophone Africa contributed 4 countries and 6 centers, respectively. Similarly, out of 90 countries and 237 centers that participated in ISAAC Phase Three worldwide, Anglophone Africa also contributed 4 and 6, respectively. Due to limited resources, participation of Anglophone Africa in ISAAC Phase Two studies, which were both labor and resource intensive, was extremely limited, Although the contribution of this region to the international ISAAC data base appears small, the impact of ISAAC, as explained below, has been immense and continues to grow by the day.

Prof Gabriel Anabwani, my mentor in pediatric cardiology at the University of Nairobi many years ago, was the Anglophone Africa Regional Coordinator at the inception of ISAAC and took responsibility for successful conduct of ISAAC Phase One in this part of the world. Anglophone Africa and indeed the whole world is indebted to Prof Anabwani whose invaluable contribution is well documented in several ISAAC publications and the ISAAC website.

At personal level, I have been greatly honored not only for the opportunity to coordinate the implementation of ISAAC Phase III, but also for the opportunity to work together in Africa with Prof Nadia Aït-Khaled, the Regional Coordinator for Francophone Africa. Prof Aït-Khaled has done a great job not only at consolidating Africa's ISAAC data in published reports, but also spearheading efforts to expand access to life-saving asthma treatment. Best of all has been the opportunity to work together with great professional minds that constitute the ISAAC Steering Committee and contribute, in some ways, to better understanding of the epidemiologic basis and management of asthma and other allergic disorders in Africa and the world at large.

Regional findings in Anglophone Africa and their interpretation

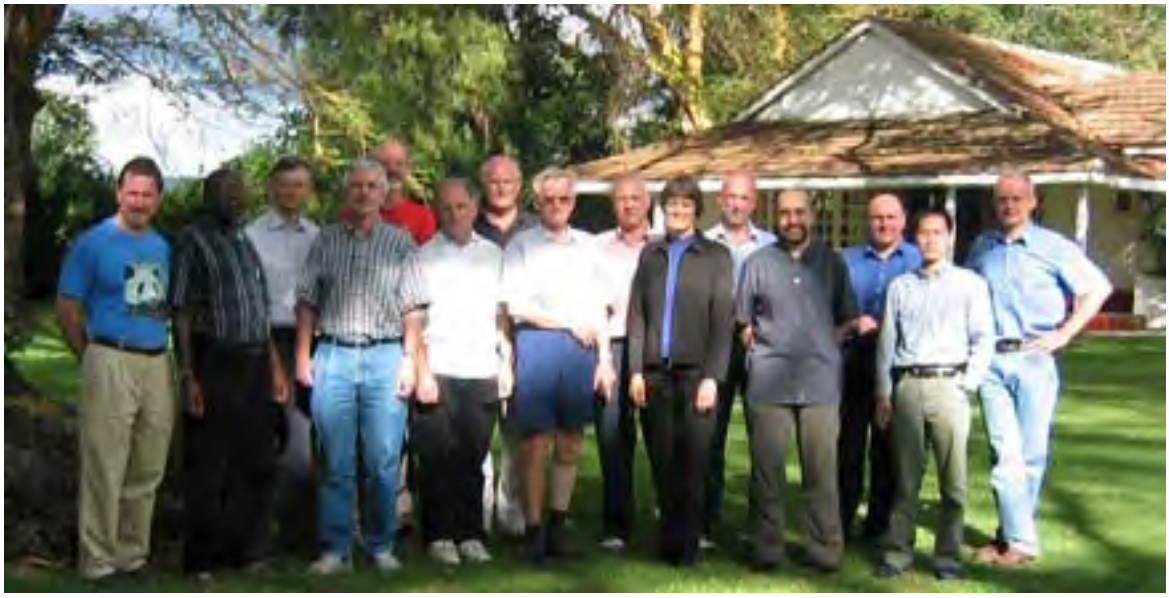
- Although only three countries (Kenya, Ethiopia and S Africa) participated in ISAAC Phase One, the outcome provided valuable information and data on prevalence patterns and potential risk factors for asthma, allergic rhinitis and eczema in Anglophone Africa.
- In ISAAC Phase Three, participation expanded to four countries with inclusion of Nigeria.
- The large variations in the prevalence of the three diseases within countries and within centers witnessed globally is mirrored by findings in Anglophone Africa.
- Overall, 15.9% of 13-14 year old participants in Anglophone Africa had "wheeze in the last 12 months". Several centers (Cape Town, 20.3%; Polokwane, 18.0%; Nairobi, 18.0%) showed relatively high asthma symptom prevalence comparable to those in Europe and elsewhere.
- The prevalence of current wheeze was generally the highest in urban centers (Nairobi, Kenya; Cape Town, S Africa). This position may be attributable to environmental risk factors linked to urbanisation and adoption of western lifestyles. Large differences in urban-rural asthma prevalence rates have been reported separately in African children of the same genetic background although recent reports from S Africa suggest the urban-rural gradient may be narrowing.
- Anglophone Africa centers reported large variation in the prevalence of rhinoconjunctivitis with high rates among 13 – 14 year old children in Cape Town (>20%).
- High eczema rates reported in some centers need to be treated with caution given possible confusion of symptoms with other itchy skin conditions such as scabies that are common in some parts of Africa.
- ISAAC Phase One and Three Anglophone Africa data indicate high rates of asthma, rhinitis and eczema. These findings demonstrate that these are important emerging public health problems in Africa that call for appropriate national and regional policy, political, advocacy and research responses.
- Moving forward, we hope more Anglophone Africa countries will carry out ISAAC Phase One surveys to provide essential and representative data this region critically needs. In addition, resources allowing, we hope those countries that are ready can undertake ISAAC Phase Three studies for the same purpose.
- ISAAC has established networks with organisations such as WHO and IUATLD who are concerned with health in developing countries. It is noteworthy that ISAAC Phase Four provides a platform for developing and expanding the ISAAC website as a resource for collaboration especially with low and middle income countries. This includes management plans and other resources that are useful for managing asthma, eczema and rhinitis.

Reminiscences/thoughts/experiences of participating in ISAAC

- The use of simple, relatively cheap and standardised tools - *written and video questionnaires* - to generate key global epidemiologic data has been one of the strongest contributions made by ISAAC.
- By showing rather than describing the signs and symptoms of asthma through video captions in ISAAC Phase One and Three, it was thought that this approach would provide more accurate recognition of clinical asthma independent of the cultural backgrounds of the13-14 year old children. For the wheezing to be clearly heard by all children seated in a classroom, we often set the TV volume to sufficiently audible levels. It is an open question to speculate on what proportion of children might have inappropriately responded "no" to what they commonly experienced but thought was not as loud as presented? Could this have lead to underestimation of asthma in settings where such perceptions were common?
- One of important ISAAC milestones was the award of the Guinness World Record. Reference is made to ISAAC's strength in rallying international collaboration with the *"single focus of understanding the trends of asthma, allergic rhinoconjuctivitis and atopic eczema in children all over the world. And with the aim of reducing the personal burden of these diseases"* Children constitute the future and any effort that promotes the welfare of mankind's future is spot on!

Impact of ISAAC in Anglophone Africa

- For those countries that participated in ISAAC Phase One and Three, the prevalence data on asthma, allergic rhinoconjuctivitis and atopic eczema have provided important advocacy tools for policy and prioritisation of these illnesses in national health programs.
- Based on ISAAC findings, efforts are being made by a cross-section of African countries, specially those who participated in ISAAC Phase One and Three to provide increased research funding to identify local environmental and lifestyle risk factors that could be modified to check disease burden in a complementary manner to expanding access to optimised clinical care of the three diseases.
- There is growing interest among countries that had not participated in ISAAC before to use ISAAC tools and approaches to generate similar data to inform national policy and prioritise their research agenda.
- ISAAC and ISAAC epidemiological tools are positively branded products in Anglophone Africa. At scientific meetings in this region, research findings from asthma, rhinitis and eczema epidemiological studies enjoy great credibility if authors quote or adapt ISAAC approaches in their work.
- ISAAC data and ISAAC expertise continues to contribute immensely to policy development and to formulation and use of updated national care guidelines in South Africa, Kenya, Ethiopia and other countries.
- Participation of several ISAAC centers in Anglophone Africa demonstrated the feasibility of involving institutions and clinicians from Africa in rigorous international surveys and provided impetus and opportunity for advancing research in Anglophone Africa
- Kenya was greatly honored to host the ISAAC Steering Committee Meeting in Anglophone Africa in November 2003. The meeting was held at the Naivasha Country Club, located by the shores of Lake Naivasha some 90 km west of Nairobi. This meeting reaffirmed the global spirit and inclusiveness of the ISAAC initiative. The one day Symposium at the Kenya Medical Research Institute (KEMRI) campus in Nairobi after the Steering Committee put together stimulating presentations on epidemiology and clinical care of asthma, rhinitis and eczema by experts provided by the Steering Committee and local Kenyan practitioners. The Kenya audience and expertise were drawn from medical schools, research institutes and medical students. The Symposium provided a unique platform for sharing essential data and evidence-based approaches to clinical care of the three diseases.



Francophone Africa

Regional Coordinator, Nadia Aït-Khaled

Background

Very few previous epidemiological studies of asthma or allergies had been done in Francophone Africa, and these were only in adults and only in Algeria, Morocco and Tunisia. Thus, asthma was generally not identified as a public health problem in Francophone Africa, except in big cities in the Maghreb.

ISAAC offered a unique possibility to raise awareness of asthma, with an international collaborative study that uses a reasonably simple methodology based on a standardised questionnaire with precise, standardised procedures that could be used in African countries.

The development of ISAAC in Francophone Africa positively interfaced with my work at the International Union against Tuberculosis and Lung Disease (IUATLD or The Union). ISAAC demonstrated the high and increasing prevalence of asthma, rhinitis and eczema in Africa. By doing so, it highlighted the need for countries to establish or improve the organisation of asthma management in Africa and in other low- and middle-income countries. These results have been crucial and have already increased the political commitment and funding at national and international level for asthma management.

Regional findings in Francophone Africa

ISAAC demonstrated that:

- The prevalence of asthma, rhinitis and eczema is high in big cities of Francophone Africa
- The prevalence is higher in big cities of Sub-Sahara Africa than in the Maghreb
- The prevalence of asthma, rhinitis and eczema increased between Phase I and Phase III in the majority of centres
- Asthma has been identified as a public health issue, not only in the Maghreb but also in Sub-Saharan Africa
- A large part of the diseases are not allergic suggesting the existence of other specific risk factors
- There is a need for new research to examine the new trend of prevalence of these diseases and to explore the existence of other specific risk factors

Impact of ISAAC

Impact in Francophone Africa: The main impact has been the creation of a network of investigators who, despite the limited resources, were interested in participating in future studies in this region. There has been an increase in political awareness of asthma management at a national level in ISAAC countries and the majority of the investigators began to organise management and/or improve management of asthma in their countries.

Impact of ISAAC at The Union: During my activity at The Union as Chief of Asthma Division my involvement in ISAAC study was very positive and played a role mainly in 2 important issues:

- Encouraging operational research on asthma and other respiratory diseases: the majority of ISAAC principal investigators committed their time to participate with me in some collaborative Union studies (asthma in emergency, rhinitis and COPD)
- Creation of the Asthma Drug Facility (ADF): ADF was created by The Union to provide developing countries with quality-assured and affordable essential medicines for asthma. The creation of ADF was promoted by Dr Nils Billo Director, executive of The Union, based on 2 main arguments: Firstly, The Union study identified low affordability of asthma drugs for patients as a main barrier for management of asthma in low and middle income countries and secondly, the ISAAC results identified asthma as a large and increasing public health problem in developing countries.

Impact at the World Health Organisation: As a technical expert participating in several WHO meetings, the ISAAC methodology and results presented during these meetings may have played a role in increasing international political commitment for asthma.

Personal Impact: ISAAC is one of the most important experiences in my professional life. Being a member of ISAAC steering committee has allowed me to discuss, even if I am only a clinician, with other members of the steering committee that have different experiences in the world and different skills, particularly with prestigious epidemiologists and researchers. It has also been a pleasure to work in a such a friendly atmosphere with special colleagues, to meet during the various “ISAAC collaborators reception” different PIs working in different parts of the world. Finally, it is for me a big honour to be a member of “The ISAAC family”

Reminiscences/thoughts/experiences of participating in ISAAC

The main challenges were:

- Scarcity of health personnel or epidemiologists who are capable of conducting scientific epidemiological studies, particularly in sub-Saharan Africa
- The ISAAC Manual was in English and could not be used by the majority of the Francophone African investigators
- Translation of the ISAAC manual into French: thanks to Karen Bissell from IUATLD who helped me to translate the ISAAC manual into French

Our experiences were:

- A limited number of centres were included in Phase I due to the very limited funding for centres. There was no funding for a regional meeting and communication with the centres was difficult.
- A workshop was organised in Paris in 2001 at the HQ of The Union. Phase I investigators participated along with and investigators from other Francophone African countries that are members of The Union to encourage them to conduct ISAAC Phase III in their respective countries
- The number of centres included in Phase III increased dramatically due to the encouraging results from Phase I and the workshop organised in Paris. In addition, communication improved as the regional coordinator was able to use email correspondence to a much greater extent during phase III
- Several presentations of the results were made in international and regional conferences of The Union (the main ones are listed in a footnote)
- A poster session on ISAAC Phase III results was organised with the principal investigators of the region at one of the international conferences in Paris
- Publications were prepared for Morocco centres and for ISAAC Phase III in Africa
- Organisation of the ISAAC Steering Committee in Casablanca (Morocco) in collaboration with the principal investigator of Morocco: this was a big honour for myself as the regional coordinator of Francophone Africa and for all the region to receive the other members of the ISAAC Steering Committee.

Conclusion

In conclusion, I want to echo the words of Prof Donald Enarson, former director of the IUATLD Scientific Activities, who wrote in his editorial about ISAAC:

"What, to my mind, was most unique about ISAAC was its capacity to engage people in research. 'Professional' researchers often have a strange ability to frighten people away from research by emphasising its complexity and intimidating those with little self confidence, thus excluding individuals from what is, in essence, not only something eminently worthwhile but something downright fun. By 'democratising' critical thinking, ISAAC has been able to break through this barrier and engage people not previously involved in research in an exercise in disciplined measurement and critical thinking. These are basic skills in the health sciences beyond their utility in research and for this ISAAC is to be heartily congratulated. As stated by the Commission on Health Research for Development, '. . . for the world's most vulnerable people, the benefits of research offer a potential for change that has gone largely untapped'. This report has emphasised the essential nature of research in achieving the changes necessary to improve health globally and the requirement that all public health action must have inbuilt research if it is to be appropriate, efficient and equitable. A major barrier to realising these lofty objectives is the lack of confidence of health care workers in involving themselves in research. ISAAC is to be applauded for addressing this obstacle through open-minded, inclusive collaboration that has produced a base of knowledge that is used globally to inform policy. ISAAC is a model that should be followed by all those of us who are committed to improving public health in low-income countries"

Footnote: ISAAC presentations, meetings, and training in Francophone Africa

- ISAAC Workshop , HQ Union, Paris, 2001. A workshop organised with the participation of Phase I investigators and of investigators from other Francophone African countries to encourage them to conduct in their respective countries ISAAC Phase III
- Poster discussion at the 34th Union World Conference on Lung Health, October 2003, Paris. Presentation of preliminary results of ISAAC III and poster discussion with the PIs of ISAAC Phase III in Africa
- World Asthma Meeting, Bangkok 2004. Presentation on asthma epidemiology in Africa.
- Union Africa Regional Conference, Algiers 2004. Presentations on ISAAC methodology and preliminary results in Africa
- 36th Union World Conference on Lung Health, 18-22 October 2005, Paris. ISAAC III in Africa
- 16th Union Africa Regional Conference, November 2007, Cape Town, South Africa. Asthma Burden in Africa
- The Union World Conference, Paris, 2008. The Union's reply to the rising prevalence of Asthma in low and middle income countries.
- Presentation of ISAAC update at each annual Lung Department meeting of the Union
- Presentation of ISAAC results at several WHO experts Meetings: 1996-1999 to establish the WHO/TB Initiative "Practical Approach For Lung Health" and since 2007 to establish with WHO/Non-communicable Diseases a new initiative "Approach on Package of Essential Non-communicable Diseases".
- Presentation of ISAAC methodology and results in several training courses or post graduate courses in Mexico, Syria, Benin, Kenya, Soudan, Algiers, and China.
- ISAAC Phase III results are included in the training module done by The Union for Asthma Drugs Facility Clients.

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Indian Sub-Continent
Latin America
North America
Northern and Eastern Europe
Oceania
Western Europe

The ISAAC Story

Africa
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Latin America
North America
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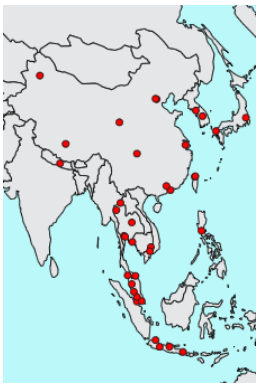
Oceania
Western Europe

Asia-Pacific Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
China	5	2	5
Indonesia	1		3
Japan	1		2
Malaysia	5		3
Philippines	1		1
SAR China	2	1	2
Singapore	1		1
South Korea	2		2
Taiwan	1		2
Thailand	2		6
Vietnam			1
Total	**21**	**3**	**28**



Regional Coordinator:

Dr Christopher Lai

Department of Medicine and Therapeutics
The Chinese University of Hong Kong
Room 1403, Takshing House
20 Des Voeux Road Central
SAR China

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Asia-Pacific
- National Coordinator for SAR China
- Phase One Principal Investigator for Hong Kong 13-14
- Phase Two Principal Investigator for Hong Kong

Pre- ISAAC era

Before the mid-1990's, existing literature published in English on asthma epidemiology in the Asia-Pacific consisted of studies from only a handful of countries/areas. Data for other allergic conditions such as rhinitis and eczema were even scarcer. At that time, medical research, including that on asthma and allergy, was a novelty for many developing counties. Even for areas where data was available, it was difficult to make valid inter-population or time-trend comparisons as recruitment methodology and definitions for asthma, rhinitis and eczema varied among different studies. Thus, when ISAAC was launched in the mid-1990's, calls to participate in the study were met with an overwhelming response within the Asia-Pacific region.

Findings

The prevalence of asthma symptoms varies widely between participating centres, ranging from less than 1% in Tibet (China) to almost 30% in Ho Chi Minh City (Vietnam) amongst adolescents. In general, the more affluent centres have a higher prevalence of asthma than the less affluent ones. For example, children in Hong Kong have a much higher rate of asthma than their counterparts in Mainland China, even though there is little difference in ethnicity between the participants. Further support for of the significance of environmental factors in the pathogenesis of asthma comes from differences in prevalence rates among ethnic Chinese children in Beijing and Guangzhou (both in Mainland China), Hong Kong, and Vancouver (Canada). Those living in Vancouver have the highest rates of asthma symptoms, while those living in Mainland China have the lowest, with rates in Hong Kong being intermediate. Asthma symptoms are also more prevalent in those who have lived in Vancouver for their entire lives than those who have lived in Vancouver for less than 7 years. Analysis of the Phase 2 data for Hong Kong, Beijing, and Guangzhou demonstrates that the higher prevalence of asthma in 9-10 year-old children in Hong Kong than those in the Mainland could also be explained by environmental factors. However, the ISAAC data leaves unanswered the question of why Tibet has the lowest prevalence of asthma symptoms worldwide, while most urban cities in Mainland China are seeing an increase in rates of prevalence. Equally intriguing is why children in Ho Chi Minh City are demonstrating such a high prevalence of asthma symptoms when compared to their counterparts in neighbouring countries.

Regional Publications

The following publications used ISAAC data from the Asia-Pacific region:

Wickens K, de Bruyne J, Calvo M, Choon-Kook S, Jayaraj G, Lai CK, Lane J, Maheshwari R, Mallol J, Nishima S, Purdie G, Siebers R, Sukumaran T, Trakultivakorn M, Crane J. *The determinants of dust mite allergen and its relationship to the prevalence of symptoms of asthma in the Asia-Pacific region.* Pediatr Allergy Immunol.2004 Feb; 15(1):55-61.

Wong GW, Leung TF, Fok TF. *ISAAC and risk factors for asthma in the Asia-Pacific.* Paediatr Respir Rev.2004;5 Suppl A:S163-9.Review.

Fok AOL, Wong GWK. *What have we learnt from ISAAC phase III in the Asia-Pacific rim?* Curr Opin Allergy Clin Immunol 2009; 9(2):116-122.

Lee H-B, Shin S-A, Oh J-W. *New Patterns of Childhood Asthma Pevalence in Six Asian Countries: Comparison of ISAAC Phases I and III* Pediatr Allergy Respir Dis(Korea) 2008; 18: 70-77

The ISAAC Story

Impact

ISAAC has vastly raised the awareness of asthma and allergies in the Asia-Pacific region. It has also provided clinicians here with the opportunity to understand how to properly conduct research and publish data in peer-reviewed journals. We now have good quality data that provide an estimate on the burden as well as insights on the aetiology of these common allergic diseases. ISAAC has also helped bring together those in the region interested in asthma and allergies to form a network, enabling collaboration for future studies, including those outside of ISAAC. Indeed, one could say that ISAAC is a forerunner of FACEBOOK in the medical fraternity!

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The ISAAC Story

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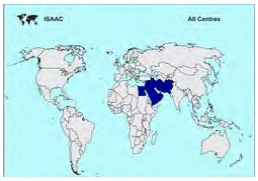
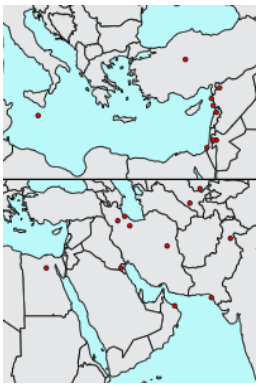
Western Europe

Eastern Mediterranean Region





Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
Egypt			1
Iran	2		4
Jordon			1
Kuwait	1		1
Lebanon	1		
Malta	1		1
Pakistan	1		2
Palestine		1	2
Sultanate Of Oman	1		1
Syria			3
Total	**7**	**1**	**16**

Regional Coordinator:

Professor Stephen Montefort

Department of Medicine
University of Malta
Appt 121 Tas- Sellum Residence

Malta

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Eastern Mediterranean
- National Coordinator for Malta
- Phase One Principal Investigator for Malta
- Phase Three Principal Investigator for Malta

Co-ordinating ISAAC in the Eastern Mediterranean region

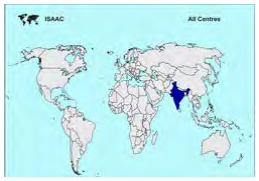
There were various major problem encountered in recruiting, coordinating and monitoring centres in this region. These stemmed from the fact that although Malta is closer to mainland Europe it is included in this region by the WHO and thus it was decided that ISAAC should follow suit. The fact that this region extended geographically from Malta in the middle of the Mediterranean Sea to Pakistan made this a very diverse region geographically, culturally and scientifically. My attempts to recruit as many centres as possible was difficult seeing that I did not have many contacts in the Middle East and in the early nineties email was not well-established so communication was even more difficult. The political situation in the area did not help much either. Research funding in this region was difficult to come by and the nominal funds given to some of these centres by ISAAC helped a lot. In spite of these difficulties we did manage to recruit and help complete ISAAC phase 1 in 10 centres in 7 countries – though we were unsuccessful to find co-ordinators in Libya, United Arab Emirates and Saudi Arabia after promising initial contacts. In Phase 3 of the study we managed to increase to 19 centres in 10 countries, losing only Lebanon in this later phase. All in all this has been a fruitful venture which has led to important data on childhood allergic conditions in these countries being published and a standardised Arabic version of the ISAAC questionnaire being established.

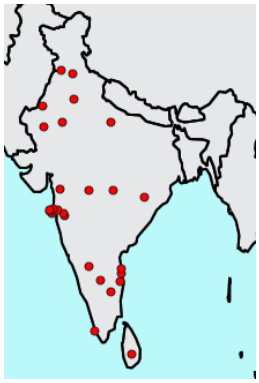
Regional findings

As only 4 centres took part in both Phase 1 and phase 3 of the 6 – 7 year old ISAAC study, time trend findings were rather limited. But one could still see that there was a consistent increase in the prevalence of wheezing and rhinitis but not eczema. In the older age group there was a mix of trends with Malta and Kuwait showing a decrease in prevalence of wheezing, rhinitis and eczema while the rest of the centres showed mixed trends for the three allergic conditions studied.

Regional impact

This study has surely opened up new research avenues for reliable epidemiological studies and other collaborations between the neighbouring centres in the Middle East that will hopefully bear more fruit in the future





Indian Sub-Continent Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
India	14	1	19
Sri Lanka			1
Total	**14**	**1**	**20**

Regional Coordinator:
Dr Jayant Shah

Jaslok Hospital & Research Centre

15 - Dr. Deshmukh Marg
Pedder Road,
India

Roles:

- Regional Coordinator for Indian Sub-Continent
- National Coordinator for India
- Phase Two Principal Investigator for Mumbai (16)

India, one of the most populous countries of the world, is almost a region in its own right. Dr Jayant Shah acted as both national co-ordinator for India and regional co-ordinator. Indian centres were numerous in both Phases One and Three, and also contributed one centre to Phase Two. Dr Shah attended the ISAAC Steering Committee meeting in Auckland in 2000.

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The ISAAC Story

Latin America Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
Argentina	3		4
Bolivia			1
Brasil	5	1	20
Chile	4		5
Colombia			3
Costa Rica	1		1
Cuba			1
Ecuador		1	2
El Salvador			1
Honduras			1
Mexico	1		10
Nicaragua			1
Panamá	1		1
Paraguay	1		1
Peru	1		1
Uruguay	1		2
Venezuela			1
Total	**18**	**2**	**56**

Regional Coordinator:

Professor Javier Mallol

Department of Pediatric Respiratory Medicine
Hospital CRS El Pino
University of Santiago de Chile (USACH)
Avenida Alberto Hurtado 13560
Chile

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Latin America
- National Coordinator for Chile

ISAAC in Latin America

ISAAC has become the largest study ever performed in the world on asthma epidemiology in childhood and also the most important and respected fountain of information on related matters. The participation of Latin America in ISAAC was a big success. ISAAC-Latin America provided approximately the 25% of the children aged 6-7 and 13-14 years who participated in ISAAC Phase III all over the world. However, before ISAAC the prevalence of respiratory symptoms related to asthma in children from this region was largely ignored.

The Region participated in Phase I and III of the International Study of Asthma and Allergies in Childhood (ISAAC) with 18 participating centres in Phase I and 56 centres in Phase III, obtaining data on asthma, rhinitis and eczema from countries and centres which despite sharing same languages (Spanish and Portuguese) have markedly different conditions of climate, socioeconomic development, cultural and environmental conditions. The countries of this region are all developing countries and share more or less the same problems related with low socioeconomic status and large income inequities.

Findings

The consistently high figures for asthma symptoms prevalence in a region with high burden of acute respiratory and gastrointestinal infections occurring early in life, high level of gastrointestinal parasites infestation, severe environmental and hygiene problems, suggested for the first time that these factors, considered as protective in developed regions of the world, in fact may act as risk factors for asthma prevalence and severity in developing regions. Furthermore, those aggressive environmental conditions acting together from very early in life might condition several different asthmatic phenotypes with more severe clinical presentation in infancy (first 2 years of life), lower atopy with enhanced airways reactivity, among others. ISAAC in Latin America indicates that prevalence of asthma and related symptoms in this region is as high and variable as in developed regions of the world and that environmental risk factors, mainly related with poverty, could be responsible for the marked difference in clinical and functional aspects of asthma between children worldwide.

Regional Publications

The following publications used ISAAC data from the Latin America region:

Mallol J, Solé D, Asher MI, Clayton T, Stein R, Soto-Quiroz M, on behalf of the Latin American ISAAC Collaborators Group. *Prevalence of asthma symptoms in Latin America: The International Study of Asthma and Allergies in Childhood (ISAAC).* Pediatr Pulmonol 2000; 30: 439-44.

Solé D, Mallol J, Camelo-Nunes IC, Wandalsen GF and Latin American ISAAC Study Group *Prevalence of rhinitis-related symptoms in Latin American children – Results of the International Study of Asthma and Allergies in Childhood (ISAAC) Phase Three* Pediatr Allergy Immunol 2010; 21 (1): e127-e136. E pub 24 Sept 2009.

Solé D, Mallol J, Wandalsen GF, Aguirre V and the Latin American ISAAC Phase 3 Study Group. *Prevalence of Symptoms of Eczema in Latin America: Results of the International Study of Asthma and Allergies in Childhood (ISAAC) Phase 3.* J Investig Allergol Clin Immunol 2010; 20(4): 311-323.

Mallol J, Solé D, Baeza-Bacab M, Aguirre-Camposano V, Soto-Quiros M, Baena-Cagnani C and the Latin American ISAAC Group. *Regional variation in asthma symptom prevalence in Latin American children.* J Asthma. 2010; 47(6):644-50.

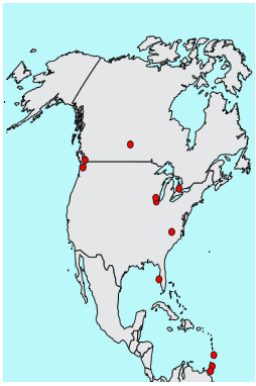
Neto HJC, Rosário NA, Solé D, and the Latin American ISAAC Group *Asthma and Rhinitis in South America: How Different They are From Other Parts of the World* Allergy Asthma Immunol Res. 2012;4(2):62-67

The ISAAC Story

Impacts

During the last 17 years I have had the honour to work with ISAAC as Regional Coordinator for Latin America and as a member of the ISAAC Steering Committee. I am very grateful to those who have generously collaborated for the big success of ISAAC Phase I and III in this Region. The creation of such a large scientific network has demonstrated its great functionality with the undertaking of the International Study of Wheezing in Infants whose results are being currently published in the medical press.

Latin America -thanks to its participation in ISAAC- has got for the first time in its history robust and reliable regional information on childhood asthma regarding prevalence, severity, risk-protective factors and ecological aspects. This should allow for a better understanding of the complexities of asthma and to improve several aspects on managing the disease in the different participating countries, hopefully resulting in the implementation of modern asthma management programs aiming to improve the quality of life of asthmatic children in this and other developing regions of the world.



North America Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
Barbados	1		1
Canada	2		2
Trinidad and Tobago			2
USA	3		3
Total	**6**	**0**	**8**

The development of ISAAC in North America did not follow the pattern adopted elsewhere with regional and national co-ordinators. Centres tended to liaise directly with the ISAAC International Data Centre, although in Canada Prof Malcolm Sears acted as an able and willing national co-ordinator. One of the regrettable deficiencies in ISAAC is the small number of participating centres in the United States, perhaps related to the difficulty in identifying a regional co-ordinator for North America early in the development of ISAAC.

Prof Fernando Martinez from Tucson, Arizona, was an active and enthusiastic member of the ISAAC Steering Committee but devoted much of his energies to establishing ISAAC in the Latin American countries, where the number of participating centres exceeded all expectations.

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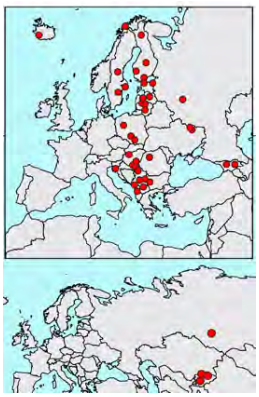
North America
Northern and Eastern Europe
Oceania
Western Europe

The ISAAC Story

Northern and Eastern Europe Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
Albania	1	1	1
Bulgaria			1
Croatia			1
Estonia	2	1	1
Finland	4		1
Georgia	2	1	1
Hungary			2
Iceland		1	
Kyrgyzstan			3
Latvia	2	1	1
Lithuania	1		3
Poland	3		2
Republic of Macedonia			1
Romania	1		1
Russia	2		1
Serbia and Montenegro			5
Sweden	2	2	1
Ukraine	1		2
Uzbekistan	2		
Total	**23**	**7**	**28**



Regional Coordinator:

Professor Bengt Björkstén

National Institute of Environmental Medicine /IMM
Division of Physiology
Karolinska Institutet
PO Box 287
Sweden

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Northern and Eastern Europe

ISAAC in Eastern Europe; Education and contribution to democratisation

Regional context

The enormous political changes in Eastern Europe in 1989 and 1990 opened an entire region for epidemiological research. During the era of socialist governments, epidemiological studies were mostly conducted in order to confirm the superior health of people living in these countries. The academic system was even more hierarchical than in other parts of the world and leadership was not always exclusively granted on research qualifications. In most universities, the standard of clinical research was not up to international standards and many academic teachers had never published in international peer reviewed journals. In addition, the economic situation was very difficult in all the countries. This was the situation when ISAAC entered into research-wise virgin territory.

The opportunity to participate in an international study attracted clinicians in 16 centres in 10 countries; Albania, Estonia, Georgia, Latvia, Lithuania, Poland, Romania, Russia, Ukraine and Uzbekistan. The regional co-ordination was done in Sweden and as a consequence the seemingly illogical ISAAC region “Northern and Eastern Europe" was created.

There was a reason to co-ordinate all centres in the formerly socialist countries from one place; academic structures in these countries were hierarchic and in most cases the seniors on top of the pyramid had little experience of actually conducting studies, in which strict adherence to an agreed protocol was required. The challenge was therefore to find young, flexible persons were open to learn from outsiders and lacking prestige, would accept to be co-ordinated and, at the same time, it was essential that the senior heads would accept that a study was performed in his department but without his direct control.

Most of the 16 local studies in the region were conducted over a three-year period, starting in March 1993. All salaries were funded locally but ISAAC could provide modest financial support for printing costs and stamps. The lack of financial resources was well compensated for by the enthusiasm of the local and national investigators. Many practical issues were solved *ad hoc*, participation rates were high and data were compiled and diligently reported to the regional centre.

Regional Publications

The following publications used ISAAC data from the Northern and Eastern Europe region:

Björkstén B. *Epidemiology of pollution-induced airway disease in Scandinavia and Eastern Europe [Review]*. Allergy 1997; 52(38 Suppl): 23-5; discussion 35-6.

Björkstén B, Dumitrascu D, Foucard T, Khetsuriani N, Khaitov R, Leja M, Lis G, Pekkanen J, Priftanji A, Riikjärv MA. *Prevalence of childhood asthma, rhinitis and eczema in Scandinavia and Eastern Europe.* Eur Respir J 1998; 12(2): 432-7.

Regional findings

So what was found? It was confirmed in many countries that allergy associated symptoms are much less common in Eastern, as compared to Western Europe, thus confirming the then novel hypothesis that the increasing prevalence of allergies in the west was due to a changed life style, probably less exposure to microbial diversity. An interesting finding was that in all the formerly socialist countries, the peak months of rhinitis symptoms occurred during the winter months, in contrast to the spring-summer peaks recorded in the Scandinavian countries in the region.

Regional impact

The impact of ISAAC in the region goes far beyond the epidemiological data of high quality that were generated in the centres. The investigators were mostly clinically working doctors with little previous experience of research. Participation in ISAAC provided research education and practical experience. Working with computers was a new experience for some.

Participation in a large global research project was a new experience and was for many a practical consequence of the freedom their country. This was perhaps particularly obvious in the Baltic countries and Poland. The informal, consensus-oriented, democratic structure of ISAAC set an example for others.

For many of the local investigators, participation in ISAAC became a starting point for further clinical research of such quality that their results could be published internationally. Many of the investigators also inspired and encouraged colleagues to launch epidemiological studies in other fields, mostly in paediatrics.

It is reasonable to conclude that the significance of ISAAC in Eastern Europe went far beyond the epidemiological data on childhood allergies that were generated. In a small fashion, ISAAC contributed to the democratization process by empowering hard working clinical researchers and exposing the academic system to alternatives to traditional hierarchical structures.

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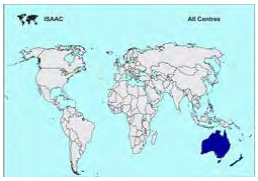
Oceania Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
Australia	5		1
Cook Islands			1
Fiji			1
French Polynesia			1
New Zealand	6	1	5
Niue			1
Nouvelle Caledonie			1
Samoa			1
Tokelau			1
Tonga			1
Total	**11**	**1**	**14**



Regional Coordinator:

Dr Sunia Foliaki

Director
Research Unit
Ministry of Health
P.O. Box 59
Kingdom Of Tonga

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Oceania
- Phase Three Principal Investigator for Nuku alofa

Oceania: A role for Research in the smaller countries in Oceania

Oceania as the name suggests consists of a region with countries and islands linked by oceans rather than countries that are adjacent and land-linked to one another. As a continental group it has the second smallest population, after Antarctica. Australia and New Zealand are by far the bigger and economically most developed compared to the smaller Polynesian and Melanesian island countries in the lower region of Oceania. The formal academic and research infrastructure likewise are more developed in these two larger countries as well as the various phases of the ISAAC studies having been well established therein. The relative isolation of smaller Oceania Pacific island countries and migration to Australia and New Zealand encouraged research activities in the Pacific and on Pacific people in their newly adopted residents. Most of the researches however were done by outsiders and on other illnesses of interest but very little on asthma. The collaborative nature of ISAAC in Oceania raised the need for capacity building and creating networks and environments that enhance health research in areas other than asthma as well as encouraging the establishment of health research as a vital tool for achieving better health.

The findings

Early studies involved Australia and New Zealand and two Polynesian island territories showed differences in reported asthma severity between Oceania and European centres with differences in exposure to risk factors and differences in the management of asthma as possible explanations. Asthma is more severe in Pacific people and Maori with a higher frequency of hospitalizations. Similar findings of the greater severity, and the greater adult prevalence, in Pacific people and Maori in New Zealand may be partly or wholly due to problems of access to culturally appropriate asthma health care and asthma education. Phase III studies in New Zealand shows increasing trends of current wheeze among Pacific people in New Zealand with a non-significant increase in Māori, and a significant decrease among Europeans/Pakeha children. The inclusion of Pacific people in Pacific islands for the first time in ISAAC III showed that although there is a significant level of morbidity, asthma prevalence in Pacific countries is lower than those among Pacific people in New Zealand and Australia. The large variations in prevalence between the six Pacific countries further lends support for the role of environmental risk factors in asthma

Regional Publications

The following publications used ISAAC data from the Oceania region:

Foliaki S, Annesi-Maesano I, Daniel R, Fakakovikaetau T, Magatongia M, Tuuau-Potai N, Waqatakirewa L, Cheng SK, Pearce N. *Prevalence of symptoms of childhood asthma, allergic rhinoconjunctivitis and eczema in the Pacific: The International Study of Asthma and Allergies in Childhood (ISAAC).* Allergy 2007; 62(3), 259-64.

Foliaki S, Annesi-Maesano I, Tuuau-Potai N, Waqatakirewa L, Cheng S, Douwes J, Pearce N. *Risk factors for symptoms of childhood asthma, allergic rhinoconjunctivitis and eczema in the Pacific: an ISAAC Phase III study.* Int J Tuberc Lung Dis 2008; 12(7): 799-806.

The ISAAC Story

Impact

The ISAAC Study and partnership with collaborators created an environment and network that encourages and strengthens the establishment of health research as one of the vital tools for achieving better health. The local collaborators gained recognition and contributed to research activities including publications. This was also an opportunity in the smaller centres at least to gain some understanding of how people with asthma are able to achieve a level of self-care that can extend to the primary health care level and the community. In this context an intervention study was conducted with the ISAAC collaborators in Tonga to introduce an asthma self-management plan intervention. The success of the introduction of the self-management plan, in the context of an asthma clinic, was reflected by improvement in measures of asthma morbidity, such as peak expiratory flow rates and nights woken with asthma or coughing. There was also a reduction in the requirement for acute medical treatment, indicated by a decrease in emergency department hospital visits for asthma and hospital admissions. The availability and access to such international studies that are systematic and standardised is valuable in aassessing the patterns and extent of asthma morbidity throughout the Pacific. The high turn-over of health staff in a dynamic population does not allow for an environment for research in small Pacific island states that also lack infrastructure for health research. The ISAAC studies has played a major role in creating networks and environments to address some of these shortfalls.

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Oceania
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Western Europe Region

Countries

Country	Phase One Centres	Phase Two Centres	Phase Three Centres
Austria	3		2
Belgium	1		1
Channel Islands	2		2
France	5	1	
Germany	2	2	1
Greece	1	2	1
Isle Of Man	1		1
Italy	14	1	13
Netherlands		1	1
Norway		1	
Portugal	4		5
Republic of Ireland	1		1
Spain	9	4	12
Turkey		1	
United Kingdom	12	1	6
Total	**55**	**14**	**46**

Regional Coordinator:

Prof Dr Ulrich Keil

Institut für Epidemiologie und Sozialmedizin
Westfälische Wilhelms Universität
Domagkstrasse 3

Germany

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Western Europe
- National Coordinator for Germany
- Phase One Principal Investigator for Münster
- Phase Three Principal Investigator for Münster

History of ISAAC in the Region of Western Europe

At the time of the two international workshops (monitoring trends of asthma and allergies in childhood)in Bochum in 1990 and 1991, which marked the beginning of ISAAC, the world had changed dramatically. The Berlin wall had collapsed,the unification of Germany became reality and the iron curtain between eastern and western Europe did not exist any longer.(Some sociologists talked of the end of history!)

Colleagues in Germany with an interest in asthma epidemiology capitalized on the unification of Germany and immediately started projects comparing prevalence figures of asthma in the eastern and western part of Germany, such as the comparison study between Munich and Leipzig.As was hypothesized prevalence figures of asthma and allergies in children were higher in the west (Munich) than in the eastern part of Germany(Leipzig). Such studies obviously stimulated interest for comparisons between east and west not only in Germany but also within the whole of Europe.

From the workshops in Bochum it had become obvious that the UK was a stronghold for research into the epidemiology of asthma and allergies and could contribute to a European and worldwide project with a lot of different centres.

The restructuring of the university system in eastern Germany required a lot of consulting and support by professors from the west. Having become a consultant to the medical faculties of the old Baltic Sea universities of Rostock and Greifswald I took the chance and asked the professor of hygiene in Greifswald, if he was willing to perform ISAAC Phase I in Greifswald. He responded affirmatively, managed to obtain the necessary funding from local sources and was very happy to be able to contribute to a worldwide study. Thus we secured at least two ISAAC Phase I centres in Germany, namely Münster in the northwest and Greifswald in the northeast of the country.

Unfortunately it was not possible to recruit more ISAAC phase I centres in Germany because the respective colleagues wanted to do more "sophisticated" studies. These more "sophisticated" studies materialized a few years later when the "Verbundprojekt" with study centres in Munich and Dresden and a coordinating centre in Münster (PIs Ulrich Keil and Stephan Weiland) was funded by the German Federal Ministry of Research. The "Verbundprojekt" became later the nucleus of ISAAC Phase II.

All the other ISAAC Phase I centres in Western Europe like the many centres in Italy, Spain, France and Portugal were recruited by professional networks and by announcing the ISAAC project at congresses of the European Respiratory Society.

The ISAAC Story

Experiences of participating in ISAAC

One of the most moving moments I had with ISAAC was at the 8th International Workshop(ISAAC Steering Committee Meeting)in September 1997 in Berlin.The workshop took place at Gendarmenmarkt in the building of the Akademie Berlin-Brandenburg and it came to my mind that I had been in the same building exactly 10 years earlier at a WHO MONICA PIs meeting.(In 1987 the building represented the headquarters of the Akademie der Wissenschaften der DDR in East Berlin) In 1987 nobody in the west had the slightest idea that within less than 3 years the world would change so dramatically.

The ISAAC Steering Committee Meeting in 1997 was also the time when Stephan Weiland was elected member of the ISAAC Executive, a position he very much deserved but tragic enough could fill out only for a decade.

Impact of ISAAC in the Region of Western Europe

The impact of ISAAC phase I and III in the region of western Europe is remarkable, because never before had such a systematic, standardized and population based study of asthma, rhinoconjunctivitis and eczema in children and adolescents been done before. In most countries of western Europe ISAAC phase I stimulated ISAAC phase III and a number of countries, respectively centres managed to obtain funding also for the "sophisticated" ISAAC phase II project.

Regional Findings and their interpretation

When considering the whole of EUROPE, this region of the world depicts the greatest range in the 12 month prevalence of self-reported asthma symptoms(written questionnaire), ranging from the highest prevalence centre in the UK to the one centre in Albania. When considering only western Europe the wide range is not much diminished, because Greece also has a very low prevalence of asthma.

When comparing the German centres Münster and Greifswald our results confirmed the hypothesis that asthma prevalences should be higher in the east compared to the west.

When looking at the changes from ISAAC phase I to II over a median time of 7 years it is interesting to note that there are quite a number of countries where prevalences of asthma, rhinoconjunctivitis and eczema are on the increase, though not dramatically. The biggest decrease for all three disease groups, however, was noted for the UK centres plus Channel Island and Isle of Man centres. It is relieving to see that centres with very high prevalences of asthma are showing a decline over time.

Albania, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Tiranë	1	Professor Alfred Priftanji	13-14, 6-7
Tiranë	2	Professor Alfred Priftanji	10-11 y. old
Tiranë	3	Professor Alfred Priftanji	13-14, 6-7

National Coordinator:

Professor Alfred Priftanji

Faculty of Medicine, University of Tirana
Head, Department of Allergology and Clinical Immunology
University Hospital Center "Mother Theresa"
Tiranë
Albania

Roles:

- National Coordinator for Albania
- Phase One Principal Investigator for Tiranë
- Phase Two Principal Investigator for Tiranë
- Phase Three Principal Investigator for Tiranë

National Publications

The following publications used ISAAC data from Albania:

Priftanji A, Strachan D, Burr M, Sinamati J, Shkurti A, Grabocka E, Kaur B, Fitzpatrick S. *Asthma and allergy in Albania and the UK.* Lancet 2001; 358(9291):1426-7.

Why we were chosen for the ISAAC study

Albania is a small European country with approximately 3 million people. Until 1990 wewere under an extremely closed communist regime. Later on, we understood that the Albanian population, as an isolated community, with a very simple lifestyle, different from "western" lifestyle, was an ideal sample for the Strachan Hygiene Hypothesis.

In 1992, Dr. Jane Layzell, a collaborator of Dr. Michael Burr in the ECRHS in Cardiff, came to Albania as part of "Feed the Children" programme. She proposed that I apply for epidemiological surveys of asthma & allergies in Tirana. In 1994 I recieved an EU grant and started the ECRHS in Albania, so called Albanian Respiratory Health Survey (ARHS). Dr. Michael Burr was appointed as a coordinator. Our center took part actively in this study and we got the first prevalence ever for adult asthma in Albania and in Balkan areas.

At the same period, with the recommendation of Dr. Michael Burr and Dr. Jane Layzell, we applied and were accepted in the ISAAC Phase One Study. The prevalence of asthma & allergies were the lowest in Europe and it was postulated that our population was not exposed to the risk factors present in the western countries. After that we were part of ISAAC family and participated in all phases of ISAAC.

The factors associated with asthma & allergy in Albania were therefore of particular interest. Prof. Alfred Priftanji and his team were supported in all other ISAAC Phases by ISAAC Steering Committee members like Prof. Stefan Weiland, Prof. David Strachan, Prof. Bengt Björkstén, Dr. Michael Burr, Prof. Erika Von Mutius, etc. The Albanian team worked meticulously and hard in order to be an active, reliable partner in this study. So, for the first time in Albania & Balkan we achieved a plausible data base for the prevalence, the risk factors of the asthma & allergic diseases in children and we had the opportunity to compare these data with the other centers worldwide.

Albania took part also in ISAAC phases Two and Three. Outstanding work was done from the teams of each phase and the primary investigator on fulfilling the work and persuading the children and the parents in order to take part in the study. The data we received from ISAAC surveys helped us to raise the awareness of the medical community, health policy makers for asthma & allergies as a growing problem.

We are very proud that Albania, a small country, thanks to all our work was able to participate in equal terms in this enormous study. We had the opportunity to work with eminent names in this field and we are grateful for to all the scientists that supported our involvement.

Now, in September 2011, with financial support from GlaxoSmithKline we will repeat the protocol of ISAAC phase One and partially phase Two in Tirana. In these 16 years the Albanian people have adopted the western lifestyle, so have been exposed to the same risk factors as in all other parts of Europe. We are really enthusiastic for this study because we are very curious to see the trend of asthma and allergic diseases and also evaluate the role of risk factors after 16 years.

Our acknowledgement goes to the team of ISAAC-Albania:

Primary Investigator: Prof. Alfred Priftanji.
Doctors: Anila Shkurti, Juventila Sinemati, Edi Grabocka, Anxhela Gurakuqi, Sokol Agolli, Kastriot Shytaj, Mira Ziçishti, Xhilda Raço.
Nurses: Frasete Kasemi, Loreta Laho.
Secretary: Margarita Doci

The ISAAC Story

Algeria, Africa

Centres:	Phase:	PI:	Age Groups
Algiers	1	Dr A Bezzaoucha	13-14
West Algiers	1	professor Badia Benhabylès	13-14
Wilaya of Algiers	3	Professor Badia Benhabylès	13-14

Algeria has no National Coordinator

Argentina, Latin America

Centres:	Phase:	PI:	Age Groups
Buenos Aires	1	Dr Natalio Salmun	13-14, 6-7
Córdoba	1	Dr Carlos E Baena-Cagnani	13-14
Rosario	1	Dr Natalio Salmun	13-14, 6-7
Córdoba	3	Dr Carlos E Baena-Cagnani	13-14, 6-7
Neuquén	3	Professor Gustavo Enrique Zabert	13-14, 6-7
Rosario City	3	Prof Dr Carlos D Crisci	13-14, 6-7
Salta	3	Dr Maximiliano Gómez	13-14

National Coordinator:
Dr Carlos E Baena-Cagnani

Faculty of Medicine
Catholic University of Córdoba
Santa Rosa 381

Argentina

Roles:

- National Coordinator for Argentina
- Phase One Principal Investigator for Córdoba
- Phase Three Principal Investigator for Córdoba

Australia, Oceania

Centres:	Phase:	PI:	Age Groups
Adelaide	1	Dr Declan Kennedy	13-14, 6-7
Melbourne	1	Professor Colin F Robertson	13-14, 6-7
Perth	1	Professor Louis Landau	13-14, 6-7
Sydney 13-14	1	Professor Adrian Bauman	13-14
Sydney 6-7	1	Dr Jennifer Peat	6-7
Melbourne	3	Professor Colin F Robertson	13-14, 6-7

National Coordinator:
Professor Colin F Robertson

Director, Department of Respiratory Medicine
Royal Children's Hospital
Flemington Rd (Affliation is: Murdoch Children's Research Institute, Melbourne)
Parkville, VIC 3052
Australia

Roles:

- ISAAC Steering Committee
- National Coordinator for Australia
- Phase One Principal Investigator for Melbourne
- Phase Three Principal Investigator for Melbourne

National Publications

The following publications used ISAAC data from Australia:

Tunon De Lara JM, Kopferschmitt Kubler MC, Raherison C, Quoix E, Taytard A, Annesi-Maesano I. *Prevalence of atopic dermatitis and atopy in general in children.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S47-4S54.

Robertson CF, Dalton MF, Peat JK, Haby MM, Bauman A, Kennedy JD, Landau LI. *Asthma and other atopic diseases in Australian children.Australian arm of the International Study of Asthma and Allergy in Childhood.* Med J Aust 1998; 168(9): 434-8.

Austria, Western Europe

Centres:	Phase:	PI:	Age Groups
Kärnten	1	Associate Professor Gerald Haidinger	6-7
Salzburg	1	Dr Josef Riedler	13-14, 6-7
Urfahr-Umgebung	1	Associate Professor Gerald Haidinger	13-14, 6-7
Kärnten	3	Associate Professor Gerald Haidinger	6-7
Urfahr-Umgebung	3	Associate Professor Gerald Haidinger	13-14, 6-7

National Coordinator:

Associate Professor Gerald Haidinger

Department of Epidemiology
Centre of Public Health
Medical University of Vienna
Borschkegasse 8a, 1090 Vienna
Austria

Roles:

- National Coordinator for Austria
- Phase One Principal Investigator for Kärnten, Urfahr-Umgebung
- Phase Three Principal Investigator for Kärnten, Urfahr-Umgebung

National Publications

The following publications used ISAAC data from Austria:

Eder W, Gamper A, Oberfeld G, Riedler J. *Prevalence and severity of bronchial asthma, allergic rhinitis and atopic dermatitis in Salzburg school children.[German].* Wien Klin Wochenschr.1998; 110(19): 669-77.

Riedler J, Gamper A, Eder W, Oberfeld G. *Prevalence of bronchial hyperresponsiveness to 4.5% saline and its relation to asthma and allergy symptoms in Austrian children* Eur Respir J 1998; 11: 355–360

Eder W, A Gamper, G Oberfeld, J Riedler. *Clinical follow-up of an epidemiological study of asthma and allergies in children [Klinische Nachuntersuchung einer epidemiologischen Studie über Asthma und Allergien im Kindesalter.](article in German).* Wien Klin Wochenschr 1998; 110(19):678-685.

Zacharasiewicz A, Zidek T, Haidinger G, Waldhör T, Suess G, Vutuc C. *Indoor factors and their association to respiratory symptoms suggestive of asthma in Austrian children aged 6-9 years.* Wien Klin Wochenschr.1999 Nov 12;111(21):882-6.

Zidek T, Haidinger G, Zacharasiewicz A, Waldhör T, Vutuc C. *[Prevalence of smoking habits of Upper Austria students of the 7th and 8th grade and effect of smoking habits of family and peers].* Soz Praventivmed.2000;45(4):174-81.German.

Zacharasiewicz A, Zidek T, Haidinger G, Waldhör T, Vutuc C, Zacharasiewicz A, Goetz M, Pearce N. *Symptoms suggestive of atopic rhinitis in children aged 6-9 years and the indoor environment.* Allergy.2000 Oct;55(10):945-50.

Schernhammer ES, Vutuc C, Waldhör T, Haidinger G. *Time trends of the prevalence of asthma and allergic disease in Austrian children.* Pediatr Allergy Immunol.2008 Mar;19(2):125-31.Epub Dec 2007.

Haidinger G, Waldhor T, Meusburger S, Suss G, Vutuc C. *The prevalence of childhood asthma and of allergies in 7 districts of Upper Austria - ISAAC III.* Allergologie 2008; 31(1):17-22.

Weber AS, Haidinger G. *The prevalence of atopic dermatitis in children is influenced by their parents' education: results of two cross-sectional studies conducted in Upper Austria.* Pediatr Allergy Immunol 2010; 21(7): 1028–1035. Epub 27 Apr.

Barbados, North America

Centres:	Phase:	PI:	Age Groups
Barbados	1	Dr Malcolm E Howitt	13-14, 6-7
Barbados	3	Dr Malcolm E Howitt	13-14, 6-7

National Coordinator:

Dr Malcolm E Howitt

Medical Practitioner
Carlton Clinic
Carlton Shopping Plaza
Black Rock
Barbados

Roles:

- National Coordinator for Barbados
- Phase One Principal Investigator for Barbados
- Phase Three Principal Investigator for Barbados

Belgium, Western Europe

Centres:	Phase:	PI:	Age Groups
Antwerp	1	Professor Paul Vermeire	13-14, 6-7
Antwerp	3	Professor Joost Weyler	13-14, 6-7

Belgium has no National Coordinator

National Publications

The following publications used ISAAC data from Belgium:

Vervloet D, Godard P, Taytard A, Oryszczyn MP, Tunon De Lara JM, Pauli G, Groupe ISAAC France. *Prevalence of atopic dermatitis in teenagers.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S55-4S60.

Wieringa MH, Weyler JJ, Van Bever HP, Nelen VJ, Vermeire PA.*Gender differences in respiratory, nasal and skin symptoms: 6-7 versus 13-14-year-old children.* Acta Paediatr 1999; 88(2):147-9.

Vellinga A, Droste JH, Vermeire PA, Desager K, De Backer WA, Nelen VJ, Weyler JJ. *Changes in respiratory and allergic symptoms in schoolchildren from 1996 to 2002, results from the ISAAC surveys in Antwerp (Belgium).* Acta Clin Belg.2005 Sep-Oct;60(5):219-25.

Bolivia, Latin America

Centres:	Phase:	PI:	Age Groups
Santa Cruz	3	Dr Rosario Pinto-Vargas	13-14

National Coordinator:

Dr Rosario Pinto-Vargas

Pediatric Pneumology
C.P.S Hospital
475 Lagunillas Street

Bolivia

Roles:

- National Coordinator for Bolivia
- Phase Three Principal Investigator for Santa Cruz

For the first time Bolivia is part of an international study of the magnitude of ISAAC Phase III. It was during the Latin American Congress of Pediatric Pulmonology in Central America, we received the invitation of Dr. Javier Mallol, International Coordinator of ISAAC Phase III for Latin American, and we gladly accepted the challenge.

Our intention was to have two teams, one team that covers the western Bolivia, La Paz, city over 3500 meters above sea level and eastern Bolivia, Santa Cruz de la Sierra, less than 400 m (asl), geographical areas with different environmental as well as different feeding habits. We got in contact with the Society of Pediatric located in La Paz, the Andean region, to propose a study, but this could not be completed on time.

THE STATE OF BOLIVIA, in central South America. (In red), department of Santa Cruz. Santa Cruz is the largest recipient of migrants from other departments, currently has 1,678,849 inhabitants

'The city of **Santa Cruz de la Sierra** is located in the eastern part of Bolivia (17°45', South, 63°14', West) at 416m above sea level. It is part of the province of Andrés Ibáñez and the capital of the department of Santa Cruz' (from Wikipedia:Santa Cruz de la Sierra http://en.wikipedia.org/wiki/Santa_Cruz_de_la_Sierra#Geography

BOLIVIA SANTA CRUZ

To finalize the project we asked for the cooperation and sponsorship of various institutions and the formation of a multidisciplinary team of professionals who are motivated only by their scientific interest.

Strictly fulfilling the criteria issued by ISAAC in the selection of schools and children from 13 to 14 years, we interviewed 3292 (three thousand two hundred ninety-two) students in 120 schools (one hundred twenty) of the city of Santa Cruz de la Sierra. After adapting the survey in Spanish to the used language and local customs, and completed the legal procedures we initiated the surveys.

- The question that apparently caused the most concern to the students Surveyed was about whether they had ever smoked. Most did not want to answer to the questionnaire until we assured them those responses would not be known either by their teachers nor by their parents.
- Among the key findings of the study was that many students reported having had wheezing without an asthma diagnosis and those who reported having or having had wheezing without an established diagnosis of asthma was about twice of those who were diagnosed.
- The study also showed that there was a significant association between rhinitis and asthma, which also was related to having adult smokers at home.

AGRADECIMIENTOS:

NUESTRO AGRADECIMIENTO A TODOS LOS COLEGAS QUE DIERON SU TIEMPO INCONDICIONAL PARA LLEVAR A CABO ESTE ESTUDIO, A TODAS LAS INSTITUCIONES QUE TRABAJARON COORDINADAMENTE CON NOSOTROS: COLEGIO MEDICO DEPARTAMENTAL –SANTA CRUZ, UNIVERSIDAD CRISTIANA DE BOLIVIA, SOCIEDAD BOLIVIANA DE PEDIATRIA, SECRETARIA DE EDUCACION– GOBERNACION SANTA CRUZ, A LOS PROFESORES Y ALUMNOS QUE APORTARON CON SUS DATOS, AL PROFESOR JAVIER MALLOL NUESTRO COORDINADOR INTERNACIONAL; EAMON ELLWOOD, PROFESOR INES ASHER STEERING COMMITTEE NUESTROS TUTORES DE AUCKLAND QUE NOS MANTUVIERON SIEMPRE INFORMADOS SOBRE TODOS LOS AVANCES Y PUBLICACIONES DEL ESTUDIO Y A NUESTRO CO AUSPICIADOR LABORATORIO GLAXO.

The ISAAC Story

Brasil, Latin America

Centres:	Phase:	PI:	Age Groups
Curitiba	1	Professor Nelson Rosário	13-14
Porto Alegre	1	Professor Renato Stein	13-14, 6-7
Recife	1	Dr Patricia Gomes M Bezerra	13-14, 6-7
Salvador	1	Associate Professor Leda de Freitas Souza	13-14
São Paulo	1	Professor Dirceu Solé	13-14, 6-7
Uruguaiana	2	Professor Renato Stein	
Aracaju	3	Dr Jackeline Machado Motta Franco	13-14, 6-7
Belo Horizonte	3	Associate Professor Paulo Augusto M Camargos	13-14
Brasília	3	Dr Wellington G Borges	13-14
Caruaru	3	Assistant Professor Almerinda Silva	13-14
Curitiba	3	Professor Nelson Rosário	13-14
Feira de Santana	3	Associate Professor Leda de Freitas Souza	13-14, 6-7
Itajaí	3	Dr Cláudia dos Santos Dutra Bernhardt	13-14, 6-7
Maceió	3	Professor Francisco José Passos	13-14, 6-7
Manaus Amazonas	3	Dra Maria do Socorro Cardoso	13-14, 6-7
Nova Iguaçu	3	Associate Professor Antônio José Ledo Aves Cunha	13-14, 6-7
Passo Fundo	3	Dr Arnaldo C Porto Neto	13-14
Porto Alegre	3	Dr Gilberto B Fischer	13-14
Recife	3	Dr Murilo de Britto	13-14
Rural Santa Maria	3	Professor Dirceu Solé	13-14
Salvador	3	Associate Professor Leda de Freitas Souza	13-14, 6-7
Santa Maria	3	Professor Dirceu Solé	13-14
Santo Andre	3	Associate Professor Neusa Wandalsen	13-14, 6-7
São Paulo	3	Professor Dirceu Solé	13-14, 6-7
São Paulo West	3	Dr Antonio Carlos Pastorino	13-14, 6-7
Vitória da Conquista	3	Associate Professor Leda de Freitas Souza	13-14, 6-7

National Coordinator:
Professor Dirceu Solé

Professor of Allergy, Clinical Immunology and Rheumatology
Dept of Pediatrics
Federal University of São Paulo-Escola Paulista de Medicina
São Paulo
Brasil

Roles:

- National Coordinator for Brasil
- Phase One Principal Investigator for São Paulo
- Phase Three Principal Investigator for Rural Santa Maria, Santa Maria, São Paulo

ISAAC in Brazil

The International Study of Asthma and Allergies in Childhood (ISAAC) in Brazil was a real watershed of our knowledge about the true prevalence of asthma and allergic diseases in the country.

Prior to this study, the Brazilian epidemiologic data were restricted to small population samples, mostly from large urban centers and educational institutions, and without any standardization that would allow the comparison between the data obtained. In 1996, for the first time, reliable epidemiological data were obtained in seven major Brazilian centers, when it was possible to verify the heterogeneity of asthma and allergic diseases in our environment.

Once consolidated for use in the Brazilian population, the ISAAC protocol has been used by other national groups and has further expanded the knowledge about the prevalence of asthma in the entire national territory.

In phase 3, the number of participant centers was significantly higher and it was possible to obtain a map of the distribution of asthma and allergic diseases in the country. These data made it possible to better inform public health systems and that their participation was more effective in controlling asthma and allergic diseases. The use of the complementary questionnaire in part of the population studied enabled the identification of risk factors and/or protection associated with asthma in the adolescent population. Regional differences were more evident taking into account that Brazil is a country with continental dimensions and that besides the native Indian population, has received the most diverse ethnic groups around the world, which resulted in high degree of miscegenation.

National Publications

The following publications used ISAAC data from Brasil:

Solé D, Vanna AT, Yamada E, Rizzo MCV, Naspitz CK. *International Study of Asthma and Allergies in Childhood (ISAAC) written questionnaire: Validation of the asthma component among Brazilian children.* J Investig Allergol Clin Immunol 1998; 8(6): 376-382.

Werneck G, Ruiz S, Hart R, White M, Romieu I. *Prevalence of asthma and other childhood allergies in Brazilian schoolchildren.* J Asthma.1999 Dec;36(8):677-90.

Solé D, Yamada E, Vana AT, Werneck G, Solano de Freitas L, Sologuren MJ, Britto M, Rosário Filho NA, Stein RT, Mallol J. *International Study of Asthma and Allergies in Childhood (ISAAC): prevalence of asthma and asthma-related symptoms among Brazilian schoolchildren.* J Investig Allergol Clin Immunol 2001; 11(2): 123-8.

Solé D, Camelo-Nunes IC, Vana AT, Yamada E, Werneck F, de Freitas LS, Sologuren MJ, Britto M, Rosário Filho NA, Stein RT, Naspitz CK. *Prevalence of rhinitis and related-symptoms in schoolchildren from different cities in Brazil.* Allergol Immunopathol (Madr). 2004 Jan-Feb;32(1):7-12.

Solé D, Camelo-Nunes IC, Wandalsen GF, Sarinho E, Sarinho S, Britto M, Rosário NA, de Freitas Souza LS, Stein R, Fischer GB, Naspitz CK. *Ecological correlation among prevalence of asthma symptoms, rhinoconjunctivitis and atopic eczema with notifications of tuberculosis and measles in the Brazilian population.* Pediatr Allergy Immunol.2005 Nov;16(7):582-6.

Solé D, Camelo-Nunes IC, Wandalsen GF, Mallozi MC, Naspitz CK, for members of the Brazilian ISAAC Group. *Prevalence of atopic eczema and related symptoms in Brazilian schoolchildren: results from the International Study of Asthma and Allergies in Childhood (ISAAC) Phase 3.* J Investig Allergol Clin Immunol 2006; 16(6): 367-76.

Solé D, Wandalsen GF, Camelo-Nunes IC, Naspitz CK, Naspitz CK, Brazilian ISAAC's Group. *Prevalence of symptoms of asthma, rhinitis, and atopic eczema among Brazilian children and adolescents identified by the International Study of Asthma and Allergies in Childhood (ISAAC) - Phase 3.* J Pediatr (Rio J) 2006; 82(5): 341-6.

Solé D, Camelo-Nunes IC, Wandalsen GF, Pastorino AC, Jacob CMA, González C, Wandalsen NF, Rosário Filho NA, Fischer GB, Naspitz CK. *Prevalence of symptoms of asthma, rhinitis, and atopic eczema in Brazilian adolescents related to exposure to gaseous air pollutants and socioeconomic status.* J Investig Allergol Clin Immunol 2007; 17(1): 6-13.

Solé D, Cassol VE, Silva AR, Teche SP, Rizzato TM, Bandim LC, Sarinho ES, Camelo-Nunes IC. *Prevalence of symptoms of asthma, rhinitis, and atopic eczema among adolescents living in urban and rural areas in different regions of Brazil.* Allergol Immunopathol (Madr). 2007 Nov-Dec;35(6):248-53.

Pereira MU, Sly PD, Pitrez PM, Jones MH, Escouto D, Dias AC, Weiland SK, Stein RT. *Non-atopic asthma is associated with helminth infections and bronchiolitis in poor children.* Eur Respir J 2007; 29:1154-1160.

Solé D, Melo KC, Camelo-Nunes IC, Freitas LS, Britto M, Rosário NA, Jones M, Fischer GB, Naspitz CK. *Changes in the prevalence of asthma and allergic diseases among Brazilian schoolchildren (13-14 years old): comparison between ISAAC Phases One and Three.* J Trop Pediatr.2007 Feb;53(1):13-21.Epub Sep 2006.

Solé D, Camelo-Nunes IC, Wandalsen GF, Rosário Filho NA, Naspitz CK, Brazilian ISAAC's Group. *Prevalence of rhinitis among Brazilian schoolchildren: ISAAC phase 3 results.* Rhinology.2007 Jun;45(2):122-8.

Solé D, Camelo-Nunes IC, Wandalsen GF, Mallozi MC, Naspitz CK, Brazilian ISAAC's Group. *Is the prevalence of asthma and related symptoms among Brazilian children related to socioeconomic status?.* J Asthma.45(1):19-25, 2008 Jan-Feb.

The ISAAC Story

Bulgaria, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Sofia	3	Dr Todor Popov	13-14, 6-7

National Coordinator:
Dr Todor Popov

Clinical Centre of Allergology
SUH 'Alexandrovska' Medical University
1, 'Georgy Sofiyski' St.

Bulgaria

Roles:

- National Coordinator for Bulgaria
- Phase Three Principal Investigator for Sofia

Cameroon, Africa

Centres:	Phase:	PI:	Age Groups
Yaounde	3	Professor Christopher Kuaban	13-14

National Coordinator:
Professor Christopher Kuaban

Faculty of Medicine
University of Yaounde
Centre Pasteur DU
B.P. 4021
Cameroon

Roles:

- National Coordinator for Cameroon
- Phase Three Principal Investigator for Yaounde

ISAAC in Yaounde, Cameroon

Cameroon is a small central African country with a population presently estimated at 20 million inhabitants. Asthma is not an uncommon disease in the country but before the ISAAC adventure only a limited number of hospital based studies had been carried out in the country. Consequently, the magnitude of asthma and allergies in Cameroon is not known. When we therefore heard about it, we thought it was an opportunity that would let us have real data about the prevalence of these diseases in our country.

We learnt about ISAAC Phase Three through Professor Nadia Ait-Khaled, the regional coordinator for francophone African countries and without hesitation decided we would participate in the venture. Our regional coordinator then asked us to register with the ISAAC steering committee in New Zealand. This was immediately done. She also asked us to help in the translation of the core questionnaire as well as the environmental questionnaire from English to French given that in Cameroon we speak and write the two languages. We willingly did the translation. But our hopes were dashed as we were told after this that we had to look for funding ourselves for the survey. Thanks to Dr Juergen Noeske, a colleague with whom I have worked for several years, we were able to obtain funding from the German Development Cooperation (GTZ, presently GIZ).

We designed our survey to be carried out in the West Region of Cameroon because in the previous years we had conducted several prevalence and operational studies there particularly in the field of tuberculosis. In this region we chose Bafoussam, the regional capital city and the third largest town of Cameroon in terms of population as our study site. All the 13-14 year old children in the 12 high schools found in the Bafoussam municipality were to be studied. We finally conducted the survey in May 2003, recruiting 2083 children out of a total of 3291 registered in these schools. Our data base was later on sent to the steering committee in New Zealand where after several correspondences checking on some inconsistencies in our data base, our data was finally validated.

Thanks to ISAAC and the publications that followed, we now have real data on the prevalence of asthma and allergies for our country. These findings have permitted us to compare our situation in this domain to that of other countries that participated in the ISAAC study. These results have also been communicated to our Ministry of Public Health and have led to asthma being packaged alongside other non communicable diseases as a major public health problem. Finally, the results of the study have given us baseline information for future interventions in the field of asthma and allergies.

Acknowledgements

We wish to thank immensely the education administrative authorities of the West Region of Cameroon as well as teachers and children who made it possible through their cooperation for us to realize this survey. We gratefully acknowledge financial support given us for this survey by the German Development Cooperation (GIZ). We wish to thank immensely the team of our fieldworkers for all they worked to make the survey a success.

Canada, North America

Centres:	Phase:	PI:	Age Groups
Hamilton	1	Professor Malcolm R Sears	6-7
Saskatoon	1	Dr Brett Taylor	13-14, 6-7
Saskatoon	3	Professor Donna Rennie	13-14, 6-7
Vancouver	3	Professor Alex Ferguson	13-14

National Coordinator:
Professor Malcolm R Sears

St. Joseph's Healthcare
Firestone Institute for Respiratory Health

Canada

Roles:

- National Coordinator for Canada
- Phase One Principal Investigator for Hamilton

THE ISAAC STORY – CANADA UPDATE

Phase I was conducted in two centres – Hamilton (Professor Malcolm Sears, National Coordinator for Canada, and Dr Marcia Pizzichini) and Saskatoon (Dr Brett Taylor, Dr Donna Rennie, Dr Ambikaipakan Sentilselvan, Dr Brian Habbick) in both 6-7 yr olds (Grade 1) and 13-13 yr olds (Grade 8).

Phase I was conducted from 1993-1994. Response rates were 75.1% among 6-7 year olds and 68.6% among 13-14 year olds, with 3337, 3051, 2418 and 1901 subjects participating in younger and older age groups in Hamilton and Saskatoon respectively.

Two publications arose from the Canadian Phase 1 data:

- Habbick BF, Pizzichini MMM, Taylor B, Rennie D, Senthilselvan A, Sears MR. Prevalence of asthma, rhinitis and eczema among children in 2 Canadian cities: the International Study of Asthma and Allergies in Childhood. Can Med Assoc J. 1999; 160:1824-1828.
  - High prevalence rates of asthma, rhinitis and eczema were found in both cities, similar to rates in other Western countries, with up to 30% reporting wheezing in the previous 12 months
- Pizzichini MMM, Rennie D, Senthilselvan A, Taylor B, Habbick BF, Sears MR. Limited agreement between written and video asthma symptom questionnaires. Ped Pulmonol 2000;30:307-312.
  - This paper concluded that the video questionnaire yielded lower reported prevalence rates for asthma symptoms, and that there is limited agreement between responses to the two questionnaires that is not explained by issues of language, culture or literacy.

Phase II was not undertaken by any centre in Canada

National Publications

The following publications used ISAAC data from Canada:

Habbick BF, Pizzichini MM, Taylor B, Rennie D, Senthilselvan A, Sears MR. *Prevalence of asthma, hay fever and eczema in children in two canadian cities the ISAAC study.* CMAJ 1999; 160: 1824-1829.

Pizzichini MM, Rennie D, Senthilselvan A, Taylor B, Habbick BF, Sears MR. *Limited agreement between written and video asthma symptom questionnaires.* Pediatr Pulmonol 2000; 30(4): 307-12.

Wang HY, Wong GW, Chen YZ, Ferguson A, Greene J, Ma Y, Zhong NS, Lai CKW, Sears M. *Prevalence of asthma among Chinese adolescents living in Canada and in China.* CMAJ 2008 179: 1133-1142.

Wang H-Y, Pizzichini MMM, Becker AB, Duncan JM, Ferguson AC, Greene JM, Rennie DC, Senthilselvan A, Taylor BW, Sears MR. *Disparate geographic prevalences of asthma, allergic rhinoconjunctivitis and atopic eczema among adolescents in five Canadian cities.* Pediatr Allergy Immunol 2010; 21(5): 867–877.

The ISAAC Story

Phase III was again coordinated by Professor Malcolm Sears, with five participating centres from the east coast to the west – Halifax (Dr Brett Taylor), Hamilton (Dr Malcolm Sears), Winnipeg (Dr Allan Becker), Saskatoon (Dr Donna Rennie, Dr Ambikaipakan Sentilselvan), and Vancouver (Dr Alexander Ferguson). All centres recruited 13-14 yr olds (Grade 8) and four centres recruited 6-7 yr olds (Grade 1). The multiplicity of parental languages in Vancouver precluded developing questionnaires for 6-7 year olds, whereas 1-14 yr olds were sufficiently competent in English to use that version only. Recruitment across all sites was much more difficult than in Phase I, and only Vancouver (which used passive consent whereas the other 4 centers were all obligated by their Research Ethics Boards to use active parental consent) achieved a sufficient response rate to be included in the international study statistics.

Despite the low response rates, two useful publications arose from Phase III in Canada

Wang H-Y, Wong GWK, Chen Y-Z, Ferguson AC, Greene JM, Ma Y, Zhong N-S, Lai CKW, Sears MR. Prevalence of asthma among Chinese adolescents living in Canada and in China. Can Med Assoc J 2008;179:1133-1142

Asthma symptoms in Chinese adolescents were lowest among residents of mainland China, were greater for those in Hong Kong and those who had immigrated to Canada, and were highest among those born in Canada, suggesting environmental factors and duration of exposure influence asthma prevalence

Wang H-Y, Pizzichini MMM, Becker AB, Duncan JM, Ferguson AC, Greene JM, Rennie DC, Senthilselvan A, Taylor BW, Sears MR. Disparate geographic prevalences of asthma, allergic rhinoconjunctivitis and atopic eczema among adolescents in 5 Canadian cities. Pediatr Allergy Immunol 2010;21:867-877

The highest prevalence rates for allergic rhinoconjuctivitis or atopic eczema were not in the same regions as the highest prevalence rates of wheezing

Channel Islands, Western Europe

Centres:	Phase:	PI:	Age Groups
Guernsey	1	Dr David Jeffs	13-14
Jersey	1	Dr Richard Grainger	13-14
Guernsey	3	Dr Peter Standring	13-14
Jersey	3	Ms Rosie Goulding	13-14

National Publications

The following publications used ISAAC data from Channel Islands:

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey*. BMJ 2004; 328(7447): 1052-3.

National Coordinator:

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
Channel Islands

Roles:

- ISAAC Steering Committee
- National Coordinator for Channel Islands

The ISAAC Story

Chile, Latin America

Centres:	Phase:	PI:	Age Groups
Central Santiago	1	Dr Ignacío Sanchez	13-14, 6-7
Punta Arenas	1	Dr Lidia Amarales	13-14, 6-7
South Santiago	1	Dra Eliana Cortez	13-14, 6-7
Valdivia	1	Dr Mario A Calvo	13-14, 6-7
Calama	3	Dr Luis Alberto Vera Benavides	13-14
Chiloe	3	Dra Amanda Contreras	13-14
Punta Arenas	3	Dr Lidia Amarales	13-14, 6-7
South Santiago	3	Dr Pedro Aguilar	13-14, 6-7
Valdivia	3	Dr Mario A Calvo	13-14, 6-7

National Coordinator:
Professor Javier Mallol

Department of Pediatric Respiratory Medicine
Hospital CRS El Pino
University of Santiago de Chile (USACH)
Avenida Alberto Hurtado 13560
Chile

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Latin America
- National Coordinator for Chile

National Coordinator:
Dra Viviana Aguirre

Depatamento de Medicina Respiratoria Infantil
Hospital CRS El Pino
Avenida Los Morros 13560
San Bernardo
Chile

Roles:

- National Coordinator for Chile

National Publications

The following publications used ISAAC data from Chile:

Mallol J, Cortez E, Amarales L, Sánchez I, Calvo M, et al. *Prevalence of asthma in Chilean schoolchildren.Descriptive study from 24,470 children ISAAC-Chile.* Rev Med Chil.2000; 128: 279-85.

Mallol J, Aguirre V, Aguilar P, Calvo M, Amarales L, Arellano P, Palma R. *[Changes in the prevalence of asthma in Chilean school age children between 1994 and 2002.International Study of Asthma and Allergies in Childhood (ISAAC)--Chile phases I and III].* Rev Med Chil.2007 May;135(5):580-6.Epub Jul 2007. Spanish.

China, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Beijing	1	Professor Yu-Zhi Chen	13-14
Chongqing	1	Professor Kun-Hua Chen	13-14
Guangzhou	1	Professor Nan-Shan Zhong	13-14
Shanghai	1	Dr Mao Bao-Shan	13-14
Wulumuqi	1	Professor Man-Lin Xiao	13-14
Beijing	2	Professor Yu-Zhi Chen	10-11
Guangzhou	2	Professor Nan-Shan Zhong	10-11
Beijing	3	Professor Yu-Zhi Chen	13-14
Guangzhou	3	Professor Nan-Shan Zhong	13-14
Tibet	3	Assistant Professor Osamu Kunii	13-14
Tong Zhou	3	Professor Yu-Zhi Chen	13-14
Wulumuqi(9)	3	Dr Qiao Li Pan	13-14

National Coordinator:
Professor Yu-Zhi Chen

Capital Institute of Pediatrics

No 2 Ya Bao Road
Beijing
China

Roles:

- National Coordinator for China
- Phase One Principal Investigator for Beijing
- Phase Two Principal Investigator for Beijing
- Phase Three Principal Investigator for Beijing, Tong Zhou

ISAAC in China

China is a very large country, and there were several studies about asthma prevalence in1990 and also in 2000. A nationwide and randomized survey on the prevalence of childhood asthma in 2000, compared with the same study in 1990, covered 31 provinces and 43 cities, including a population of 437873 children aged 0-14 years. The results show us that there was a concerning increase in asthma prevalence. But they had a different methodology than ISAAC Study. For this reason we considered it very important to join ISAAC. We thought joining the ISAAC study would let us get data about asthma and allergies prevalence in different cities in China and give us the opportunity of comparing our data with the data of other countries involved in this study. With ISAAC we also expected to achieve a better understanding and treatment of our patients.

When we knew that an international study about asthma and allergies was being prepared. We were very enthusiastic about including 5 cities of mainland China in that study in 1994 ISAAC Phase One. The 5 cities were Beijing, Shanghai, GuangZhou, Chongqing and Urumuqi, and we worked very hard do the study.

In ISAAC Phase Two study, as the study was more difficult than Phase One, and only needed a few centres to take part in it, we chose 2 centres, Beijing and Guangzhou, to join the Phase Two study. Expecially, our team did a lot of difficult work in the study. For example, in the dust collection work, you could imagine how hard it was to go to 200 children's home when the pupils were dismissed from school, and to get the dust from those children's bed, floor, etc.

In Phase Three China, a new centre, Tongzhou (Beijing rural) was added to the study in the 13-14 years group. Tongzhou is an area about 50km away from the Beijing urban city that included children from farmland. It was very important to have the centre within the study, so we could compare the result of Tongzhou with Beijing urban city, and to have a better understanding of the prevalence and machanism of asthma and allergic diseases. And finally, we found that the wheezing and allergic diseases prevalence were much lower in rural Beijing students than in urban Beijing students, and also the prevalence of positive allergy of SPT was much lower in rural Beijing students than in urban Beijing students.

Overall, in 12 years of ISAAC Study from Phase I to Phase III, about 90,000 chinese children joined the study, and 25,000 Beijing children joined the study.

And more, for the I-III ISAAC Study, we got the award of "Science and Technology Advancement Prize" awarded by the Beijing Municipal Government in 2006, and recieved 20000 RMB prize.

National Publications

The following publications used ISAAC data from China:

Zhao T, Wang HJ, Chen Y, Xiao M, Duo L, Liu G, Lau Y, Karlberg J. *Prevalence of childhood asthma, allergic rhinitis and eczema in Urumqi and Beijing.* J Paediatr Ch Health 2000; 36(2): 128-33.

Wong GW, Hui DS, Chan HH, Fok TF, Leung R, Zhong NS, Chen YZ, Lai CK. *Prevalence of respiratory and atopic disorders in Chinese schoolchildren.* Clin Exp Allergy.2001 Aug;31(8):1225-31.

Wong GWK, Hui DSC, Tam CM, Chan HH, Fok TF, Chan-Yeung M, Lai CKW. *Asthma, atopy and tuberculin responses in Chinese schoolchildren in Hong Kong.* Thorax 2001; 56(10): 770–773

Wong GW, Li ST, Hui DS, Fok TF, Zhong NS, Chen YZ, Lai CK. *Individual allergens as risk factors for asthma and bronchial hyperresponsiveness in Chinese children.* Eur Respir J.2002 Feb;19(2):288-93.

Chen YZ, Wang HY, Wang HJ, Ma Y, Li S, Zhao J, Zhong NS, Huang YJ, Huo TH, Lai QW. *[Prevalence of respiratory and atopic disorders in Chinese school children].* Chin J Tuberc Respir Dis.2003 Mar;26(3):143-7.Chinese.

Chen YZ, Ma Y, Wang HY, Wang HJ, Zhao J, Cao L, Li S, Wong GW, Zhong NS, Fok TF, Lai CK. *[Individual allergens as risk factors for asthma and bronchial hyperresponsiveness in Chinese children].[Chinese].* Zhonghua Erke Zazhi.2003 Jul.41(7):538-41.

Wong GW, Ko FW, Hui DS, Fok TF, Carr D, von Mutius E, Zhong NS, Chen YZ, Lai CK. *Factors associated with difference in prevalence of asthma in children from three cities in China: multicentre epidemiological survey.* BMJ 2004; 329(7464): 486.

Wang HY, Chen YZ, Ma Y, Wong GW, Lai CK, Zhong NS. *[Disparity of asthma prevalence in Chinese schoolchildren is due to differences in lifestyle factors].* Zhonghua Er Ke Za Zhi.2006 Jan;44(1):41-5.Chinese.

Wang HY, Wong GW, Chen YZ, Ferguson A, Greene J, Ma Y, Zhong NS, Lai CKW, Sears M. *Prevalence of asthma among Chinese adolescents living in Canada and in China.* CMAJ 2008 179: 1133-1142.

Regional
National
Colombia
Republique Democratique du Congo
Local

Colombia, Latin America

Centres:	Phase:	PI:	Age Groups
Barranquilla	3	Dr Alfonso M Cepeda	13-14, 6-7
Bogotá	3	Dr Gustavo Aristizábal	13-14, 6-7
Cali	3	Dr Gustavo A Ordoñez	13-14, 6-7

Colombia has no National Coordinator

Republique Democratique du Congo, Africa

Centres:	Phase:	PI:	Age Groups
Kinshasa	3	Prof Dr Jean-Marie Kayembe	13-14

National Coordinator:
Dr Etienne Bahati

Director, PMLT

Republique Democratique du Congo

Roles:

- National Coordinator for Republique Democratique du Congo

National Coordinator:
Dr Jean Paul Okiata

Directeur du PNT RDCongo

Republique Democratique du Congo

Roles:

- National Coordinator for Republique Democratique du Congo

Replaced Etienne Bahati in 2011

ISAAC In DR Congo

Kinshasa, the capital of D R Congo is a big country with almost ten million habitants. The ISAAC Phase Three survey was conducted under the supervision of the Faculty of Medicine (University of Kinshasa) and the Public health school of Kinshasa for statistical analyses.

This was the first survey on allergy in schoolchildren and the selected schools where chosen with the assistance of the ministry of education. Resident students in the last year at the faculty of medicine were included for data collection among schoolchildren and all the parts of the town were concerned. French is the teaching language but we encountered many difficulties due to a poor understanding of some questions which were translated in local languages. Some schools are very far from the centre and access is limited.

Data collected are very helpful and an ongoing study is now conducted by Dr Kapinga to analyze the level of asthma control in adults in Kinshasa. Three workshops have been organized in Kinshasa under the umbrella of pharmaceutical industry (Glaxo Smith Kline) and data from the ISAAC survey were presented.

We are interested in future collaboration at the level of all sub-saharan Africa and a survey on respiratory health will take place in Kinshasa next July
Prof J M Kayembe

The ISAAC Story

Congo, Africa

Centres:	Phase:	PI:	Age Groups
Brazzaville	3	Professor Joseph M'Boussa	13-14

Congo has no National Coordinator

Cook Islands, Oceania

Centres:	Phase:	PI:	Age Groups
Rarotonga	3	Dr Roro Daniel	13-14

National Coordinator:

Dr Roro Daniel

Health Manager
Ministry of Health, Cook Islands
Box 109
Avarua
Cook Islands

Roles:

- National Coordinator for Cook Islands
- Phase Three Principal Investigator for Rarotonga

Costa Rica, Latin America

Centres:	Phase:	PI:	Age Groups
Costa Rica	1	Dr Manuel E Soto-Quirós	13-14, 6-7
Costa Rica	3	Dr Manuel E Soto-Quirós	13-14, 6-7

National Coordinator:

Dr Manuel E Soto-Quirós

Unidad de Enseñanza
Hospital Nacional de Niños
PO Box 1654-1000

Costa Rica

Roles:

- National Coordinator for Costa Rica
- Phase One Principal Investigator for Costa Rica
- Phase Three Principal Investigator for Costa Rica

National Publications

The following publications used ISAAC data from Costa Rica:

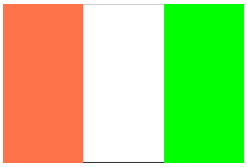
Celedon JC, Soto-Quirós ME, Silverman EK, Hanson L, Weiss ST. *Risk factors for childhood asthma in Costa Rica.* Chest.120(3):785-90, 2001 Sep.

Soto-Quirós ME, Silverman EK, Hanson LA, Weiss ST, Celedon JC. *Maternal history, sensitization to allergens, and current wheezing, rhinitis, and eczema among children in Costa Rica.* Pediatr Pulmonol.2002 Apr;33(4):237-43.

Soto-Quirós ME, Soto-Martínez M, Hanson LA. *Epidemiological studies of the very high prevalence of asthma and related symptoms among school children in Costa Rica from 1989 to 1998.* Pediatr Allergy Immunol.2002 Oct;13(5):342-9.

Regional
National
Côte D'Ivoire
Croatia
Cuba
Local

Cote d'Ivoire, Africa



Centres:	Phase:	PI:	Age Groups
Urban Cote d Ivoire	3	Dr Bernard Ngoran Koffi	13-14

National Coordinator:
Dr Bernard Ngoran Koffi

27 BP 340

Côte D'Ivoire

Roles:

- National Coordinator for Côte D'Ivoire
- Phase Three Principal Investigator for Urban Cote d Ivoire

Croatia, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Rijeka	3	Dr Kristina Lah Tomulic	13-14, 6-7

National Coordinator:
Professor Vladimir Ahel

Department of Paediatrics
Children's Hospital Kantrida
Istarska 43

Croatia

Roles:

- National Coordinator for Croatia

Cuba, Latin America

Centres:	Phase:	PI:	Age Groups
La Habana	3	Dra Patricia Varona Peréz	13-14, 6-7

National Coordinator:
Dra Patricia Varona Peréz

J'Grupo de Epidemiología de la División Epidemiología y Salud Publica de INHEM
Instituto Naconal de Higiene Epidemiología y Microbiología (INHEM)
Infanta # 1158 e/
Clavel y Llinás
Cuba

Roles:

- National Coordinator for Cuba
- Phase Three Principal Investigator for La Habana

National Publications

The following publications used ISAAC data from Cuba:

Fabre Ortiz D, Varona Pérez P, Suárez Medina R. *[Prevalence of asthma in Cuban adolescents by different clinical criteria].* Rev Alerg Mex.2005 May-Jun;52(3):132-7.Spanish.

The ISAAC Story

Ecuador, Latin America

Centres:	Phase:	PI:	Age Groups
Pichincha	2	Dr Phillip Cooper	7-17
Guayaquil	3	Dr César Bustos	13-14
Quito	3	Dr Sergio Barba	13-14, 6-7

National Coordinator:

Dr Sergio Barba

Ecuadorian Allergy and Asthma Association

260 Vozandes
AXXIS-Medical centre of. 509
Ecuador

Roles:

- National Coordinator for Ecuador
- Phase Three Principal Investigator for Quito

Like others places in the world, the study of allergic diseases until the last century were tailored with anarchic protocols and we felt that all were segmental and with many biases, which prevented correlation with other studies performed in other countries.

On behalf of the Ecuadorian Society of Allergy, Immunology and Allied Sciences (SEAICA), Dr. Sergio Barba MD, the President, contacted Javier Mallol MD, Regional Coordinator of ISAAC and through him with the International Program obtained the best support to undertake the ISAAC Three-b study since we had not participated in ISAAC Phase One. The first action was to make an adaptation to Ecuadorian terms the questionnaire implemented in the regional study. Then we made contact with researchers of Mind Marketing, an Institution that had experience with us in other studies of allergies in our country.

With them, we planned the ISAAC WORK PLAN: we asked the Ministry of Education for the database of the primary and secondary schools of the urban area of the city, then separated the city into three sectors: North, Center and South and with socio-economic information of INEC (National Institute of Statistics and Census) we chose 40 establishments that represented the city demographically. Then we had an interview with rectors, directors and scholar physicians; we trained teachers about the questions of the poll, started the survey and sent the questions to parents of children aged 6-7 years old. With the teen's group, we gathered the students in a classroom and displayed the video. When they answered the questionnaire, with the help of an ISAAC investigator, they completed the second part of the document.
As an initiative of the SEAICA, we donated to the participating schools a First Aid Kit to thank them for their participation in the study.

The survey was finished in about 7 weeks, and then it was analyzed and sent to the ISAAC International Data Centre. Subsequently we made a few clarifications and successfully completed Phase Three-b in Quito, whose local coordinator was appointed as National Coordinator for this research.

It is important to acknowledge the support provided by the ISAAC international Data Centre. I believe that is important to emphasize that we do not receive financial aid from any pharmaceutical group to complete the work. We currently have the desire to make a new study (10 years later), and to be involved in the ISAAC Phase IV.

Egypt, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Cairo	3	Dr Maggie Louis Naguib	13-14

Egypt has no National Coordinator

El Salvador, Latin America

Centres:	Phase:	PI:	Age Groups
San Salvador	3	Dr Margarita Figueroa Colorado	13-14, 6-7

National Coordinator:

Dr Margarita Figueroa Colorado

Hospital Nacional San Rafael

Insituto de Ojos Blvd.
Tutunichapa N 326
El Salvador

Roles:

- National Coordinator for El Salvador
- Phase Three Principal Investigator for San Salvador

In September 1994, I knew the ISAAC project an its protocol to determine the incidence of Asthma and Allergy in the world. IN 2001 the ERS Congress in Berlin, Phillippa Ellwood, Innes Asher; Javier Mallol, was presented as Coordinator for Latin America for the ISAAC III.

Since that time it was a challenge for me, develop the study to determine first the Incidence of Asthma and Allergies in my country El Salvador. Start with the planning of the survey, supported by the University Doctor José Matías Delgado, with Dr. Clifton Huang and his group of enthusiastic students who conducted the survey.

Today our group has grown and consolidates. In the picture, in the front: Coordinator: Margarita Figueroa, William Hoyos, Reseacher , behind , Pablo Salazar, Reseacher, Mauricio Flores, Pediatric Allergist.

Estonia, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Narva	1	Dr Mall-Anne Riikjärv	13-14
Tallinn	1	Dr Mall-Anne Riikjärv	13-14, 6-7
Tallinn	2	Dr Mall-Anne Riikjärv	10
Tallinn	3	Dr Mall-Anne Riikjärv	13-14, 6-7

National Coordinator:

Dr Mall-Anne Riikjärv

Clinical Director
Tallinn Children's Hospital
Tervise, 28

Estonia

Roles:

- National Coordinator for Estonia
- Phase One Principal Investigator for Narva, Tallinn
- Phase Two Principal Investigator for Tallinn
- Phase Three Principal Investigator for Tallinn

ISAAC in Estonia (East Europa)

Estonia was a socialist country, which regained its independence in 1991. In these days Estonian pediatricians met prof. Bengt Björksten, who initiated the first epidemiological study of asthma and allergies in Estonian children. He encouraged us also to take part in the international study ISAAC, which we accepted with great enthusiasm. It was especially important for us that prof. Björksten found the resources for the study, as the economical situation in Estonia in these times was very difficult. The group of field workers was formed from pediatricians, who did the demanding field work in addition to their everyday clinical work. Such a study in schools was rather unusual, but the scool staff accepted the study group intervention into the everyday school activities rather calmly. In data processing we were pleased to receive help from an experienced statsitician, whose qualified collaboration enabled us to forward high quality data to the ISAAC center.

The positive experience from the ISAAC I encouraged us also to take part in the next phases of ISAAC. The ISAAC II study with it's multiple tasks and procedures was rather challenging for our small group of field workers . However, we don't remember any exceptional situations and the schoolchildren were always eager to get the reason to miss their lessons.

National Publications

The following publications used ISAAC data from Estonia:

Annus T, Björkstén B, Mai XM, Nilsson L, Riikjärv MA, Sandin A, Bråbäck L. *Wheezing in relation to atopy and environmental factors in Estonian and Swedish schoolchildren.* Clin Exp Allergy 2003; 31(12): 1846-53.

Sandin A, Annus T, Björkstén B, Nilsson L, Riikjärv MA, van Hage-Hamsten M, Bråbäck L. *Prevalence of self-reported food allergy and IgE antibodies to food allergens in Swedish and Estonian schoolchildren.* Eur J Clin Nutr.2005 Mar;59(3):399-403.

The ISAAC Story

Participating in the ISAAC studies was an enriching experience in many ways for Estonian pediatrics. It was the first experince in the international scientific cooperation for us. Using the internationally accepted methods we got reliable data about the epidemiological situation on asthma and allergies in Estonian children. Several papers in international scientific journals and a doctoral thesis were based on the research data. We believe that the data from Estonia, a country in transition from socialism to the market economy, were a valuable addition to the international comparison. Such data gave the reason to the hypothesis that socialism protects from allergies.

We gratefully acknowledge prof. Bengt Björksten, who opened the door to the International allergy world for us and warranted the financial support for the studies. We also thank the schools and families of the participating children. Our study woudn't have been possible without enthusiastic team of pediatricians who bore the main burden .

Ethiopia, Africa

Centres:	Phase:	PI:	Age Groups
Addis Ababa	1	Associate Professor Kibrebeal Melaku	13-14
Jima	1	Professor Berhane Seyoum	13-14
Addis Ababa	3	Associate Professor Kibrebeal Melaku	13-14

Ethiopia has no National Coordinator

National Publications

The following publications used ISAAC data from Ethiopia:

Melaku K, Berhane Y. *Prevalence of wheeze and asthma related symptoms among school children in Addis Ababa, Ethiopia.* Ethiop Med J.1999 Oct;37(4):247-54.

Haileamlak A, Lewis SA, Britton J, Venn AJ, Woldemariam D, Hubbard R, Williams HC. *Validation of the International Study of Asthma and Allergies in Children (ISAAC) and U.K. Criteria for atopic eczema in Ethiopian children.* Br J Dermatol 2005; 152(4): 735-41.

Fiji, Oceania

Centres:	Phase:	PI:	Age Groups
Suva	3	Dr Rosalina Sa'aga-Banuve	13-14

National Coordinator:

Dr Lepani Waqatakirewa

Children's Hospital
Government Buildings
PO Box 2223

Fiji

Roles:

- National Coordinator for Fiji

Finland, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Helsinki	1	Dr Merja Kajosaari	13-14
Kuopio County	1	Dr Juha Pekkanen	13-14
Lappland Area	1	Dr Leena Soininen	13-14
Turku and Pori County	1	Dr Turku Antti Koivikko	13-14
Kuopio County	3	Dr Juha Pekkanen	13-14

National Coordinator:

Dr Juha Pekkanen

Head, Department of Environmental Epidemiology
National Public Health Institute
KTL. P.O. Box 95

Finland

Roles:

- National Coordinator for Finland
- Phase One Principal Investigator for Kuopio County
- Phase Three Principal Investigator for Kuopio County

National Publications

The following publications used ISAAC data from Finland:

Pekkanen J, Remes ST, Husman T, Lindberg M, Kajosaari M, Koivikko A, Soininen L. *Prevalence of asthma symptoms in video and written questionnaires among children in four regions of Finland.* Eur Respir J 1997; 10(8): 1787-94.

Remes ST, Korppi M, Kajosaari M, Koivikko A, Soininen L, Pekkanen J. *Prevalence of allergic rhinitis and atopic dermatitis among children in four regions of Finland.* Allergy 1998; 53(7): 682-689.

Remes ST, Pekkanen J, Soininen L, Kajosaari M, Husman T, Koivikko A. *Does heredity modify the association between farming and allergy in children?* Acta Paediatr.2002;91(11):1163-9.

France, Western Europe

Centres:	Phase:	PI:	Age Groups
Marseille	1	Professor Denis Charpin	13-14
Montpellier	1	Professor Philippe Godard	13-14
Pessac	1	Professor André Taytard	13-14, 6-7
Strasbourg	1	Dr Christine Kopferschmitt-Kubler	13-14
West Marne	1	Dr Isabella Annesi-Maesano	13-14
Crétail	2	Dr Isabella Annesi-Maesano	10-11 yrs.

National Coordinator:

Dr Isabella Annesi-Maesano

EPAR Dept, INSERM, UMR- S 707
Faculté de Médecine Pierre et Marie Curie
Site Saint-Antoine
27 rue Chaligny 75571
France

Roles:

- National Coordinator for France
- Phase One Principal Investigator for West Marne
- Phase Two Principal Investigator for Crétail

National Coordinator:

Professor Denis Charpin

Service de Pneumologie-Allergologie
Hôpital Nord

France

Roles:

- National Coordinator for France
- Phase One Principal Investigator for Marseille

ISAAC Phase One in France

Denis Charpin acted as the national coordinator for the French Phase 1 study and Isabella Annesi-Maesano for Phase 2.

Phase 1 was performed In France in 1993-1994. Five centers have been selected : Bordeaux, on the Atlantic coast, Créteil, near Paris, Reims, in the Champagne area, Strasbourg on the northeast border, and Marseille on the Mediterranean coast on the basis of these geographic locations, quite different climatic conditions and, of course, willingness to embark on a demanding survey. Overall, 8.697 children 6-7 years old and 18.555 children 13-14 years old have participated.

ISAAC has been the first national survey ever performed in France on asthma and allergy. Its results have been published in a supplement of the French review of respiratory diseases (Revue des maladies respiratoires) and the French « Bulletin épidémiologique hebdomadaire ». These results have clearly show to physicians, pharmaceuticals and the public that allergic diseases are by far the first chronic disease in childhood.

National Publications

The following publications used ISAAC data from France:

Annesi-Maesano I, Oryszczyn MP, Lanteaume A, Berlier M, Kopferschmitt Kubler MC, Godard P. *Prevalence and severity of allergic rhinitis in adolescents.* Rev Mal Respir 1997; 14(suppl.4): 4S23-4S31 [in French].

Charpin D, Annesi-Maesano I, Godard P, Kopferschmitt Kubler MC, Oryszczyn MP, Peray P, Quoix E, Raherison C, Taytard A, Vervloet D. *ISAAC survey.General presentation of the survey.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S7-4S14.

Daures JP, Raherison C, Annesi-Maesano I, Berlier A, Lanteaume A, Taytard A. *Prevalence of asthma or signs suggestive of rhinitis in adolescents (13-14 years) in the ISAAC survey.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S41-4S46.

Kopferschmitt Kubler MC, Nisand G, Raherison C, Tunon De Lara M, Taytard A, Pauli G. *Rhinitis in 6-7 year-old children.The ISAAC survey.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S15-4S21.

Quoix E, Hedelin G, Kopferschmitt Kubler MC, Berlier M, Charpin D, Pauli G, Groupe ISAAC France. *Comparison between written and video questionnaires for assessment of asthma prevalence in adolescents.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S61-4S66.

Raherison C, Tunon De Lara JM, Taytard A, Kopferschmitt Kubler MC, Quoix E, Pauli G. *Prevalence of asthma in children.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S33-4S39.

Raherison C, Tunon De Lara JM, Vernejoux JM, Taytard A. *Management of asthma in a school population in Bordeaux.[in French].* Rev Mal Respir 1997; 14(suppl.4): 4S67-4S72.

Annesi-Maesano I, Oryszczyn MP. *Rhinitis in adolescents. Results of the ISAAC survey.* Rev Fr Allergol Immunol Clin 1998; 38(4):283-289

Charpin D, Annesi-Maesano I, Godard P, Kubler MCK, Oryszczyn MP, Ray P, Quoix E, Raherison C, Taytard A, Vervloet D. *General description of the ISAAC study.* Rev Fr Allergol Immunol Clin 1998; 38(4):275-282

Koffi N, Aka J, Nigue L, Kouassi B, Ngom A, Amon-Dick F, Nibaud A, Fadiga A, Aka-Danguy E. *Prévalence des maladies allergiques de l'enfant : résultants de l'enquête ISAAC - Côte d'Ivoire phase I.[French].* Rev Fr Allergol Immunol Clin 2000; 40(5):539-47.

Raherison C, Tunon-de-Lara JM, Vernejoux JM, Taytard A. *Practical evaluation of asthma exacerbation self-management in children and adolescents.* Respir Med.2000 Nov;94(11):1047-52.

Ramadour M, Burel C, Lanteaume A, Vervloet D, Charpin D, Dutau H, Brisse F *Prevalence of asthma and rhinitis in relation to long-term exposure to gaseous air pollutants* Allergy 2000; 55(12): 1163–1169

Nguyen L, Raherison C, Vernejoux JM, Tunon-De-Lara JM, Taytard A.*[Impact of smoking habits on the every day life of asthmatic adolescents].* Rev Mal Respir.2002 Jun;19(3):301-9.

Prodanovic H, Raherison C, Vernejoux JM, Tunon de Lara JM, Taytard A. *[Does the presence of a pet at home influence the prevalence of asthma and rhinitis?].* Rev Mal Respir.2002 Dec;19(6):735-40.

Jouaville LF, Annesi-Maesano I, Nguyen LT, Bocage AS, Bedu M, Caillaud D. *Interrelationships among asthma, atopy, rhinitis and exhaled nitric oxide in a population-based sample of children.* Clin Exp Allergy.2003 Nov;33(11):1506-11.

Pénard-Morand C, Raherison C, Kopferschmitt C, Caillaud D, Lavaud F, Charpin D, Bousquet J, Annesi-Maesano I. *Prevalence of food allergy and its relationship to asthma and allergic rhinitis in schoolchildren* Allergy 2005; 60(9): 1165 - 1171

Pénard-Morand C, Charpin D, Raherison C, Kopferschmitt C, Caillaud D , Lavaud F, and Annesi-Maesano I *Long-term exposure to background air pollution related to respiratory and allergic health in schoolchildren* Clin Exp Allergy 2005; 35(10): 1279–1287

Annesi-Maesano I, Moreau D, Caillaud D, Lavaud F, Le Moullec Y, Taytard A, Pauli G, Charpin D. *Residential proximity fine particles related to allergic sensitisation and asthma in primary school children* Respir Med 2007; 101: 1721–1729

Annesi-Maesano I, Caillaud D, Lavaud F, Moreau D, Le Moullec Y, Taytard A, Pauli G, Charpin D. *Exposure to fine air particles and occurrence of allergic diseases: Results of ISAAC-France phase 2.* Rev Fr Allergol Immunol Clin 2008; 48(6):427-433Oct

Annesi-Maesano I, Caillaud D, Lavaud F, Moreau D, Le Moullec Y, Taytard A, Pauli G, Charpin D. *Exposure to fine air particles and occurrence of allergic diseases: Results of ISAAC-France phase 2.* Arch Pediatr 2009; 16(3):299-305.

Charpin D, Pénard-Morand C, Raherison C, Kopferschmitt C, Lavaud F, Caillaud D, Annesi-Maesano I. *Long-term exposure to urban air pollution measured through a dispersion model and the risk of asthma and allergy in children* Bull Acad Natl Med 2009; 193(6): 1317-1328

Randriamanantany ZA, Annesi-Maesano I, Moreau D, Raherison C, Charpin D, Kopferschmitt C, Lavaud F, Taytard A, De Blay F, Caillaud D.*Alternaria sensitization and allergic rhinitis with or without asthma in the French Six Cities study* Allergy 2010; 65: 368–375.

Pénard-Morand C, Raherison C, Charpin D, Kopferschmitt C, Lavaud F, Caillaud D, Annesi-Maesano I. *Long-term exposure to proximity air pollution and asthma and allergies in urban children* Eur Respir J Jan 2010; 36(1): 33-40 Epub January

French Polynesia, Oceania

Centres:	Phase:	PI:	Age Groups
Polynesie Francaise	3	Dr Isabella Annesi-Maesano	13-14

National Coordinator:

Dr René Chansin

Directeur Institut Louis Malardé

French Polynesia

Roles:

- National Coordinator for French Polynesia

Gabon, Africa

Centres:	Phase:	PI:	Age Groups
Port-Gentil	3	Dr Isabelle Ekoume Hypolite	13-14

National Coordinator:

Dr Isabelle Ekoume Hypolite

BP 428

Gabon

Roles:

- National Coordinator for Gabon
- Phase Three Principal Investigator for Port-Gentil

Georgia, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Kutaisi	1	Dr Nino Khetsuriani	13-14, 6-7
Tbilisi	1	Professor Amiran Gamkrelidze	13-14, 6-7
Tbilisi	2	Dr Maia Gotua	10-11 years
Kutaisi	3	Dr Maia Gotua	13-14, 6-7

National Coordinator:

Dr Maia Gotua

Director
Center of Allergy & Immunology
2/6 Lubliana str.
Tbilisi
Georgia

Roles:

- National Coordinator for Georgia
- Phase Two Principal Investigator for Tbilisi
- Phase Three Principal Investigator for Kutaisi

Background

Georgia, which former was one of the Soviet Union countries, gained its independence in 1990 and faced most complicated political situations and hard economic conditions. Despite the mentioned Georgia was always opened to new researches, including epidemiological studies. The ISAAC regional coordinator for Northern and Eastern Europe professor Bengt Bjorksten kindly invited Georgia to participate in ISAAC study in 1994. This participation was defined according to the following key points: the lack of any epidemiological data regarding markers of allergy diseases for that time in Georgia; the interest to confirm the purpose that the prevalence of these diseases in Georgia should be much lower than in country with market economy (as it was revealed in the other less industrialized formerly socialist countries); as well as personal contact with Prof. Gamkrelidze and his team of highly-qualified allergologists at the Tbilisi State Medical University and later staff of Center of Allergy and Immunology.

National Publications

The following publications used ISAAC data from Georgia:

Abramidze T, Gotua M, Rukhadze M, Gamkrelidze A. *ISAAC I and III in Georgia time trends in prevalence of asthma and allergies.* Georgian Med News.2006 Aug;(137):80-2.

Abramidze T, Gotua M, Rukhadze M, Gamkrelidze A. *Prevalence of asthma and allergies among adolescents in Georgia comparison between two surveys.* Georgian Med News.2007 Mar;(144):38-41.

Impact of ISAAC

Involvement in a large global research project gave chance of new research, education and obtaining of practical experience to our country. It was extremely important for developing allergy and epidemiology fields in Georgia and learning new approaches of standardized high quality research. Participation in ISAAC expanded our professional contacts and was good opportunity for active exchanging of scientific knowledge with our colleagues in other countries.

Findings

ISAAC Phase I and as well as ISAAC Phase III were conducted in two cities of Georgia – Tbilisi and Kutaisi, characterized by different geographical and urban peculiarities. The prevalence of symptoms of allergic diseases in Georgia according to the results of ISAAC I survey mostly was less than 5%. The exception was the prevalence of wheezing 12 months among 6-7 yrs. Old children (Kutaisi – 9.3%, Tbilisi -5.4%), which possibly could be less related to allergy and more associated with infections in the younger children. The regional differences (between two study centers) in symptoms were not obvious among 13-14 yrs. Old children. The 12 month prevalence of wheezing and conjunctivitis were slightly higher in Kutaisi than in Tbilisi among the 6-7 yr olds children.

ISAAC Phase II was performed in Tbilisi, in 2001-2002. The prevalence rate of asthma became 9.2%, the prevalence rate of 12 months of itchy rash and flexural dermatitis were 7.6% and 5.9%, respectively, which was higher than the prevalence of eczema symptoms reported in Georgia 6-7 years ago (ISAAC Phase I – 1995-1996). The prevalence of current rhinoconjunctivitis was increased as well (6.3% vs. 4.7%). An interesting finding was that the family history of allergic diseases and damp spots on the wall was the main determinants for all types of allergic symptoms as well as high co-morbidity of allergic diseases.

ISAAC Phase III was conducted in May 2003 – December 2003 in two centers. Unfortunately, Tbilisi center was excluded from the global data analysis. That was caused by very low response rate (46% - 13/14 yrs old group, 56% - 6/7 yrs old group) during the fieldwork period, due to the difficult political situation inside the country (so-called “Rose Revolution" located in Tbilisi). In order to reveal tendency of changes of allergic symptoms prevalence in our country we analyzed both centers. The results of ISAAC phase III study indicate that the epidemiological features of asthma and allergies in Georgia are changing, although the causes are still uncertain. Considerable geographic variation in time trends of prevalence of symptoms of asthma and allergies can been seen in both age groups (6/7 and 13/14 yrs old). The prevalence changes, particularly the increasing pattern, more clearly expressed in Tbilisi than in Kutaisi centre. Among adolescences in Kutaisi center only “current wheezing” increased from 1996 (3,6% (95%CI 3.1-4.1)) to 2003 (5.1% (95%CI 4.3-5.9)), the prevalence of all other allergic diseases decreased or remained without changes. It should be noted, that the prevalence of current wheezing among 6-7 yrs old children, in contrast to other age group, decreased by 2,4% (9,3% (1996) and 6,9% (2003)), the symptoms of current rhino-conjunctivitis slightly decreased and symptoms of flexural dermatitis reduced by 2.8% ($p < 0.01$).

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3. Abramidze T, Gotua M, Rukhadze M, Gamkrelidze A. Prevalence of asthma and allergies among adolescences in Georgia: comparison between two surveys. Georgian Med News. 2007 Mar ;(144):38-41

Acknowledgment

We wish to thank Prof. Bengt Bjorksten for a supervision and great support in carrying out of all phases of ISAAC study in Georgia. Many thanks to ISAAC group of University of Ulm under the leadership of Prof. Stephan Weiland and ISAAC group in Auckland for supporting in data entry and analysis. We are also grateful to all the children, parents and school staff who participated in the surveys.

The ISAAC Story

Germany, Western Europe

Centres:	Phase:	PI:	Age Groups
Greifswald	1	Professor Axel Kramer	13-14, 6-7
Münster	1	Prof Dr Ulrich Keil	13-14, 6-7
Dresden	2	Professor W Leopold	9-11
Munich	2	Professor Erika von Mutius	9-11
Münster	3	Prof Dr Ulrich Keil	13-14, 6-7

National Coordinator:

Prof Dr Ulrich Keil

Institut für Epidemiologie und Sozialmedizin
Westfälische Wilhelms Universität
Domagkstrasse 3

Germany

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Western Europe
- National Coordinator for Germany
- Phase One Principal Investigator for Münster
- Phase Three Principal Investigator for Münster

Prof Dr med Stephan Weiland

Institute of Epidemiology
Ulm University
Helmholtzstr. 22

Germany

Roles:

- ISAAC Executive
- ISAAC Steering Committee
- National Coordinator for Germany

As we all know, ISAAC originated in Bochum, Auckland and London and therefore it is no surprise that the first ISAAC Study in Germany took place in Bochum. It was part of a pilot study which, besides Bochum comprised regions in New Zealand, Australia and England. The publication which originated from this pilot study has the title " Self-reported prevalence of asthma symptoms in children in Australia, England, Germany and New Zealand: An international comparison using the ISAAC written and video questionnaires." Eur Resp J 1993;6:1455-1461.

The ISAAC data from Bochum also helped producing another landmark paper, which deals with traffic density on street of residence and wheezing and symptoms of allergic rhinitis in children. The positive results derived from these data stimulated the debate on diesel exhaust and its relation to asthma and rhinitis symptoms in children. The respective publication has the title " Self-reported wheezing and allergic rhinitis in children and traffic density on street of residence" and appeared in Ann Epidemiol 1994; 4: 243-247.

In 1993 I moved from Bochum to Münster and therefore we organized the first ISAAC Phase One study in our new home town Münster.I was happy to secure funding for this study from the ministry of the environment of the state of North-Rhine Westphalia, the most populous state in the Federal Republic of Germany. (18 million)

The great political changes of 1989 and the 1990ies lead to the unification of Germany. In this context the universities in the eastern part of the country were evaluated by the German Wissenschaftsrat and among others I was asked to travel to Greifswald and help set up a community medicine program in the medical faculty of this old and prestigious university. As one can imagine ISAAC fitted very well in this community medicine program and I advised the medical faculty of the university of Greifswald to participate in the worldwide ISAAC project. Axel Kramer, professor of hygiene in Greifswald, became the principal investigator of ISAAC Greifswald and this is why Münster and Greifswald appear as the only German regions on the ISAAC world map publication in the Lancet in 1998.

The results concerning the prevalence of wheezing in Münster and Greifswald, respectively, corresponded to our expectations, namely higher prevalence figures in the west compared to the east. This was the situation in 1994/1995.

When ISAAC Phase Three came into being another cross sectional survey in Münster was performed in 2000 but the PI in Greifswald was unable to secure funding for another survey in this north eastern part of Germany. This is why time trends for asthma and allergies in the region of Greifswald are not available.

With hindsight it is sad to see that only two regions are representing Germany in ISAAC Phase One and only one region, namely Münster, is representing Germany in both ISAAC phases. Heinrich Duhme, my colleague in Münster, deserves special praise for having done such a wonderful job when organizing and carrying out the two cross sectional studies in Münster in 1994/1995 and 2000. For the ISAAC Phase One study Münster he received his PhD.

The ISAAC Story

Why is it that only two regions, namely Münster and Greifswald, are representing Germany on the world map of asthma and allergies? Well, the answer is quite simple: ISAAC Phase One and Three was too simple for the German mind. Most colleagues in this field, for example in Munich or Berlin, wanted to do more sophisticated studies with clinical examinations and hopefully a genetic component. In light of this, ISAAC Phase One and Three were clearly underestimated and the enthusiasm for this part of ISAAC in Germany was limited.

The big hit for the scientific community in Germany was the "Verbundstudie", which was a study on ten year olds in Munich and Dresden, promoted and funded by the Federal Ministry of Research and Technology, and organized and administered from Münster. This study contained a number of clinical assessments in ten year old participants and later on developed also a strong interest in genetic questions. From this German "Verbundstudie", whose origin was in Münster, ISAAC Phase Two developed and when Stephan Weiland moved from Münster to Ulm in 2002 he transferred administrative and scientific tasks of this project to his new university institute in Ulm.

Because of scarce resources for the funding of the "Verbundstudie" it was not possible to also establish a study centre in Münster and therefore ISAAC Phase Two by many scientists in Germany and elsewhere was not seen as a project which originated in Münster, but a project whose study centres are in Munich and Dresden, with a data centre and an administrative centre in Ulm for the worldwide ISAAC Phase Two study.

Obviously, the merits of ISAAC phases one and three are overwhelming and I am very proud that Germany is represented by two regions. By the way, I will never forget the exact year of ISAAC Phase One in Münster, namely the time 1994/1995, because my youngest daughter, who was born in 1981, participated in ISAAC Phase One Münster as a 13-14 year old adolescent.

The evaluation and appreciation of the merits of ISAAC Phase Two I will leave to others. My impression is that many expectations, especially those in the field of genetics have not (yet) been met.

Whenever I go to Berlin and pass by Gendarmenmarkt I vividly remember our ISAAC Steering Committee Meeting in 1997 at the Berlin-Brandenburgische Akademie and a very pleasant site visit to Potsdam. It was at this meeting in Berlin when Stephan Weiland was elected member of the ISAAC Executive. As we all know he served on this committee very successfully for about 10 years until his untimely death in 2007.

National Publications

The following publications used ISAAC data from Germany:

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Ghana, Africa

Centres:	Phase:	PI:	Age Groups
Kintampo	2	Dr Emmanuel OD Addo-Yobo	

Ghana has no National Coordinator

Greece, Western Europe

Centres:	Phase:	PI:	Age Groups
Athens	1	Associate Professor Christina Gratziou	13-14, 6-7
Athens	2	Associate Professor Christina Gratziou	10-11
Thessaloniki	2	Associate Professor John Tsanakas	10-11
Thessaloniki	3	Associate Professor John Tsanakas	6-7

National Publications

The following publications used ISAAC data from Greece:

Papadopoulou A, Hatziagorou E, Matziou VN , Grigoropoulou DD, Panagiotakos DB, Tsanakas JN, Gratziou C, Priftis KN *Comparison in asthma and allergy prevalence in the two major cities in Greece the ISAAC phase II survey* Allergol Immunopathol(Madr).2011; epub ahead of print

National Coordinator:

Associate Professor Christina Gratziou

Ass. Prof. Pulmonary and Critical Care Medical School, Athens University
Head of Asthma and Allergy Centre
Eugenidio Hospital ,Athens
Greece

Roles:

- National Coordinator for Greece
- Phase One Principal Investigator for Athens
- Phase Two Principal Investigator for Athens

ATHENS ISAAC STORY

Phase I (1994-1995)

Greece was involved as a partner in ISAAC study for the first time in 1994 taking part in ISAAC Phase I with two centers one in Athens and one in Thessaloniki.

The aim of the Phase I ISAAC study was to evaluate allergic disease in children in Greece. The standardized questionnaire was translated in Greek and was delivered at schools and completed by parents of Children 6-7years old and 13-14 yr. Questions regarding cough, wheezing, asthma history and symptoms of rhinitis without infection and atopy, rash coming and go for more than 6 months were recorded. The meaning of asthma, allergic rhinoconjuctivitis and eczema were not widely known and attempts were made to educate parents.

71 and 38 schools for 6-7 years and 13-14 years old children respectively were randomly selected and questionnaires were sent home via children. 1654 (50.2%boys) and 2561 (47%boys) fully answered data were collected from children and adolescences respectively during May 1994 and May 1995.

Phase II (2000-2001)

Greece has also been involved in ISAAC phase II study with two centers,one in Athens and one in Thessaloniki. This study was undertaken between October 2000 - November 2001 in order to further evaluate children with asthma. In brief, children were selected from 43 primary schools (28% of the total schools) The selection of schools was random and based on the school listings provided by the Ministry of Education. All children from each school were asked to participate. The participation rates were 85%. 1003 Greek schoolchildren, aged 9-10-year-old (47.9% boys), were participated in the ISAAC-II survey. All participated children answered the ISAAC-II questionnaire, tested with skin prick testing (SPT) to seven common aeroallergen and examined for flexural dermatitis. SPTs were performed with common seasonal or perennial allergens seasonal (with additional SPts with locally important allergens) (mixed grass pollen, mixed tree pollen and olive tree pollen,parietaria, Dermatophagoides pteronyssinus, Dermatophagoides farinae, Alternaria tenuis and cat dander). In addition according to the protocol a provocation test was performed with hypertonic saline in 100children selected of the participant who referred lifetime asthma. Data collected and analysed centrally.

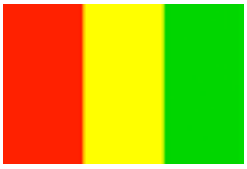
The ISAAC Story

Phase III (2000-2001)

Greece has also been involved in ISAAC phase III study. According to ISAAC phase III study, questionnaire was sent to parents via children 6-7 years old at schools to re- evaluate (after some years) the epidemiology of asthma, rhinitis and atopy in young children 6-7 yr as in phase I study. This time due to practical problems there was a smaller school participation and data from 858 children were collected. Data were sent to coordination center.

Full data analysis of Phase I,II,and III was done centrally by ISAAC coordination center and presented in several ISAAC Publications.National data were presented in national and international meetings.

République de Guinée, Africa



Centres:	Phase:	PI:	Age Groups
Conakry	3	Professeur Oumou Younoussa Sow	13-14

République de Guinée has no National Coordinator

Honduras, Latin America

Centres:	Phase:	PI:	Age Groups
San Pedro Sula	3	Dr Agustin Bueso-Engelhardt	13-14, 6-7

National Coordinator:

Dr Agustin Bueso-Engelhardt

Centro de Neumología y Alergia Siglo XXI
Edificio CNA
Entrada a Col.
Los Laureles
Honduras

Roles:

- National Coordinator for Honduras
- Phase Three Principal Investigator for San Pedro Sula

SAR China, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Hong Kong 13-14	1	Dr Christopher Lai	13-14
Hong Kong 6-7	1	Professor Yu Lung Lau	6-7
Hong Kong	2	Dr Christopher Lai	10-11
Hong Kong 13-14	3	Professor Gary Wong	13-14
Hong Kong 6-7	3	Professor Yu Lung Lau	6-7

National Coordinator:

Dr Christopher Lai

Department of Medicine and Therapeutics
The Chinese University of Hong Kong
Room 1403, Takshing House
20 Des Voeux Road Central
SAR China

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Asia-Pacific
- National Coordinator for SAR China
- Phase One Principal Investigator for Hong Kong 13-14
- Phase Two Principal Investigator for Hong Kong

The ISAAC Story

I got involved in the ISAAC project when I was invited to the steering committee as the regional coordinator of Asia Pacific in the early 90's. At that time, Hong Kong already had some prevalence data on asthma, rhinitis and eczema, although these data were based on studies using different methodologies and included a wide range of subjects - children, adults and hospital patients. This makes comparison between studies from different time points and with other populations from different geographic locations difficult. The ISAAC study has allowed us to make valid comparisons with our counterparts in mainland China. The phase 1 data revealed a striking difference in the prevalence of asthma symptoms – up to a 4-fold difference – between schoolchildren in Hong Kong and those in mainland China. This, together with the demonstration that we have a relatively high asthma prevalence amongst our children, we were able to secure funding from the research grant funding bodies to further our research on asthma epidemiology.

The grants enabled us to conduct the phase 2 study not only in Hong Kong, but also in 2 mainland centres, Beijing and Guangzhou. This study identified certain environmental factors that could account for the difference in asthma prevalence between Hong Kong and its mainland counterparts. The data provided some insights to further research into the aetiology of asthma not only in China, but also in other parts of the world.

Our experience in the previous 2 phases of the study certainly helped us to conduct the phase 3 much more smoothly. We are pleasantly surprised to see the prevalence of asthma symptoms has declined though still not certain what was causing this change.

During the time of our participation in the project, we have validated the video questionnaire on asthma symptoms[1] and the Chinese translated version of the ISAAC core questions for atopic eczema[2].

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2. Chan HH, Pei A, van Krevel C, Wong GWK, Lai CKW. Validation of the Chinese translated version of ISAAC core questions for atopic eczema. *Clin Exp Allergy 2001, 31: 903-907.*

National Publications

The following publications used ISAAC data from SAR China:

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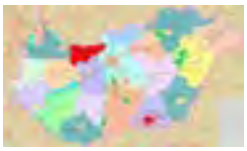
Wong GWK, Hui DSC, Tam CM, Chan HH, Fok TF, Chan-Yeung M, Lai CKW. *Asthma, atopy and tuberculin responses in Chinese schoolchildren in Hong Kong.* Thorax 2001; 56(10): 770–773

Lee SL, Wong W, Lau YL. *Increasing prevalence of allergic rhinitis but not asthma among children in Hong Kong from 1995 to 2001 (Phase 3 International Study of Asthma and Allergies in Childhood).* Pediatr Allergy Immunol 2004; 15(1): 72-8.

Wong GWK, Leung TF, Ko FWS, Lee KKM, Lam P, Hui DSC, Fok TF, Lai CKW. *Declining asthma prevalence in Hong Kong Chinese schoolchildren.* Clin Exp Allergy 2004; 34(10): 1550-5.

Hungary, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Svábhegy	3	Dr Györgyi Zsigmond	13-14, 6-7
Szeged	3	Dr Zoltán Novák	13-14



National Coordinator:

Dr Györgyi Zsigmond

Senior Consultant Pediatrician, Pediatric Pulmonologist,
Svabhegy Institute,
Budapest,

Hungary

Roles:

- National Coordinator for Hungary
- Phase Three Principal Investigator for Svábhegy

ISAAC in Hungary

I had always a feeling that the prevalence of asthma and allergic rhinitis was absolutely underestimated in my country, Hungary, during the last decades. Although there were some studies performed on this field, the questionnaires and other methods were not validated, so we could not compare the results with the international data. When I took part in the ATS Congress in the early nineties, I was aware that an international study about asthma and allergies was being prepared. In 2002, I was not only the head of the pulmonary division of the University of Szeged, but I was also the science director of the Institute of Svábhegy in Budapest, in our capital city. During this time, we could join the “ISAAC family” with these two institutions. I nominated Dr. Zsigmond to be the national coordinator, and I also invited some excellent pediatricians to participate in the trial, Dr Marianne Kovács, Dr Ildikó Kovács from Szeged and Dr Károly Berényi from Hódmez?vásárhely. You can see on the picture the map of Hungary with two areas marked with red color, where ISAAC Phase Three was performed in both age groups. We translated the questionnaire into Hungarian, sent hundreds of letters to try to get some financial support – to tell the truth it was extremely difficult - sent also letters to the directors of the schools to let us perform the trial in the schools. You can see a photo, how the questionnaire was done in one of the schools.

We had difficulties of course during the investigations, but with the continuous help of Philippa Ellwood and the other staff members of the team, we were able to solve them. After finishing ISAAC Phase Three, we had clear data about the prevalence of asthma, eczema and allergic rhinitis in Hungary. We had some publications and lectures in different national conferences about our results and also proudly found the excellent publications of ISAAC Phase Three in high impact international journals.

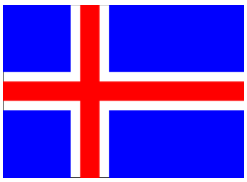
Last but not least, it was a great pleasure to meet the other members of the ISAAC family in different international conferences, to take part in the informal meetings during the last years, with other words, we were very proud to became the members of such a nice family. I also hope, that we did not finish, and we can find other possibilities to continue our common work in the future.

As the president of the Hungarian Society of Pediatric Pulmonology and also the president of Hungarian Society of Pediatric Allergology, all the other members of ISAAC family are cordially invited to come and visit our beautiful country anytime. Please, do not hesitate to contact me if you needed any help in the future.

Zoltan Novak

Hungary.

Iceland, Northern and Eastern Europe



Centres:	Phase:	PI:	Age Groups
Reykjavik	2	Dr Michael Clausen	

Iceland has no National Coordinator

National Publications

The following publications used ISAAC data from Iceland:

Clausen M, Kristjansson S, Haraldsson A, Björkstén B. *High prevalence of allergic diseases and sensitization in a low allergen country.* Acta Paediatr.2008 Jul 9; 97(9): 1216-1220.

India, Indian Sub-Continent

Centres:	Phase:	PI:	Age Groups
Akola	1	Dr Ramesh M. Maheshwari	13-14, 6-7
Bombay (16)	1	Dr Mohan Keshav Joshi	13-14, 6-7
Bombay (17)	1	Dr Uday Anath Pai	13-14, 6-7
Bombay (18)	1	Dr Kalyani Raghavan	13-14, 6-7
Borivali	1	Dr Vasant A Khatav	13-14, 6-7
Chandigarh	1	Professor Lata Kumar	13-14, 6-7
Jodhpur	1	Dr K C Jain	13-14, 6-7
Kottayam	1	Dr T U Sukumaran	13-14, 6-7
Madras (2)	1	Dr Sarela Rajajee	13-14, 6-7
Madras (3)	1	Dr N Somu	13-14, 6-7
New Delhi (7)	1	Dr Kamlesh Chopra	13-14, 6-7
Neyveli	1	Dr G Jayaraj	13-14, 6-7
Orissa	1	Dr Pradeep Kumar Kar	13-14, 6-7
Pune	1	Dr Neeta Milind Hanumante	13-14, 6-7
Mumbai (16)	2	Dr Jayant Shah	10-11 yrs.
Bangalore	3	Professor Sylvan Rego	13-14, 6-7
Bikaner	3	Professor Mohammed Sabir	13-14
Borivali	3	Dr Vasant A Khatav	13-14, 6-7
Chandigarh	3	Dr Meenu Singh	13-14
Chennai (3)	3	Dr Gururaj Setty	13-14, 6-7
Davangere	3	Dr P S Suresh Babu	13-14, 6-7
Jaipur	3	Professor Virendra Singh	13-14, 6-7
Jodhpur	3	Dr K C Jain	13-14, 6-7
Kottayam	3	Dr T U Sukumaran	13-14, 6-7
Lucknow	3	Professor Shally Awasthi	13-14, 6-7
Ludhiana	3	Professor Jugesh Chhatwal	13-14, 6-7
Mumbai (16)	3	Dr Mohan Keshav Joshi	13-14, 6-7
Mumbai (18)	3	Dr Asha Vijaykumar Pherwani	13-14, 6-7
Mumbai (29)	3	Dr Sumant Narayan Mantri	13-14, 6-7
Nagpur	3	Dr Sundeep Salvi	13-14, 6-7
New Delhi (7)	3	Professor S K Sharma	13-14, 6-7
Pimpri	3	Dr Sundeep Salvi	13-14, 6-7
Pune	3	Dr Neeta Milind Hanumante	13-14, 6-7
Rasta Peth	3	Associate Professor Sheila Bhave	13-14, 6-7

National Coordinator:

Dr Jayant Shah

Jaslok Hospital & Research Centre

15 - Dr. Deshmukh Marg
Pedder Road,
India

Roles:

- Regional Coordinator for Indian Sub-Continent
- National Coordinator for India
- Phase Two Principal Investigator for Mumbai (16)

India, one of the most populous countries of the world, is almost a region in its own right. Dr Jayant Shah acted as both national co-ordinator for India and regional co-ordinator. Indian centres were numerous in both Phases One and Three, and also contributed one centre to Phase Two. Dr Shah attended the ISAAC Steering Committee meeting in Auckland in 2000.

Indonesia, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Bandung	1	Prof Dr Karnen Baratawidjaja	13-14, 6-7
Bali	3	Professor Putu Konthen	13-14
Bandung	3	Prof Dr Cissy B Kartasasmita	13-14, 6-7
Semarang	3	Dr Winarto Suprihati	13-14

National Coordinator:

Prof Dr Karnen Baratawidjaja

Head, Allergy-Immunology Study Group
Department of Medicine, Faculty of Medicine
University of Indonesia
Sisingamangaraja 49/51
Indonesia

Roles:

- National Coordinator for Indonesia
- Phase One Principal Investigator for Bandung

Iran, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Rasht	1	Dr Mohammed-Reza Masjedi	13-14, 6-7
Tehran	1	Dr Mohammed-Reza Masjedi	13-14, 6-7
Birjand	3	Dr Mohammed-Reza Masjedi	13-14, 6-7
Rasht	3	Dr Mohammed-Reza Masjedi	13-14, 6-7
Tehran	3	Dr Mohammed-Reza Masjedi	13-14, 6-7
Zanjan	3	Dr Mohammed-Reza Masjedi	13-14, 6-7

National Coordinator:

Dr Mohammed-Reza Masjedi

Masih Daneshvary Hospital
Dorabad
Shaheed Bahoner Ave
Darabad
Iran

Roles:

- National Coordinator for Iran
- Phase One Principal Investigator for Rasht, Tehran
- Phase Three Principal Investigator for Birjand, Rasht, Tehran, Zanjan

National Publications

The following publications used ISAAC data from Iran:

Masjedi MR, Fadaizadeh L, Najafizadeh K, Dokouhaki P. *Prevalence and Severity of Asthma Symptoms in Children of Tehran- International Study of Asthma and Allergies in Childhood (ISAAC).* Iran J Allergy Asthma Immunol.2004 Mar;3(1):25-30.

Masjedi MR, Fadaizadeh L, Najafizadeh K, Dokouhaki P *Prevalence and Severity of Asthma Symptoms in Children of the Tehran-ISAAC Study* Pediatric Asthma, Allergy and Immunology. Winter 2004, 17(4): 244-250.

Moghadam M, Jou S. *Prevalence of Asthma Symptoms among 13-14 years old Children in Birjand* TABIB-E-SHARGH Fall 2004; 6(3):183-192.

Masjedi MR, Fadaizadeh L, Najafizadeh K, Dokouhaki P *A Study of the Prevalence and Severity of Rhinitis in Children in Tehran: ISAAC Study* Journal of Isfahan Medical School (I.U.M.S) Spring 2005; 23(76):36-41.

Fadaizadeh L, Salek S, Najafizadeh K, Masjedi MR *Prevalence and Severity of Asthma Symptoms in Students of Tehran and Rasht: Phase III ISAAC Study* Tanaffos (2008) 7(3), 31-36

Fadaizadeh L, Keyvan S, Najafizadeh K, Masjedi MR *Evaluation of Agreement between Video and Written Questionnaires for Asthma Symptoms Amoung Children of Tehran: ISAAC Study.* Journal of Shahid Sadoughi University of Medical Sciences and Health Services, summer 2008; 16(2):36-43.

Najafizadeh K, Fadaizadeh L, Salek S *Prevalence and Severity of Asthmatic Symptoms in Rasht Students: A Report from ISAAC Study.* TANAFFOS 2008; 7(1):40-46.

Republic of Ireland, Western Europe

Centres:	Phase:	PI:	Age Groups
Republic of Ireland	1	Professor Luke Clancy	13-14
Republic of Ireland	3	Professor Luke Clancy	13-14

National Coordinator:

Dr Patrick Manning

National Clinical Lead – Asthma
Health Service Executive,
Dr Steeven's Hospital,
Dublin
Republic Of Ireland

Roles:

- National Coordinator for Republic Of Ireland

THE IRISH ISAAC STORY

The Irish ISAAC team consisted of Prof Luke Clancy as Principal Investigator and the national coordinator Dr Pat Manning, with technical inputs from Prof Patrick Goodman and Dr Zubair Kabir and Sheila Keogan (all based in Dublin). Ireland participated in two phases of the ISAAC study- Phase 1 in 1995 and Phase 3 in 2002/2003. 'Wave 2' was a follow-up on Phase 1 in 1998 and 'Wave 4' was follow-up on Phase 3 in 2007 and was done in collaboration with the Asthma Society of Ireland headed-up by Dr Jean Holohan. Ireland had only one centre, St. James's Hospital based in Dublin. A target of ~3000 respondents was aimed for in the probability multi-stage sampling of post-primary schools all across Ireland in all 4 surveys. Participation rates were high (>80%) and the response rates were also high (>90%) in both the Phases. A few schools did not participate and a few were closed in Phase 3 and therefore so some new schools were included in Phase 3 compared to Phase 1. Only one age group of school children between 13 and 14 years were recruited for both the Phases. The study findings were disseminated through various platforms- presentations in annual scientific meetings (both national and internationally- such as the Irish Thoracic Society Meetings and the European Respiratory Society Meetings). A few high quality publications were also published in international medical journals. Following is the list of publications from each Phase of the ISAAC study in Ireland, including key messages of each individual publication.

Following publications arose from Phase I study

1. *Asthma, hay fever and eczema in Irish teenagers (ISAAC protocol).*
   Manning PJ, Curran K, Kirby B, Taylor MR, Clancy L.
   Ir Med J. 1997 Apr-May; 90(3):110-2.

The prevalence values for asthma, hay fever and eczema were 15.2%, 24.8% and 9.4% respectively. Although 5.4% reported having asthma and hay fever, combinations of the other allergic conditions were less than 2%. Sex difference in prevalence rates for the various conditions occurred with asthma prevalence being higher for males, eczema in females, but hay fever was almost equally reported between males and females.

2. *Smoking, atopy and certain furry pets are major determinants of respiratory symptoms in children: the International Study of Asthma and Allergies in Childhood Study (Ireland).*
   Yarnell JW, Stevenson MR, MacMahon J, Shields M, McCrum EE, Patterson CC, Evans AE, Manning PJ, Clancy L.
   Clin Exp Allergy. 2003 Jan; 33(1):96-100.

Questionnaires were completed by 2,364 children from Northern Ireland and 2,671 from the Republic- about 90% of those eligible to participate. The prevalences of wheeze at various levels of severity, of diagnosed asthma and of treated wheeze were very similar in Northern Ireland and the Republic of Ireland. A significant proportion of those reporting more severe symptomatology (four or more attacks of wheeze in the past 12 months and/or one or more nights disturbed and/or moderate or greater disruption of daily activities and/or speech restriction due to wheeze) had been neither diagnosed nor treated for asthma (20-37%). To investigate the determinants of the more severe symptomatology of asthma or treated wheeze a series of stepwise multiple regression analyses was performed. A history of atopy, cigarette smoking, and possession of a furry pet other than a dog or cat and age were each independently associated with severe wheeze, whilst atopy, a furry pet (as above) and gender were each independently associated with asthma or treated wheeze. Cigarette smoking is closely associated with the reporting of significant respiratory symptoms together with atopy and exposure to furry pets. Some 20-37% of severe symptoms were neither diagnosed nor treated as asthma.

National Publications

The following publications used ISAAC data from Republic of Ireland:

Manning PJ, Curran K, Kirby B, Taylor MR, Clancy L. *Asthma, hay fever and eczema in Irish teenagers (ISAAC protocol).* Ir Med J 1997; 90(5): 110-2.

Manning P, Goodman P, Kinsella T, Lawlor M, Kirby B, Clancy L. *Bronchitis symptoms in young teenagers who actively or passively smoke cigarettes.* Ir Med J.2002 Jul-Aug;95(7):202-4.

Yarnell JW, Stevenson MR, MacMahon J, Shields M, McCrum EE, Patterson CC, Evans AE, Manning PJ, Clancy L. *Smoking, atopy and certain furry pets are major determinants of respiratory symptoms in children the International Study of Asthma and Allergies in Childhood Study (Ireland).* Clin Exp Allergy.2003 Jan;33(1):96-100.

Manning PJ, Goodman P, O'Sullivan A, Clancy L. *Rising prevalence of asthma but declining wheeze in teenagers (1995-2003) ISAAC protocol.* Ir Med J.2007 Nov-Dec;100(10):614-5.

Kabir Z, Manning PJ, Holohan J, Goodman PG, Clancy L. *Active smoking and second-hand-smoke exposure at home among Irish children, 1995–2007.* Arch Dis Child 2010; 95: 42–45

Kabir Z, Manning PJ, Holohan J, Goodman PG, and Clancy L *Prevalence of Symptoms of Severe Asthma and Allergies in Irish School Children An ISAAC Protocol Study, 1995–2007* Int J Environ Res Public Health 2011; 8(8): 3192-3201

The following publication arose from Phase 1 and Wave 2

1. *Bronchitis symptoms in young teenagers who actively or passively smoke cigarettes.*
   Manning P, Goodman P, Kinsella T, Lawlor M, Kirby B, Clancy L
   Ir Med J. 2002 Jul-Aug; 95(7):202-4.

This study was undertaken to examine the prevalence of bronchitis (cough with phlegm) symptoms in teenagers who either smoked cigarettes on a regular basis (active smokers) or were non-smokers but who are exposed to passive smoking (passive smokers) in the home. The study was undertaken in 1995 and repeated in 1998. The 1995 study was a cross sectional questionnaire survey of smoking habits in secondary school children aged 13-14 years and was undertaken as part of the ISAAC questionnaire survey. Thirty representative and randomly selected schools from throughout the Republic of Ireland took part in the study. In the 1995 study, 3066 students completed a questionnaire on their current smoking habits and symptoms of cough and phlegm. We found that 634 (20.7%) of these young teenagers actively smoked cigarettes with significantly more females smoking than males with 23.3% of girls compared to 17.6% boys ($p = 0.0001$). We found that 46.3% of non-smoking children were exposed to smoking in the home (passive smokers) with parental smoking accounting for most of the passive smoking. Bronchitis symptoms were more commonly reported in active smokers compared to non-smokers with an odds ratio of 3.02 (95% CI 2.34-3.88) ($p < 0.0001$) or in passive smokers compared to those not exposed to smoking with odds ratio of 1.82 (95% CI 1.32-2.52) ($p < 0.0001$). The 1998 study showed similar results for smoking habits, passive smoking and prevalence of bronchitis symptoms as with the 1995 study. These results document that increased bronchitis symptoms occur in teenagers exposed to active or passive smoking.

The following publication arose from Phase 1 and Phase 3:

1. *Rising prevalence of asthma but declining wheeze in teenagers (1995-2003): ISAAC protocol.*
   Manning PJ, Goodman P, O'Sullivan A, Clancy L.
   Ir Med J. 2007 Nov-Dec; 100(10):614-5.

The results of the initial International Study of Asthma and Allergies in Childhood (ISAAC) undertaken in the mid 1990s demonstrated a substantial increase in asthma and wheeze symptoms prevalence in Irish teenagers aged 13-14 years from the 1980s. International research suggests that asthma has increased further in some countries and this study was undertaken to determine whether an upward trend in childhood asthma prevalence had continued in the Republic of Ireland in recent years. We therefore conducted two further national cross sectional studies in the same previously surveyed childhood population throughout the Republic of Ireland, one in 1998 (n=2580) and the other in 2002-3 (n=3089). We reported here on rising prevalence trends of asthma (42.1% relative increase) but falling wheeze (10.4% relative reduction) prevalence in these teenage children in 2002-3.

Wave 4 was the final study and was conducted in 2007 as a follow-up on Phase 3. Some interesting question, for example, the inclusion of questions related to smoking in cars was found useful and was unique.

The following publications arose from Wave 4, including analyses from previous Phases:

1. *Second hand smoke exposure - in cars and respiratory health effects in children.*
   Kabir Z, Manning PJ, Holohan J, Keogan S, Goodman PG, Clancy L.
   Eur Respir J. 2009 Sep; 34(3):629-33.

Overall, 14.8% (13.9% in young males, 15.4% in young females) of Irish children aged 13-14 yrs old were exposed to SHS in cars. Although there was a tendency towards increased likelihood of both respiratory and allergic symptoms with SHS exposure in cars, wheeze and hay fever symptoms were significantly higher (adjusted OR 1.35 (95% CI 1.08-1.70) and 1.30 (1.01-1.67), respectively), while bronchitis symptoms and asthma were not significant (1.33 (0.92-1.95) and 1.07 (0.81-1.42), respectively). Approximately one in seven Irish schoolchildren is exposed to SHS in cars and could have adverse respiratory health effects. Further studies are imperative to explore such associations across different population settings.

2. *Active smoking and second-hand-smoke exposure at home among Irish children, 1995-2007.*
   Kabir Z, Manning PJ, Holohan J, Goodman PG, Clancy L.
   Arch Dis Child. 2010 Jan; 95(1):42-5

There were significant reductions in active smoking rates between 1995 and 2007 (from 19.9% to 10.6%, respectively) resulting in 3.3% survey-to-survey reductions, with a significantly greater survey-to-survey decline among girls compared to boys (3.8% vs 2.7%, respectively). 45% of children were exposed to SHS at home in 2007. There was a statistically non-significant 2% overall decline in SHS exposure levels at home in 2007 relative to 2002/03, which was more pronounced in girls. The continual reduction in active smoking prevalence in children is welcome. That there was no significant increase in SHS exposure at home after the nationwide workplace smoking ban suggesting that the ban did not increase smoking inside homes as had been feared.

3. *Prevalence of Symptoms of Severe Asthma and Allergies in Irish School Children: An ISAAC Protocol Study, 1995-2007.*
   Kabir Z, Manning PJ, Holohan J, Goodman PG, Clancy L.
   Int J Environ Res Public Health. 2011 Aug; 8(8):3192-201.

Childhood asthma is a recurring health burden and symptoms of severe asthma in children are also emerging as a health and economic issue. This study examined changing patterns in symptoms of severe asthma and allergies (ever eczema and hay fever). Children aged 13-14 years were studied: 2,670 (in 1995), 2,273 (in 1998), 2,892 (in 2002-2003), and 2,805 (in 2007). Generalized linear modelling using Poisson distribution was employed to compute adjusted prevalence ratios (PR). A 39% significant increase in symptoms of severe asthma was estimated in 2007 relative to the baseline year 1995 (adjusted PR: 1.39 [95% CI: 1.14-1.69]) increasing from 12% in 1995 to 15.3% in 2007. Opposite trends were observed for allergies, showing a decline in 2007, with an initial rise. The potential explanations for such a complex disease pattern whose aetiological hypothesis is still evolving are speculative. Changing environmental factors may be a factor, for instance, an improvement in both outdoor and indoor air quality further reinforcing the hygiene hypothesis but obesity as a disease modifier must also be considered.

Funding: Royal City of Dublin Hospital Trust; Health Research Board of Ireland

National Publications

The following publications used ISAAC data from Isle Of Man:

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey.* BMJ 2004; 328(7447): 1052-3.

Isle Of Man, Western Europe

Centres:	Phase:	PI:	Age Groups
Isle of Man	1	Dr Peter Powell	13-14
Isle of Man	3	Dr Andreea Steriu	13-14, 6-7

National Coordinator:

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
Isle of Man

Roles:

- ISAAC Steering Committee
- National Coordinator for Isle of Man

Why was this centre selected for ISAAC?

Evidence suggested that the prevalence of respiratory and related disorders increased in the British Isles over the past six decades. The Isle of Man was no exception. Hay fever and allergic symptoms have caught the attention of health professionals, not only in their own right, but also as an indicator of their association with asthma. To address these problems, a major international research project, The International Study of Asthma and Allergies in Childhood (ISAAC), was established in 1991. The Steering Committee is based in New Zealand at the University of Auckland, and a range of countries, including the United Kingdom, began their research in 1995 when Phase One was carried out. The Isle of Man and the Channel Islands, although linked to the UK, carried out their surveys independently, also known as the offshore arm of the British study.

The Isle of Man is a Crown Dependency and lies in the middle of the Irish Sea. It has its own Government and the Parliament, Tynwald, is a Parliament with the longest continuous activity in the world. In 2009 this was established at 130 years. It has a population of about 80,000 inhabitants (last interim Census in 2006) and enjoys a varied economy with financial services and e-commerce, agriculture, fisheries and tourism being the most important economic activities. The Isle of Man is mostly known for the motorbike open road race TT (Tourist Trophee). This is unique in the world and annually visitors travel from all parts of the globe to watch the races and also enjoy festivities. Since 2009 a 'Green' race has been added to the race schedule, allowing for electric motorbikes to compete in the famous circuit race.

The Island's geography is stunning and the countryside is beautiful regardless the weather. Most population (about 50%) lives in the South-East, in the capital town of Douglas and surrounding villages. The highest peak is Snaefell and on a clear day "all surrounding kingdoms can be seen from the top of it: England, Scotland, Northern Ireland, Republic of Ireland, Wales, and the Kingdom of Mann.

The ISAAC Story

Our Experience of ISAAC

The aim of Phase One in the Isle of Man was to describe the prevalence and severity of asthma and related disorders in 13/14 year-old children. Results were released in 1996 and revealed the distribution and frequency of asthma and related disorders. These rates were very similar to those observed elsewhere in the UK and the Channel Islands at the time. Results were used in service planning and considered a baseline to benchmark against any new surveys. Four out of the six secondary schools took part in this round. In Phase Two of the Study the Island took part with data collection aimed at environmental factors, particularly linked with air quality. Data for the Island on daily air temperature, annual rainfall and the prevalence of chemicals such as Nitrogen Dioxide and Sulphur Dioxide in the air were collected in 1998 specifically for this phase of the Study. The results were again similar to the readings reported in the UK and the Channel Islands, as reported at the time. Such readings were considered a 'baseline' and these would be again considered in the future. It is after all that emerging climate change and other environmental monitoring will be crucial in assisting the Isle of Man government with ensuring clean air for this small country which lays in the middle of the Irish Sea.

ISAAC Phase Three was carried out in October 2001. The main objective was to identify changes that may have occurred in the last six years in the frequency of respiratory and allergic conditions in children, to evaluate any association with air quality and other environmental factors and to assess the present situation. The Study was extended to younger children (6-8 year olds) to enable long-term comparisons to be made. The 6-8 year old survey was unique to the Isle of Man of all areas in the British Isles and results were published separately in the 6-8 year olds report. The Isle of Man study was carried out as an offshore-arm of the UK study and was led by Dr David Jeffs, Director of Public Health in Guernsey. Locally, the Principal Investigator for the Isle of Man obtained LREC approval for the study and used an opt-out consent form. The 6-8 year old study was a self-responding questionnaire for parents of primary school children. The 13-14 year olds self-responded to the questionnaire. There was no sampling carried out and all children of the right age were targeted to take part: in 34 primary schools and six secondary schools. They all took part with 1,086 (6-8 years) and 1,917 (13-14 years) students. A small team of researchers carried out delivery of questionnaires and return envelopes for parental responses in the 34 primary schools and almost 60% of the 6-8 year old target population and over 80% of the 13-14 year old target population were returned for processing. All forms, over 3,000 were posted to the UK Centre at St George's Hospital Medical School and were processed in standard format along with the other centres in the British Isles. National reports were published and a paper led by Prof. Ross H Anderson and co-authored by all British centres was published in the BMJ in 2004[1]. The Principal Investigator supplemented the study results with other information for this paper, such as hospital admissions and GP visits recorded during the same year the survey took place. The Isle of Man has not used any of the videos in the data collection.

The burden of self reported asthma and related disorders among adolescents has changed for the better in the recent years throughout the British Isles and the Isle of Man is no exception. ISAAC has provided much needed information for policy purposes, for example establishing the need for first aid and inhalers available in all schools. Methodologically the 6-8 year old questionnaire asked parents about the administration of paracetamol to their children and the approach in the Isle of Man was to include in the questionnaires as many as known brand names of this over the counter drug. Pharmacies and supermarkets were approached and the most frequently sold paediatric brands were included in the questionnaire. The Island's data were used in the publication of a paper in the Lancet in 2009[2].

Acknowledgements

We gratefully acknowledge the financial support of the Isle of Man Government, Department of Health and Department of Local Government. We gratefully acknowledge the invaluable assistance of the offshore British Coordinator Dr David Jeffs, the UK Coordinators Prof. Ross H Anderson and David Strachan for their continuous support. As the Isle of Man Principal Investigator I am grateful for the invaluable assistance of the database management provided by the St George's Medical Hospital School Team for their help with the timely database setting and a continuous dialogue in assisting with the publication of our reports and indebted to all the children, parents and school staff who participated in the surveys. I wish to thank my fieldwork team for their enthusiasm and motivation throughout Phase Three of the Study.

Dr Andreea Steriu, Isle of Man ISAAC Phase Three Principal Investigator

The ISAAC Story

References

1. The Anderson, H.R., Ruggles, R., Strachan, D.P., Austin, J.B., Burr, M., Jeffs, D., Standring, P., Steriu, A. And Goulding, R. *"Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002: questionnaire survey"*. BMJ 2004; 328:1052-53.
2. Beasley R, Clayton T, Crane J, von Mutius E, Lai CKW, Montefort S, Stewart A, for the ISAAC Phase Three Study Group. *Association between paracetamol use in infancy and childhood, and risk of asthma, rhinoconjunctivitis, and eczema in children aged 6-7 years: analysis from Phase Three of the ISAAC programme*. Lancet 2008; 372(9643): 1039-48.

Italy, Western Europe

Centres:	Phase:	PI:	Age Groups
Ascoli Piceno	1	Professor Sergio Bonini	13-14
Cosenza	1	Dr Enea Bonci	13-14
Cremona	1	Mr Franca Rusconi	13-14, 6-7
Emilia-Romagna	1	Dr Marco Biocca	13-14, 6-7
Empoli	1	Ms Lucia Chetoni	13-14, 6-7
Firenze	1	Dr Elisabetta Chellini	13-14, 6-7
Frosinone	1	Mr Roberto Ronchetti	13-14
Milano	1	Dr Luigi Bisanti	13-14, 6-7
Roma	1	Dr Francesco Forastiere	13-14, 6-7
Siena	1	Ms Elisabetta Renzoni	13-14
Torino	1	Dr Giovannino Ciccone	13-14, 6-7
Trento	1	Dr Silvano Piffer	13-14
Verona	1	Professor Attilio Boner	13-14, 6-7
Viterbo	1	Mr Guiseppe Corbo	6-7
Roma	2	Dr Francesco Forastiere	9-11
Bari	3	Dr Lucio Armenio	13-14, 6-7
Colleferro-Tivoli	3	Dr Valerio Dell'Orco	13-14, 6-7
Cosenza	3	Dr Enea Bonci	13-14
Emilia-Romagna	3	Dr Claudia Galassi	13-14, 6-7
Empoli	3	Dr M G Petronio	13-14, 6-7
Firenze	3	Dr Elisabetta Chellini	13-14, 6-7
Mantova	3	Dr Gabriele Giannella	13-14, 6-7
Milano	3	Dr Luigi Bisanti	13-14, 6-7
Palermo	3	Dr Stefania La Grutta	13-14
Roma	3	Dr Francesco Forastiere	13-14, 6-7
Siena	3	Dr Piersante Sestini	13-14
Torino	3	Dr Giovannino Ciccone	13-14, 6-7
Trento	3	Dr Silvano Piffer	13-14, 6-7

National Coordinator:

Dr Francesco Forastiere

Department of Epidemiology
Rome E Health Authority 00198 Roma
Via Santa Costanza 53

Italy

Roles:

- ISAAC Steering Committee
- National Coordinator for Italy
- Phase One Principal Investigator for Roma
- Phase Two Principal Investigator for Roma
- Phase Three Principal Investigator for Roma

The Italian extension of the International Study of Asthma and Allergies in childhood (ISAAC) in Italy has been the SIDRIA project (Studi italiani sui disturbi respiratori nell'infanzia e l'ambiente- Italian Studies on Respiratory Disorders in Children and the Environment). Phase I and Phase III have been conducted and SIDRIA largely extended the original objectives of ISAAC, since from the first phase it was also aimed at evaluating the prevalence and the role of several potential environmental risk factors for children respiratory health. ISAAC phase II was conducted in one centre, Rome, and it included lung function measurements and prick tests to 9-11 years children.

Francesco Forastiere from the Department of Epidemiology (Lazio Region) in Rome was the coordinator of SIDRIA phase 1 and ISAAC phase II whereas Claudia Galassi from the Center of Cancer Prevention in Turin was the coordinator of SIDRIA phase II.

The ISAAC Story

SIDRIA is a large multicentre, population based cross-sectional survey, conducted in two phases. Most of the centres that participated in ISAAC were included in the SIDRIA project. The first phase was carried out between October 1994 and March 1995, in 10 centers of Northern and Central Italy, varying in size, latitude, climate and level of urbanization (Torino, Milano, Cremona, Trento, Emilia-Romagna, Firenze, Empoli, Siena, Viterbo,Roma). The second phase was carried out between January and May 2002 in 13 Italian centers, including 3 centers from Southern Italy (Torino, Milano, Mantova, Trento, Emilia-Romagna, Firenze/Prato, Empoli, Siena, Roma, Colleferro/Tivoli, Cosenza, Bari e Palermo).

In each phase, the study population consisted of a random sample of children aged 6-7 years attending the first and second grade of primary schools and adolescents aged 13-14 years attending the last grade of middle school. Standardized self-administered questionnaires were used. They included the ISAAC core questions regarding the frequency of wheezing, symptoms of allergic rhinitis and atopic eczema in the 12 months prior to the survey (defined as current symptoms), and the lifetime frequency of the diseases. In addition, the health section of the SIDRIA questionnaires included questions on medical diagnosis and access to health care for asthma, occurrence of respiratory symptoms other than asthma, medical history on episodes of respiratory diseases that occurred during the first two years of life. The questionnaires also included other sections aimed at investigating children's exposure to many known or suspected risk factors for respiratory diseases, including exposure to passive smoking, housing factors (as moulds and dampness), and traffic in the area of residence.

A questionnaire was distributed to the children and adolescents at school and filled in at home by their parents; a shorter questionnaire, mainly on current respiratory symptoms and on personal smoking habits, was filled in directly by adolescents at school. The protocols of both phases were approved by Ethics Committee of the Catholic University in Rome.

The results of the SIDRIA project have been extensively published. (see right)

National Publications

The following publications used ISAAC data from Italy:

Anonymous. *Asthma and respiratory symptoms in 6-7 yr old Italian children: gender, latitude, urbanization and socioeconomic factors. SIDRIA (Italian Studies on Respiratory Disorders in Childhood and the Environment).* Eur Respir J 1997; 10(8): 1780-6.

Anonymous. *Frequency of childhood asthma in various Italian regions.Results from ISAAC. Collaborating group of ISRDCE (Italian Studies of Respiration Disorders in Childhood and the Environment).[in Italian].* Epidemiol Prev.1997; 21(4): 235-42.[Italian]

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Cesaroni G, Farchi S, Davoli M, Forastiere F, Perucci CA. *Individual and area-based indicators of socioeconomic status and childhood asthma.* Eur Respir J.2003 Oct;22(4):619-24. Italian.

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Japan, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Fukuoka	1	Professor Sankei Nishima	13-14, 6-7
Fukuoka	3	Dr Hiroshi Odajima	13-14, 6-7
Tochigi	3	Professor Makino Sohei	13-14

National Coordinator:

Professor Sankei Nishima

Director of Pediatrics
The National Minami-Fukuoka Chest Hospital
Yakatabaru 4-39-1
Minami-ku
Japan

Roles:

- National Coordinator for Japan
- Phase One Principal Investigator for Fukuoka

The ISAAC Story

Japan has been still in confusion due to the Eastern Japan Earthquake, tsunami disaster, and nuclear plant accident. However, the heart-warming support from all over the world has been helping Japan restore the country little by little. We deeply appreciate your warm support. ISAAC Fukuoka Centre is located at the western part of Japan, and therefore we didn't have damage from the earthquake. Fukuoka city is a center of southern part of Japan, Kyusyu area, with the population of 13 million, and is now having its ordinary activities.

Our Centre participated in ISAAC Phase ???. Recently, we have started the epidemiological survey for 35,000 elementary school children of 11 prefectures at western Japan. This survey was conducted in 1982, 1992, and 2002 in the same districts with the same methods, and this recent survey is the forth survey.

The prevalence of bronchial asthma has been a 2.1 increase compared with that of 1982 and 2002. Since 1992, we have done the survey of other childhood allergic diseases besides asthma. As a result, the prevalence of atopic dermatitis has been decreased, but the prevalence of allergic rhinitis and conjunctivitis has been increased. (Sankei Nishima et al; Surveys on the Prevalence of Pediatric Bronchial Asthma in Japan: A Comparison between the 1982,1992,and 2002 Surveys Conducted in the Same Region Using the Same Methodology, Allergology International. 2009; 58:37-53). The result of our recent forth survey will come out in 2012.

Also, this year, the total guideline for pediatric allergic diseases (BA,AR,AD,FA) has been established in Japan. Furthermore, Japanese Guideline for the Diagnosis and Treatment of Allergic Diseases 2010(JAGL 2010) is published in English in the latest Allergology International and is free to be viewed. All access are welcome. (http://www.jstage.jst.go.jp/browse/allergolint/60/2/_contents/-char/ja/?

Jordon, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Amman	3	Dr Faisal Abu-Ekteish	13-14, 6-7

Jordon has no National Coordinator

Kenya, Africa

Centres:	Phase:	PI:	Age Groups
Eldoret	1	Dr Fabian O Esamai	13-14
Nairobi	1	Dr Joseph A Odhiambo	13-14
Eldoret	3	Dr Fabian O Esamai	13-14
Nairobi	3	Dr Lucy Ng'ang'a	13-14

National Coordinator:
Dr Lucy Ng'ang'a

Centres for Disease Control & Prevention (CDC)
C/O American Embassy
P.O. Box 9123

Kenya

Roles:

- National Coordinator for Kenya
- Phase Three Principal Investigator for Nairobi

South Korea, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Provincial Korea	1	Dr Sang-Il Lee	13-14, 6-7
Seoul	1	Dr Sang-Il Lee	13-14, 6-7
Provincial Korea	3	Professor Ha-Baik Lee	13-14, 6-7
Seoul	3	Professor Ha-Baik Lee	13-14, 6-7

National Coordinator:
Professor Ha-Baik Lee

Department of Pediatrics
Hanyang University College of Medicine
17 Haengdang-Dong
Sungdong-Ku
South Korea

Roles:

- National Coordinator for South Korea
- Phase Three Principal Investigator for Provincial Korea, Seoul

Regional
National
Kuwait
Kyrgyzstan
Latvia
Local

Kuwait, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Kuwait	1	Dr Jawad A al-Momen	13-14
Kuwait	3	Dr Jawad A al-Momen	13-14

Kuwait has no National Coordinator

National Publications

The following publications used ISAAC data from Kuwait:

Behbehani NA, Abal A, Syabbalo NC, Abd Azeem A, Shareef E, Al-Momen J. *Prevalence of asthma, allergic rhinitis, and eczema in 13- to 14-year-old children in Kuwait: an ISAAC study.International Study of Asthma and Allergies in Childhood.* Ann Allergy Asthma Immunol 2000; 85(1): 58-63.

Owayed A, Behbehani N, Al-Momen J. *Changing prevalence of asthma and allergic diseases among Kuwaiti children.An ISAAC Study (Phase III).* Med Princ Pract.2008;17(4):284-9.Epub Jun 2008.

Kyrgyzstan, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Balykchi	3	Dr Imanalieva Cholpon	13-14, 6-7
Bishkek	3	Dr Imanalieva Cholpon	13-14, 6-7
Jalalabat	3	Professor Shairbek Sulaimanov	13-14, 6-7

National Coordinator:

Dr Imanalieva Cholpon

Kyrgyz Scientific Research Institute of Obstetrics and Pediatrics

Flat 9, 136 Panfilov str.

Kyrgyzstan

Roles:

- National Coordinator for Kyrgyzstan
- Phase Three Principal Investigator for Balykchi, Bishkek

The questionnaire by ISAAC technique was conducted in 2002. Employees of the National centre of motherhood and childhood protection participated in research. The ISAAC team in Bishkek was: Imanalieva Cholon, Najimidinova Gulmira, Boronbaeva Elnura, Djanuzakova Nurgul and Moldogazieva Aigul. The ISAAC team in Balykchi was: Moldogazieva Aigul, Seitalieva Chiinara and Asankojoeva Janyl.

Before the questionnaire study began, letters of support from the Ministry of Health and the Ministry of science, formation and culture of the Kyrgyz Republic had been prepared and these departments gave the consent to carry out the research. In Bishkek 8194 children were questioned. 3146 of them were at the age of 6-7 years and 5048 children were aged 13-14 years and attended comprehensive schools. In Balykchi 2111 children were surveyed in all the comprehensive schools of the city, 729 aged 6-7 years old and 1382 aged 13-14 years.

Participation in the research has given us the invaluable experience of performing a large questionnaire study under international standards. The data have helped to achieve a representation about the prevalence of allergic diseases in the Kyrgyz Republic. Some elements of the questionnaire have now been introduced in medical institutions for diagnostics of allergic diseases.

We wish ISAAC creative successes and well-being.

Latvia, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Riga	1	Dr Marcis Leja	13-14, 6-7
Rural Latvia	1	Dr Marcis Leja	13-14
Riga	2	Dr Vija Svabe	10-11 years
Riga	3	Dr Vija Svabe	13-14

Latvia has no National Coordinator

The ISAAC Story

Lebanon, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Beirut	1	Dr Fuad M Ramadan	13-14

Lebanon has no National Coordinator

Lithuania, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Kaunas	1	Professor Jurgis Bojarskas	13-14, 6-7
Kaunas	3	Associate Professor Jolanta Kudzyte	13-14, 6-7
Panevezys	3	Professor Jurgis Bojarskas	13-14, 6-7
Siauliai	3	Professor Jurgis Bojarskas	13-14, 6-7

National Coordinator:

Associate Professor Jolanta Kudzyte

Clinic of Children's Diseases
Kaunas Medical University
Eiveniu str. 2

Lithuania

Roles:

- National Coordinator for Lithuania
- Phase Three Principal Investigator for Kaunas

Why our country joined ISAAC

We were late finding out about ongoing ISAAC studies, and so we were late with our Phase One results. Nevertheless, we were very eager to find out about the real situation concerning allergic diseases in Lithuania, especially among children, as being paediatric allergists and pulmonologists we saw the dramatically increasing numbers of allergic children. We selected the three biggest Lithuanian cities (Kaunas, Panevezys, Siauliai) as centres and examined all children from the secondary schools and kindergartens in them. Phase Three results were produced in time, as we already knew about the invitation to take part repeatedly in this survey. We were interested to see the dynamics of the prevalence of allergic diseases, which is why Kaunas centre completed repeat phases of ISAAC.

Impact of ISAAC in our country

Various lecturers (pediatric and adult) and even Health Ministry representatives quote our ISAAC data, when talking about the spreading of allergies in Lithuania. Then we are sitting proud, with our heads raised, as still there are no data about the prevalence of adult allergies in Lithuania. Some data from our Lithuanian ISAAC results were published in the most popular Lithuanian medical journal ‘Medicina’.

Republic of Macedonia, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Skopje	3	Assoc Prof Emilija Vlaski	13-14

National Coordinator:

Assoc Prof Emilija Vlaski

Department of Pulmonology and Allergology
University Children's Hospital
Vodnjanska 17
1000 Skopje
Republic of Macedonia

Roles:

- National Coordinator for Republic of Macedonia
- Phase Three Principal Investigator for Skopje

The ISAAC Story

WHY WAS MACEDONIA SELECTED FOR ISAAC?

The epidemiological data about the prevalence and severity of asthma and allergies in childhood in the Republic of Macedonia (FYROM) before the ISAAC Phase Three was scarce, although seen in the physician practise more frequently in the last decade. As well there was a lack of data about the influence of environmental factors on these diseases. R. Macedonia is a developing country in which some aggravating as well some preventive factors for allergic diseases are highly present. For example, the prevalence of ETS has been demonstrated to be very high. On the other hand, dietary antioxidants intake has been documented to be high as well, which may be explained by the geographical area where our country is situated and its climate.

Skopje was chosen as an investigational centre as a capital of R. Macedonia with almost one third of the inhabitants in our small country (600.000 out of around 2 millions inhabitants) and 55 primary schools with 10934 children 13-14 years old in 2001, which enabled at least 3000 respondents at this age group from randomly selected primary schools to be investigated. Contrary, other towns in R. Macedonia are much smaller with less than 3000 schoolchildren of the same age group. Compared to the rest of the country, in Skopje all proposed environmental risk factors for asthma and rhinitis and eczema, especially air pollution, are mostly present.

IMPACT OF ISAAC IN MACEDONIA

The conduction of ISAAC Phase Three and the report of its data from Skopje have actualized the problem of childhood asthma, rhinoconjuncticitis and eczema as diseases with an increase in R. Macedonia.

Compared to the asthma, rhinoconjuncticitis and eczema prevalence rates worldwide, R. Macedonia i.e. Skopje in 2001/2002 appeared to have a moderately low prevalence of asthma and low prevalence rates of rhinitis and eczema symptoms. The much lower prevalence of ever-diagnosed asthma in contrast to the prevalence rates of current wheeze, current exercise-induced wheeze and dry night cough apart from chest infection suggested under-diagnosis of asthma and/or underreporting of the diagnosis by the young adolescents in our country. In contrast, ever-diagnosed hay fever and eczema seemed to be over-diagnosed and/or over-reported. Some environmental risk factors associated with these diseases were identified in our country.

With intention to get an information about the same problem for the biger part of the country, another study on local level using the same methodology and the ISAAC Phase Three questionnaires was performed in 2005/2006 in 7 cities in R. Macedonia, including 1000 respondents from each city. Skopje was one of the investigational centres in this study again. The two cross-sectional surveys 4-yr apart in Skopje showed a decrease in asthma symptoms accompanied with an increase in ever-diagnosed asthma, which seems to be a result to the improved awareness, diagnosis and treatment of asthma. However, the partial control i.e. under-treatment of severe asthma in the capital of our country is still present (an increase of severe asthma symptoms).

Acknowledgments

We would like to thank children for their participation and the principals, psychologists, teachers for their collaboration in the ISAAC Phase Three survey. The Ministry of Education and Science of The Republic of Macedonia provided financial support for the study.

Malaysia, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Alor Setar	1	Dr Keng Hwang Teh	13-14, 6-7
Ipoh	1	Dr Lim Wee Yeong	13-14, 6-7
Klang Valley	1	Associate Professor Jessie de Bruyne	13-14, 6-7
Kota Bharu	1	Associate Professor Ban Seng Quah	13-14, 6-7
Muar	1	Dr Kok Wai Chum	13-14, 6-7
Alor Setar	3	Dr Keng Hwang Teh	13-14, 6-7
Klang Valley	3	Associate Professor Jessie de Bruyne	13-14, 6-7
Kota Bharu	3	Associate Professor Ban Seng Quah	13-14, 6-7

National Coordinator:

Associate Professor Jessie de Bruyne

Department of Paediatrics
Faculty of Medicine
University of Malaya

Malaysia

Roles:

- National Coordinator for Malaysia
- Phase One Principal Investigator for Klang Valley
- Phase Three Principal Investigator for Klang Valley

Malta, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Malta	1	Professor Stephen Montefort	13-14, 6-7
Malta	3	Professor Stephen Montefort	13-14, 6-7

National Coordinator:

Professor Stephen Montefort

Department of Medicine
University of Malta
Appt 121 Tas- Sellum Residence

Malta

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Eastern Mediterranean
- National Coordinator for Malta
- Phase One Principal Investigator for Malta
- Phase Three Principal Investigator for Malta

ISAAC in Malta

This study was a first for our small country where we managed to gather a strong set of data which we could reliably compare to other countries. This was especially significant as the numbers required by ISAAC to be recruited were a good percentage of Maltese children in the chosen age-groups. The results have opened the eyes of the health authorities and the public to the very real problem our country has with childhood allergic conditions. We have managed to publish our findings and this was an added bonus to our medical department. So all in all our experience in ISAAC has certainly been very good. This should encourage us to partake in future similar international studies.

Findings

Malta seemed to have amongst the highest prevalences of allergic condition in the Mediterranean with the rate of rhinoconjunctivitis in 13 – 14 year olds being third highest in the world in phase 1 of the study. In the younger age group we have noticed that along the years between phase 1 and phase 3 we had a very significant increase in the prevalence of wheezing and rhinitis but not eczema. Thankfully this was also associated with better control and decresase in severity of the conditions studied. In the older age groups the prevalences tended to plateau and in the case of rhinitis and eczema, they actually decreased significantly.

National Publications

The following publications used ISAAC data from Malta:

Montefort S, Lenicker HM, Caruna S, Agius Muscat H. *Asthma, rhinitis and eczema in Maltese 13-15 year-old schoolchildren -- prevalence, severity and associated factors [ISAAC].International Study of Asthma and Allergies in Childhood.* Clin Exp Allergy 1998; 28(9): 1089-99.

Montefort S, Muscat HA, Caruana S, Lenicker H.*Allergic conditions in 5-8-year-old Maltese schoolchildren: Prevalence, severity, and associated risk factors [ISAAC].* Pediatr Allergy Immunol.2002 Apr;13(2):98-104.

Montefort S, Ellul P, Montefort M, Caruana S, Muscat HA. *Increasing prevalence of asthma, allergic rhinitis but not eczema in 5- to 8-yr-old Maltese children (ISAAC).* Pediatr Allergy Immunol 2009; 20(1):67-71.

Montefort S, Ellul P, Montefort M, Caruana S, Agius Muscat H.*A decrease in the prevalence and improved control of allergic conditions in 13- to 15-yr-old Maltese children (ISAAC).* Pediatr Allergy Immunol 2010; 22(1): e107-e111

Mexico, Latin America

Centres:	Phase:	PI:	Age Groups
Cuernavaca	1	Professor Isabelle Romieu	13-14, 6-7
Ciudad de México (1)	3	Dra Blanca E Del-Río-Navarro	13-14, 6-7
Ciudad de México (3)	3	Dra Mercedes Barragán-Meijueiro	13-14, 6-7
Ciudad de México (4)	3	Dra Nelly Ramírez-Chanona	13-14, 6-7
Ciudad Victoria	3	Dr Roberto García-Almaráz	13-14, 6-7
Cuernavaca	3	Professor Isabelle Romieu	13-14, 6-7
Mérida	3	Dr Manuel Baeza-Bacab	13-14, 6-7
Mexicali Valley	3	Dr J Valente Merida-Palacio	13-14, 6-7
Monterrey	3	Dr Sandra Nora González-Díaz	13-14, 6-7
Toluca	3	Dr Francisco J Linares-Zapién	13-14, 6-7
Villahermosa	3	Dr Sergio Romero-Tapia	13-14, 6-7

National Coordinator:

Dr Manuel Baeza-Bacab

Facultad de Medicina
University Autónoma de Yucatán
Avenida Itzáes No. 498 por calle 59-A
Centro, Mérida
Mexico

Roles:

- National Coordinator for Mexico
- Phase Three Principal Investigator for Mérida

National Publications

The following publications used ISAAC data from Mexico:

Tatto-Cano MI, Sanin-Aguirre LH, González V, Ruiz-Velasco S, Romieu I *Prevalence of asthma, rhinitis and eczema in school children in the city of Cuernavaca, Mexico.[in Spanish].* Salud Publica Mex 1997; 39(6): 497-506.

Del-Río-Navarro BE, Hernández-Román MP, Espinola Reyna G, Berber A, escalante Domínguez AJ, González-Reyes M, Rosas-Vargas MA, Pérez-Lopez J, Baeza-Bacab M, Sienra-Monge JJ. *A comparative study of bronchodilator reversibility with albuterol, between asthma symptomatic and asymptomatic children according to ISAAC questionnaire in Mexico City.* Allergol Immunopathol (Madr). 2004 Nov-Dec;32(6):334-9.

Violante R, Del-Río Navarro BE, Berber A, Ramírez Chanona N, Baeza Bacab M, Sienra Monge JJ. *Obesity risk factors in the ISAAC (International Study of Asthma and Allergies in Childhood) in Mexico City.* Rev Alerg Mex.2005 Jul-Aug;52(4):141-5.

Barragan-Meijueiro MM, Morfin-Maciel B, Nava-Ocampo AA. *A Mexican population-based study on exposure to paracetamol and the risk of wheezing, rhinitis, and eeczema in childhood.* J Investig Allergol Clin Immunol 2006 16(4):247-52.

Del-Río-Navarro B, Berber A, Blandón-Vijil V, Ramírez-Aguilar M, Romieu I, Ramírez-Chanona N, Heras-Acevedo S, Serrano-Sierra A, Barraza-Villareal A, Baeza-Bacab M, Sienra-Monge JJ. *Identification of asthma risk factors in Mexico City in an International Study of Asthma and Allergy in Childhood survey.* Allergy Asthma Proc.2006 Jul-Aug;27(4):325-33.

Morfin-Maciel B, Barragan-Meijueiro Mde L, Nava-Ocampo AA. *Individual and family household smoking habits as risk factors for wheezing among adolescents.* Prev Med.2006 Aug;43(2):98-100.Epub May 2006.

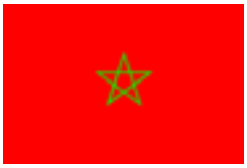
Del-Río-Navarro B, Del-Río-Chivardi JM, Berber A, Sienra-Monge JJ, Rosas-Vargas MA, Baeza-Bacab M. *Asthma prevalence in children living in north Mexico City and a comparison with other Latin American cities and world regions.* Allergy Asthma Proc.2006 Jul-Aug;27(4):334-40.

Del-Río-Navarro BE, Luna-Pech JA, Berber A, Zepeda-Ortega B, Avila-Castañon L, Del-Río-Chivardi JM, Baeza-Bacab M, Sienra-Monge JJ. *Factors associated with allergic rhinitis in children from northern Mexico City.* J Investig Allergol Clin Immunol 2007; 17(2): 77-84.

Del-Río-Navarro BE, Ito-Tsuchiya FM, Berber A, Zepeda-Ortega B, Sienra-Monge JJ, García-Almaraz R, Baeza-Bacab M. *Study of the relationship between acetaminophen and asthma in Mexican children aged 6 to 7 years in 3 Mexican cities using ISAAC methodology.* J Investig Allergol Clin Immunol.2008;18(3):194-201.

Gutiérrez-Delgado RI, Barraza-Villarreal A, Escamilla-Núñez MC, Solano-González M, Moreno-Macías H, Romieu I. *Food consumption and asthma in school children in Cuernavaca, Morelos, Mexico. [Consumo de alimentos y asma en niños escolares de Cuernavaca]* Salud Publica Mex 2009; 51(3): 202-211.

González-Díaz SN, Del Río-Navarro BE, Pietropaolo-Cienfuegos DR, Escalante-Domínguez AJ, García-Almaraz RG, Mérida-Palacio V, Berber A *Factors associated with allergic rhinitis in children and adolescents from northern Mexico: International Study of Asthma and Allergies in Childhood Phase IIIB* Allergy Asthma Proc 2010; 31(4): 53-62



Morocco, Africa

Centres:	Phase:	PI:	Age Groups
Casablanca	1	Professor Zoubida Bouayad	13-14
Marrakech	1	Professor Zoubida Bouayad	13-14
Rabat	1	Professor Abedelkrim Bennis	13-14
Benslimane	3	Professor Zoubida Bouayad	13-14
Boulmene	3	Professor Zoubida Bouayad	13-14
Casablanca	3	Professor Zoubida Bouayad	13-14
Marrakech	3	Professor Zoubida Bouayad	13-14

National Coordinator:

Professor Zoubida Bouayad

Service des Maladies Respiratoires

Hôpital 20 Août
CHU Ibn Rochd
Morocco

Roles:

- National Coordinator for Morocco
- Phase One Principal Investigator for Casablanca, Marrakech
- Phase Three Principal Investigator for Benslimane, Boulmene, Casablanca, Marrakech

Netherlands, Western Europe

Centres:	Phase:	PI:	Age Groups
Netherlands (Utrecht)	2	Professor Bert Brunekreef, PhD	7-12
Netherlands	3	Professor Rutger Engels	13-14

National Coordinator:

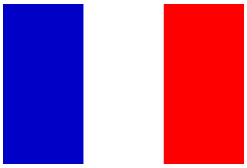
Mr Roy Otten

Institute of Family and Child Care Studies
University of Nijmegen
PO Box 9104

Netherlands

Roles:

- National Coordinator for Netherlands



Nouvelle Caledonie, Oceania

Centres:	Phase:	PI:	Age Groups
Nouvelle Caledonie	3	Dr Isabella Annesi-Maesano	13-14

National Coordinator:

Dr Sylvie Barny

Direction des Affaires Sanitaires et Sociales (DRASS)

Nouvelle Caledonie

Roles:

- National Coordinator for Nouvelle Caledonie

New Zealand, Oceania

Centres:	Phase:	PI:	Age Groups
Auckland	1	Professor M Innes Asher ONZM	13-14, 6-7
Bay of Plenty	1	Dr Chris Moyes	13-14, 6-7
Christchurch	1	Associate Professor Philip Pattemore	13-14, 6-7
Hawkes Bay	1	Dr David Barry	13-14, 6-7
Nelson	1	Dr Richard MacKay	13-14, 6-7
Wellington	1	Professor Julian Crane	13-14, 6-7
Hawkes Bay	2	Professor Julian Crane	10.1-12.6 years
Auckland	3	Professor M Innes Asher ONZM	13-14, 6-7
Bay of Plenty	3	Dr Chris Moyes	13-14, 6-7
Christchurch	3	Associate Professor Philip Pattemore	13-14, 6-7
Nelson	3	Dr Richard MacKay	13-14, 6-7
Wellington	3	Professor Neil Pearce	13-14, 6-7

National Coordinator:

Professor Innes Asher

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- Chairperson of the ISAAC Steering Committee
- Chairperson of the ISAAC Executive
- Director, ISAAC International Data Centre
- National Coordinator for New Zealand

Professor Asher is head of the Department of Paediatrics: Child and Youth Health at the University of Auckland and a Consultant Paediatrician at the Starship Children's Hospital, Auckland. Professor Asher's current research interests include asthma epidemiology, bronchiectasis, inhaler devices and poverty and child health.

Why was New Zealand selected for ISAAC?

New Zealand started focusing on asthma in earnest in 1981 when it became apparent that a new epidemic of asthma deaths had arisen in 1977, affecting New Zealand more than any other country. This stimulated a range of research programmes exploring the reasons for this epidemic, starting with a prospective national asthma mortality study which confirmed the presence of an epidemic of asthma deaths. A focus on the number of admissions to hospital for asthma found that there were dramatic increases in New Zealand, Australia, The United Kingdom, Canada and USA and the highest number of admissions per capita was in New Zealand children.

In the 1980s in New Zealand there were several studies of asthma prevalence which showed a high and rising prevalence of asthma in school aged children. The 1985 Auckland asthma prevalence study of 7-10 year old children was able to explore potential reasons for differences in mortality and hospital admissions between NZ and Australia, and between European, Maori and Pacific children in Auckland. For the first time anywhere in the world, this study used the same protocol (questionnaire and histamine challenge) to compare asthma in two different countries. Current wheezing was very similar in Auckland European children (14.8%) and Wagga Wagga, inland NSW (15%) and slightly lower in Belmont, coastal NSW (10%), and these changes were paralleled very closely in the BHR prevalences (20.2%, 19.1%, 15.5% respectively). Within the Auckland sample, we found that Maori children had the highest prevalence of respiratory symptoms, and Europeans had rates similar to Pacific children. The prevalence of diagnosed asthma was similar between the three ethnic groups, whereas bronchial hyperresponsiveness to histamine, unlike the Auckland-NSW comparisons, did not parallel the symptom prevalences. Bronchial hyperresponsiveness among Europeans was 20%, Maori 13% and Pacific children 8.7%. As a result of this study it seemed that the symptoms more clearly paralleled the hospital admission and mortality data than did bronchial hyperresponsiveness, and the questionnaire used in this study therefore set the pattern for future studies.

In 1991 we received a grant from the Health Research Council of New Zealand to compare the prevalence and severity of childhood asthma in two age-groups of children both between countries and within New Zealand (by area and ethnic group). This HRC grant covered the costs of fieldwork in Auckland, Wellington and Christchurch, and in Auckland a full-time data manager, and secretarial and computing support. The funding remained conditional upon at least one other centre outside New Zealand obtaining funds for a similar survey in their own centre, a requirement which was soon met. This initiative joined with the German initiative (see 'Origins') in March 1991, which then formally became ISAAC.

National Publications

The following publications used ISAAC data from New Zealand:

Shaw RA, Crane J, Pearce N, et al. *Comparison of a video questionnaire with the IUATLD written questionnaire for measuring asthma prevalence.* Clin Exp Allergy 1992; 22(5): 561-568.

Shaw R, Woodman K, Ayson M, Dibdin S, Winkelmann R, Crane J, Beasley R, Pearce N. *Measuring the prevalence of bronchial hyper-responsiveness in children.* Int J Epidemiol 1995; 24(3): 597-602.

Stewart AW, Asher MI, Clayton TO, Crane J, D'Souza W, Ellwood PE, Ford RPK, Mitchell EA, Pattemore PK, Pearce N. *The effect of season-of-response to ISAAC questions about asthma, rhinitis and eczema in children.* Int J Epidemiol 1997; 26: 126-36.

Asher MI, Barry D, Clayton T, Crane J, D'Souza W, Ellwood P, Ford RPK, Mackay R, Mitchell EA, Moyes C, Pattemore P, Pearce N, Stewart AW. *The burden of symptoms of asthma, allergic rhinoconjunctivitis and atopic eczema in children and adolescents in 6 New Zealand centres ISAAC Phase One.* NZ Med J 2001; 114: 114-20.

Pattemore PK, Ellison-Loschmann L, Asher MI, Barry DMJ, Clayton TO, Crane J, D'Souza WJ, Ellwood P, Ford RPK, Mackay RJ, Mitchell EA, Moyes C, Pearce N, Stewart AW. *Asthma prevalence in European, Maori, and Pacific children in New Zealand ISAAC study.* Pediatr Pulmonol 2004; 37(5): 433-42.

Erwin EA, Wickens K, Custis NJ, Siebers R, Woodfolk J, Barry D, Crane J, Platts-Mills TA. *Cat and dust mite sensitivity and tolerance in relation to wheezing among children raised with high exposure to both allergens.* J Allergy Clin Immunol 2005; 115(1): 74-9.

National Publications

The following publications used ISAAC data from New Zealand:

Asher MI, Stewart AW, Clayton T, Crane J, Ellwood P, MacKay R, Mitchell E, Moyes C, Pattemore PK, Pearce N. *Has the prevalence and severity of symptoms of asthma changed among children in New Zealand? ISAAC Phase Three.* NZ Med J 2008; 121(1284): 52-63

Ellison-Loschmann L, Pattemore PK, Asher MI, Clayton TO, Crane J, Ellwood P, Mackay RJ, Mitchell EA, Moyes C, Pearce N, Stewart AW. *Ethnic differences in time trends in asthma prevalence in New Zealand ISAAC Phases I and III.* Int J Tuberc Lung Dis 2009; 13(6):775-782.

Mitchell EA, Stewart AW, Clayton TO, Asher MI, Ellwood P, Mackay R, Moyes C, Pattemore PK, Pearce N. *Cross-sectional survey of risk factors for asthma in 6–7-year-old children in New Zealand International Study of Asthma and Allergy in Childhood Phase Three.* J Paediatr Ch Health 2009 June; 45(6): 375–383.

Our experience of ISAAC

Phase One:

Six centres took part in both age groups in 1992-3: Auckland, Bay of Plenty, Christchurch, Hawkes Bay, Nelson, Wellington [Asher 2001]. We found that asthma, rhinitis and eczema symptoms were common in New Zealand school children with resultant morbidity and cost. The prevalence of symptoms was high, for asthma 25% and 30%, allergic rhinoconjunctivitis 10% and 19%, and atopic eczema 15% and 13% in the 6-7 year (children) and 13-14 year (adolescent) age groups respectively. More than 40% of participants had symptoms in the last year of at least one condition, most commonly asthma. There was little regional variation with the exception of lower rates in Nelson children who had significantly lower prevalence values for some symptoms of asthma and allergic rhinoconjunctivitis.

Season of response

In New Zealand we chose to examine whether the season in which the parent/adolescent responded to the questionnaire influenced the symptom prevalence of asthma. Auckland, Wellington and Christchuch were the three New Zealand centres where this was examined. The resultant publication [Stewart 1997] showed that there was no effect for eczema symptoms, a small effect for asthma symptoms, and a significant season-of-response effect for rhinitis symptoms.

Ethnic comparisons Phase One

We had sufficient numbers of participants to undertake a comparison based on ethnicity [Pattemore 2004]. Maori children had higher rates of diagnosed asthma and reported asthma symptoms than Pacific participants in both age groups (diagnosed asthma in 6-7-year-olds: Maori, 31.7%; Pacific, 21.2%; 13-14-year-olds: Maori, 24.7%; Pacific, 19.2%; recent wheeze in 6-7-year-olds: Maori, 27.6%; Pacific, 22.0%; 13-14-year-olds: Maori, 30.8%; Pacific, 21.1%). European children had rates intermediate between those of Maori and Pacific children (6-7-year-olds) or similar to those of Maori participants (13-14-year-olds), but had the lowest prevalence of night waking with wheeze in both age groups. The pattern of differences closely resembled that in the 1985 Auckland study, despite a 1.5–1.7-fold overall increase in prevalence between 1985 and 1992-3. Thus there are important differences in asthma prevalence among Maori, Pacific, and European children and adolescents. These differences are small compared to worldwide variation, but the pattern is stable over time. The higher rate of severe asthma symptoms that Maori and Pacific children and adolescents report may be one reason for the increased asthma morbidity in these groups.

Phase Two:

One centre took part in Phase Two: Hawke's Bay. We chose to undertake ISAAC Phase Two study in Hawke's Bay because it gave us an opportunity to undertake two studies using largely a single set of fieldwork, to provide data for ISAAC Phase Two and secondly we were able to use much of the same data to provide to repeat one of the first international asthma prevalence surveys that had been undertaken by Michael Burr and David Barry in the Hawke's Bay and Wales[Barry 1991], and later included South Africa and Sweden[Burr 1994], using the same schools, methodology and personnel to give us a comparison of prevalence over a 10 year period.

The study was run by Dr Kristin Wickens in the Hawkes Bay over the summer period 2000. We had excellent help from Dr Barry himself and also from one of his retired senior paediatric nurses – Ms Ngaire Bone. We were also fortunate to have two third year medical students join us from the Netherlands looking for a small student elective to undertake research and they provided excellent additional support for the field work and also got a publication from an add on project undertaking during the fieldwork[Rhodius 2002]. The study provided New Zealand data for ISAAC Phase Two, but also provided a number of spin-off studies that looked at fast foods and asthma and changes in obesity and their relationship to asthma over 10 years[Wickens 2005(1), Wickens 2005(2)]. The data also formed the basis for some interesting work on cat allergen[Erwin 2005] undertaken by Tom Platt-Mills and colleagues who also measured spIgE levels for the study.

The Hawkes Bay turned out to be an excellent place to undertake research like this and we had tremendous co-operation from the schools and from the surrounding community and also had enormous benefit from employing people who were well known in the community and were able to encourage both schools and parents to take part.

Also we undertook two forms of measurement of airway hyperresponsiveness, exercise and hypertonic saline. The exercise challenge used a five minute running test[Burr 1989] allowing us to compare this challenge with previous studies and with the UK centre which also used it. We also undertook a hypertonic saline challenge and again were fortunate to have a visiting research fellow to help us with this.

In this 8 to 12 age group we found the prevalence of wheezing in the last year was 22.0% and asthma ever, 35.7%. A positive exercise challenge (=15% fall in PEFR post exercise) was found in 8.4%. A positive skin prick test to any allergen was found in 34.7% of children. Interestingly when comparing the prevalence from 10 years before (restricted to just the 12 year old children) wheezing had increased from 17.7% to 23.3%, asthma ever from 16.9% to 37%, while a positive exercise response had fallen from 12.3% to 9.0%.

Phase Three:

Five centres took part in Phase Three in both age groups 9 years after their participation in Phase One [Asher 2008]: Auckland, Bay of Plenty, Christchurch, Nelson and Wellington. The low response rate for children within Wellington meant that centre was excluded for the younger age group. Reported asthma ever increased from 24.6% to 30.2% in children and from 24.1% to 32.4% in adolescents. Current wheeze (written questionnaire) significantly decreased in children from 23.6% to 22.2% and in adolescents from 29.7% to 26.7%, and for the video questionnaire from 18.1% to 11.1% ($p<0.001$). There was a significant reduction in wheezing limiting speech from 5.0% to 3.7% in children, and 7.9% to 6.2% in adolescents. Little regional variation was found; the lower prevalence for some symptoms reported for Nelson in Phase One was not evident for Phase Three. A higher proportion of participants with asthma symptoms in Phase Three reported having ever had asthma compared with Phase One. The decrease in prevalence and severity of symptoms of asthma was encouraging, but the reasons for these trends are currently unclear. Increases in asthma labelling are likely to be due to greater awareness of asthma. A trend of decreasing prevalence of asthma symptoms, if maintained, has positive implications for lessened burden of disease among asthmatics and lowered cost of treatment.

Ethnic comparisons Phase Three

Ethnic disparities were examined again, the first international report of time trends in ethnicity [Ellison-Loschmann 2009]. The prevalence of current wheeze in children was 28.5% in Maori and 25.2% in Pacific, compared with 20.7% in European/Pakeha. In adolescents, 29.9% of Maori and 20.8% of Pacific experienced current wheeze, compared to 28.6% of European/Pakeha. Between Phases One and Three, the prevalence of current wheeze increased significantly by 0.49% per year in Pacific children, increased non-significantly by 0.12% per year in Maori children, and decreased significantly by 0.25% per year in European/Pakeha children. Among adolescents, the prevalence of current wheeze increased by 0.05% per year in Pacific. In contrast, European/Pakeha and Maori adolescents showed decreases of 0.33% per year and by 0.07%per year respectively. Ethnic differences in asthma symptom prevalence in New Zealand have thus increased between Phase One and Phase Three. The reasons for this are unclear, but may reflect inequalities in access to health services.

Risk factor analyses

Risk factor analyses are being undertaken for each of the three diseases. As for the worldwide analyses, antibiotics and paracetamol used in the first year of life were associated with an increased risk of current wheeze. Watching television for 5 or more hours per day was associated with an increased risk of current wheeze, whereas consumption of milk and eggs consumption in the last 12 months was associated with a reduced risk of current wheeze.

Impact of ISAAC

ISAAC has provided vital information concerning prevalence and time trends of asthma, rhinitis and eczema within New Zealand, as well as providing a global context. We presumed that prevalence in New Zealand was high compared with many other countries but this could only be confirmed by a unique international study such as ISAAC. Ethnic disparities in asthma within New Zealand have been confirmed, and the widening gap for Maori could be preventable. ISAAC has also promoted development of research links within New Zealand, and with international collaborators, and has provided New Zealand researchers with invaluable experience of playing a leading role in a large international collaborative research programme.

Acknowledgements

We gratefully acknowledge financial support from the Health Research Council of New Zealand, the Asthma and Respiratory Foundation of New Zealand, the Child Health Research Foundation, the Hawke's Bay Medical Research Foundation, the Waikato Medical Research Foundation, Glaxo Wellcome New Zealand, Nelson Marlborough Health Services Ltd, the NZ Lottery Board and Astra Zeneca New Zealand. We are also indebted to all the children, parents and school staff who participated in the surveys, and wish to thank our fieldwork teams for their enthusiasm and diligence throughout each study.

Nicaragua, Latin America

Centres:	Phase:	PI:	Age Groups
Managua	3	Dr José Félix Sánchez	13-14, 6-7

National Coordinator:

Dr José Félix Sánchez

Pediatric Pulmonologist, Director of the Department of Medicine and Pulmonology
Children's Hospital "Manuel de Jesus Rivera",
National Referral Hospital of Pediatrics in Nicaragua
District V, Managua,
Nicaragua

Roles:

- National Coordinator for Nicaragua
- Phase Three Principal Investigator for Managua

Why was this centre selected for ISAAC?

I found out about ISAACphase III by Dr. Manuel Soto Quiros, who was my mentor during my Pulmonology fellowship in Costa Rica. Dr Quiros and Dr. Lars Å Hanson, Department Clinical Immunology, Göteborg University, Sweden, both were involved in the decision that Nicaragua participated in the study. Nicaragua didn't count with prevalence studies of asthma or allergies. Our country could participate in the phase III of ISAAC thanks to their collaboration.

In the survey on Conditions of Life (EMNV'98) it was found that 64.8% of the families in Nicaragua live in situation of poverty, or extreme poverty and that only one out of four homes satisfies its basic necessities. Managua, as the capital of Nicaragua, have the major density population, were the industrial development is settled. However, behind the acute conditions the chronic diseases appear, but in the developing countries they are often not noticed, diagnosed and properly treated. Such diseases may, because of their chronic nature, severely impair growth and development as well as educational capacity in children. They will also affect the whole family in many ways, not least its economy. The hospitalization rates in children with asthma have been increasing in Nicaragua, and we didn't count with studies that that could measure the prevalence of symptoms and severity among our population.

The area of study was District VI of Managua (Ministry of Health), located in the eastern part of Managua (Fig 1). It has an area of 42 sq km. The total population is estimated to 146,050 inhabitants; of those 65,722 are children less than 15 years old.

The VI District of Managua was chosen because this is the city area where most of the poor people live, in "barrios" and settlements. The epidemiological profile shows a high incidence of respiratory diseases and acute diarrheas. There is a higher prevalence of malnutrition and parasitism. The sewer and drainage structures are deficient. There are unsuitable potable water services, with inappropriate liquid waste elimination. Many families do not have drain and waste water installation of the people use latrines. The garbage collection service is deficient. The electricity service is inappropriate. Their health care service is principally provided by the State.

Fig 1. Map of the capital city of Managua. Area of the study circled in black.

Our experience of ISAAC

The ISAAC core questionnaires were translated into Spanish, according to defined guidelines, including the familiar terminology of the local community, such as "silbido", "lira" referring to wheezing . At first we applied a pilot study for the questionnaires that was reviewed by Dr. Manuel Soto Quirós, Costa Rica National Coordinator for ISAAC. We didn't use the videos mode.

School Principals that participated were very enthusiastic and their collaboration was very important to achieve the study. We had good acceptance from families and children, 95% of questionnaires were sent back complete from parents.

Impact of ISAAC in our country

Before ISAAC data was insufficient, it was the first study for asthma and allergies in Nicaragua, and it marked the beginning for similar studies in other areas of our country, such as the rural areas. Evenly it initiated the development of health and education strategies for the accurate diagnose and treatment for these diseases.

The ISAAC Story

Acknowledgements

This study was conducted with the guidance of Dr. Manuel Soto-Quiros pediatric pulmonologist, from the National Children's Hospital of Costa Rica "Carlos Saenz" and Dr. Lars Å Hanson Department Clinical Immunology, Göteborg University, Sweden. Both were involved in the decision to develop the study, translation of the instrument, pilot study, school selection, monitoring collection of the questionnaires and finally the recording of the information according to the ISAAC protocol for the phase III.

For this study the technical and methodological quality were counted with the financial support of SAREC and VARDAL, both Swedish institutions that support scientific and development in Latin America.

For its realization we had the approval and collaboration of the Ministry of Health of Nicaragua and Ministry of Education of the government of Nicaragua.

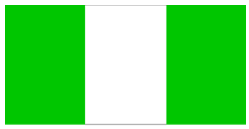
Eduardo Parrales, M.D, was the Ministry of Health director of the area VI where we developed the study. He was a very important support to achieve the objectives.

For the collection of the questionnaires, we hired two registered nurses, Lic. Alba Sandoval and Lic. Martha Garcia who made an excellent work in the field.

We appreciate all the support and coordination of the school directors and teachers with the study. As well children and their families, they were very interested in the study and the results.

Click the link to the left to see our photos.

Nigeria, Africa



Centres:	Phase:	PI:	Age Groups
Ibadan	1	Professor Babatunde O Onadeko	13-14, 6-7
Ibadan	3	Professor Babatunde O Onadeko	13-14, 6-7

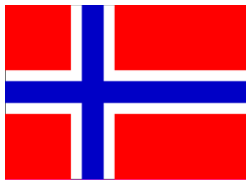
Nigeria has no National Coordinator

Niue, Oceania

Centres:	Phase:	PI:	Age Groups
Niue Island	3	Ms Moka Magatogia	13-14, 6-7

Niue has no National Coordinator

Norway, Western Europe



Centres:	Phase:	PI:	Age Groups
Tromsø	2	Dr Wenche Nystad	9-11

Norway has no National Coordinator

Sultanate Of Oman, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Al-Khod	1	Associate Professor Bazdawi Al-Riyami	13-14, 6-7
Al-Khod	3	Associate Professor Omar Al-Rawas	13-14, 6-7

National Coordinator:

Associate Professor Omar Al-Rawas

Head, Department of Medicine
College of Medicine and Health Sciences
Sultan Qaboos University
P.O. Box 35; Postal Code 123
Sultanate Of Oman

Roles:

- National Coordinator for Sultanate Of Oman
- Phase Three Principal Investigator for Al-Khod

The ISAAC Story

Why was this Centre Selected for ISAAC?

We received invitation from Professor Stephen Montfort, coordinator for the Eastern Mediterranean region as very few centres in the region had shown interest. At the time Oman did not have any community based asthma data and this was a welcome opportunity for us to collaborate with this international study. This proved to be wonderful opportunity.

In collaboration with the national school health department under the Ministry of Health we were able to survey all the health regions in the country and sample from a base of all public schools which represented more than99% of all schools. Effectively our centre produced national data although we are known as Al Khodh centre because of the location of the Sultan Qaboos University.

Our Experience with ISAAC

The Pilot Study: This was an interesting exercise because when we started the translation initially we used a written Arabic language version of the translation of key words such as wheezing, asthma, eczema, hay fever etc. only to find out later that this was not universally understood. We had to go back to the “clinical" language used during normal consultation. The video questionnaire was striking for many of the children.

Phases One & Three: Both age groups participated in both phases which were 6 years apart (1995 and 2001). In both surveys, the total national target samples were randomly selected from the ten administrative (representing the eight geographical) regions of Oman using the proportion allocation method. The total number of distributed questionnaires (Arabic version) was 7,625 (4,079 aged 6–7 years and 3,546 aged 13–14 years) in in Phase One (April 1995) and 8,080 questionnaires (4,235 aged 6–7 years and 3,853 aged 13–14 years) in Phase Three (April 2001). In Phase Three, in addition to the written questionnaire, 13-14 year old children completed the ISAAC asthma video questionnaire.

The phase I survey in 1995 was the first survey of asthma symptoms in Oman. It showed that the prevalence rates of reported diagnoses of asthma, allergic rhinitis and eczema were higher in older children (20.7%, 10.5% and 14.4% compared with 10.5%, 7.4% and 7.5%, respectively). Although the prevalence of asthma in Omani children was in the intermediate range of the ISAAC global ranking, it was the highest among the participating Eastern Mediterranean countries and Omani children had a relatively high prevalence of severe asthma symptoms (sleep disturbance and speech limiting wheeze).

Over the 6 years there was a significant increase in the prevalence of current wheeze ‘any wheeze during the past 12 months’ in the younger group with no significant change in asthma diagnosis (10.5% vs. 10.6%) or any other asthma symptoms. In the older group, all asthma symptoms remained unchanged except speech-limiting wheeze which declined from 4.0% to 2.8. In both surveys, more than 60% of current wheezers reported severe asthma symptoms, while only 60% of these reported a diagnosis of asthma. The persistence of the relatively high prevalence of severe asthma symptoms in Omani children is of particular concern. These findings suggest under diagnosis and/or poor recognition of asthma which had not improved over time and require further studies.

Phase one result also showed a surprisingly high prevalence in all asthma symptoms in the Eastern Region (Sharqiya) of the country. This appears to be genuine as it was confirmed in the Phase Three studies. Over the period of six years, the Sharqiya (Eastern) region continued to have the highest prevalence of self-reported asthma diagnosis and all asthma symptoms in both age groups, with a significant increase in the prevalence of wheeze in the past 12 months (from 8.7% to 13.8%) and asthma diagnosis (from 13.8% to 17.8 %) in the young group,and a significant increase in night cough (from 21.6% to 27.8%) in the older group. All other regions had lower prevalence rates in Phase One in both age groups, and showed either no significant change or a decline in one or two of the self-reported asthma symptoms in Phase Three (2001).

Phase Two: Due to the cost and logistics, we were not able to formally participate in the full ISAAC Phase Two Protocol. However, we used the questionnaire component of the survey with the addition of questions concerning the use and effect of Arabian incense (common practice in Omani households) on asthma symptoms to investigate the potential risk factors for asthma and allergies in two representative regions of Oman. A target sample (2441) of 10 year old schoolchildren was randomly selected from a representative sample of public schools from Muscat (1241 children) and South Sharqiya(1200 children) using stratified multi-stage sampling method. The selected tworegions out of the ten regions of Oman were considered as potentially informative based on their different prevalence rates of asthma identified in ISAAC phase I, and the potential for differences in environmental exposures. As the capital of Oman, Muscat population comes from most regions of the country ,and the prevalence of asthma symptoms and diagnosis in Muscat resembles the national average, whereas South Sharqiya (Eastern) region has the highest prevalence rates of all asthma symptoms. The results of this survey confirmed the higher prevalence of all asthma symptoms in Sharqiya in a different age group. It also identified exposure to Arabian incense as a common trigger factor for asthma symptoms in Omani children.

Our ISAAC results gave the first insight to the burden of asthma and allergies in Oman and provided a good platform for future studies.

Acknowledgements

Our ISAAC studies were supported by grants from Sultan Qaboos University. We also gratefully acknowledge the valuable support from Ministry of Health and Ministry of Education. We thank all children and parents who participated in the study. We also thank the school health physicians of the Ministry of Health for distributing and retrieving the questionnaires.

Pakistan, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Karachi	1	Dr Zulfiqar A Bhutta	13-14
Islamabad	3	Dr Mohammad Osman Yusuf	13-14, 6-7
Karachi	3	Dr Naseeruddin Mahmood	13-14, 6-7

National Coordinator:

Dr Naseeruddin Mahmood

Department of Paediatrics
The Aga Khan University
PO Box 3500
Stadium Road
Pakistan

Roles:

- National Coordinator for Pakistan
- Phase Three Principal Investigator for Karachi

Panamá, Latin America

Centres:	Phase:	PI:	Age Groups
David-Panamá	1	Dr Gherson Cukier	13-14, 6-7
David-Panamá	3	Dr Gherson Cukier	13-14, 6-7

National Coordinator:

Dr Gherson Cukier

Pulmonary and Bronchoscopy Pediatrics Section
Hospital Materno Infantil Jose Domingo de Obaldia
PO Box 662

Panamá

Roles:

- National Coordinator for Panamá
- Phase One Principal Investigator for David-Panamá
- Phase Three Principal Investigator for David-Panamá

Paraguay, Latin America

Centres:	Phase:	PI:	Age Groups
Asunción	1	Dr Jaime A Guggiari-Chase	13-14
Asunción	3	Dr Jaime A Guggiari-Chase	13-14

National Coordinator:

Dr Jaime A Guggiari-Chase

Jefe del Servicio de Alergia e Immunologia
Centro Médico Bautista
San Antonio 1019

Paraguay

Roles:

- National Coordinator for Paraguay
- Phase One Principal Investigator for Asunción
- Phase Three Principal Investigator for Asunción

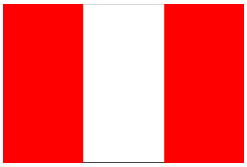
Due to special circumstances, Paraguay is a country that has taken long to develop, including our medicine. Until very recently, our medicine was primarily asistencialist, and mainly dealt with emergencies only. Chronic diseases were not treated and of course the prevention of these chronic diseases was not considered. Bronchial asthma, and the drama and severity of its crisis, has always occupied an important place in emergency clinics.

The ISAAC Story

In the decade from 1950 to 60, pulmonologists were busy with tuberculosis, and the first allergists appeared. The ISAAC survey in 1998 came to fill an important place in the consideration of allergic conditions. For example, allergic rhinoconjunctivitis was a disease largely ignored by general practitioners and specialists. Five years later, in the 2nd ISAAC survey, allergic rhinoconjunctivitis, came to the fore with an incidence greater than 40% and this coincided with the appearance of ARIA (Allergic Rhinitis and its Impact on Asthma)

These events attracted the attention of specialists, and this made otolaryngologists and allergists come to a consensus on allergic diseases that affect upper respiratory conditions. Unfortunately, this consideration was not taken with atopic dermatitis. However, there is always the desire and hope of a consensus with dermatologists, to consider together the various aspects of this disease

Finally, it should be noted that the survey was received by the young people surveyed with enthusiasm and many of them were helped, because it gave them attention that they never received before.



Peru, Latin America

Centres:	Phase:	PI:	Age Groups
Lima	1	Dr Pascual Chiarella	13-14
Lima	3	Dr Pascual Chiarella	13-14, 6-7

National Coordinator:

Dr Pascual Chiarella

Universidad Peruana Cayetano Heredia
Departamento de Pediatria
Av. La Floresta 175 Dpto 302
Chacarilla, Surco
Peru

Roles:

- National Coordinator for Peru
- Phase One Principal Investigator for Lima
- Phase Three Principal Investigator for Lima

ISAAC Study in Peru

On September 17, 1993, I received the invitation from Dr Javier Mallol, Regional Coordinator for Latin America, to participate in the ISAAC study as a National Coordinator for Peru. We gladly accepted a few days later, and since that time we have participated in this project; it is quite interesting to see how much time has gone by.

In 1994, we made all the arrangements to run the study in a district of Lima, Santiago de Surco; I must acknowledge the help of Drs. Eduardo Negron, Juanita Aching, Luis Vega, Aldo Navarro, and many other people. We are also thankful for the grant that Dr. Mallol gave us.

The ISAAC Phase I study was run between April and June1995, and the data for Lima was submitted in the second part of that year. Afterwards we submitted several Phase I publications, including national publications. After Phase I, we performed several smaller studies in Peru using the ISAAC methodology; while the numbers were smaller, we used the same methodology, and the results could provide some data for comparison with ISAAC.

ISAAC Phase III Data was collected in May to July 2001, with the help of Dr. Erick Forno. In both phases we used the written and video questionnaires.

The Lima Centre in Peru is known for its particularly high prevalence of asthma symptoms in 13–14 year-old children, but with mild symptoms. The discussion continues: why do wehave such high prevalence of asthmatic patients?

We want to thank Drs Mallol, Tadd Clayton, Innes Asher, Philippa Ellwood, and everyone who works on ISAAC for inviting and helping us all these years.

Philippines, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Metro Manilla	1	Professor Felicidad Cua-Lim	13-14, 6-7
Metro Manila	3	Professor Felicidad Cua-Lim	13-14, 6-7

National Coordinator:

Professor Felicidad Cua-Lim

University of Santo Tomas

7 Roosevelt St. Green Hills West
San Juan
Philippines

Roles:

- National Coordinator for Philippines
- Phase One Principal Investigator for Metro Manilla
- Phase Three Principal Investigator for Metro Manila

The ISAAC Story

Why was this centre selected for ISAAC?

Our country was selected to participate in both ISAAC Phase I and Phase III of the study. It started on a meeting in an asian respiratory disease convention in Tokyo in 1994. Dr Chrisopher Lai invited Dr Felicidad Cua-Lim, then the President of the National Asthma Movement in the Philippines, to be the National Coordinator and Principal Investigator for the ISAAC study Phase I in the Philippines.

Our experience of ISAAC

For Phase I Dr Felicidad Cua-Lim assembled her team whose members included Drs Camilo Roa, Jose Pepito Amores, Manuel Fereria, and Madeleine Sumpaico. The questionnaires, with the help of a social scientist Nina Carandang, were translated and back translated to the local dialect – Tagalog. The study was implemented in schools in Metro Manila. Both the data for the 6-7 years old and 13-14 years old were accepted for inclusion in the Lancet publication for the global coverage of the ISAAC study.

In the phase III Dr Cua-Lim was again invited to participate in the study. Dr Rodolfo Pagcatipunan became a member of her team. Aside from the core questionnaires, an environmental questionnaire was included in this phase which was again translated and back translated to the local dialect. Only the 13-14 years old data was accepted by the data center. There were data integrity problems encountered in the 6-7 years old. This was attributed to the initially low number of returned questionnaires or drop-outs. Upon consultation with a statistician, these drop-outs were replaced by another set of responders to attain the desired sample size.

The data generated from the phase I and III studies became the source of prevalence data for asthma and allergy in children in the Philippines. It also triggered the implementation of the National Asthma Prevalence Study, an asthma prevalence study for both adult and children sponsored by the Department of Health of the Philippines.

Poland, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Krakow (1993)	1	Associate Professor Grzegorz Lis	13-14
Kraków (1995)	1	Associate Professor Grzegorz Lis	13-14, 6-7
Poznan	1	Associate Professor Anna Brêborowicz	13-14, 6-7
Kraków (1995)	3	Associate Professor Grzegorz Lis	13-14, 6-7
Poznan	3	Associate Professor Anna Brêborowicz	13-14, 6-7

National Coordinator:

Associate Professor Grzegorz Lis

Department of Pediatrics
Polish-American Children's Hospital
ul. Wielicka 265

Poland

Roles:

- National Coordinator for Poland
- Phase One Principal Investigator for Krakow (1993), Kraków (1995)
- Phase Three Principal Investigator for Kraków (1995)

National Publications

The following publications used ISAAC data from Poland:

Lis G, Brêborowicz A, Swiatly A, Pietrzyk JJ, Alkiewicz J, Moczko J. *Prevalence of allergic diseases in schoolchildren in Krakow and Poznan (based on a standardized ISAAC questionnaire).[in Polish].* Pneumonol Alergol Pol.1997; 65(9-10): 621-7.

Lis G, Pietrzyk JJ. *Evaluation of hyperresponsiveness to the exercise challenge test in school children.[in Polish].* Pneumonol Alergol Pol.1997; 65(1-2): 53-60.

Lis G, Pietrzyk JJ. *[The effect of air pollution on the prevalence of asthma in schoolchildren from Krakow].[in Polish].* Pneumonol Alergol Pol.1997; 65(9-10): 611-20.

Lis G, Pietrzyk JJ, Cichocka-Jarosz E, Szczerbinski T, Kwinta P. *Bronchial asthma: do boys or girls have the highest incidence? [in Polish].* Przegl Lek.1997; 54(9): 602-6.

Brêborowicz A, Swiatly A, Alkiewicz J, Moczko J. *Use of a video questionnaire for assessment of asthma prevalence in school children as part of the ISAAC epidemiological study.[Polish].* Pneumonol Alergol Pol.1998; 66(7-8): 368-72.

Lis G, Cichocka-Jarosz E, Gazurek D, Szczerbinski T, Glodzik I, Sawiec P, Bialoruska B. *[Relationships between atopy and bronchial hyper-reactivity in Polish school age children].* Przegl Lek.2002;59(10):780-4.Polish.

Lis G, Brêborowicz A, Cichocka-Jarosz E, Swiatly A, Glodzik I, Gazurek D, Sobkowiak P, Alkiewicz J, Pietrzyk JJ. *[Increasing prevalence of asthma in school children--ISAAC study (International Study of Asthma and Allergies in Children)].* Pneumonol Alergol Pol.2003;71(7-8):336-43.Polish.

Lis G, Brêborowicz A, Cichocka-Jarosz E, Sobkowiak P, Gazurek D, Swiatly A, Alkiewicz J, Pietrzyk JJ. *[The prevalence of allergic rhinitis and conjunctivitis in school children from Krakow and Poznan--ISAAC study (International Study of Asthma and Allergies in Childhood)].[Polish].[English Abstract.Journal Article.Multicenter Study].* Otolaryngol Pol.58(6):1103-9, 2004.

Flohr C, Williams HC *Childhood eczema according to the International Study of Asthma and Allergies in Childhood (ISAAC) questionnaire tool – response to Czarnobilska et al.* J Eur Acad Dermatol Venereol 2011; epub May 14, DOI: 10.1111/j.1468-3083.2011.04126 x

National Publications

The following publications used ISAAC data from Portugal:

Pinto JR, Almeida MM. *Epidemiology of asthma in schoolchildren in Portuguese speaking regions.* Rev Fr Allergol Immunol Clin 2005; 45(7):547-549.

Rosado-Pinto J, Gaspar A, Morais-Almeida M. *Epidemiology of asthma and allergic diseases in Portuguese speaking regions.* Rev Fr Allergol Immunol Clin 2006; 46(3):305-308

Portugal, Western Europe

Centres:	Phase:	PI:	Age Groups
Funchal	1	Dr Fernando D Borges	13-14, 6-7
Lisbon	1	Dr José E Rosado Pinto	13-14, 6-7
Portimao	1	Dr Carlos Nunes	13-14, 6-7
Porto	1	Dr José M Lopes dos Santos	13-14
Coimbra	3	Dr M Lourdes Chiera	13-14
Funchal	3	Dra Rita Câmara	13-14, 6-7
Lisbon	3	Dr José E Rosado Pinto	13-14, 6-7
Portimao	3	Dr Carlos Nunes	13-14, 6-7
Porto	3	Dr José M Lopes dos Santos	13-14, 6-7

National Coordinator:

Dr José E Rosado Pinto

Immunoallergology Department,
Hospital da Luz,
Av Lusíadas n. 100,
1500-650 Lisboa
Portugal

Roles:

- National Coordinator for Portugal
- Phase One Principal Investigator for Lisbon
- Phase Three Principal Investigator for Lisbon

ISAAC in Portugal

ISAAC Portugal started in 1991 only with Lisbon Centre 13-14 years old group. During 12 years (1992-2003) we organized a network of 7 centers with around 40,000 children (6-7; 13-14 years old) both in the continent and Madeira Island (Funchal). It is one of the largest epidemiological study produced until today in Portugal.

The results of the ISAAC study are until now the reference data of prevalence of asthma and allergic diseases in children. It is also a reference for several scientific studies and thesis. Presently there is an epidemiological study and a master dissertation using the ISAAC questionnaire.

The ISAAC study enhanced the establishment of a network among colleagues (including GP in the primary health centers), teachers, parents and children from more than 300 schools involved in the project. The ISAAAC Portugal had the support of Ministry of Health and GSK for the data analysis, but the great part of the work was done without any financial support.

The annual meetings of the Western Europe Group in Munster under the coordination of Prof. Ulrich Keil and Stefen Weiland in the first years provided closer professional and personal contact. Along the years several meetings took place during phase I and III with representatives of ISAAC Spain and Brasil which gave us the opportunity to exchange experiences both at organization and scientific levels. In Portugal the main objectives were the dissemination of results in scientific journals and media at country level, as well as to stimulate other studies based on ISAAC experience focusing school and the allergic diseases in children.

Reunion Island, Africa

Centres:	Phase:	PI:	Age Groups
Reunion Island	3	Dr Isabella Annesi-Maesano	13-14

National Coordinator:

Mme Christine Catteau

Direction des Affaires Sanitaires et Sociales (DRASS)

2 bis, avenue Georges Brassens

Reunion Island

Roles:

- National Coordinator for Reunion Island

National Publications

The following publications used ISAAC data from Reunion Island:

Martignon G, Catteau C, Debotte G, Duffaud B, Lebot F, Annesi-Maesano I. *Childhood allergies in Reunion Island: is there any difference with metropolitan.* Rev Epidemiol Sante Publique.2004 Apr;52(2):127-37.French.

Romania, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Cluj	1	Professor Diana Deleanu	13-14
Cluj	3	Professor Diana Deleanu	13-14

National Coordinator:

Professor Diana Deleanu

President of Romanian Society of Allergy and Clinical Immunology (SRAIC)
University of Medicine & Pharmacy IULIU HATIEGANU
3rd Medical Clinic, Allergy – Immunology Dept.
Croitorilor 19-23;
Romania

Roles:

- National Coordinator for Romania
- Phase One Principal Investigator for Cluj
- Phase Three Principal Investigator for Cluj

The story of ISAAC in Cluj

In a hot summer day in Transylvania, an ordinary mail send to Professor Bengt Björkstén was the certificate of birth for ISAAC Cluj centre.

I was a young researcher in the field of medicine with a dream for allergy diseases. So I was looking for foreign collaboration (after many years of “iron curtain”). Professor Bengt Björkstén was very pleased with my “desire” for an epidemiological study in the field of allergic diseases (Romania was a white spot on Europe for allergy) – I was a resident in the allergy specialty at that time.

We did our collaboration during those years (beginning of 90’s) by mail and after that on e-mail (which helped us a lot!).

It was difficult at the beginning but working on the project, things were moving one with a lot of enthusiasm. I was contacted by Professor Mircea Nanulescu, the chief of Pediatrics in our University, the director of 3rd Pediatric Clinic with a department for asthma, so we started an almost 20 years of collaboration. He also arranged for one of his youngest, optimistic collaborators – Paraschiva Chereches Panta (Pusa for friends) – to work at the study.

One year later I had the opportunity to met professor Bengt Björkstén, one of the most remarkable people I have known during these years. Working with the questionnaires we could see the good changes that were happening in our country: in schools, in hospitals. Pusa and I reached the title of specialty in allergy, and pediatrics respectively.

We organized a summer school in Cluj with EAACI and Ga2len and Tadd Clayton was one of our guests - speakers. He presented the phase three results from ISAAC.

Unhappily, it was difficult for us to organize the study for 6 years old children and video questionnaires. Also the phase two study was performed in only some of our responders.

But with new help we did the ISAAC phase three study: Diana Church joined us. We the ISAAC team “grew” with the study: I organized the study of allergy in our University, and became president of our Allergy Society, Pusa is one of the most famous doctors for asthmatic children, Diana Church is working in Southampton and Berlin in the field of allergy, Professor Mircea Nanulescu organized the Romanian Pediatric Society for Respiratory Diseases.

We are pleased that our work, the only one in our country is recognized by our colleagues as a priority in epidemiology of asthma and allergic diseases in Romania.

The ISAAC Story

Russia, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Moscow	1	Professor Rakhim M Khaitov, Director of the Institute of Immunology	13-14
Novosibirsk	1	Prof Dr Elena G Kondiourina	13-14, 6-7
Novosibirsk	3	Prof Dr Elena G Kondiourina	13-14, 6-7

National Coordinator:

Professor Rakhim M Khaitov

Director, Institute of Immunology
National Research Center
24-2 Kashirskoye Shosse
Moscow
Russia

Roles:

- National Coordinator for Russia

Samoa, Oceania

Centres:	Phase:	PI:	Age Groups
Apia	3	Ms Peone Fuimaono	13-14

National Coordinator:

Dr Nuualofa Tuuau-Potoi

Ministry of Health, Samoa
Preventive Health
Department of Health
Private Bag
Samoa

Roles:

- National Coordinator for Samoa

The ISAAC Study in Samoa was the first major project handed to me to do after I completed my undergraduates and in my second year of work. It was a study introduced by Dr Sunia to Dr Nuualofa Tuuau-Potoi and supported by the then Director General of Health the late Dr Taulealeausumai Eti Enosa. It took us approximately 1 month to collate all the data and tally and ship them. We did not get an allowance for working in this study as it is the norm in projects attached to Health service but the experience obtained from this exposure has helped in the development of health research of this magnitude and taking the experience on in the law and justice sector which I am now employed in.

Mr Mose Faatamala worked on in the Ministry of Health as a leading Health Educator until 2007 when he migrated to New Zealand with his young family and where they now reside. His ability to command an audience as required by his profession and made easy by his personality was a significant contributor to the success of ISAAC Samoa. Our field survey was implemented in an unfavourable time for the Education curriculum as exams were pending. However, the speed in which the questionnaires were explained and understood and taken from one school to another favoured both the limited time granted to us by the schools and the timeframe planned for ISAAC Samoa to complete. Through this story, Mr Faatamala's contribution to the ISAAC Study in Samoa and around the world, can be acknowledged and recognised.

Due credit must also go to the then Assistant Chief Executive Officer Public Health in the Samoa Ministry of Health Namulauulu Dr Nuualofa Tuuau-Potoi for her vision in bringing ISAAC to Samoa and the late Lolofietele Dr Eti Enosa for his faith and support in Samoa joining this global study. Health resources were used to take this study to the selected schools. ISAAC and MOH also needs to acknowledge and thank the Samoa Ministry of Education, Sports and Culture without whom, the opportunity to collect this number and level of data for this study, would not have been possible. To the late Chief Executive Officer of the Ministry Mr Tupae Esera and the Division of School Operations for the prompt and organised assistance in allowing the study to be in school hours, Faafetai tele.

Samoa is aspiring to meet the MDGs and I hope the data collected will be fully utilised by health professionals to inform public health policy and improve child health in asthma and other allergies in children. Thank you ISAAC for the experience.

Soifua.

Serbia and Montenegro, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Belgrade	3	Dr Zorica Zivkovic MD, Phd	13-14, 6-7
Nis	3	Asst Professor Snezana Zivanovic	13-14, 6-7
Novi Sad	3	Dr Mila Hadnadjev	13-14, 6-7
Podgorica	3	Dr Omer Adzovic	13-14, 6-7
Sombor	3	Dr Eva Panic	13-14, 6-7

National Coordinator:

Dr Zorica Zivkovic

Professor in Pediatrics American School of Medicine at Belgrade
Pediatric pulmonologist Children's Hospital for Lung Diseases and Tuberculosis
Medical Center "Dr Dragisa Misovic"
Belgrade
Republic of Serbia

Roles:

- National Coordinator for Serbia and Montenegro

SERBIA AND MONTENEGRO

During the ISAAC Phase 3 Serbia and Montenegro consisted of one country. Currently, Serbia and Montenegro are two separate countries.

ISAAC Phase 3 is the largest and the most important epidemiological study on asthma and allergies in childhood in Serbia. Four Centers from Serbia were enrolled to study: Belgrade, Nis, Novi Sad, Sombor and one Center from Montenegro : Podgorica. Around 15000 children were recruited for the study and finally the results were obtained on approximately 13485 of children. Enormous number of colleagues, paediatricians, pulmonologists and allergologists were involved in the project, together with huge number of teachers, psychologists, medical assistants and caregivers. Having in mind the fact that we had no funds or financial support from the National, Local or Regional Authorities, the ISAAC Phase 3 has been the most successful feature of the enthusiasm and professional motivation.

For these 10 years we reported ISAAC Phase 3 protocol, methodology and results at national, international scientific meetings, published several articles in the national journals and just recently, the paper on prevalence of childhood asthma and allergies in Serbia and Montenegro has been published in World Journal of Pediatrics.

Citation from the article: Prevalence of Childhood asthma and Allergies in Serbia and Montenegro. World J Pediatr. 2010; 331-336. "In the 13 485 children from five study centers who responded to the questionnaire, the prevalence for childhood asthma ranged from 2.5% to 9.8%, for allergic rhinoconjunctivitis (hay fever) from 4.6% to 21%, and for eczema from 8.2% to 17.2%. The prevalence of current wheezing was high in both age groups (16.5% and 12.4% respectively). In conclusion : The prevalence of asthma is higher in 6-7 years old school children in the urban and largest cities of Belgrade and Nis, and in 13-14 years old children in Podgorica. The prevalence of asthma, allergic rhinitis and eczema in the school children of Serbia and Montenegro seems similar to that of other countries in Central and South-Eastern Europe."

National Publications

The following publications used ISAAC data from Serbia and Montenegro:

Živkovic Z, Vukašinovic Z, Cerovic S, Radulovic S, Živanovic S, Panic E, Hadnadjev M and Adžovic O. *Prevalence of childhood asthma and allergies in Serbia and Montenegro.* World J Pediatr 2010; 6(4): 331-336 epub May

Singapore, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Singapore	1	Professor Bee-Wah Lee	13-14, 6-7
Singapore	3	Associate Professor Daniel Yam Thiam Goh	13-14, 6-7

National Coordinator:

Professor Bee-Wah Lee

Children's Medical Center
National University Hospital
5 Lower Kent Ridge Rd

Singapore

Roles:

- National Coordinator for Singapore
- Phase One Principal Investigator for Singapore

The Singapore ISAAC Centre

As Singapore is a small city state, our ISAAC centre was also the national centre.

It provided us with important national epidemiology data on asthma, allergic rhinitis and eczema, which hitherto, was unavailable. The prevalence data has provided us with an important reference point for the planning of educational and awareness programs, medical programs for asthma and allergies in children, as well as scientific studies.

The ISAAC prevalence obtained for Singapore was very similar urban and developed communities in the Asian region, such as Japan and Korea, and were the highest for the Asia Pacific region. For example, the prevalence for Phase one survey on current wheeze for 6-7 years old was 13.3 in Korea, 15.7 in Singapore and 17.4 in Japan.

The team acknowledges the contribution of the many student helpers that contributed to the success of these studies.

National Publications

The following publications used ISAAC data from Singapore:

Goh DY, Chew FT, Quek SC, Lee BW. *Prevalence and severity of asthma, rhinitis, and eczema in Singapore schoolchildren.* Arch Dis Child 1996; 74(2): 131-5.

Chew FT, Goh DY, Lee BW. *Geographical comparison of the prevalence of childhood asthma and allergies in Singapore.* Ann Trop Paediatr 1999; 19(4): 383-90.

Chew FT, Goh DY, Lee BW. *Under-recognition of childhood asthma in Singapore: evidence from a questionnaire survey.* Ann Trop Paediatr 1999; 19(1): 83-91.

Wang XS, Tan TN, Shek LP, Chng SY, Hia CP, Ong NB, Ma S, Lee BW, Goh DY.*The prevalence of asthma and allergies in Singapore; data from two ISAAC surveys seven years apart.* Arch Dis Child.2004 May;89(5):423-6.

Wang XS, Shek LP, Ma S, Soh SE, Lee BW, Goh DYT.*Time trends of co-existing atopic conditions in Singapore school children: prevalence and related factors.* Pediatr Allergy Immunol 2010; 21 (1): e137-e141. E pub 21 Apr 2009.

South Africa, Africa

Centres:	Phase:	PI:	Age Groups
Cape Town	1	Dr Hugo Nelson	13-14
Cape Town	3	Professor Heather J Zar	13-14
Polokwane	3	Professor Kuku Voyi	13-14, 6-7

National Coordinator:

Professor Heather J Zar

Red Cross Childrens Hospital

Klipfontein Road
7th floor ICH Building
South Africa

Roles:

- National Coordinator for South Africa
- Phase Three Principal Investigator for Cape Town

ISAAC in South Africa

ISAAC Phase 1 in South Africa, done in Cape Town in 1995, under the direction of Dr Hugo Nelson, enrolled adolescents aged 13-14 years. ISAAC Phase 3 was performed in 2 centres, Cape Town in 2002 (led by Prof Heather Zar) and in Polokwane in 2004-2005 (led by Prof Kuku Voyi). Both these centres enrolled 13 to 14 year old adolescents, and in addition Polokwane also enrolled 6-7 year old children. These studies have greatly contributed to describing the burden of asthma, eczema and allergic rhinitis in South African children and the impact on quality of life. The ISAAC 3 studies showed that these diseases are common in both centres (asthma is now identified as one of the commonest chronic diseases in South African adolescents) and increasing in prevalence.

Although Cape Town and Polokwane represent very different parts of South Africa, and different populations, some of the results (such as the prevalence of asthma in 13 to 14 year old children) were strikingly similar. In addition, results of these studies have contributed to quantifying the burden of asthma in African children. This has been especially important as asthma has been considered to be relatively uncommon in African children, especially those in rural settings. The results of ISAAC 3 have shown a striking increase in asthma prevalence in many African countries, and prevalence rates that are similar to or higher than the global average. The results have also highlighted an emerging burden of childhood asthma in such settings, the relatively severe disease and the widespread problem of under diagnosis. Such information can greatly facilitate advocacy for better access to inhaled asthma medication and to appropriate management which remains a problem in many African settings.

Publications of the South African and African results include:

1. Wichmann J, Wolvaardt JE, Maritz C, Voyi KV. Household conditions, eczema symptoms and rhinitis symptoms: relationship with wheeze and severe wheeze in children living in the Polokwane area, South Africa. Matern Child Health J. 2009 Jan;13(1):107-18.
2. Zar HJ, Ehrlich RI, Workman L, Weinberg EG. The changing prevalence of asthma, allergic rhinitis and atopic eczema in African adolescents from 1995 to 2002. Pediatr Allergy Immunol. 2007 Nov;18(7):560-5.
3. Wichmann J, Wolvaardt JE, Maritz C, Voyi KV. Association between children's household living conditions and eczema in the Polokwane area, South Africa. Health Place. 2008 Jun;14(2):323-35.
4. Ait-Khaled N, Odhiambo J, Pearce N, Adjoh KS, Maesano IA, Benhabyles B,Bouhayad Z, Bahati E, Camara L, Catteau C, El Sony A, Esamai FO, Hypolite IE, Melaku K, Musa OA, Ng'ang'a L, Onadeko BO, Saad O, Jerray M, Kayembe JM, Koffi NB, Khaldi F, Kuaban C, Voyi K, M'Boussa J, Sow O, Tidjani O, Zar HJ. Prevalence of symptoms of asthma, rhinitis and eczema in 13- to 14-year-old children in Africa: the International Study of Asthma and Allergies in Childhood Phase III.v Allergy. 2007 Mar;62(3):247-58.
5. Mercer MJ, Joubert G, Ehrlich RI, Nelson H, Poyser MA, Puterman A, Weinberg EG. Socioeconomic status and prevalence of allergic rhinitis and atopic eczema symptoms in young adolescents. Pediatr Allergy Immunol. 2004 Jun;15(3):234-41.
6. Poyser MA, Nelson H, Ehrlich RI, Bateman ED, Parnell S, Puterman A, Weinberg E. Socioeconomic deprivation and asthma prevalence and severity in young adolescents. Eur Respir J. 2002 May;19(5):892-8.

Spain, Western Europe

Centres:	Phase:	PI:	Age Groups
Barcelona	1	Dr Rosa M Busquets	13-14
Bilbao	1	Dr Alfonso Delgado Rubio	13-14, 6-7
Cádiz	1	Dr Andrés Rabadán Asensio	13-14
Cartagena	1	Professor Luis García-Marcos	13-14, 6-7
Castellón	1	Dr Alberto Arnedo-Pena	13-14, 6-7
Madrid	1	Dr Gloria García-Hernández	13-14, 6-7
Pamplona	1	Professor Francisco Guillén-Grima	13-14, 6-7
Valencia	1	Professor Maria M. Morales-Suárez-Varela	13-14, 6-7
Valladolid	1	Professor Alfredo Blanco-Quirós	13-14
Almeria	2	Dr José Batlles-Garrido	10-11 years
Cartagena	2	Professor Luis García-Marcos	10-11 years
Madrid	2	Dr Gloria García-Hernández	10-11
Valencia	2	Professor Maria M. Morales-Suárez-Varela	10-11 years
A Coruña	3	Dr Angel López-Silvarrey Varela	13-14, 6-7
Almeria	3	Dr José Batlles-Garrido	13-14, 6-7
Asturias	3	Dr Ignacio Carvajal-Urueña	13-14, 6-7
Barcelona	3	Dr Rosa M Busquets	13-14, 6-7
Bilbao	3	Dr Carlos González Díaz	13-14, 6-7
Cartagena	3	Professor Luis García-Marcos	13-14, 6-7
Castellón	3	Dr Alberto Arnedo-Pena	13-14, 6-7
Madrid	3	Dr Gloria García-Hernández	13-14, 6-7
Pamplona	3	Professor Francisco Guillén-Grima	13-14, 6-7
San Sebastián	3	Professor Eduardo G Pérez-Yarza	13-14, 6-7
Valencia	3	Professor Maria M. Morales-Suárez-Varela	13-14, 6-7
Valladolid	3	Professor Alfredo Blanco-Quirós	13-14

The ISAAC Story

National Coordinator:

Professor Luis García-Marcos

Respiratory Medicine and Allergy Units
'Virgen de la Arrixaca' University Children's Hospital
University of Murcia
Pabellón Docente HUVA, Campus Ciencias de la Salud
Spain

Roles:

ISAAC Executive
ISAAC Steering Committee
National Coordinator for Spain
Phase One Principal Investigator for Cartagena
Phase Two Principal Investigator for Cartagena
Phase Three Principal Investigator for Cartagena

The ISAAC story in Spain

The story of ISAAC in Spain is quite intermingled with that of the centre in Cartagena. As told in more detail in the story of that centre, ISAAC started in Spain after a meeting held in Madrid in March 1993 with researchers coming from different parts of the country. Prof. Weiland, coordinator for Western Europe, and Prof. Pearce from the ISAAC Executive Committee -at that time at the University of Paris- attended to the meeting. Except for one, all attendees were starting Phase One some months after the meeting. It must be said that launching and coordinating of ISAAC in Spain was in great part possible by the interest of a person working for Glaxo at that time: Mr Claudio Jansen.

Phase One

Nine centres from all over Spain started ISAAC Phase One some time between autumn 1993 and spring 1994. Madrid was included in 1996. Most centres included children of the two age groups. ISAAC allowed having a very accurate picture of the prevalence of allergic diseases among children and adolescents in Spain for the first time. Spanish contributors were proud to offer ISAAC one of the most numerous populations within one country in this phase. The first shocking finding was that the prevalence of asthma on the coastal centres was higher than those on the central plateau.

Phase Two.

Spain was the only country to include four centres in this phase: Almería, Cartagena, Madrid and Valencia. The study was not easy as it took some time and effort to train all fieldworkers according to the workshops held in Munster which was the coordinating and data centre for this phase. All four centres chose the 100 wheezers plus 100 non-wheezers option in the bronchial challenge test and only Cartagena provided with house dust samples. Although a very effortful and time consuming phase, it has given much information about the risk factors of asthma and allergies, as well as many international publications.

Phase Three.

Most centres included in Phase One also performed Phase Three, thus providing with data on the change of the prevalence of allergic diseases in children in the country. Moreover, most centres included children from the two age-groups. All in all, 11 centres participated in this phase, many of which took advantage of the automatic scanning of questionnaires implemented in Cartagena. Apart from information about the change of prevalence, phase three has also provided with information about risk or protective factors with special interest in Spain such as, relative humidity, sunny hours, pollution, Mediterranean diet or paracetamol.

National Publications

The following publications used ISAAC data from Spain:

Busquets RM, Anto JM, Sunyer J, Sancho N, Vall O. *Prevalence of asthma-related symptoms and bronchial responsiveness to exercise in children aged 13-14 yrs in Barcelona, Spain.* Eur Respir J 1996; 9(10): 2094-8.

Fernández Benitez M, Guillén F, Marin B, Pajaron MJ, Brun C, Aguinaga I, Esteban MA, García B, Martínez González MA, Notivol P, Santos MA, Zapata MA. *International study of asthma and allergies in childhood.Results of the first phase of the I.S.A.A. C.project in Pamplona, Spain.* J Investig Allergol Clin Immunol 1996; 6(5): 288-93.

Grupo ISAAC Espana. *[Aims and methods of the ISAAC study (International Study of Asthma and Allergy in Childhood)].* An Sist Sanit Navar.1997 Jan-Apr;20(1):57-69.Spanish.

Pierdomenico R, Bonini S *Prevalence of paediatric asthma in Central Italy [Abstract]* Allergy 1997; 52(s37): 188

González Díaz C, Sánchez González E, García-Marcos L, Morato Rodríguez MD, Molina Zelaia I, Burgaleta Sagaseta A, Zaballa Gorordo J, Delgado Rubio A. *Prevalence and severity of asthma in 13-14-year-old children in Bilbao.[Spanish].* An Esp Pediatr.1998; 48(6): 608-14.

Aguinaga Ontoso I, Arnedo Peña A, Bellido J, Guillén-Grima F, Morales Suárez-Varela MM. *The prevalence of asthma-related symptoms in 13-14-year-old children from 9 Spanish populations. The Spanish Group of the ISAAC Study (International Study of Asthma and Allergies in Childhood).[Spanish].* Med Clin (Barc) 1999; 112(5): 171-5.(published erratum appears in Med Clin (Barc) 1999; 112(13):494).

Anonymous. *Prevalence of symptoms suggestive of allergic rhinitis and atopic dermatitis in adolescents (Spanish ISAAC Study Group).[Spanish].* An Esp Pediatr.1999; 51(4): 369-76.

Morales Suárez-Varela MM, González AL, Martínez Selva MI. *Socioeconomic risk factors in the prevalence of asthma and other atopic diseases in children 6 to 7 years old in Valencia Spain.* Eur J Epidemiol 1999; 15(1): 35-40.

Carvalho N, Fernández-Benitez M, Cascante L, Aguinaga I, Guillén F. *International Study of Asthma and Allergies in Childhood.Results on rhinitis of first phase in Pamplona, Spain.* Allergol Immunopathol (Madr). 2000 Jul-Aug;28(4):207-12.

García-Marcos Alvarez L, Martínez Torres A, Batllés-Garrido J, Morales Suárez-Varela MM, García Hernández G, Escribano Montaner A. *[International Study of Asthma and Allergies in Childhood (ISAAC) Phase II: Methodology and results of the participation rate in Spain].* An Esp Pediatr.2001 Nov;55(5):400-5.Spanish.

Busquets Monge RM, Vall Combelles O, Checa Vizcaino MA, García Algar O. *[Epidemiological features of exercise-induced bronchial hyperresponsiveness in children aged 13-14 years old in Barcelona (Spain)].* An Esp Pediatr.2002 Apr;56(4):298-303.Spanish.

Arnedo Peña A, García-Marcos L, Blanco-Quirós A, Martínez Gimeno A, Aguinaga Ontoso I, González Díaz C, Díaz Vazquez C, Busquets-Monge R, Morales Suárez-Varela MM, Batllés-Garrido J, López-Silvarrey Varela A, García de Andoin N. *[Time trends in prevalence of symptoms of allergic rhinitis in 13-14 year-old schoolchildren in 8 areas of Spain between 1993-1994 and 2001-2002 according to the International Study of Asthma and Allergies in Childhood (ISAAC)].[Spanish].* Med Clin (Barc) 2004; 123(13): 490-5.

García-Marcos L, Quirós AB, Hernández GG, et al. *Stabilization of asthma prevalence among adolescents and increase among schoolchildren (ISAAC phases I and III) in Spain.* Allergy 2004; 59(12):1301-1307.

Martin Fernández-Mayoralas D, Martin Caballero JM, García-Marcos AL. *Association between atopic dermatitis, allergic rhinitis and asthma in schoolchildren aged 13-14 years old.[article in spanish].* An Pediatr (Barc) 2004; 60(3):236-242.

Martin Fernández-Mayoralas D, Martin Caballero JM, García-Marcos AL. *Prevalence of atopic dermatitis in schoolchildren from Cartagena (Spain) and relationship with sex and pollution.[article in spanish].* An Pediatr (Barc) 2004; 60(6):555-560.

Mata Fernández C, Fernández-Benitez M, Pérez Miranda M, Guillén-Grima F. *Validation of the Spanish version of the Phase III ISAAC questionnaire on asthma.* J Investig Allergol Clin Immunol 2005; 15(3): 201-10.

Arnedo Peña A, García-Marcos L, García HG, et al. *Time trends and geographical variations in the prevalence of symptoms of allergic rhinitis in 6-7-year-old children from eight areas of Spain according to the ISAAC.[article in spanish].* An Pediatr (Barc) 2005; 62(3):229-236.

Blanco-Quirós A, García-Marcos L, Garrote JA, et al. *Antibody levels to Bordetella pertussis in 10-yr-old children with atopy and atopic asthma.* Pediatr Allergy Immunol 2005; 16(8):637-640.

García-Marcos L, Castro-Rodríguez JA, Morales Suárez-Varela MM, Batlles Garrido J, Hernandez GG, Gimeno AM, González AL, Ruíz TR, Torres AM. *A different pattern of risk factors for atopic and non-atopic wheezing in 9-12-year-old children.* Pediatr Allergy Immunol 2005; 16(6):471-477.

García-Marcos L, Morales Suárez-Varela MM, Canflanca IM, et al. *BCG immunization at birth and atopic diseases in a homogeneous population of Spanish schoolchildren.* Int Arch Allergy Immunol 2005; 137(4):303-309.

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García-Marcos L, Canflanca IM, Garrido JB, et al. *Relationship of asthma and rhinoconjunctivitis with obesity, exercise and Mediterranean diet in Spanish schoolchildren.* Thorax 2007; 62(6):503-508.

García-Marcos L, Garcia-Hernández G, Morales Suárez-Varela MM, Batlles Garrido J, Castro-Rodríguez JA *Asthma attributable to atopy: does it depend on the allergen supply?* Pediatr Allergy Immunol 2007; 18(3):181-187.

García-Marcos L, Sánchez-Solis M, Martínez-Torres AE, et al.*Phadiatop compared to skin-prick test as a tool for diagnosing atopy in epidemiological studies in schoolchildren.* Pediatr Allergy Immunol 2007; 18(3):240-244.

Morales Suárez-Varela MM, García-Marcos AL, González DC, et al. *Prevalence of atopic eczema and nutritional factors in 6-7 year old children.[article in spanish].* Aten Primaria 2007; 39(7):355-360.

López-Silvarrey Varela A, González Barcala FJ, Paz Esquete JJ, Pérez Castro TR, Valdes Cuadrado L, Castro Iglesias A. *[Prevalence of asthma and rhinitis symptoms in A Coruna (Spain)].* An Pediatr (Barc). 2007 Feb;66(2):146-53.Spanish.

Arnedo Peña A, Bellido-Blasco J, Puig-Barbera J, Artero-Civera A, Campos-Cruanes JB, Pac-Sa MR, Villamarin-Vazquez JL, Felis-Dauder C. *[Domestic water hardness and prevalence of atopic eczema in Castellon (Spain) school children].[Spanish].* Salud Publica Mex.49(4):295-301, 2007 Jul-Aug.

Tornador-Gaya E, Tosca-Segura R, Arnedo Peña A, Puig-Barbera J, Bellido-Blasco JB, Pac-Sa MR, Artero-Civera A, Campos-Cruanes JB, Museros-Recatala L. *[Incidence of allergic rhinitis in a cohort of schoolchildren between 1994 and 2002 in Castellon (Spain), following the ISAAC study].* An Pediatr (Barc). 2007 Feb;66(2):154-8.Spanish.

Arnedo A, Bellido JB, Pac MR, Artero A, Campos JB, Museros L, Puig-Barbera J, Tosca R, Tornador E. *[Incidence of asthma and risk factors in a cohort of schoolchildren aged from 6-7 years old to 14-15 years old in Castellon (Spain) following the International Study of Asthma and Allergies in Childhood (ISAAC)].* Med Clin (Barc). 2007 Jun 30;129(5):165-70.Spanish.

Fernandez-Benitez M, Antnon J, Grima FG. *Risk factors associated to the prevalence of asthma in adolescence.* Allergol Immunopathol (Madr). 2007; 35(5):193-196

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Morales Suárez-Varela MM, García-Marcos Alvarez L, Kogan MD, González AL, Gimeno AM, Ontoso IA, Díaz CG, Arnedo Peña A, Aurrecoechea BD, Monge RM, Quirós AB, Garrido JB, Canflanca IM, López-Silvarrey Varela A. *Climate and prevalence of atopic eczema in 6- to 7-year-old school children in Spain.ISAAC phase III.* Int J Biometeorol.2008 Nov;52(8):833-40.Epub 2008 Sep 9.

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Pac-Sa MR, Museros-Recatala L, Arnedo Peña A, Bellido-Blasco JB, Puig-Barbera J, Artero-Sivera A, Campos-Cruanes JB, Aguinaga-Ontoso I. *[Risk factors for symptoms of allergic rhinitis in adolescents in Castellon, Spain].* Rev Panam Salud Publica.2008 May;23(5):333-40.Spanish.

García-Marcos L, Batllés-Garrido J, Blanco-Quirós A, García-Hernández G, Guillén-Grima F, González Díaz C, García-Merino A, Arnedo Peña A, Busquets-Monge RM, Morales Suárez-Varela MM, López-Silvarrey-Varela A, García-Andoin N. *Influence of two different geo-climatic zones on the prevalence and time trends of asthma symptoms among Spanish adolescents and schoolchildren.* Int J Biometeorol.2009 Jan;53(1):53-60.Epub 2008 Oct 30.

Arnedo Peña A, García-Marcos L, Carvajal Urueña I, Busquets Monge R, Morales Suárez-Varela MM, Miner Canflanca I, Batllés-Garrido J, Blanco Quirós A, López-Silvarrey Varela A, García Hernández G, Aguinaga Ontoso I, González Díaz C. *Air Pollution and Recent Symptoms of Asthma, Allergic Rhinitis, and Atopic Eczema in Schoolchildren Aged Between 6 and 7 Years.[Article in Spanish].* Arch.Bronconeumol.2009;45(5):224-9.Epub Feb 2009.

Arnedo Pena A, Puig-Barbera J, Bellido-Blasco JB, Pac-Sa MR, Campos-Cruanes JB, Artero-Sivera A, Museros-Recatala L. *Risk factors and prevalence of asthma in schoolchildren in Castellon (Spain): a cross-sectional study.* Allergol Immunopathol (Madr). 2009; 37(3):135-142.

García-Marcos L, Ruiz TR, García-Hernández G, Morales Suárez-Varela MM, Valverde-Molina J, Sánchez-Solis M. *Asthma and rhinoconjunctivitis comorbidity: United airway disease or inherited target organs?* Pediatr Allergy Immunol 2010; 21 (1): e142-e148. E pub 7 Apr 2009.

Batllés-Garrido J, Torres-Borrego J, Bonillo-Perales A, Rubí-Ruiz T, González-Jiménez Y, Momblán De Cabo J, Aguirre-Rodríguez J, Jiménez Liria R, Losillas-Maldonado A, Torres-Daza M. *Prevalence and factors linked to atopic eczema in 10- and 11-year-old schoolchildren. Isaac 2 in Almeria, Spain* Allergol Immunopathol(Madr). 2010; 38(4): 174–180. epub May

Batllés-Garrido J, Torres-Borrego J, Rubí-Ruiz T, Bonillo-Perales A, González-Jiménez Y, Momblán De Cabo J, Aguirre-Rodríguez J, Losillas-Maldonado A, Torres-Daza M. *Prevalence and factors linked to atopy in 10-and 11-year-old children in Almería, Spain* Allergol Immunopathol (Madr). 2010; 38(1):13-9.

Batlles-Garrido J, Torres-Borrego J, Rubí-Ruiz T, Bonillo-Perales A, González-Jiménez Y, Momblán-De Cabo J, Aguirre-Rodríguez J, Losillas-Maldonado A, Torres-Daza M. *Prevalence and factors linked to allergic rhinitis in 10 and 11-year-old children in Almería. Isaac Phase II, Spain* Allergol Immunopathol (Madr). 2010;38(3):135-41.

García-Marcos L, González-Díaz C, Garvajal-Urueña I, Pac-Sa MR, Busquets-Monge RM, Suárez-Varela MM, Batlles-Garrido J, Blanco-Quirós A, Varela Á L-S, García-Hernández G, Aguinaga-Ontoso I. *Early exposure to paracetamol or to antibiotics and eczema at school age: modification by asthma and rhinoconjunctivitis.* Pediatr Allergy Immunol 2010; 21(7): 1036-1042. Epub 28 Jun

Morales Suárez-Varela M, García-Marcos L, Kogan MD, Costa Ferreira J, Martínez Gimeno A, Aguinaga Ontoso I, González Díaz C, Arnedo Pena A, Domínguez Aurrecoechea B, Busquets Monge RM; Blanco Quiros A, Batlles Garrido J, García de Andoain N, López-Silvarrey Varela Á, García Merino A, Gimeno Clemente N, Llopis González A. *Diet and Prevalence of Atopic Eczema in 6 to 7-Year-Old Schoolchildren in Spain: ISAAC Phase III* J Investig Allergol Clin Immunol 2010; 20(6): 469-475

Arnedo-Pena A, García-Marcos L, Fernández-Espinar JF, Bercedo-Sanz A, Aguinaga-Ontoso I, González-Díaz C, Carvajal-Urueña I, Busquet-Monge R, Suárez-Varela MM, de Andoín NG, Batlles-Garrido J, Blanco-Quirós A, López-Silvarrey Varela A, García-Hernández G *Sunny hours and variations in the prevalence of asthma in schoolchildren according to the International Study of Asthma and Allergies (ISAAC) Phase III in Spain* Int J Biometeorol 2011; 55(3): 423-434

Sri Lanka, Indian Sub-Continent

Centres:	Phase:	PI:	Age Groups
Sri Lanka	3	Dr Kirthi D Gunasekera	13-14, 6-7

National Coordinator:

Dr Kirthi D Gunasekera

Consultant Chest Physician
Respiratory Disease Control Programme
Chest Clinic
Ministry of Health, General Hospital Badulla
Sri Lanka

Roles:

- National Coordinator for Sri Lanka
- Phase Three Principal Investigator for Sri Lanka

The ISAAC Story

Sudan, Africa

Centres:	Phase:	PI:	Age Groups
Khartoum	3	Professor Omer Abdel Aziz Musa	13-14

National Coordinator:

Dr Asma El Sony

Epi lab Director
AMST
EPI LAB

Sudan

Roles:

- National Coordinator for Sudan

ISAAC in Sudan

The International Study of Asthma and Allergies in Childhood (ISAAC) in Sudan wasthe first collaboration work between Dr Asma Elsony (Epi-Lab) and Pro Omer Musa (Ribat uinveristy). The preparation for ISAAC study started in 2002; the questionnaire was translated to Arabic by professional translator and checked, over 3000 copy were printed and Khartoum (the capital) was chosen as a research site.

The data collection took place between February-September 2003, number of student included in the in the study was 3000, their age was 13 to 14 and they were included from 55 school. Data was entered, and analyzed by Epi info 6. The collaboration between the Epi-Lab and Ribat university made it possible to carry the activities; the data was collected through the Ribat university and the data entry and analysis was done in the Epi-Lab; we have to mention here that when the data was submitted to the regional coordinator and analyzed it showed that Sudan had the highest percentage of heavy truck passing near the houses. This percentage appeared higher than expected, therefore we checked the questionnaire and we found that heavy truck was translated mistakenly in Arabic to a car. Consequently that question was eliminated from the analysis.

The most especial about the ISAAC in Sudan is that the partnership established between the Epi-Lab and Ribat University in 2002 continued up to date. The Epi-Lab and Ribat university together conducted 7 studies. Two of these studies used the same questionnaire and investigated asthma and allergies in children in rural areas (Atbra and Algadarif). The prevalence of asthma in rural areas is around 5% , a percentage much lower than that in Khartoum state (12.5%), the studies are not published. ISAAC questionnaire was later modified to study the prevalence of asthma in adult communities (five universities students in five sates) and consequently several papers were published in the International Journal of Tuberculosis and Lung Disease.

Sweden, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Linköping	1	Professor N-I Max Kjellman	13-14, 6-7
Stockholm/Uppsala	1	Dr Tony Foucard	13-14, 6-7
Linköping	2	Dr Lennart Bråbäck	10-11
Östersund	2	Dr Lennart Bråbäck	10-11
Linköping	3	Dr Hartmut Vogt	13-14, 6-7

National Coordinator:

Dr Lennart Nilsson

Department of Molecular and Clinical Medicine
Division of Pediatrics
University Hospital, Linköping

Sweden

Roles:

- National Coordinator for Sweden

Dr Lennart Bråbäck

Sundsvall Hospital

Mid Sweden Research and Development Centre

Sweden

Roles:

- National Coordinator for Sweden
- Phase Two Principal Investigator for Linköping, Östersund
- National Coordinator for Sweden Phase Two

Study sites in Sweden were Linköping in phase I, II and III and Östersund in phase II Linköping in Southern Sweden (latitude 588) is the fifth largest city in Sweden and is currently undergoing expansion with a university and several large sites of industry. At the time of ISAAC Phase II in 1997, the population was 132,089 (24% of whom were below 20 years of age). Östersund is an administrative center in Northern Sweden (latitude 618) with sparsely populated surroundings. In 1997, the total population in Östersund was 59,188 (23 % of whom were below 20 years of age).

As a member of the international steering committee and the regional coordinator in Eastern Europe, professor Bengt Björkstén had an important role as a promoter of the ISAAC studies in Sweden. The ISAAC study phase II was carried out in close cooperation with the study centres in Estonia and the field workers were trained together in skin prick test technique and bronchial hyperreactivity tests.

In phase II, clusters of children were randomly selected in each centre for the study, using schools as sampling units. In Linköping, the survey involved 15 schools and in Östersund all schools were selected due to the lower population. All 10-11 years old children (forms 4 and 5) were invited to participate in skin prick tests and parental questionnaires. Information on anthropometric measures at birth and pre- and perinatal exposures were collected from the medical birth registry. The local mass medias paid a great deal of attention to the study, particularly in Östersund. The participation rates in the questionnaire study were 82% in Linköping and 86% in Östersund. All children with a history of wheeze in the past 12 months as reported in the parental questionnaires and a random sample of non-wheezing children from the original cohorts were invited to a case-control study, which included parental questionnaire, examination for flexural dermatitis and bronchial challenge with hypertonic saline.

The sensitivity of hypertonic saline challenge test to detect asthma ever, current asthma and current atopic asthma was 62, 61 and 83%, and the specificity was 83, 81 and 60%, respectively. Also, the degree of bronchial hyperresponsiveness increased with the number of wheezy episodes. It was concluded that hypertonic saline provocation test is useful as a tool to detect asthma in epidemiological studies in children. Xiao-Mei Mai, a talented researcher, now working in Norway, wrote her thesis using data from ISAAC phase II and Professor Ulrich Wahn, Humboldt University Berlin, was her opponent.

For ISAAC III paediatrician Hartmut Vogt and the study nurses Kicki Helander and Ing-Marie Sandberg were at all schools in the municipality of Linköping evaluating children for asthma and allergy. When watching different clips of the ISAAC video questionnaire, many of the children first laughed quietly at the children in the film clips but after a while some of them seemed to become aware that this was their own problems that were shown. In almost every school, several children stayed afterwards and discussed their health problems with our research group/staff and talked about the possibilities they had, to get rid of their symptoms. This was really a sudden insight for many of the children (and us). The photo, taken by the local newspaper, shows some children and one of our research nurses.

When comparing the results from ISAAC III with ISAAC I we could, for the first time, see a decrease in the incidence of asthma symptoms in Sweden. The 12-month prevalence of wheezing in Linköping decreased from 11.2% to 9.7% among 13-14 years old children.

National Publications

The following publications used ISAAC data from Sweden:

Nilsson L, Castor O, Löfman O, Magnusson A, Kjellman N-IM. *Allergic disease in teenagers in relation to urban or rural residence at various stages of childhood.* Allergy 1999; 54(7): 716-721.

Annus T, Björkstén B, Mai XM, Nilsson L, Riikjärv MA, Sandin A, Bråbäck L. *Wheezing in relation to atopy and environmental factors in Estonian and Swedish schoolchildren.* Clin Exp Allergy 2003; 31(12): 1846-53.

Bråbäck L, Kjellman NI, Sandin A, Björkstén B *Atopy among schoolchildren in northern and southern Sweden in relation to pet ownership and early life events* Pediatr Allergy Immunol. 2001;12:4-10.

Mai X-M, Nilsson L, Kjellman N-IM, Björkstén B. *Hypertonic saline challenge tests in the diagnosis of bronchial hyperresponsiveness and asthma in children.* Pediatr Allergy Immunol 2002; 13(5): 361-7.

Mai X-M, Nilsson L, Bråbäck L, Sandin A, Kjellman N-IM, Björkstén B. *High body mass index, asthma and allergy in Swedish schoolchildren participating in the International Study of Asthma and Allergies in Childhood: Phase II.* Acta Paediatr 2003; 92(10): 1144-48.

Sandin A, Annus T, Björkstén B, Nilsson L, Riikjärv MA, van Hage-Hamsten M, Bråbäck L. *Prevalence of self-reported food allergy and IgE antibodies to food allergens in Swedish and Estonian schoolchildren.* Eur J Clin Nutr.2005 Mar;59(3):399-403.

Syria, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Aleppo	3	Dr Khaldoun Tabbah	13-14
Lattakia	3	Professor Yousser Mohammad	13-14, 6-7
Tartous	3	Dr Samira Mohammad	13-14, 6-7

National Coordinator:

Dr Samira Mohammad

Head of Paediatrics Department

PO Box 2500

Syria

Roles:

- National Coordinator for Syria
- Phase Three Principal Investigator for Tartous

National Publications

The following publications used ISAAC data from Syria:

Mohammad Y, Tabbah K, Mohammad S, Yassine F, Clayton T and Hassan M*International Study of Asthma and Allergies in Childhood: phase 3 in the Syrian Arab Republic* East Med Health J 2010; 16(7): 710-716

Taiwan, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Taipei	1	Professor Kue-Hsiung Hsieh	13-14, 6-7
Taipei	3	Dr Jing-Long Huang	13-14, 6-7
Taoyuan	3	Dr Chun-Chieh Kao	13-14, 6-7

National Coordinator:

Dr Jing-Long Huang

Chief, Department of Pediatrics
Chang Gung Children's Hospital
5, Fu-Hsin Street
Kweishan
Taiwan

Roles:

- National Coordinator for Taiwan
- Phase Three Principal Investigator for Taipei

About Taiwan

Taiwan is located on the east coast of Asia in the Western Pacific. There are 22.9 million people, and the land area is 36,188 km2; therefore, the population density is 636/km2, which is second rank in the world. Taiwan is noted for her subtropical climate. The average monthly temperature in the lowlands is 16oC in the winter and ranges between 24 to 30oC in the rest of the year. The average relative humidity is 78% year around. The gross domestic product (GDP) per person was USD 16,423 in 2010. A compulsory National Health Insurance (NHI) was implemented in Taiwan since 1995, and more than 96% of the population is covered by this system. The participation rate of medical institutions was around 94% nationwide.

Background

The first prevalence survey of childhood asthma was conducted by Professor Hsieh in 1974. It was reported that the childhood asthma prevalence was 1.3%. In 1985, prevalence survey in school children in Taipei city was investigated again and it was found increasing to 5.0%. Tsuang et al. had reported the prevalence of childhood asthma as 6.5% in 1993 and 8.5% in 1997 in Tainan City. However, neither of the questionnaires used in these local studies was standardized. It is better to have a constructed and validated tool to investigate the prevalence.

ISAAC Findings

Asthma, allergic rhinitis, and atopic dermatitis are very common allergic diseases in Taiwan. Although there were some reports that the prevalence of asthma might reach a plateau in western countries, the increasing prevalence of asthma and allergic rhinitis is still prominent in Taiwan. According to the International Study of Asthma and Allergies in Childhood (ISAAC) survey in different parts of Taiwan, the asthma prevalence rate was 16.8% to 19.7% in children of age 6-7 years, and 10.8% to 14.3% in age of 13-14 years. The average admission rate of childhood asthma was 105.0 per 100,000 populations. However, the admission rate was significantly lower in children than in adults

In addition to asthma, allergic rhinitis had an even higher prevalence rate than asthma. From a survey for 2,240 six- to seven-year-old children, 47.7% suffered from rhinitis, but only 10.7% of them were not troubled by it in their daily activities. As for physician-diagnosed allergic diseases, the prevalence was 24.6% for rhinitis and 18.0% for eczema, respectively.

Impact of ISAAC in Taiwan

From phase I to III of ISAAC survey, asthma prevalence in children was increasing in Taiwan. It was hard to ascribe to one specific reason to explain this phenomenon. However, improving awareness of disease entity might in part explain this condition. For improving asthma care in children, asthma education course was developed and conducted to all school nurses in Taiwan. This was shown to have greatly improved their asthma knowledge. The program, supported and funded by the government, was also extended to public health nurses and teachers in kindergarten in the past five years. It was also shown to improve the participants' competence on asthma care. Till now, there have been more than 2,000 school nurses and 500 community nurses who have taken the asthma education course. One of the purposes of the course is to be able to recognize the symptoms of asthma and have the patients receive appropriate treatment as early as possible. Asthma education is much more emphasized than ever. The knowledge of asthma care among patients and physicians should be reinforced by a continued educational program.

Thailand, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Bangkok	1	Dr Pakit Vichyanond	13-14, 6-7
Chiang Mai	1	Associate Professor Muthita Trakultivakorn	13-14, 6-7
Bangkok	3	Dr Pakit Vichyanond	13-14, 6-7
Chantaburi	3	Dr Thanong Prasarnphanich	13-14, 6-7
Chiang Mai	3	Associate Professor Muthita Trakultivakorn	13-14, 6-7
Chiangrai	3	Dr Rawee Nettagul	13-14, 6-7
Khon Kaen	3	Associate Professor Jamaree Teeratakulpisarn	13-14, 6-7
Nakorn Pathom	3	Dr Aree Kongpanichkul	13-14, 6-7

National Coordinator:

Dr Pakit Vichyanond

Faculty of Medicine Siriraj Hospital
Mahidol University
2 Prannok Road
Siriraj Bangkoknoi
Thailand

Roles:

- National Coordinator for Thailand
- Phase One Principal Investigator for Bangkok
- Phase Three Principal Investigator for Bangkok

ISAAC in Thailand

In the early 1990, Richard Beasley visited me (Pakit Vichyanond) at my medical school (Faculty of Medicine Siriraj Hospital) to invite myself to function as a Thailand coordinator for starting ISAAC study in Thailand. The idea struck me so much and I immediately accepted the offer. Professor Montri Tuchinda – my predecessor – had earlier performed questionnaire survey among children and medical students in Bangkok and demonstrated prevalence of asthma among children in Thailand to be only 4%. Such figure seemed to be too low for specialists in the field. We were in need of more well defined questionnaire survey and the idea of ISAAC was the perfect match for us at that time.

We were earlier assigned to the West Asia (Prof Shah, India) section of the ISAAC. The translation and back transferred of the data was done very quickly by a group of pediatric allergists in Thailand. At this time, the group of pediatric allergist/immunologists in the Asia Pacific region was well organized and thus Thailand was transferred to the East Asia region under Chris Lai (Hong Kong) as the regional coordinator. The initial survey was earlier launched in Bangkok by my group. In order to spread the survey across the Bangkok Metropolitan area, we mapped out schools to be surveyed to cover the entire Bangkok region. In addition, we balanced the schools to be equally include private and public schools. The high prevalence of asthma prevalence from the first survey was made known to the public (13%). In fact this figure was not that much different from figures all over Asia. This brought about a high degree of publicity among the Thai medical community since it represented such a large increase in load of asthmatic children. Additional centers from various parts of the countries including Chiangmai, Khon Kaen, Nakorn Pathom, and others applied for participating in the survey. In total, 10 centers all over the country were included (however, not all data were submitted to ISAAC center in Auckland). Results from these centers confirmed that the high prevalence of asthma (around 10%), allergic rhinitis (40%) and atopic dermatitis (10%) were corrected throughout the country. Results from Chantaburi center (east of Thailand) showed prevalence of asthma of 16%!!!

National Publications

The following publications used ISAAC data from Thailand:

Vichyanond P, Jirapongsananuruk O, Visitsunthorn N, Tuchinda M. *Prevalence of asthma, rhinitis and eczema in children from the Bangkok area using the ISAAC (International Study for Asthma and Allergy in Children) questionnaires.* J Med Assoc Thai 1998; 81(3): 175-84.

Trakultivakorn M, Sangsupawanich S, Vichyanond P. *Time trends of the prevalence of asthma, rhinitis and eczema in Thai children-ISAAC (International Study of Asthma and Allergies in Childhood) Phase Three.* J Asthma 2007; 44(8): 609-11.

The ISAAC Story

The Bangkok center launched their own version of ISAAC-II but due to slight variation of their methods from the official ISAAC-II, the results were not included for ISAAC-II analysis. Results of this investigation are available from myself.

Two centers, Bangkok and Chiangmai participated in ISAAC Phase One and Three time trends. Increase in prevalence was documented from the Bangkok center whereas Chiangmai center showed plateau to slight decline. Results of environment and other factors in this ISAAC-III were used in subsequent analysis forming the report by the ISAAC committee. In addition, ISAAC questionnaire survey was conducted among University students in Bangkok and data among these students were quite similar to those in children

Overall, ISAAC investigation has been well received in Thailand. This has brought a great enthusiasm on allergic diseases in children. We are keen to participate in further investigations with ISAAC committee.

Regional
National
Thailand
Togo
Tokelau
Tonga
Trinidad and Tobago
Tunisia
Local

Togo, Africa

Centres:	Phase:	PI:	Age Groups
Lome	3	Professor Osseni Tidjani	13-14

Togo has no National Coordinator

Tokelau, Oceania

Centres:	Phase:	PI:	Age Groups
Tokelau	3	Dr Tekie Iosefa	13-14

National Coordinator:

Dr Tekie Iosefa

Chief Health Advisor
Ministry of Health

Tokelau

Roles:

- National Coordinator for Tokelau
- Phase Three Principal Investigator for Tokelau

Tonga, Oceania

Centres:	Phase:	PI:	Age Groups
Nuku alofa	3	Dr Sunia Foliaki	13-14

National Coordinator:

Dr Toakase Fakakovi

Paediatrician
Vaiola Hospital
Box 69

Tonga

Roles:

- National Coordinator for Tonga

Trinidad and Tobago, North America

Centres:	Phase:	PI:	Age Groups
St Augustine	3	Dr Michelle A Monteil	13-14, 6-7
Tobago	3	Dr Michelle A Monteil	13-14, 6-7

Trinidad and Tobago has no National Coordinator

Tunisia, Africa

Centres:	Phase:	PI:	Age Groups
Sousse	1	Professeur Mohamed Jerray	13-14
Grand Tunis	3	Professeur Faouzia Khaldi	13-14
Sousse	3	Professeur Mohamed Jerray	13-14

Tunisia has no National Coordinator

Turkey, Western Europe

Centres:	Phase:	PI:	Age Groups
Ankara	2	Dr Yildiz Saraçlar	8-11 y.

Turkey has no National Coordinator

National Publications

The following publications used ISAAC data from Turkey:

Saraçlar Y, Kuyucu S, Tuncer A, Sekerel B, Saçkesen C, Kocabas C. *Prevalence of asthmatic phenotypes and bronchial hyperresponsiveness in Turkish schoolchildren: an International Study of Asthma and Allergies in Childhood (ISAAC) study*. Ann Allergy Asthma Immunol.2003 Nov;91(5):477-84.Erratum in: Ann Allergy Asthma Immunol.2004 Jan;92(1):87.

Kuyucu S, Saraçlar Y, Tuncer A, Saçkesen C, Adalioglu G, Sümbüloglu V, Sekerel BE. *Determinants of atopic sensitization in Turkish school children: Effects of pre and post-natal events and maternal atopy*. Pediatr Allergy Immunol 2004; 15(1): 62–71.

Kuyucu S, Saraçlar Y, Tuncer A, Geyik PO, Adalioglu G, Akpinarli A, Sekerel BE, Sumbuloglu V. *Epidemiologic characteristics of rhinitis in Turkish children: the International Study of Asthma and Allergies in Childhood (ISAAC) phase 2*. Pediatr Allergy Immunol.2006 Jun;17(4):269-77.

Ukraine, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Kharkiv	1	Associate Professor Viktor Ognev	13-14, 6-7
Kharkiv	3	Associate Professor Viktor Ognev	13-14, 6-7
Rural Kharkiv	3	Associate Professor Viktor Ognev	13-14, 6-7

National Coordinator:

Associate Professor Viktor Ognev

Head, Department of Social Medicine
Organization and Economics of Public Health
Kharkov State Medical University
4 Lenin Avenue
Ukraine

Roles:

- National Coordinator for Ukraine
- Phase One Principal Investigator for Kharkiv
- Phase Three Principal Investigator for Kharkiv, Rural Kharkiv

Ukraine

Ukraine is a sovereign state in the Eastern Europe. In 1991 Ukraine declared itself an independent state.

- Capital: the City of Kyiv.
- Population: 47 million people.
- Religions: Christianity, Islam.
- Climate: moderate, an average temperature in January is -7°C and +23°C in June.

Ukraine stretches 893 kilometers from North to South and 1316 kilometers from West to East. Ukraine is situated in the middle latitudes and has outlets to the Black Sea and the Sea of Azov. It occupies one of the first places among the European countries in area extent. Due to the favourable geographical position in the centre of Europe and divaricated network of air, railway, sea and automobile transport Ukraine is a transit country for passengers and freights from different states. Ukraine is one of the quietest and most stable among the former USSR countries. It is acknowledged as offering high quality of life. The Ukrainian nation is widely known for hospitality. The Ukrainians are always glad to welcome guests who feel here at home.

Kharkiv

Kharkiv is the second largest city in Ukraine; its area is more than 300 km2. The city was founded in 1654. The population of the city is over 1.5 million people. In the city there is an international airport increasing a number of flights every year, railway and bus stations. A well-developed network of underground lines and other city transport (trolley buses, trams, buses, and taxis) provide transportation in the city. Kharkiv is a cultural centre. There are 10 theatres, concert halls, a city picture gallery, museums, about 80 libraries, art monuments, temples, a circus, the Chamber Music Hall, disco clubs. Kharkiv is a city of students. It takes

one of the leading places in Ukraine in the number of higher educational establishments (31). Today 300,000 students are trained in higher educational establishments, including 11,800 from more than 106 nations of the world. Every year more than 30,000 young specialists graduate from higher educational establishments in Kharkiv. Kharkiv is the leading scientific center of Ukraine. There are 3 Nobel Prize winners from Kharkiv scientific school:

Semen Abramovich Kuznets - in Economics;
Ilya Ilyich Mechnikov - in Physiology and Medicine;
Lev Davydovich Landau- in Physics.

Kharkiv National Medical University

Kharkiv National Medical University was the first higher medical educational institution in Ukraine.

The University was founded in 1805 as the Medical Faculty of Kharkiv Emperor University.
In 1920, the Medical Faculty was united with the Women's Medical Institute, and Kharkiv Medical Academy was organized.
In 1921, the Academy was renamed as Kharkiv Medical Institute.
In 1994, the Institute served as a base for establishing Kharkiv State Medical University.
Since 1998 the University has been a member of the International Association of Universities (under the aegis of UNESCO).
In 2007 the President of Ukraine issued the order to assign the National status to the University.
The Diploma of Kharkiv National Medical University is prestigious and recognized in many nations of the world. KhNMU is listed in the World Health Organization (W.H.O.) directory of medical schools.

Kharkiv National Medical University is worldwide known for high grade education. Due to favourable references of international educational and medical organizations and associations, the diploma of KhNMU is a reliable pledge of perspective career and prosperity for its graduates. Among foreign citizens who were our students there are outstanding personalities who have significantly succeeded as professionals. And this all began far in 1951 when 2 citizens of Czechoslovakia and 1 citizen of Poland came to study at Kharkiv Medical Institute and they were its first foreign graduates in 1957.

Over the next years, educational contacts of KhNMU have significantly expanded. Our University is continuously selected as a place of study by many foreign representatives.

Annually the University enrolls approximately 500 foreign citizens in the first year. The University is currently training more than 5,000 students, among them about 2,000 are foreign citizens from 60 nations including Bahrain, Belgium, China, Denmark, Germany, Israel, Jordan, India, Kenya, Lebanon, Malaysia, Mauritius, Morocco, Nigeria, Peru, Russia, Sudan, Syria, Tunisia, USA, and others. Foreign students study at the Faculty for Training Foreign Students, the Preparatory Department, or undergo the clinical postgraduate course.

About 6,000 specialists from 86 states of Europe, Asia, Africa, Latin America, Middle East have graduated from KhNMU since 1951. Among them there are 3 Doctors and 80 Candidatesof Medical Science, more than 300 postgraduates.

Department of social medicine, organization and economic of Public Health service.

History Department of social medicine, organization and economic of Public Health service of Kharkiv National medical university began from 27 of October 1923 and this department was first in Ukraine. Minister of Public Health service of Ukraine M.G. Gurevich was the founder of the Department.

It were 5 Heads of Department during the department's of social medicine, organization and economic of Public Health service work. There are: professor M.G. Gurevich (1923 – 1925), professor S.A. Tomilin (1925 – 1932), professor Z.A. Gurevich (1932 – 1974), professor N.A. Galicheva (1972 – 2002) and professor V.A. Ognev (from 2002 till now). The staff of teachers consist 16 persons. There are 3 professors (V.A. Ognev, N.A. Galicheva, K.M. Sokol), 3 vice professor and teachers. Many disciplines are studied by department. There are: History of medicine, Biostatistic, Public Health, Economy of Public Health. Over the years the department had issued 23 books, 5 textbooks and teaching aids, granted 8 patents. Since 1998, the Department is the national focal points of the international program "ISAAC" on the study of bronchial asthma in children in Ukraine. At the present stage of work the Department has taken part in international grant project "Intas", carrying the theme "Epidemiological study reproductive function of Ukraine's population, which is influenced by biologically persistent organochlorine compounds (dioxins) environment.

United Kingdom, Western Europe

Centres:	Phase:	PI:	Age Groups
Anglia and Oxford	1	Professor H Ross Anderson	13-14
North east and Yorkshire	1	Professor H Ross Anderson	13-14
North Thames	1	Professor H Ross Anderson	13-14
North West	1	Professor H Ross Anderson	13-14
Scotland	1	Professor H Ross Anderson	13-14
South and West	1	Professor H Ross Anderson	13-14
South Thames	1	Professor H Ross Anderson	13-14
Sunderland	1	Dr Mohammad H Shamssain	13-14, 6-7
Surrey/Sussex	1	Professor David Strachan	13-14
Trent	1	Professor H Ross Anderson	13-14
Wales	1	Professor H Ross Anderson	13-14
West Midlands	1	Professor H Ross Anderson	13-14
West Sussex	2	Professor David Strachan	
North Thames	3	Professor H Ross Anderson	13-14
Scotland	3	Dr Jane B Austin	13-14
South Thames	3	Professor H Ross Anderson	13-14
Sunderland	3	Dr Mohammad H Shamssain	13-14, 6-7
Surrey/Sussex	3	Professor David Strachan	13-14
Wales	3	Dr Michael Burr	13-14

National Coordinator:

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for Anglia and Oxford, North east and Yorkshire, North Thames, North West, Scotland, South and West, South Thames, Trent, Wales, West Midlands
- Phase Three Principal Investigator for North Thames, South Thames

ISAAC Perspective of National Coordinator – United Kingdom

Representatives from the UK were closely associated with the development of ISAAC (HR Anderson, ML Burr, B Sibbald, DP Strachan, H Williams) and have had a continuing role in the Steering Group and Executive Committee. The UK has participated in all phases of ISAAC including the early study of asthma using the video questionnaire in the counties of Surrey and Sussex .

With funding from the National Asthma Campaign we conducted Phase One in 13-14 year-olds on a nationwide basis by sampling a high school from every county in England, Scotland and Wales. The regions of England were used to define ISAAC “centres” for the purposes of international reporting, but national publications were also prepared using the combined dataset.

Phase One fieldwork was carried out concurrently in the Channel Islands (Jersey and Guernsey) and the Isle of Man. Independently, a survey of 6-7 year-olds was carried out in Sunderland. A special feature of Phase One in the UK was the inclusion of a questionnaire on domestic pollution sources, which was a precursor to the environmental risk factor questionnaire used internationally in Phase Three.

Schools from the West Sussex area of southern England participated in Phase Two.

Again with support from the National Asthma Campaign, the UK successfully completed Phase Three studies in the all of the centres that took part in Phase One, with the exception of England where the survey was repeated only in South East England (London and its surrounding counties).

National Publications

The following publications used ISAAC data from United Kingdom:

Kaur B, Anderson HR, Austin J, Burr M, Harkins LS, Strachan DP, Warner JO. *Prevalence of asthma symptoms, diagnosis, and treatment in 12-14 year old children across Great Britain (International Study of Asthma and Allergies in Childhood, ISAAC UK).* BMJ 1998; 316(7125): 118-24.

Austin JB, Kaur B, Anderson HR, Burr M, Harkins LS, Strachan DP, Warner JO. *Hay fever, eczema, and wheeze a nationwide UK study (ISAAC, international study of asthma and allergies in childhood).* Arch Dis Child 1999; 81(3): 225-30.

Burr ML, Anderson HR, Austin JB, Harkins LS, Kaur B, Strachan DP, Warner JO. *Respiratory symptoms and home environment in children a national survey.* Thorax 1999; 54: 27-32.

Priftanji A, Strachan D, Burr M, Sinamati J, Shkurti A, Grabocka E, Kaur B, Fitzpatrick S. *Asthma and allergy in Albania and the UK.* Lancet 2001; 358(9291):1426-7.

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey.* BMJ 2004; 328(7447): 1052-3.

Austin JB, Selvaraj S, Godden D, Russell G. *Deprivation, smoking and quality of life in asthma.* Arch Dis Child 2005; 90(3): 253-7.

The ISAAC Story

USA, North America

Centres:	Phase:	PI:	Age Groups
Chicago (3)	1	Professor Victoria Persky	13-14
Chicago (4)	1	Professor Victoria Persky	13-14
Seattle	1	Professor Gregory J Redding	13-14
Chapel Hill	3	Dr Karin Yeatts	13-14
Sarasota	3	Dr Hugh H Windom	13-14
Seattle	3	Professor Gregory J Redding	13-14

USA has no National Coordinator

Uruguay, Latin America

Centres:	Phase:	PI:	Age Groups
Montevideo	1	Dra Dolores Holgado	13-14, 6-7
Montevideo	3	Dra Dolores Holgado	13-14
Paysandú	3	Dra María Cristina Lapides	13-14, 6-7

National Coordinator:
Dra Dolores Holgado

Facultad de Medicina
Cátedra de Pediatría "B"
Department of pulmology, allergy and immunology
Pediatrics hospital Pereira Rossell
Uruguay

Roles:

- National Coordinator for Uruguay
- Phase One Principal Investigator for Montevideo
- Phase Three Principal Investigator for Montevideo

ISAAC in Uruguay

Uruguay is a very small country, however there were several studies about asthma prevalence since 1970, but all of them had a different methodology and differences in the age of the samples. The studies about allergies prevalence were very scarce.

In 1990 when I attended the ATS and IUATLD congress in Boston, I was aware that an international study about asthma and allergies was being prepared. When I came back to Montevideo I was very enthusiastic about including Uruguay in that study . I am a pneumologist and allergist pediatrician. At that time I was in charge of the Department of pulmonology, allergy and immunology of the Pereira Rossell hospital, so I talked with my colleagues Dra. María Julia Saráchaga and Dra. Sylvia Brea who worked with me and we decided to participate in the study. We were connected with ISAAC Steering Committee thanks to Dr. Fernando Martinez.

In the different asthma prevalence studies that had been done between 1970 and 1990, even taking into account that they had different methodology, we could see that there was a concerning increase in asthma prevalence. For this reason we considered very important to join ISAAC. We thought it was a huge step that would let us have real data about asthma and allergies prevalence in our country and give us the opportunity of comparing our data with the data of other countries involved in this study. With ISAAC we also expected to achieve a better understanding and treatment of our patients.

Since Uruguay participated in ISAAC, we can feel that there has been a growing concern about asthma in the physician community. Pediatricians were aware about the importance of ISAAC and our data by attending national congresses and courses of MCE related with these diseases. They are now more committed with the management of asthma, which is contributing to a better treatment of the patients.

We have not yet matched prevalence data between the core questionnaire and the environmental questionnaire.

In Phase One Montevideo was the only centre due to the low population of Uruguay. Montevideo the capital city of Uruguay has almost half of the population. In the hole country we are only 3.000.000 inhabitants,

In Phase Three a second centre was added thanks to the participation of Dra. Cristina Lapides in Paysandú city and ISAAC Steering Committee who accepted a lower number of children than Montevideo Centre. In Paysandú 1512 children participated in the 6-7 years group and 1738 in the 13-14 years group. It was very important to have a second centre within an area far from the capital city that included children from farmland, to have a better idea of the prevalence of asthma and allergies in Uruguay.

We gratefully acknowledge financial support from Glaxo Wellcome. We wish to thank all parents, children and school staff who participated in the surveys and also our fieldworkers team for their enthusiasm and effort thoughout each study.

The ISAAC Story

Uzbekistan, Northern and Eastern Europe

Centres:	Phase:	PI:	Age Groups
Samarkand	1	Professor Tamara Aripova	13-14
Tashkent	1	Professor Tamara Aripova	13-14

Uzbekistan has no National Coordinator

Venezuela, Latin America

Centres:	Phase:	PI:	Age Groups
Caracas	3	Dr Oscar Aldrey	13-14, 6-7

National Coordinator:
Dr Oscar Aldrey

Jefe del Instituto
Instituto de Inmunología
Avenida Roosevelt
Ciudad Universitaria, Instituto de Inmunología
Venezuela

Roles:

- National Coordinator for Venezuela
- Phase Three Principal Investigator for Caracas

Vietnam, Asia-Pacific

Centres:	Phase:	PI:	Age Groups
Ho Chi Minh City	3	Dr Baïch Vaên Cam	13-14, 6-7

Vietnam has no National Coordinator

Palestine, Eastern Mediterranean

Centres:	Phase:	PI:	Age Groups
Ramallah	2	Dr Nuha El Sharif	6-12
North Gaza	3	Mr Shaban Mortaja	13-14, 6-7
Ramallah	3	Dr Nuha El Sharif	13-14, 6-7

National Coordinator:
Dr Nuha El Sharif

Associate professor of Medical Sciences-Epidemiology
Alquds University, Faculty of Public Health
Abu Dies Camp PO Box 51915
Jerusalem
Palestine

Roles:

- National Coordinator for Palestine
- Phase Two Principal Investigator for Ramallah
- Phase Three Principal Investigator for Ramallah

Why was this centre selected for ISAAC?

In a personal communication, year 2000, with Professor Ameen Thalji, a researcher in Pediatric's health in the West Bank and Jerusalem, he reported a gradient increase of childhood infections as seen at the emergency rooms and hospitals' clinics in the past 10 years. Thalji and Abdeen agreed that a potential justification could be the increased effect of indoor allergen especially house dusts mites and smoking, and outdoor air pollution by traffic and allergens which were also believed to be the main risk factors for increasing asthma in the Palestinian children (Professor Ameen Thalji and Professor Hani Abdeen, personal communication, 2000). Similarly, a case control study in Gaza Strip at the refugees' camps (1) indicated that house dust mites were probably important allergens in the region and has a major role in asthma trends and its severity among children especially at the coastal areas. Also, kerosene use for heating and cooking was a strong potential risk factor for developing asthma symptoms in those children, in addition to the effect of smoking and house dust mites. Therefore, poverty and humidity in Palestine and especially in Gaza Strip were considered important risk factors for asthma too.

National Publications

The following publications used ISAAC data from Palestine:

El-Sharif NA, Nemery B, Barghuthy F, Mortaja S, Qasrawi R, Abdeen Z. *Geographical variations of asthma and asthma symptoms among schoolchildren aged 5 to 8 years and 12 to 15 years in Palestine the International Study of Asthma and Allergies in Childhood (ISAAC).* Ann Allergy Asthma Immunol 2003 Jan;90(1):63-71.

References

Mumcuoglu KY, Abed Y, Armenios B, et al. Asthma in Gaza refugee camp children and its relationship with house dust mites. Ann.Allergy 1994; 72: 163-166.

El-Sharif NA, Nemery B, Barghuthy F, Mortaja S, Qasrawi R, Abdeen Z. Geographical variations of asthma and asthma symptoms among schoolchildren aged 5 to 8 years and 12 to 15 years in Palestine: the International Study of Asthma and Allergies in Childhood (ISAAC). Ann Allergy Asthma Immunol. 2003 Jan;90(1):63-71.

El-Sharif N, Abdeen Z, Qasrawi R, Moens G, Nemery B. Asthma prevalence in children living in villages, cities and refugee camps in Palestine. Eur Respir J. 2002 Jun;19(6):1026-34.

El-Sharif N, Abdeen Z, Barghuthy F, Nemery B. Familial and environmental determinants for wheezing and asthma in a case-control study of school children in Palestine. Clin Exp Allergy. 2003 Feb;33(2):176-86.

El Sharif N, Douwes J, Hoet PH, Doekes G, Nemery B. Concentrations of domestic mite and pet allergens and endotoxin in Palestine. Allergy. 2004 Jun;59(6):623-31.

El-Sharif N, Douwes J, Hoet P, Nemery B.Childhood asthma and indoor aeroallergens and endotoxin in Palestine: a case-control study. J Asthma. 2006 Apr;43(3):241-7.

Until year 2000, there was no real work that described the real situation or explored the possible risk factors and determinants of asthma in Palestine. The urban-rural and inland-coastal area differences were not studied in depth. Therefore, we decided at Al Quds University-Palestine in cooperation with KULeven Belgium to initiate several studies in two selected area (West Bank and Gaza Strip) that provide a framework for further etiological research into lifestyle, environmental, genetic and medical care factors affecting asthma prevalence and incidence. Ramallah governorate, the inland area, and Gaza governorate, the coastal area, were chosen for implementing the series of studies that was planned according to ISAAC protocols (phase three and phase 2).

ISAAC studies were used as a research that led to obtaining my own PhD, Nuha El Sharif PhD, from the K.U.Leuven.

Center findings

ISAAC Phase Three studies:

This phase was done in two governorates: Gaza and Ramallah governorates. After a two-stage stratified systematic sampling, approximately 14,500 schoolchildren, from the first and second grades of elementary school (ages 5 to 8 years) and eighth and ninth school grades (ages 12 to 15 years), were invited to participate in a survey using ISAAC phase III questionnaires and protocols.

The main study results showed that younger children had a higher 12-month wheezing prevalence rate of 9.6% compared to older children (7.2%) and more physician-diagnosed asthma (8.4% and 5.9%, respectively). However, nocturnal cough and exercise-related wheezing were higher in the older age group compared with younger children. Younger children living in North Gaza district showed slightly higher prevalence rates for asthma and asthma symptoms, but older children had higher rates in Ramallah district. After adjustment using logistic regression analysis, male sex, living in inland areas, and younger age were shown to predict 12-month wheezing and physician-diagnosed asthma (2).

ISAAC phase 2

In the fall of 2000, 3382 schoolchildren aged 6-12 year were surveyed in 12 schools in Ramallah governorate, using ISAAC-phase III, parents-administered translated questionnaire. The crude prevalence rates for "wheezing ever", "wheezing in the previous 12 months", and "physician-diagnosed asthma"' were 17.1%, 8.8% and 9.4% respectively, with urban areas having higher prevalence rates than rural areas. Within urban areas, refugee camps had higher prevalence rates than cities. Yet, within the rural areas, the 12 months prevalence was lower in the deprived villages than other residence. Place of residence remained significant for asthma and asthma symptoms, after adjusting for gender, age, and place of birth (3).

To investigate the role of familial, early days' exposures, and indoor environmental determinants for asthma in children in Palestine, ISAAC phase 2 protocols were used. From the population of our previous study (3), a group of 273 children with wheeze in the past 12 months (of whom 99 children had physician-diagnosed asthma) were matched with an equal number of non-wheezing controls. This case-control study involved a parental questionnaire; skin prick testing (SPT) with mixed house dust mites, cat and dog dander, mixed grass, mixed trees pollen, Alternaria, olives tree, and cockroach extracts, and serum for total and specific IgE for the same 8 allergens (4). Moreover, to evaluate the relationship between wheezing or sensitization and concentrations of mites, cat and dog allergens, and bacterial endotoxin samples were taken from the mattress and floor dust of a 110 children's houses with reported wheezing and without wheezing (5,6).

The results showed that paternal asthma and maternal hay fever significantly tripled the risk for their children to have wheezing. Previous diagnoses of bronchial allergy, bronchitis, pneumonia, or whooping cough, and positive SPT for house dust mites and cockroaches were significantly more likely among wheezing and asthmatic children than controls. Specific IgE levels for house dust mites and cat allergens showed significantly higher risk to report wheezing. Domestic damp spots and visible moulds were reported more for both wheezing and asthmatic children. After adjustment for several environmental and socio-demographic factors using multivariate logistic regression analysis, paternal asthma, maternal hay fever, damp houses, and cockroach allergen positivity proved to be strong predictors for wheezing symptoms (4).

No consistent associations between allergen levels and either wheeze or specific atopic sensitization were found. Furthermore, no clear associations between mattress endotoxin levels and wheeze or atopy were found. Endotoxin in floor dust was inversely associated with atopic sensitization and wheeze, statistically significant only for atopic wheeze. Finally, a non-significant inverse association was observed between living room endotoxin and atopy within the non-wheezing control group (5,6).

The conclusion of phase 2 confirmed that familial "atopic" diseases are significant predictors of childhood asthma. Moreover, indoor environment such as domestic moulds also appears to play a role. Also, results suggest that endotoxin on living room floors might protect against atopic wheeze in the Palestinian children.

The ISAAC Story

A Coruña Centre

Phase Three			
Centre:		A Coruña, Spain (Western Europe)	
Principal Investigator:		Dr Angel López-Silvarrey Varela	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2003 to November 2003
Sampling Frame:		13-14yr: All schools in A Coruña Township 6-7yr:All schools in A Coruña, Culleredo and Oleiros townships.	

Team and P.I. La Coruña, Spain

Personnel

Dr Angel López-Silvarrey Varela

Polígono de A Grela
Edificio WorkCenter
C/ Galileo Galilei, n 4A
A Coruna
Spain

Roles:

- Phase Three Principal Investigator for A Coruña

LA CORUÑA (SPAIN) ISAAC CENTRE

The La Coruña centre joined the ISAAC initiative in phase III. Since we first became aware of this study in 1995 thanks to Professor García-Marcos (national coordinator), our interest in it has been stimulated by the enormous scientific interest of the International Study of Asthma and Allergies in Childhood, its repercussion on a worldwide scale, and the absence of epidemiological data regarding allergic illnesses in childhood in our Autonomous Community (Galicia). Unfortunately, despite several attempts, we did not receive funding for the development of the first phases of the project.

In 2003 the María José Jove Foundation (www fundacionmariajosejove.org), an organisation dedicated to childhood protection in our city, decided to promote and finance phase III of ISAAC in La Coruña. At last we were able to participate in this important project, with the satisfaction of being pioneers in Galicia and contributing our data to the data obtained at a national and worldwide level.

Both the interest generated by the initiative and the solvency of the promoters facilitated the collaboration of the University of La Coruña. Professor Castro Iglesias was chosen to follow the progress of the project, and her contributions were most valuable. Moreover, the following four students received a scholarship to participate in the project: Rosalía Pérez, Vanesa Moure, María Jesús Mella and Yolanda Iglesias. They all did a magnificent job, working tirelessly, rigorously, and more than willingly.

The study took place in the city and in some outer municipalities in the year 2003. The support and coordination of Professor Garcia-Marcos were fundamental. Both the educational authorities and the teachers made us feel very welcome and were willing to collaborate at all times.

The obtained results were both original, seen as there was hardly any previous existing data regarding the prevalence of the studied illnesses in our Autonomous Community, and striking, given the notable differences found in relation to other Spanish cities and the great similarities discovered with other cities characterized by similar climatic and environmental conditions.

The study in general, along with the results obtained, enjoyed both a strong social repercussion and coverage in the local press. On a scientific level, our work was rewarded with several regional prizes and also allowed us to put together some publications[1], along with other congress communications. Moreover, we were able to contribute with our data to many national and international publications.

This important repercussion made possible a further study, with the promotion of the María José Jove Foundation and the collaboration of the Galician Paediatric Society and the Health Council of the Government of Galicia. In this later study, we were able to extend our investigation to the remaining areas and cities of our Autonomous Community. As a result of the data obtained, it was possible to estimate the global prevalence of childhood allergic diseases in Galicia[2].

Participating in the ISAAC was, for us, a magnificent experience and we feel proud of our contribution. We are available to continue with future phases of this initiative, and encourage all other groups to do likewise.

[1]*López-Silvarrey Varela A, González Barcala FJ, Paz Esquete JJ, Pérez Castro TR, Valdés Cuadrado L, Castro Iglesias A. "Prevalencia de síntomas de asma y rinitis en la población de A Coruña". An Pediatr 2007; 66 (2): 146-53*

[2]*López-Silvarrey Varela A, Pértega Díaz S, Rueda Esteban S, Sánchez Lastres JM, San José González MA, Sampedro Campos M, Pérez Castro T, Garnelo Suárez L, Bamonde Rodríguez L, López-Silvarrey Varela J, González Barcala J. "Prevalencia de síntomas de asma en los niños de la Comunidad Autónoma de Galicia (España) y sus variaciones geográficas". Arch Bronconeumol 2011; 47: 274-282.*

Local Publications

The following publications used ISAAC data from the Addis Ababa centre:

Melaku K, Berhane Y. *Prevalence of wheeze and asthma related symptoms among school children in Addis Ababa, Ethiopia.* Ethiop Med J.1999 Oct;37(4):247-54.

Addis Ababa Centre

Phase One			
Centre:		Addis Ababa, Ethiopia (Africa)	
Principal Investigator:		Associate Professor Kibrebeal Melaku	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All junior high schools in Addis Ababa.	

Phase Three			
Centre:		Addis Ababa, Ethiopia (Africa)	
Principal Investigator:		Associate Professor Kibrebeal Melaku	
Age Groups:	13-14	**Timeframe:**	June 2003 to June 2003
Sampling Frame:		13-14yr: All schools in the city of Addis Ababa, the same sampling frame as Phase One.	

Personnel

Associate Professor Kibrebeal Melaku

Department of Internal Medicine
Faculty of Medicine
Addis Ababa University
P.O. Box 16489
Ethiopia

Roles:

- Phase One Principal Investigator for Addis Ababa
- Phase Three Principal Investigator for Addis Ababa

Adelaide Centre

Phase One			
Centre:		Adelaide, Australia (Oceania)	
Principal Investigator:		Dr Declan Kennedy	
Age Groups:	13-14, 6-7	**Timeframe:**	August 1993 to November 1993
Sampling Frame:		13-14yr: All schools in the Adelaide metropolitan area. 6-7yr:All schools in the Adelaide metropolitan area except schools with combined enrolments in Years 1 and 2 of less than 40 children.	

Personnel

Dr David Bates

Dept Paediatrics
University of Adelaide
Australia

Roles:

- Phase One collaborator for Adelaide

Dr Declan Kennedy

Respiratory Medicine
Adelaide Children's Hospital
Australia

Roles:

- Phase One Principal Investigator for Adelaide

Akola Centre

Phase One			
Centre:		Akola, India (Indian Sub-Continent)	
Principal Investigator:		Dr Ramesh M. Maheshwari	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1994 to October 1995
Sampling Frame:			

Personnel

Dr Ramesh M. Maheshwari

Coordinator
Allergy Asthma Hospital
Yogakshem
New Bhagvat Plot
India

Roles:

- Phase One Principal Investigator for Akola

Al-Khod Centre

Phase One			
Centre:		Al-Khod, Sultanate Of Oman (Eastern Mediterranean)	
Principal Investigator:		Associate Professor Bazdawi Al-Riyami	
Age Groups:	13-14, 6-7	**Timeframe:**	April 1995 to April 1995
Sampling Frame:			
Phase Three			
Centre:		Al-Khod, Sultanate Of Oman (Eastern Mediterranean)	
Principal Investigator:		Associate Professor Omar Al-Rawas	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2001.
Sampling Frame:		All the Government schools. These represent more than 99% of all schools in the country. The same sampling frame as Phase One.	

Personnel

Dr. Asiya A. Al Riyami,

Director of Research,
Ministry of Health,
Sultanate of Oman

Roles:

- Phase Three collaborator for Al-Khod

Associate Professor Omar Al-Rawas

Head, Department of Medicine
College of Medicine and Health Sciences
Sultan Qaboos University
P.O. Box 35; Postal Code 123
Sultanate Of Oman

Roles:

- National Coordinator for Sultanate Of Oman
- Phase Three Principal Investigator for Al-Khod

Associate Professor Bazdawi Al-Riyami

Sultan Qaboos University
Department of Medicine
P.O. Box 35
Al-Khodh, 123
Sultanate Of Oman

Roles:

- Phase One Principal Investigator for Al-Khod

Dr. Laila Jassim,

Department of Primary Heath Care and School Health,
Ministry of Health,
Sultanate of Oman

Roles:

- Phase Three collaborator for Al-Khod

Why was this Centre Selected for ISAAC?

We received invitation from Professor Stephen Montfort, coordinator for the Eastern Mediterranean region as very few centres in the region had shown interest. At the time Oman did not have any community based asthma data and this was a welcome opportunity for us to collaborate with this international study. This proved to be wonderful opportunity.

In collaboration with the national school health department under the Ministry of Health we were able to survey all the health regions in the country and sample from a base of all public schools which represented more than99% of all schools. Effectively our centre produced national data although we are known as Al Khodh centre because of the location of the Sultan Qaboos University.

Local Publications

The following publications used ISAAC data from the Al-Khod centre:

Al-Rawas OA, Al-Riyami BM, Al-Maniri AA, Al-Riyami AA. *Trends in asthma prevalence and severity in Omani schoolchildren Comparison between ISAAC phases I and III.* Respirology 2008 Sep;13(5):670-3. Epub May 2008.

The ISAAC Story

Our Experience with ISAAC

The Pilot Study: This was an interesting exercise because when we started the translation initially we used a written Arabic language version of the translation of key words such as wheezing, asthma, eczema, hay fever etc. only to find out later that this was not universally understood. We had to go back to the "clinical" language used during normal consultation. The video questionnaire was striking for many of the children.

Phases One & Three: Both age groups participated in both phases which were 6 years apart (1995 and 2001). In both surveys, the total national target samples were randomly selected from the ten administrative (representing the eight geographical) regions of Oman using the proportion allocation method. The total number of distributed questionnaires (Arabic version) was 7,625 (4,079 aged 6–7 years and 3,546 aged 13–14 years) in in Phase One (April 1995) and 8,080 questionnaires (4,235 aged 6–7 years and 3,853 aged 13–14 years) in Phase Three (April 2001). In Phase Three, in addition to the written questionnaire, 13-14 year old children completed the ISAAC asthma video questionnaire.

The phase I survey in 1995 was the first survey of asthma symptoms in Oman. It showed that the prevalence rates of reported diagnoses of asthma, allergic rhinitis and eczema were higher in older children (20.7%, 10.5% and 14.4% compared with 10.5%, 7.4% and 7.5%, respectively). Although the prevalence of asthma in Omani children was in the intermediate range of the ISAAC global ranking, it was the highest among the participating Eastern Mediterranean countries and Omani children had a relatively high prevalence of severe asthma symptoms (sleep disturbance and speech limiting wheeze).

Over the 6 years there was a significant increase in the prevalence of current wheeze 'any wheeze during the past 12 months' in the younger group with no significant change in asthma diagnosis (10.5% vs. 10.6%) or any other asthma symptoms. In the older group, all asthma symptoms remained unchanged except speech-limiting wheeze which declined from 4.0% to 2.8. In both surveys, more than 60% of current wheezers reported severe asthma symptoms, while only 60% of these reported a diagnosis of asthma. The persistence of the relatively high prevalence of severe asthma symptoms in Omani children is of particular concern. These findings suggest under diagnosis and/or poor recognition of asthma which had not improved over time and require further studies.

Phase one result also showed a surprisingly high prevalence in all asthma symptoms in the Eastern Region (Sharqiya) of the country. This appears to be genuine as it was confirmed in the Phase Three studies. Over the period of six years, the Sharqiya (Eastern) region continued to have the highest prevalence of self-reported asthma diagnosis and all asthma symptoms in both age groups, with a significant increase in the prevalence of wheeze in the past 12 months (from 8.7% to 13.8%) and asthma diagnosis (from 13.8% to 17.8 %) in the young group, and a significant increase in night cough (from 21.6% to 27.8%) in the older group. All other regions had lower prevalence rates in Phase One in both age groups, and showed either no significant change or a decline in one or two of the self-reported asthma symptoms in Phase Three (2001).

Phase Two: Due to the cost and logistics, we were not able to formally participate in the full ISAAC Phase Two Protocol. However, we used the questionnaire component of the survey with the addition of questions concerning the use and effect of Arabian incense (common practice in Omani households) on asthma symptoms to investigate the potential risk factors for asthma and allergies in two representative regions of Oman. A target sample (2441) of 10 year old schoolchildren was randomly selected from a representative sample of public schools from Muscat (1241 children) and South Sharqiya(1200 children) using stratified multi-stage sampling method. The selected tworegions out of the ten regions of Oman were considered as potentially informative based on their different prevalence rates of asthma identified in ISAAC phase I, and the potential for differences in environmental exposures. As the capital of Oman, Muscat population comes from most regions of the country ,and the prevalence of asthma symptoms and diagnosis in Muscat resembles the national average, whereas South Sharqiya (Eastern) region has the highest prevalence rates of all asthma symptoms. The results of this survey confirmed the higher prevalence of all asthma symptoms in Sharqiya in a different age group. It also identified exposure to Arabian incense as a common trigger factor for asthma symptoms in Omani children.

Our ISAAC results gave the first insight to the burden of asthma and allergies in Oman and provided a good platform for future studies.

Acknowledgements

Our ISAAC studies were supported by grants from Sultan Qaboos University. We also gratefully acknowledge the valuable support from Ministry of Health and Ministry of Education. We thank all children and parents who participated in the study. We also thank the school health physicians of the Ministry of Health for distributing and retrieving the questionnaires.

Regional
National
Local
Aleppo
Algiers
Almeria

Aleppo Centre

Phase Three			
Centre:		Aleppo, Syria (Eastern Mediterranean)	
Principal Investigator:		Dr Khaldoun Tabbah	
Age Groups:	13-14	**Timeframe:**	April 2001 to April 2001
Sampling Frame:		13-14yr: All schools in Aleppo City Area (not Aleppo County)	

Personnel

Associate Professor Wasim Maziak

Aleppo School of Medicine
P O Box 12782
Syria

Roles:

- Phase Three collaborator for Aleppo

Dr Khaldoun Tabbah

PO Box 8348
Syria

Roles:

- Phase Three Principal Investigator for Aleppo

Local Publications

The following publications used ISAAC data from the Aleppo centre:

Mohammad Y, Tabbah K, Mohammad S, Yassine F, Clayton T and Hassan M *International Study of Asthma and Allergies in Childhood phase 3 in the Syrian Arab Republic* East Med Health J 2010; 16(7): 710-716

Algiers Centre

Phase One			
Centre:		Algiers, Algeria (Africa)	
Principal Investigator:		Dr A Bezzaoucha	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:			

Personnel

Dr A Bezzaoucha

Chu de Blida
Hôpital Frantz-Fanon
Service d'Epidemologie
Algeria

Roles:

- Phase One Principal Investigator for Algiers

Local Publications

The following publications used ISAAC data from the Almeria centre:

Batllés-Garrido J, Torres-Borrego J, Bonillo-Perales A, Rubí-Ruiz T, González-Jiménez Y, Momblán De Cabo J, Aguirre-Rodríguez J, Jiménez Liria R, Losillas-Maldonado A, Torres-Daza M. *Prevalence and factors linked to atopic eczema in 10- and 11-year-old schoolchildren. Isaac 2 in Almeria, Spain* Allergol Immunopathol(Madr). 2010; 38(4): 174–180. epub May

Batllés-Garrido J, Torres-Borrego J, Rubí-Ruiz T, Bonillo-Perales A, González-Jiménez Y, Momblán De Cabo J, Aguirre-Rodríguez J, Losillas-Maldonado A, Torres-Daza M. *Prevalence and factors linked to atopy in 10- and 11-year-old children in Almería, Spain* Allergol Immunopathol (Madr). 2010; 38(1):13-9.

Batlles-Garrido J, Torres-Borrego J, Rubí-Ruiz T, Bonillo-Perales A, González-Jiménez Y, Momblán-De Cabo J, Aguirre-Rodríguez J, Losillas-Maldonado A, Torres-Daza M. *Prevalence and factors linked to allergic rhinitis in 10 and 11-year-old children in Almería. Isaac Phase II, Spain* Allergol Immunopathol (Madr). 2010;38(3):135-41.

Almeria Centre

Phase Two			
Centre:		Almeria, Spain (Western Europe)	
Principal Investigator:		Dr José Batlles-Garrido	
Age Groups:	10-11 years,	**Timeframe:**	March 2000 to June 2001.
Sampling Frame:		All public schools in the Almeria city district.	

Phase Three			
Centre:		Almeria, Spain (Western Europe)	
Principal Investigator:		Dr José Batlles-Garrido	
Age Groups:	13-14, 6-7	**Timeframe:**	May 1996 to January 1997
Sampling Frame:		The geographic area is the whole Province of Almeria	

Personnel

Dr José Batlles-Garrido

Department of Pediatrics
Torrecárdenas Hospital
Crtra. de Ronda, 226
Spain

Roles:

- Phase Two Principal Investigator for Almeria
- Phase Three Principal Investigator for Almeria

Alor Setar Centre

Phase One			
Centre:		Alor Setar, Malaysia (Asia-Pacific)	
Principal Investigator:		Dr Keng Hwang Teh	
Age Groups:	13-14, 6-7	**Timeframe:**	April 1995 to June 1995
Sampling Frame:			
Phase Three			
Centre:		Alor Setar, Malaysia (Asia-Pacific)	
Principal Investigator:		Dr Keng Hwang Teh	
Age Groups:	13-14, 6-7	**Timeframe:**	July 2002 to August 2002
Sampling Frame:		All government schools in the Kota Setar area of the state of Kedah. Same geographical area for both Phase One and Phase Three	

Personnel

Dr Wee Teik Keng

Medical Officer
Department of Paediatrics,
Hospital Alor Setar
Lebuhraya Darulaman
05250 Alor Setar. Kedah
Malaysia

Roles:

- Phase One collaborator for Alor Setar
- Left Alor Setar and is now: Consultant Clinical Geneticist Head of Department of Genetics Hospital Kuala Lumpur

Dr Azhar Napis

Medical Officer
Department of Paediatrics,
Hospital Alor Setar
Lebuhraya Darulaman
05250 Alor Setar. Kedah
Malaysia

Roles:

- Phase Three collaborator for Alor Setar
- Left Alor Setar and is now: Medical Officer Department of Paediatrics Hospital Sultan Abdul Halim

Dr Chun Khian Tan

Medical Officer
Department of Paediatrics, Hospital Alor Setar
Lebuhraya Darulaman
05250 Alor Setar. Kedah
Malaysia

Roles:

- Phase Three collaborator for Alor Setar
- Left Alor Setar and is now in private practice as a Paediatrician in Sungai Petani Kedah

Dr Keng Hwang Teh

Consultant Paediatrician and Intensivist
Department of Paediatrics,
Hospital Sultanah Bahiyah
(formerly Hospital Alor Setar)
Jalan Langgar
05460 Alor Setar. Kedah
Malaysia

Roles:

- Phase One Principal Investigator for Alor Setar
- Phase Three Principal Investigator for Alor Setar

Dr Teik Guan Yew

Medical Officer
Department of Paediatrics,
Hospital Alor Setar
Lebuhraya Darulaman
05250 Alor Setar. Kedah
Malaysia

Roles:

- Phase One collaborator for Alor Setar
- Left Alor Setar and is now: Specialist Paediatrician TK CHHAN Clinic Bandar Seri Begawan Brunei Darussalam.

The ISAAC Story

Why was this centre selected for ISAAC?

I was invited by the national Coordinator, Professor Jessie De Bruyne, to participate in ISAAC. We were really excited as we don't have much opportunity to participate in such a big study. It was also important to be able to know the prevalence of asthma and allergic disorders from this region which is known as the Rice Bowl of Malaysia and to be able to compare with other parts of Malaysia especially the urban section of the population. Alor Setar, situated in the north western region of the peninsula, has a largely rural population with padi planting as the main occupation and is also predominantly Malay. However there is also a significant population of Chinese and Indian ethnicity.

Our experience of ISAAC

The questionnaires for conducting the survey were translated into the Malay language and Mandarin and this were tested out by Professor Jessie de Bruyne and Professor Quah Ban Seng. The students in the age group of 13-14 years were able to respond to the Malay questionnaire as this is the medium of instruction in the secondary school. As for the primary school children aged 6-7 years where the medium of instruction is mandarin questionnaires were given in that language. Teachers were very helpful in translating for the parents as well.

The initial enthusiasm in conducting the study was a bit dampened as we realized we had to undertake the survey ourselves, having to go to schools using our own transport and some of these schools were rather inaccessible and located right inside the padi fields. Nevertheless the response from everybody was heartwarming and I was very fortunate that my fellow investigators helped lighten the load. And it was a great learning experience.

Getting permission from the State Director of Education to conduct the survey was not difficult. Teachers in the school were obliging and helped arranged for a suitable time and place for the survey and video presentation. Where there was anticipated discipline problem the presence of the discipline teacher helped in maintaining order. With such co operation it is not surprising that the response rate was high.

Acknowledgements

We wish to thank the Ministry of Education, Malaysia for granting permission to perform both phase One and Three surveys among the school children in the Kota Setar district. We are also indebted to all children, parents and school staff who participated in the surveys.

Amman Centre

Phase Three			
Centre:		Amman, Jordon (Eastern Mediterranean)	
Principal Investigator:		Dr Faisal Abu-Ekteish	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2001 to April 2001
Sampling Frame:		Some schools in East, Central and West Amman city including public, private and UNRWA schools.	

Personnel

Dr Faisal Abu-Ekteish

Jordon University of Science and Technology
Pediatric Department
Faculty of Medicine Jordon University of Science and Technology
PO Box 3030
Jordon

Roles:

- Phase Three Principal Investigator for Amman

Why Amman Center was chosen for the study

Amman is the capital city and the most inhabitant area in Jordan. It is considered one of the largest cities of Jordan and encompasses one of the largest metropolitan areas in the Arab world. It is the country's political, cultural and commercial centre and one of the oldest continuously inhabited cities in the world.

Amman is a regional hub in communications, transportation, medical tourism, education, and investment. Amman is aggressively positioning itself as a hub for business, and new projects are continually transforming the city's skyline. Several industrial cities are being developed near Amman, most important being Al-Mushatta. These factors contribute to air pollution in this city and possibly increasing the risk of allergic diseases.

This is why Amman's Environment and its inhabitant are considered the best center for collecting the study data. Amman's Primary schools are divided into Governmental, Private and UNRWA. Depending on these three types of schools, we were able to collect data from different types of social environments.

Local Publications

The following publications used ISAAC data from the Amman centre:

Abu-Ekteish F, Otoom S, Shehabi I. *Prevalence of asthma in Jordan Comparison between Bedouins and urban schoolchildren using the International Study of Asthma and Allergies in Childhood phase III protocol.* Allergy Asthma Proc 2009; 30(2):181-185.

Amman

Amman

The ISAAC Story

Our Experience with ISAAC

Our study was centered through the capital Amman study as mentioned above. We participated in phase three study where we studied asthma allergic diseases in children two ages' groups:

6 -7 yrs
13 -14 yrs

This study highlights our experience and knowledge and considered as the first study in such field which gives an idea about the magnitude and scale in such diseases in our country.

With the acknowledgement of the help of collecting the data for this study to Miss. Rana Saied Shehabi and her efforts in collecting the data.

Definitely we would like to keep in touch always with ISACC and keep our participation in future studies and researches which will enrich us with knowledge with such insignificant and important disease.

Anglia and Oxford Centre

Phase One			
Centre:		Anglia and Oxford, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in East Anglia and Oxford. Stratified by county, followed by a random sample of one school from each county.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for Anglia and Oxford

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for Anglia and Oxford

Dr Jan Poloniecki

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for Anglia and Oxford

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

Ross Anderson, David Strachan, 18 July 2011

Regional
National
Local
Ankara
Antwerp

Ankara Centre

Phase Two			
Centre:		Ankara, Turkey (Western Europe)	
Principal Investigator:		Dr Yildiz Saraçlar	
Age Groups:	8-11 y.,	**Timeframe:**	October 1999 to April 2000.
Sampling Frame:		Central administrative districts of Ankara. A sample of schools was selected, stratified by administrative borough.	

Personnel

Professor Ali Kocabas

Dept. of Chest Diseases
Cukurova Univ. School of Medicine
Turkey

Roles:

- Phase Two collaborator for Ankara

Dr Semanur Kuyucu

Hacettepe University
Faculty of Medicine
Pediatric Asthma & Allergy Unit
Sihhiye
Turkey

Roles:

- Phase Two collaborator for Ankara

Dr Yildiz Saraçlar

Professor of Pediatrics and Allergist
Ataturk Bulvari 158/20
Turkey

Roles:

- Phase Two Principal Investigator for Ankara

Local Publications

The following publications used ISAAC data from the Ankara centre:

Kuyucu S, Saraçlar Y, Tuncer A, Geyik PO, Adalioglu G, Akpinarli A, Sekerel BE, Sumbuloglu V. *Epidemiologic characteristics of rhinitis in Turkish children the International Study of Asthma and Allergies in Childhood (ISAAC) phase 2.* Pediatr Allergy Immunol.2006 Jun;17(4):269-77.

Kuyucu S, Saraçlar Y, Tuncer A, Saçkesen C, Adalioglu G, Sümbüloglu V, Sekerel BE. *Determinants of atopic sensitization in Turkish school children Effects of pre and post-natal events and maternal atopy.* Pediatr Allergy Immunol 2004; 15(1): 62–71.

Antwerp Centre

Phase One			
Centre:		Antwerp, Belgium (Western Europe)	
Principal Investigator:		Professor Paul Vermeire	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:September 1995 to November 1995 6-7yr:December 1994 to November 1995
Sampling Frame:			

Phase Three			
Centre:		Antwerp, Belgium (Western Europe)	
Principal Investigator:		Professor Joost Weyler	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2002 to June 2002
Sampling Frame:		Some secondary schools in Antwerp centre and Antwerp South. Sample frame the same as for both Phase One and Phase Three.	

Personnel

Professor Paul Vermeire

Dienst Lonziekten
UZ Antwerp
Wilrijkstraat 10
Belgium

Roles:

- Phase One Principal Investigator for Antwerp

Professor Joost Weyler

Epidemiology & Social Medicine
University of Antwerp CDE
Blok S-5
Universiteitsplein 1, R-2
Belgium

Roles:

- Phase Three Principal Investigator for Antwerp

Local Publications

The following publications used ISAAC data from the Antwerp centre:

Vellinga A, Droste JH, Vermeire PA, Desager K, De Backer WA, Nelen VJ, Weyler JJ. *Changes in respiratory and allergic symptoms in schoolchildren from 1996 to 2002, results from the ISAAC surveys in Antwerp (Belgium).* Acta Clin Belg.2005 Sep-Oct;60(5):219-25.

The Belgian ISAAC story

Asthma and allergies are some of the most prevalent chronic diseases in Belgium, a small West European country with a population of almost 11 million people (2010). Before the 1990's no prevalence rates of asthma and allergic diseases were available for the general Belgian population.

The ISAAC Story

In Antwerp, a research group was founded in order to study the epidemiology of asthma and allergies. This research group was a unique collaboration between the Department of Respiratory Medicine of the Antwerp University Hospital (Prof. Paul Vermeire) and the Department of Epidemiology and Social Medicine of the University of Antwerp (Prof. Joost Weyler and Prof. Marc van Sprundel). In 1991-1992, the Belgian research group participated in the European Community Respiratory Health Survey (ECRHS) with two Antwerp centres; one in the centre of Antwerp (urban) and one in 13 municipalities at the southern border of the city (suburban). This was the first large epidemiologic study in which the occurrence of respiratory symptoms, asthma, allergic disorders and potential risk factors was assessed in a general adult population. In Belgium, marked differences were found in the occurrence of respiratory symptoms between young adults in an urban and suburban area. The strong indication that childhood asthma was playing an important role in the area differences has increased the interest of the Antwerp asthma research group in the occurrence of respiratory symptoms in children in these areas.

Therefore, when the international steering committee decided to initiate the International Study on Asthma and Allergies in Childhood (ISAAC), the Antwerp asthma research group (reinforced with researchers of the Department of Paediatrics of the Antwerp University Hospital (Prof. Hugo Van Bever) did not hesitate to participate with schools in the same two Antwerp regions. In total, 6342 elementary school children (6-7-year-olds) and 2864 secondary school children (13-14-year-olds) participated in the first phase of the Belgian ISAAC.

Results showed that the regional differences that were found in adults, were not present in children. To look deeper into the potential mechanisms behind these observations a prospective birth cohort study ('Prospective Study on the Influence of Perinatal factors on the Occurrence of Asthma and Allergies' or 'PIPO') was carried out in the province of Antwerp. This project is still ongoing.

Apia Centre

Phase Three			
Centre:		Apia, Samoa (Oceania)	
Principal Investigator:		Ms Peone Fuimaono	
Age Groups:	13-14	**Timeframe:**	October 2003 to October 2003
Sampling Frame:		13-14yr: Primary and secondary schools in the Apia Urban Area.	

Personnel

Mr Mose Faatamala

Ministry of Health
Samoa

Roles:

- Phase Three collaborator for Apia

Ms Peone Fuimaono V Pisi

Ministry of Health
Samoa

Roles:

- Phase Three Principal Investigator for Apia

Dr Herbert Peters

Tupua Tamasese Meaole (TTM) Hospital
Samoa

Roles:

- Phase Three collaborator for Apia

The ISAAC Study in Samoa was the first major project handed to me to do after I completed my undergraduates and in my second year of work. It was a study introduced by Dr Sunia to Dr Nuualofa Tuuau-Potoi and supported by the then Director General of Health the late Dr Taulealeausumai Eti Enosa. It took us approximately 1 month to collate all the data and tally and ship them. We did not get an allowance for working in this study as it is the norm in projects attached to Health service but the experience obtained from this exposure has helped in the development of health research of this magnitude and taking the experience on in the law and justice sector which I am now employed in.

The ISAAC Story

Mr Mose Faatamala worked on in the Ministry of Health as a leading Health Educator until 2007 when he migrated to New Zealand with his young family and where they now reside. His ability to command an audience as required by his profession and made easy by his personality was a significant contributor to the success of ISAAC Samoa. Our field survey was implemented in an unfavourable time for the Education curriculum as exams were pending. However, the speed in which the questionnaires were explained and understood and taken from one school to another favoured both the limited time granted to us by the schools and the timeframe planned for ISAAC Samoa to complete. Through this story, Mr Faatamala's contribution to the ISAAC Study in Samoa and around the world, can be acknowledged and recognised.

Due credit must also go to the then Assistant Chief Executive Officer Public Health in the Samoa Ministry of Health Namulauulu Dr Nuualofa Tuuau-Potoi for her vision in bringing ISAAC to Samoa and the late Lolofietele Dr Eti Enosa for his faith and support in Samoa joining this global study. Health resources were used to take this study to the selected schools. ISAAC and MOH also needs to acknowledge and thank the Samoa Ministry of Education, Sports and Culture without whom, the opportunity to collect this number and level of data for this study, would not have been possible. To the late Chief Executive Officer of the Ministry Mr Tupae Esera and the Division of School Operations for the prompt and organised assistance in allowing the study to be in school hours, Faafetai tele.

Samoa is aspiring to meet the MDGs and I hope the data collected will be fully utilised by health professionals to inform public health policy and improve child health in asthma and other allergies in children. Thank you ISAAC for the experience.

Soifua.

Aracaju Centre

Phase Three			
Centre:		Aracaju, Brasil (Latin America)	
Principal Investigator:		Dr Jackeline Machado Motta Franco	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to December 2002
Sampling Frame:		Some schools of Aracaju Municipality	

Personnel

Dra Jackeline Machado Motta Franco

Pediatrician and Children's Allergist
Graduated from: Universidade Federal de Sergipe (UFS)
Trained in Allergy at: Universidade Federal de São Paulo (UNIFESP)
Aracaju
Brasil

Roles:

- Phase Three Principal Investigator for Aracaju

The Northeast region of Brazil comprises nine states, where a population of 50 million people lives in an area of 1,561,177 km². A tropical climate predominates with large inland areas of semiarid land and dry weather, and much more humid coastal areas. There are marked socioeconomic disparities in this part of Brazil, which is regarded as the least developed and poorest region of the country.

Sergipe is the smallest state in the Northeast. Its capital city, Aracaju, is considered to be the state capital with the lowest economic inequality in the region, as well as with the healthiest lifestyles in the country and the lowest number of smokers, according to the national Ministry of Health. With a population of 461,534 people in the year 2000 (coming to over 570,000 in 2010, according to the Brazilian Institute of Geography and Statistics census of 2010), distributed throughout 174 km², Aracaju has a high population density of over 3,100 inhabitants/km² and human development index of 0.794 (IBGE/PNAD, 2000).

In 2002-2003, the ISAAC phase three was undertaken in Aracaju and it was the first tool to improve knowledge on asthma prevalence in this city. We used the same ISAAC methodology established by the ISAAC International Data Center for all the centers in our region. The written questionnaires were previously validated for the Portuguese language and ethical approval for the study was obtained from the Federal University of Sergipe. The questionnaires were circulated among subjects of ages 6-7 and 13-14 years old. There was great difficulty in having the questionnaires for the group aged 6-7 returned, due to some cultural misinformation on the side of the public school mothers.

The study was encouraged by the ISAAC coordinator in Brazil, Dr. Dirceu Solé, who invited me to take part in the study, including the city of Aracaju as one of the centers in the Northeast of Brazil. The data collected was later used in the preparation of my master's thesis.

The ISAAC has been an important milestone in the study of allergic conditions in the world. The conduction of this study in our city has also been considered a milestone, since it

Local Publications

The following publications used ISAAC data from the Aracaju centre:

Franco JM, Gurgel R, Sole D, França VL, Brabin B and the Brazilian Isaac Group. *Socio-environmental conditions and geographical variability of asthma prevalence in Northeast Brazil* Allergol Immunopathol (Madr). 2009; 37(3):116-121

contextualized Aracaju in the international panorama of the allergic diseases prevalence, thus enabling comparisons between our rates and those of other cities in the Northeast region, in the whole of Brazil and in the world.

This work has only been possible with the important help from another colleague: Dr. Ricardo Queiroz Gurgel MD, MSc, PhD, Department of Medicine and University Hospital, Federal University of Sergipe, Aracaju, Brazil.

Local Publications

The following publications used ISAAC data from the Ascoli Piceno centre:

Pierdomenico R, Bonini S *Prevalence of paediatric asthma in Central Italy [Abstract]* Allergy 1997; 52(s37): 188

Ascoli Piceno PI, Sergio Bonini

Ascoli Piceno Centre

Phase One			
Centre:		Ascoli Piceno, Italy (Western Europe)	
Principal Investigator:		Professor Sergio Bonini	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Local Health Autority	

Personnel

Professor Sergio Bonini

Professor of Medicine, Second University of Naples,
Institute of Translational Pharmacology,
Italian National Research Council,
Rome
Italy

Roles:

- Phase One Principal Investigator for Ascoli Piceno

Background

The decision of creating the ISAAC Ascoli Piceno Centre was the natural outcome of a longstanding collaboration between the Institute of Neurobiology and Molecular Medicine of the Italian Research Council (INMM-CNR) and the Local Health Unit of Ascoli Piceno (ASL). In fact, these two institutions were already involved in an observational study on the prevalence of allergic diseases in school children and its relationship to the life-style in Rome and Ascoli Piceno. The launch of ISAAC represented an attracting opportunity to collect data with a validated questionnaire and methodology, also permitting to compare them with those collected in other centres worldwide.

For the ISAAC study, it was decided to confine the population sample to school-children in Ascoli Piceno- a middle-size city in Central Italy- since this allowed to study all the children of a Health Unit living both in the urban and the country area of Ascoli Piceno, thus avoiding the potential bias deriving from the socio-economic differences among schools in Rome.

Impact of ISAAC on the Ascoli Piceno Centre

Although for organizational and economic reasons it was not possible to have the Ascoli Piceno Centre involved in further ISAAC phases, it was decided to repeat an ISAAC Phase one four years later, and to compare data with those collected during the original Phase One as well as with those collected in Tirana (Albania). In this second survey, following the publications from some of us of strict relationships between allergic diseases and infections (1,2) also data about early-life infections were recorded (3).

Some years later, the study was extended to children living in Maranello, a small Ferrari-Maserati Town in Central Italy, with special focus on the relationships between physical exercise, obesity and asthma.(4).

Unfortunately, most of the data collected were not published, but as abstracts. However, the ISAAC methodology represented a standard procedure for many studies and helped in educating to epidemiological research a large number of medical students and young investigators.

Findings of our Centre

The Phase One data are summarized in the first ISAAC paper and in an abstract (5). They were made available for being accessed by everybody interested.

In addition, mostly unpublished research showed :

1. A significant increase in asthma prevalence in Ascoli Piceno after 4 years, which almost doubled being usually associated with rhinitis.
2. No association between allergy prevalence and vaccinations or respiratory infections (which, on the contrary, appeared to be a risk factor for subsequent development of asthma).
3. A marked higher prevalence of allergy and asthma in Ascoli Piceno vs Tirana, in spite of the same latitude and aerobiological features.
4. A higher prevalence of allergy and asthma in Rome vs Maranello, associated with a reduced attitude to physical exercise and a higher prevalence of increased BMI or obesity.

Co-workers

Most of the studies were made possible by the commitment of Dr. Rosella Pierdomenico and the staff of the ASL of Ascoli Piceno. My co-ordination of the study was greatly helped at INMM-CNR by Prof. Guido Rasi and by the CNR staff made by Paolo Matricardi, Megon Bresciani and Claudia Gramiccioni, Claudio D'Ambrosio, Claudio Parisi and Andrea Torre. The Ascoli/Tirana survey was performed with the collaboration of Prof. Albert Priftanij. The Rome/Maranello study with the collaboration of Dr. Antonella Schirru and Dr. Valeria Porcaro.

1. Matricardi PM, Rosmini F, Riondino S, Fortini M, Ferrigno L, Rapicetta M, Bonini S.
Exposure to foodborne and orofecal microbes versus airborne viruses, in relation to atopy and allergic asthma: epidemiological study.
Br Med J. 2000; 320: 412-17.
2. Matricardi PM, Rosmini F, Panetta V, Ferrigno L, Bonini S.
Hay fever and asthma in relation to markers of infection in the United States.
J Allergy Clin Immunol 2002; 110: 381-387.
3. Pierdomenico R, D'Ambrosio C, Rasi G, Lapucci G, Torre A, Matricardi PM, Carlucci A, Bonini S.
Allergic diseases in relation to vaccinations and infectious diseases: two cross-sectional studies in schoolchildren 4 years Apart.
J Allergy Clin Immunol 2003; 111: S292.
4. Bresciani M, Parisi C, Schirru MA, Porcaro V, Torre A, Bonini M, Biffi A, Fernando F, D'Ambrosio C, Rasi G, Bonini S.
Lifestyle, Sports Activities and Allergic Diseases
J Allergy Clin Immunol 2006; 117: S294 (1134).
5. Pierdomenico R, Bonini
Prevalence of paediatric asthma in Central Italy.
Allergy. 1997; 52 (37): 188.

Asturias Centre

Phase Three			
Centre:		Asturias, Spain (Western Europe)	
Principal Investigator:		Dr Ignacio Carvajal-Urueña	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to March 2002
Sampling Frame:		All schools in Asturias region (Spain)	

Personnel

Dr Ignacio Carvajal-Urueña

Pediatrician Doctor
Centro de Salud La Ería
Oviedo
Asturias
Spain

Roles:
- Phase Three Principal Investigator for Asturias

Carlos Díaz Vázquez

Pediatrician
Quality Coordinator
Health Service of Principality of Asturias
Asturias
Spain

Roles:
- Phase Three collaborator for Asturias

Carmen Díez Fernández

Community Nurse
Centro de Salud Las Vegas.
Corvera de Asturias
Asturias
Spain

Roles:
- Phase Three collaborator for Asturias

Begoña Domínguez Aurrecoechea

Pediatrician
Centro de Salud Otero.
Oviedo
Asturias
Spain

Roles:
- Phase Three collaborator for Asturias

Agueda García Merino

Pediatrician
Centro de Salud Vallobin-Concinos
Riosa
Asturias
Spain

Roles:
- Phase Three collaborator for Asturias

Local Publications

The following publications used ISAAC data from the Asturias centre:

Morales Suárez-Varela MM, García-Marcos AL, González DC, et al. *Prevalence of atopic eczema and nutritional factors in 6-7 year old children.[article in spanish]*. Aten Primaria 2007; 39(7):355-360.

Arnedo-Pena A, García-Marcos L, Fernández-Espinar JF, Bercedo-Sanz A, Aguinaga-Ontoso I, González-Díaz C, Carvajal-Urueña I, Busquet-Monge R, Suárez-Varela MM, de Andoín NG, Batlles-Garrido J, Blanco-Quirós A, López-Silvarrey Varela A, García-Hernández G *Sunny hours and variations in the prevalence of asthma in schoolchildren according to the International Study of Asthma and Allergies (ISAAC) Phase III in Spain* Int J Biometeorol 2011; 55(3): 423-434

The ISAAC Story

Ismael Huerta González

Epidemiologist
Consejería de Salud y Servicios Sanitarios
Oviedo
Asturias
Spain

Roles:
- Phase Three collaborator for Asturias

Mar Marcilla Escotet

Family & Community Doctor
Asturias
Spain

Roles:
- Phase Three collaborator for Asturias

Maria Olvido Díez Fernández

Family & Community Doctor
Centro de Salud de Infiesto
Asturias
Spain

Roles:
- Phase Three collaborator for Asturias

The ISAAC Story in Asturias

In Asturias, ISAAC Phase III was developed by an enthusiastic group of primary health care professionals which are particularly interested in asthma and prevalent respiratory and allergy diseases during infancy. In this task, the ISAAC Phase III Asturias Team had the support and funding of the Public Health Service of the Autonomous Region of Asturias as well as the counseling and collaboration of ISAAC Spain Coordinator Professor Luis García-Marcos. Organized as a workgroup, the participants of this effort contributed, with other professionals, in many initiatives related to asthma and allergy care, the most important being the elaboration and implementation of Asthma Guidelines and the Strategic Plan for Asthma Management in the Community.

Asunción Centre

Phase One			
Centre:		Asunción, Paraguay (Latin America)	
Principal Investigator:		Dr Jaime A Guggiari-Chase	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Asunción.	
Phase Three			
Centre:		Asunción, Paraguay (Latin America)	
Principal Investigator:		Dr Jaime A Guggiari-Chase	
Age Groups:	13-14	**Timeframe:**	May 2002 to June 2002
Sampling Frame:		13-14yr: All schools in Asunción area	

Personnel

Dr Jaime A Guggiari-Chase

Jefe del Servicio de Alergia e Immunologia
Centro Médico Bautista
San Antonio 1019
Paraguay

Roles:
- National Coordinator for Paraguay
- Phase One Principal Investigator for Asunción
- Phase Three Principal Investigator for Asunción

Due to special circumstances, Paraguay is a country that has taken long to develop, including our medicine. Until very recently, our medicine was primarily asistencialist, and mainly dealt with emergencies only. Chronic diseases were not treated and of course the prevention of these chronic diseases was not considered. Bronchial asthma, and the drama and severity of its crisis, has always occupied an important place in emergency clinics.

In the decade from 1950 to 60, pulmonologists were busy with tuberculosis, and the first allergists appeared. The ISAAC survey in 1998 came to fill an important place in the consideration of allergic conditions. For example, allergic rhinoconjunctivitis was a disease largely ignored by general practitioners and specialists. Five years later, in the 2nd ISAAC survey, allergic rhinoconjunctivitis, came to the fore with an incidence greater than 40% and this coincided with the appearance of ARIA (Allergic Rhinitis and its Impact on Asthma)

These events attracted the attention of specialists, and this made otolaryngologists and allergists come to a consensus on allergic diseases that affect upper respiratory conditions. Unfortunately, this consideration was not taken with atopic dermatitis. However, there is always the desire and hope of a consensus with dermatologists, to consider together the various aspects of this disease

Finally, it should be noted that the survey was received by the young people surveyed with enthusiasm and many of them were helped, because it gave them attention that they never received before.

Regional
National
Local
Athens

Athens Centre

Phase One			
Centre:		Athens, Greece (Western Europe)	
Principal Investigator:		Associate Professor Christina Gratziou	
Age Groups:	13-14, 6-7	**Timeframe:**	May 1994 to May 1995
Sampling Frame:			
Phase Two			
Centre:		Athens, Greece (Western Europe)	
Principal Investigator:		Associate Professor Christina Gratziou	
Age Groups:	10-11,	**Timeframe:**	October 2000 to February 2001.
Sampling Frame:		A sample of 58 schools selected in random order from the city centre and suburbs.	

Personnel

Associate Professor Christina Gratziou

Ass. Prof. Pulmonary and Critical Care
Medical School, Athens University
Head of Asthma and Allergy Centre
Eugenidio Hospital ,Athens
Greece

Roles:

- National Coordinator for Greece
- Phase One Principal Investigator for Athens
- Phase Two Principal Investigator for Athens

Athanasia Magafa

Athens
Greece

Roles:

- Phase One collaborator for Athens
- Nurse

Aggeliki Michael

Athens
Greece

Roles:

- Phase One collaborator for Athens
- Nurse

Dr Athina Papadopoulou

Pedetrician Asthma and Allergy Unit,
Pediatric Department,
''KAT'' General Hospital.
Athens
Greece

Roles:

- Phase One collaborator for Athens

Dr Kostas Priftis

Ass. Prof Allegiology and Pneumonology,
3rd Department of Pediatrics,
"Attikon" Hospital,
Athens University
Greece

Roles:

- Phase One collaborator for Athens

See Greece country page for details of ISAAC in Athens

Local Publications

The following publications used ISAAC data from the Athens centre:

Papadopoulou A, Hatziagorou E, Matziou VN , Grigoropoulou DD, Panagiotakos DB, Tsanakas JN, Gratziou C, Priftis KN *Comparison in asthma and allergy prevalence in the two major cities in Greece the ISAAC phase II survey* Allergol Immunopathol(Madr).2011; epub ahead of print

The ISAAC Story

Auckland Collaborators

Auckland Fieldwork

Auckland Centre and International Data Centre

IIDC meeting

Auckland Centre

Phase One			
Centre:		Auckland, New Zealand (Oceania)	
Principal Investigator:		Professor M Innes Asher ONZM	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1992 to August 1993 6-7yr:October 1992 to August 1993
Sampling Frame:			
Phase Three			
Centre:		Auckland, New Zealand (Oceania)	
Principal Investigator:		Professor M Innes Asher ONZM	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to September 2002
Sampling Frame:		All schools in the Auckland region of the Ministry of Education. The Auckland district incudes the Rodney, North Shore, Waitemata, Auckland, Manukau, Papakura and Franklin territorial local authorities.	

Personnel

Professor Innes Asher

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- Chairperson of the ISAAC Steering Committee
- Chairperson of the ISAAC Executive
- Director, ISAAC International Data Centre
- National Coordinator for New Zealand
- Phase One Principal Investigator for Auckland
- Phase Three Principal Investigator for Auckland

Mr Tadd Clayton

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- Phase One collaborator for Auckland
- Phase Three collaborator for Auckland
- Fieldworker Phase One and Three
- IIDC
- ISAAC Data Manager

Mrs Philippa Ellwood

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- ISAAC Steering Committee
- Phase One collaborator for Auckland
- Phase Three collaborator for Auckland
- ISAAC Research Manager
- Principal fieldworker Phases One and Three
- Advisor for NZ centres

Mr Eamon Ellwood

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- Phase Three collaborator for Auckland
- IIDC
- ISAAC Webmaster

The ISAAC Story

Mrs Tania Milne

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences Private Bag 92019
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- Phase One collaborator for Auckland
- Phase Three collaborator for Auckland
- Administrator Sept 2003 - Mar 2006

Professor Ed Mitchell

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- ISAAC Steering Committee
- Phase One collaborator for Auckland
- Phase Three collaborator for Auckland
- IIDC
- Professor of Child Health Research

Mr Alistair Stewart

Epidemiology and Biostatistics
School of Population Health
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- ISAAC Steering Committee
- Phase One collaborator for Auckland
- Phase Three collaborator for Auckland
- IIDC
- Biostatistician

Mrs Christine Thomas

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- Phase One collaborator for Auckland
- Administrator Nov 1998 - Jan 2000

Mrs Nancy Williams

Department of Paediatrics: Child and Youth Health
Faculty of Medical and Health Sciences
The University of Auckland
Private Bag 92019
New Zealand

Roles:

- Phase One collaborator for Auckland
- Administrator Apr 2000 - Sept 2003

Why was this centre selected for ISAAC?

Asthma symptom prevalence in children was first studied in Auckland in 1985, using a written questionnaire and bronchial hyper-responsiveness. The background context is described in 'The origins of ISAAC: a New Zealand perspective'. This led to the development of a study to explore international differences in severity of asthma symptoms in children using standardised methods, of which Auckland was to become one of five New Zealand centres.

In 1991 we successfully applied for a grant from the Health Research Council (HRC) of New Zealand to compare between countries and within New Zealand (by area and ethnic group) the prevalence and severity of childhood asthma in two age-groups of children (6-7 year old children and 13-14 year adolescents). This HRC grant covered the costs of the fieldwork in Auckland, Wellington and Christchurch, and for Auckland a full-time data manager, and secretarial and computing support. The funding remained conditional upon at least one other centre outside New Zealand obtaining funds for a similar survey in their own centre. This initiative joined with the German initiative in March 1991, which then formally became ISAAC.

Auckland is the New Zealand city with the largest population, and the most ethnically diverse with the largest populations of M?ori and Pacific children residing in Auckland

Our experience of ISAAC

Phase One:

The Auckland centre undertook Phase One core questionnaire on asthma, rhinitis and eczema without any additions. The schools were chosen from within the boundaries of the Auckland district of the Ministry of Education. There were 47 participating schools in the childrens group and 13 participating schools in the adolescent group.

In New Zealand we chose to examine whether the season in which the parent/adolescent responded to the questionnaire influenced the symptom prevalence of asthma. Auckland was one of three New Zealand centres in whom this was examined. The resultant publication [Stewart 1997] showed that there was no effect on eczema symptoms, a little effect on asthma symptoms, and a positive season-of response effect on rhinitis symptoms.

Phase Three:

The Auckland centre undertook Phase Three core questionnaire and the complete environmental questionnaires for both age groups from the same sampling frame as Phase One. There were 37 participating schools in the 6-7 year age group and 15 participating schools in the 13-14 year age group.

References

The data from Auckland Phases One and Three are included in all the publications from New Zealand (there are no separate Auckland –only publications)

Acknowledgements

We gratefully acknowledge financial support from The HRC and the Hawke's Bay Medical Research Foundation for supporting the Phases One and Three Auckland fieldwork. We are also indebted to all the children, parents and school staff who participated in the surveys, and wish to thank our fieldwork teams for their enthusiasm and diligence throughout each study.

Bali Centre

Phase Three			
Centre:		Bali, Indonesia (Asia-Pacific)	
Principal Investigator:		Professor Putu Konthen	
Age Groups:	13-14	**Timeframe:**	September 2001 to January 2002
Sampling Frame:		13-14yr: Some schools in Buleleng County	

Personnel

Professor Putu Konthen

Department of Medicine
Faculty of Medicine
Airlangga University
Jl. Ngagel Madya No. 25
Indonesia

Roles:

- Phase Three Principal Investigator for Bali

Balykchi Centre

Phase Three			
Centre:		Balykchi, Kyrgyzstan (Northern and Eastern Europe)	
Principal Investigator:		Dr Imanalieva Cholpon	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to October 2002
Sampling Frame:		All schools in Balykchi city	

Personnel

Moldogazieva Aigul

National centre of motherhood and childhood protection
Bishkek, Balykchi
Kyrgyzstan

- Phase Three collaborator for Balykchi

Seitalieva Chiinara

National centre of motherhood and childhood protection
Balykchi
Kyrgyzstan

- Phase Three collaborator for Balykchi

Dr Imanalieva Cholpon

Kyrgyz Scientific Research Institute of Obstetrics and Pediatrics
Flat 9, 136 Panfilov str.
Kyrgyzstan

- National Coordinator for Kyrgyzstan
- Phase Three Principal Investigator for Balykchi

Boronbaeva Elnura

National centre of motherhood and childhood protection
Bishkek
Kyrgyzstan

- Phase Three collaborator for Balykchi

Dr Najimidinova Gulmira

National Centre of Pediatrics and Child surgery
720020
Kyrgyzstan

- Phase Three collaborator for Balykchi

Asankojoeva Janyl

National centre of motherhood and childhood protection
Balykchi
Kyrgyzstan

- Phase Three collaborator for Balykchi

Djanuzakova Nurgul

National centre of motherhood and childhood protection
Bishkek
Kyrgyzstan

- Phase Three collaborator for Balykchi

The questionnaire by ISAAC technique was conducted in 2002. Employees of the National centre of motherhood and childhood protection participated in research. The ISAAC team in Bishkek was: Imanalieva Cholon, Najimidinova Gulmira, Boronbaeva Elnura, Djanuzakova Nurgul and Moldogazieva Aigul. The ISAAC team in Balykchi was: Moldogazieva Aigul, Seitalieva Chiinara and Asankojoeva Janyl.

Before the questionnaire study began, letters of support from the Ministry of Health and the Ministry of science, formation and culture of the Kyrgyz Republic had been prepared and these departments gave the consent to carry out the research. In Bishkek 8194 children were questioned. 3146 of them were at the age of 6-7 years and 5048 children were aged 13-14 years and attended comprehensive schools. In Balykchi 2111 children were surveyed in all the comprehensive schools of the city, 729 aged 6-7 years old and 1382 aged 13-14 years.

Participation in the research has given us the invaluable experience of performing a large questionnaire study under international standards. The data have helped to achieve a representation about the prevalence of allergic diseases in the Kyrgyz Republic. Some elements of the questionnaire have now been introduced in medical institutions for diagnostics of allergic diseases.

We wish ISAAC creative successes and well-being.

The ISAAC Story

Bandung Centre

Phase One			
Centre:		Bandung, Indonesia (Asia-Pacific)	
Principal Investigator:		Prof Dr Karnen Baratawidjaja	
Age Groups:	13-14, 6-7	**Timeframe:**	April 1996 to April 1996
Sampling Frame:			

Phase Three			
Centre:		Bandung, Indonesia (Asia-Pacific)	
Principal Investigator:		Prof Dr Cissy B Kartasasmita	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to July 2002
Sampling Frame:		Geographic area and Government permit. The same schools were used for Phase One and Phase Three plus some others randomly selected.	

Personnel

Prof Dr Karnen Baratawidjaja

Head, Allergy-Immunology Study Group
Department of Medicine, Faculty of Medicine
University of Indonesia
Sisingamangaraja 49/51
Indonesia

Roles:

- National Coordinator for Indonesia
- Phase One Principal Investigator for Bandung

Prof Dr Cissy B Kartasasmita

Department of Child Health
School of Medicine - Padjajaran University
Hasan Sadikin General Hospital
J1. Pasteur 38
Indonesia

Roles:

- Phase Three Principal Investigator for Bandung

Bangalore Centre

Phase Three			
Centre:		Bangalore, India (Indian Sub-Continent)	
Principal Investigator:		Professor Sylvan Rego	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to October 2002
Sampling Frame:		All schools in the Ashok Nagar Region	

Personnel

Professor Sylvan Rego

Department of Pediatrics
St John`s Medical College & Hospital
Bangalore 560034
India

Roles:

- Phase Three Principal Investigator for Bangalore

BANGALORE CENTRE

The St John's Medical College Hospital, Bangalore, Karnataka State, India is a 1200 bed tertiary level care medical center. I head the Division of Pediatric Allergy and Immunology at St John's. My special interest in pediatric asthma and allergies was the reason that I was very keen to participate in the ISAAC Study. I informed the National Coordinator for India (Dr Jayant Shah) of my interest to participate in the study

The institutional heads of all the schools that participated in the ISAAC study from the Bangalore Centre were happy to participate in the study and their cooperation in this regard was exemplary I am very grateful to all the children, parents and school staff who participated in the study.

The results of the ISAAC study have evoked interest in the reasons for the differences in the prevalence of asthma and allergies between different geographical locations in India.

Bangkok Centre

Phase One			
Centre:		Bangkok, Thailand (Asia-Pacific)	
Principal Investigator:		Dr Pakit Vichyanond	
Age Groups:	13-14, 6-7	**Timeframe:**	January 1995 to July 1996
Sampling Frame:			
Phase Three			
Centre:		Bangkok, Thailand (Asia-Pacific)	
Principal Investigator:		Dr Pakit Vichyanond	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2001 to August 2001
Sampling Frame:		Random sampling from public and private schools in Bangkok. The same sampling frame was used for both Phases.	

Personnel

Dr Pakit Vichyanond

Faculty of Medicine Siriraj Hospital
Mahidol University
2 Prannok Road
Siriraj Bangkoknoi
Thailand

Roles:

- National Coordinator for Thailand
- Phase One Principal Investigator for Bangkok
- Phase Three Principal Investigator for Bangkok

ISAAC in Thailand

In the early 1990, Richard Beasley visited me (Pakit Vichyanond) at my medical school (Faculty of Medicine Siriraj Hospital) to invite myself to function as a Thailand coordinator for starting ISAAC study in Thailand. The idea struck me so much and I immediately accepted the offer. Professor Montri Tuchinda – my predecessor – had earlier performed questionnaire survey among children and medical students in Bangkok and demonstrated prevalence of asthma among children in Thailand to be only 4%. Such figure seemed to be too low for specialists in the field. We were in need of more well defined questionnaire survey and the idea of ISAAC was the perfect match for us at that time.

We were earlier assigned to the West Asia (Prof Shah, India) section of the ISAAC. The translation and back transferred of the data was done very quickly by a group of pediatric allergists in Thailand. At this time, the group of pediatric allergist/immunologists in the Asia Pacific region was well organized and thus Thailand was transferred to the East Asia region under Chris Lai (Hong Kong) as the regional coordinator. The initial survey was earlier launched in Bangkok by my group. In order to spread the survey across the Bangkok Metropolitan area, we mapped out schools to be surveyed to cover the entire Bangkok region. In addition, we balanced the schools to be equally include private and public schools. The high prevalence of asthma prevalence from the first survey was made known to the public (13%). In fact this figure was not that much different from figures all over Asia. This brought about a high degree of publicity among the Thai medical community since it represented such a large increase in load of asthmatic children. Additional centers from various parts of the countries including Chiangmai, Khon Kaen, Nakorn Pathom, and others applied for participating in the survey. In total, 10 centers all over the country were included (however, not all data were submitted to ISAAC center in Auckland). Results from these centers confirmed that the high prevalence of asthma (around 10%), allergic rhinitis (40%) and atopic dermatitis (10%) were corrected throughout the country. Results from Chantaburi center (east of Thailand) showed prevalence of asthma of 16%!!!

The Bangkok center launched their own version of ISAAC-II but due to slight variation of their methods from the official ISAAC-II, the results were not included for ISAAC-II analysis. Results of this investigation are available from myself.

Two centers, Bangkok and Chiangmai participated in ISAAC Phase One and Three time trends. Increase in prevalence was documented from the Bangkok center whereas Chiangmai center showed plateau to slight decline. Results of environment and other factors in this ISAAC-III were used in subsequent analysis forming the report by the ISAAC committee. In addition, ISAAC questionnaire survey was conducted among University students in Bangkok and data among these students were quite similar to those in children

Overall, ISAAC investigation has been well received in Thailand. This has brought a great enthusiasm on allergic diseases in children. We are keen to participate in further investigations with ISAAC committee.

Barbados Centre

Phase One			
Centre:		Barbados, Barbados (North America)	
Principal Investigator:		Dr Malcolm E Howitt	
Age Groups:	13-14, 6-7	**Timeframe:**	
Sampling Frame:			
Phase Three			
Centre:		Barbados, Barbados (North America)	
Principal Investigator:		Dr Malcolm E Howitt	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2001 to February 2002
Sampling Frame:		All schools in Barbados	

Personnel

Dr Malcolm E Howitt

Medical Practitioner
Carlton Clinic
Carlton Shopping Plaza
Black Rock
Barbados

Roles:

- National Coordinator for Barbados
- Phase One Principal Investigator for Barbados
- Phase Three Principal Investigator for Barbados

Barcelona Centre

Phase One			
Centre:		Barcelona, Spain (Western Europe)	
Principal Investigator:		Dr Rosa M Busquets	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in two city districts, Saut Marti and Ciutat Vella.	
Phase Three			
Centre:		Barcelona, Spain (Western Europe)	
Principal Investigator:		Dr Rosa M Busquets	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to November 2002
Sampling Frame:		All the schools belonging to Barcelona districts (Spain) - located in the influencing area of the hospital. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Dr Rosa M Busquets

Metge Adjunt, Unitat de Pneumologia Pediatica,
Hospital del Mar
Paseig Marítim, 25
Spain

Roles:

- Phase One Principal Investigator for Barcelona
- Phase Three Principal Investigator for Barcelona

Dr Oriol Vall

Servicio de Pediatría
Hospital del Mar
Paseo Marítimo, 25-29
Spain

Roles:

- Phase One collaborator for Barcelona

Bari Centre

Phase Three			
Centre:		Bari, Italy (Western Europe)	
Principal Investigator:		Dr Lucio Armenio	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to February 2002
Sampling Frame:		All schools in the Municipality of Bari.	

Personnel

Dr Lucio Armenio

Dipartimento di Biomedicina dell'Età volutiva
Clinica Pediatrica III dell'Università di Bari
Policlinico P.zza G. Cesare 11
Italy

Roles:

- Phase Three Principal Investigator for Bari

Barranquilla Centre

Phase Three			
Centre:		Barranquilla, Colombia (Latin America)	
Principal Investigator:		Dr Alfonso M Cepeda	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2002 to March 2003
Sampling Frame:		Some schools in the Barranquilla and Soledad area	

Personnel

Dr Alfonso M Cepeda

Hospital Universitario Metropolitano
Universidad Metropolitana
Carrera 58 N 81-160 Apt. 8
Baranquilla
Colombia

Roles:

- Phase Three Principal Investigator for Barranquilla

Bay of Plenty Centre

Phase One			
Centre:		Bay of Plenty, New Zealand (Oceania)	
Principal Investigator:		Dr Chris Moyes	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:June 1993 to August 1993 6-7yr:May 1993 to September 1993
Sampling Frame:			

Phase Three			
Centre:		Bay of Plenty, New Zealand (Oceania)	
Principal Investigator:		Dr Chris Moyes	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2002 to October 2002
Sampling Frame:		Geographic area, the same geographic area as Phase One.	

Personnel

Dr Chris Moyes

Director of Paediatrics
Pacific Health
Whakatane Hospital
P.O. Box 241
New Zealand

Roles:

- Phase One Principal Investigator for Bay of Plenty
- Phase Three Principal Investigator for Bay of Plenty

Ms Amohaere Tangitu

Whakatane Hospital
Whakatane
New Zealand

Roles:

- Phase Three collaborator for Bay of Plenty

Dr John Waldon

Research Centre for Maori Health Research and Development,
School of Public Health,
Massey University
Palmerston North
New Zealand

Roles:

- Phase One collaborator for Bay of Plenty

ISAAC had its birth in the Bay of Plenty in a preliminary trial of the parental questionnaire in 8-12 year olds in Kawerau in 1992. The initial intent was to depend on parents returning questionnaires sent through the schools, but a poor response of less than 40% was immensely improved by use of a local public health nurse personally contacting parents, which resulted in 82% participation.

Subsequent interest was stimulated by community concerns that industrial fumes from Kawerau paper mills or natural sulphurous emissions in Rotorua might influence asthma prevalence or severity.

The Eastern Bay of Plenty has a high proportion of Maori and socioeconomic deprivation spread diffusely over a large rural area, with many small primary schools. The schools surveyed in the formal ISAAC studies included the more central parts of the Eastern Bay of Plenty around Whakatane, Kawerau, and Opotiki together with urban Rotorua. Outlying rural areas were not included.

Phase 1 was carried out by subcontracting the Hepatitis Foundation (who had extensive experience of school surveys) from May to September 1992. Questionnaires on 2681 6-7yr old children were completed (87% of target) in 45 schools. 2813 secondary school pupils participated in the survey (89% of target).

Phase 3 ran from August to October 2002 and utilised staff from the Eastern Bay of plenty Maori Health unit centred at Whakatane Hospital. It was felt that the relative lack of research experience of this team would be compensated by their positive attitude and a greater acceptance among Maori schoolchildren and parents (just under half of population studied). Training was provided by the core team at Auckland and particular thanks are due to Philippa Ellwood.

Local Publications

The following publications used ISAAC data from the Bay of Plenty centre:

Moyes CD, Waldon J, Ramadas D, Crane J, Pearce N. *Respiratory symptoms and environmental factors in schoolchildren in the Bay of Plenty*. NZ Med J 1995; 108(1007): 358-61.

The ISAAC Story

It was immediately apparent that the conditions for the Phase 3 survey were going to be much more difficult. Schools were generally less supportive, feeling under pressure from curriculum changes, and some schools opted out. The questionnaire was several times longer than Phase 1. Above all, the secondary students required active signed parental consent to participate rather than the 'opt-off' approach taken in Phase 1. It was therefore a credit to the Maori Health Team that completed questionnaires for 6-7 yr olds were obtained for 2150 (80%) of target children, and a much reduced but still statistically viable 1976 (76%) of target 13-14 yr olds.

Local Publications

The following publications used ISAAC data from the Beijing centre:

Zhao T, Wang HJ, Chen Y, Xiao M, Duo L, Liu G, Lau Y, Karlberg J. *Prevalence of childhood asthma, allergic rhinitis and eczema in Urumqi and Beijing.* J Paediatr Ch Health 2000; 36(2): 128-33.

Ma Y, Zhao J, Han ZR, Chen YZ, Leung TF, Wong GWK. *Very Low Prevalence of Asthma and Allergies in Schoolchildren From Rural Beijing, China.* Pediatr Pulmonol 2009; 44(8):793-799.

Zhao J, Ma Y, Chen YZ, Han ZR. *Prevalence of allergic respiratory disorders and skin prick test in Beijing urban and suburban children a comparative study.* Zhonghua Yi Xue Za Zhi 2003; 83(21):1879-81.

Beijing

Beijing Centre

Phase One			
Centre:		Beijing, China (Asia-Pacific)	
Principal Investigator:		Professor Yu-Zhi Chen	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All 92 junior high schools in Chaoyang District	
Phase Two			
Centre:		Beijing, China (Asia-Pacific)	
Principal Investigator:		Professor Yu-Zhi Chen	
Age Groups:	10-11,	**Timeframe:**	October 1997 to February 1998.
Sampling Frame:		A random sample of schools from the metropolitan area of Beijing.	
Phase Three			
Centre:		Beijing, China (Asia-Pacific)	
Principal Investigator:		Professor Yu-Zhi Chen	
Age Groups:	13-14	**Timeframe:**	October 2001 to December 2001
Sampling Frame:		13-14yr: Some school in the Chao Yang District of Beijing	

Personnel

Professor Yu-Zhi Chen

Capital Institute of Pediatrics
No 2 Ya Bao Road
Beijing
China

Roles:

- National Coordinator for China
- Phase One Principal Investigator for Beijing
- Phase Two Principal Investigator for Beijing
- Phase Three Principal Investigator for Beijing

ISAAC in China

China is a very large country, and there were several studies about asthma prevalence in1990 and also in 2000. A nationwide and randomized survey on the prevalence of childhood asthma in 2000, compared with the same study in 1990, covered 31 provinces and 43 cities, including a population of 437873 children aged 0-14 years. The results show us that there was a concerning increase in asthma prevalence. But they had a different methodology than ISAAC Study. For this reason we considered it very important to join ISAAC. We thought joining the ISAAC study would let us get data about asthma and allergies prevalence in different cities in China and give us the opportunity of comparing our data with the data of other countries involved in this study. With ISAAC we also expected to achieve a better understanding and treatment of our patients.

When we knew that an international study about asthma and allergies was being prepared. We were very enthusiastic about including 5 cities of mainland China in that study in 1994 ISAAC Phase One. The 5 cities were Beijing, Shanghai, GuangZhou, Chongqing and Urumuqi, and we worked very hard do the study.

In ISAAC Phase Two study, as the study was more difficult than Phase One, and only needed a few centres to take part in it, we chose 2 centres, Beijing and Guangzhou, to join the Phase Two study. Expecially, our team did a lot of difficult work in the study. For example, in the dust collection work, you could imagine how hard it was to go to 200 children's home when the pupils were dismissed from school, and to get the dust from those children's bed, floor, etc.

In Phase Three China, a new centre, Tongzhou (Beijing rural) was added to the study in the 13-14 years group. Tongzhou is an area about 50km away from the Beijing urban city that included children from farmland. It was very important to have the centre within the study, so we could compare the result of Tongzhou with Beijing urban city, and to have a better understanding of the prevalence and machanism of asthma and allergic diseases. And finally, we found that the wheezing and allergic diseases prevalence were much lower in rural Beijing students than in urban Beijing students, and also the prevalence of positive allergy of SPT was much lower in rural Beijing students than in urban Beijing students.

The ISAAC Story

Overall, in 12 years of ISAAC Study from Phase I to Phase III, about 90,000 chinesechildren joined the study, and 25,000 Beijing children joined the study.

And more, for the I-III ISAAC Study, we got the award of "Science and Technology Advancement Prize" awarded by the Beijing Municipal Government in 2006, and recieved 20000 RMB prize.

Beirut Centre

Phase One			
Centre:		Beirut, Lebanon (Eastern Mediterranean)	
Principal Investigator:		Dr Fuad M Ramadan	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All private, private (subsidized), and Government schools in Beirut.	

Personnel

Amani Chehade

Lebanon

- Phase One collaborator for Beirut

Terreza Hajaar

Lebanon

- Phase One collaborator for Beirut

Dr Fuad M Ramadan

American University of Beirut
Medical Center P.O. BOx: C22 Beirut
Lebanon

- Phase One Principal Investigator for Beirut

Local Publications

The following publications used ISAAC data from the Beirut centre:

Ramadan FM, Khoury MN, Hajjar TA, Mroueh SM. *Prevalence of allergic diseases in children in Beirut comparison to worldwide data.* J Med Liban 1999; 47(4): 216-21.

Belgrade Centre

Phase Three			
Centre:		Belgrade, Serbia and Montenegro (Northern and Eastern Europe)	
Principal Investigator:		Dr Zorica Zivkovic MD, Phd	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2001 to October 2001
Sampling Frame:		13-14yr: All schools in down city and some in suburbs. 6-7yr:All schools in central zone of the city and some in suburbs	

Personnel

Dr Zorica Zivkovic

Professor in Pediatrics
American School of Medicine at Belgrade
Pediatric pulmonologist
Children's Hospital for Lung Diseases and Tuberculosis
Medical Center "Dr Dragisa Misovic"
Belgrade
Serbia and Montenegro

Roles:

- National Coordinator for Serbia and Montenegro
- Phase Three Principal Investigator for Belgrade

Local Publications

The following publications used ISAAC data from the Belgrade centre:

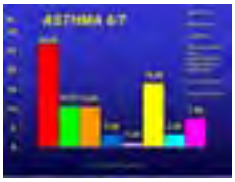
Živcovic Z. *Prevalence of childhood asthma, rhinitis and eczema in Belgrade area and Serbia.* Child Pulmonol 2002; 10(1-2): 27-43.

Živkovic Z, Živanovic S, Panic E. *International study of asthma and allergies in childhood (phase 3) in Yugoslavia.* Child Pulmonol 2001; 9(1-2): 41-44.

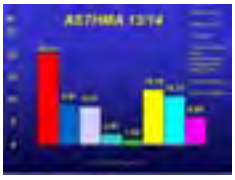
Smiljanic S, Radic S, Živkovic Z. *Asthma and allergies in childhood.* Child Pulmonol 2002; 10(1-2): 61-63.

Živkovic Z, Vukašinovic Z, Cerovic S, Radulovic S, Živanovic S, Panic E, Hadnadjev M and Adžovic O. *Prevalence of childhood asthma and allergies in Serbia and Montenegro.* World J Pediatr 2010; 6(4): 331-336 epub May

The ISAAC Story



graph of Belgrade results



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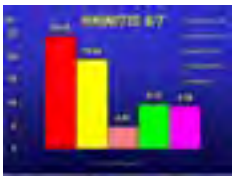
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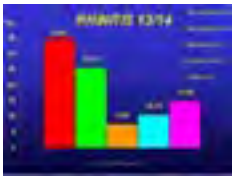
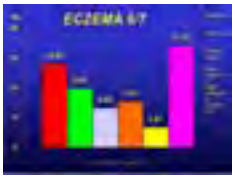
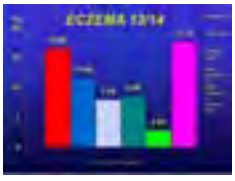

graph of Belgrade results



graph of Belgrade results



graph of Belgrade results

ISAAC Phase 3 in Belgrade was conducted during spring and autumn season 2001. Belgrade, the capital of Republic of Serbia, encompasses around 2 million citizens.

The location of Schools was randomly assigned to down city and suburbs as well. The number of Schools for 6/7 years of age was 21 in Belgrade and 26 for13/14 years of age groups of pupils. In the 6/7 years of age we analyzed 1932 children. In older group of pupils we analyzed 3232 children.

The survey was performed by pediatricians from Primary Health Centers from Belgrade supported by allied medical professionals from Schools. The logistics and support were performed by pediatric pulmonologist from Children's Hospital for Lung Diseases and Belgrade Principal Investigator Zorica Zivkovic.

Overall results of our investigation in Republic of Serbia have been published in the World Journal of Pediatrics. (Živkovic Z, Vukašinovic Z, Cerovic S, Radulovic S, Živanovic S, Panic E, Hadnjadjev M, Adžovic O. Prevalence of childhood asthma and allergies in Serbia and Montenegro. World J Pediatr 2010; 6(4):331-336.)

Results of ISAAC Phase 3 Belgrade Center were published in the national paediatric journal. (Živkovic Z. Prevalence of Childhood Asthma, Rhinitis and Eczema in Belgrade area and Serbia. Child Pulmol 2002; 1-2:27-43.)

ISAAC Phase 3 in Belgrade gave us important figures on epidemiology of asthma and allergies representing the very first and for many years the only one statistical data on asthma and childhood allergies prevalence rate.

We are sharing here some of our results from Belgrade Center.
See photos (left)


Zorica Zivkovic at the World Asthma Congress, Mexico 2006


ISAAC Steering Committee, Stockholm 2002


ISAAC Steering Committee, Stockholm 2002

ISAAC Publications from Serbia

Belo Horizonte Centre

Phase Three			
Centre:		Belo Horizonte, Brasil (Latin America)	
Principal Investigator:		Associate Professor Paulo Augusto M Camargos	
Age Groups:	13-14	**Timeframe:**	November 2001 to May 2002
Sampling Frame:		13-14yr: Public schools in Belo Horizonte City	

Personnel

Professor Paulo Augusto M Camargos

Professor of Pediatrics
Dept of Pediatrics,Medical School
Federal University of Minas Gerais
Belo Horizonte
Brasil

Roles:

- Phase Three Principal Investigator for Belo Horizonte

Professor Cristina Gonçalves Alvim

Associate professor of Pediatrics
Dept of Pediatrics,Medical School
Federal University of Minas Gerais
Belo Horizonte
Brasil

Roles:

- Phase Three collaborator for Belo Horizonte

Professor Maria Jussara Fernands Fontes

Associate professor of Pediatrics
Dept of Pediatrics,Medical School
Federal University of Minas Gerais
Belo Horizonte
Brasil

Roles:

- Phase Three collaborator for Belo Horizonte

Professor Cláudia Ribeiro de Andrade

Associate professor of Pediatrics
Dept of Pediatrics,Medical School
Federal University of Minas Gerais
Belo Horizonte
Brasil

Roles:

- Phase Three collaborator for Belo Horizonte

Brazil is a large country (190,000,000 inhabitants) , however there were several studies about asthma prevalence since 1970, but all of them had a different methodology and differences in the age of the samples. The studies about allergies prevalence were very scarce.

Minas Gerais State has 20,000,000 inhabitants and Belo Horizonte city, 2,500,000 inhabitants. Apart from teachers listed above, the ISAAC phase 3 team involved 18 medicalstudents. Data collection was partially supported by 1) Federal University of Minas Gerais and 2) Belo Horizonte Municipal Health Authority, that provided cars and drivers to taken medical students and researchers to the randomly selected schools.

Benslimane Centre

Phase Three			
Centre:		Benslimane, Morocco (Africa)	
Principal Investigator:		Professor Zoubida Bouayad	
Age Groups:	13-14	**Timeframe:**	November 1999.
Sampling Frame:		13-14yr: All junior high schools of Benslimane (which is a rural area).	

Personnel

Professor Zoubida Bouayad

Service des Maladies Respiratoires
Hôpital 20 Août
CHU Ibn Rochd
Morocco

Roles:

- National Coordinator for Morocco
- Phase Three Principal Investigator for Benslimane

Local Publications

ISAAC phase 3 at Belo Horizonte protocol generated 1) part of two PhD thesis and apart from studies authored by Prof. Dirceu Solé, 2) two other papers as listed below:

Alvim, Cristina Goncalves ; Picinin, Isabela Mendonca ; Camargos, Paulo Moreira ; COLOSIMO, Enrico ; Lasmar, Laura Belizario ; Ibiapina, Cassio Cunha ; Fontes, Maria Jussara ; Andrade, Claudia Ribeiro . Quality of Life in Asthmatic Adolescents: An Overall Evaluation of Disease Control. The Journal of Asthma, v. 46, p. 186-190, 2009.

ANDRADE, Cláudia Ribeiro de ; IBIAPINA, Cássio da Cunha ; ALVIM, Cristina Gonçalves ; FONTES, Maria Jussara Fernandes ; LASMAR, Laura Maria de Lima Belizário Facury ; CAMARGOS, P. A. M. . Asthma and allergic rhinitis comorbidity: a cross-sectional questionnaire study on adolescents aged 13-14 years. Primary Care Respiratory Journal, v. 17, p. 222-225, 2008.

The ISAAC Story

Bikaner Centre

Phase Three			
Centre:		Bikaner, India (Indian Sub-Continent)	
Principal Investigator:		Professor Mohammed Sabir	
Age Groups:	13-14	**Timeframe:**	April 2001 to November 2001
Sampling Frame:		13-14yr: Some schools in the Bikaner District, Rajasthan, India.	

Personnel

Professor Mohammed Sabir

Respiratory Division, Department of Medicine
S.P. Medical College
Mohalla Choongaran
India

Roles:

- Phase Three Principal Investigator for Bikaner

Bilbao Centre

Phase One			
Centre:		Bilbao, Spain (Western Europe)	
Principal Investigator:		Dr Alfonso Delgado Rubio	
Age Groups:	13-14, 6-7	**Timeframe:**	February 1994 to November 1994
Sampling Frame:			

Phase Three			
Centre:		Bilbao, Spain (Western Europe)	
Principal Investigator:		Dr Carlos González Díaz	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2001 to March 2002
Sampling Frame:		All schools in Bilbao city district area (Spain). The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Dr Carlos González Díaz

Pediatric Allergy Unit
Department of Pediatrics
Hospital de Basurto
Bilbao
Spain

Roles:

- Phase Three Principal Investigator for Bilbao

Dr Alfonso Delgado Rubio

Urgencias de Pediatria. Pabellon Makua
Hospital de Basurto
Avda Montevideo, 18
Spain

Roles:

- Phase One Principal Investigator for Bilbao
- Phase Three collaborator for Bilbao

In 1994, the ISAAC project was started in Spain, launched by our national coordinator, Prof. Luis Garcia Marcos. At the beginning, eight centers constituted the Phase One, and ISAAC Bilbao center was led until 1998 by Prof. Alfonso Delgado. Since 1998, I have been the principal investigator and responsible for the Phases One and Three.

The results of this Project, apart from the multiple articles that have been published, have allowed me to defend my doctoral thesis entitled ‘’Prevalence and severity of asthma in 13-14 years old children living in Bilbao “ in February of 1997 with the highest grade.

It highlighted that the prevalence of asthma in our center had increased in Phase Three relative to Phase One, both in children aged 6-7 years (6.9% vs 12.2%) and in children 13-14 years (11.9% vs 12.8%)

I would like to thank all people who at some point belonged to the Bilbao ISAAC Centre in any of its phases without them it would have not be possible to perform this work:Those people are : Prof Alfonso Delgado, Dr. Andres Gonzalez, Dra. Elena Sanchez, Dra. Nelida Garcia, Dra Marga Ferrer, Dr Javier Zaballa, and Dra Nekane Morato,

Local Publications

The following publications used ISAAC data from the Bilbao centre:

González Díaz C, Sánchez González E, García-Marcos L, Morato Rodríguez MD, Molina Zelaia I, Burgaleta Sagaseta A, Zaballa Gorordo J, Delgado Rubio A. *Prevalence and severity of asthma in 13-14-year-old children in Bilbao.[Spanish].* An Esp Pediatr.1998; 48(6): 608-14.

Morales Suárez-Varela MM, García-Marcos AL, González DC, et al. *Prevalence of atopic eczema and nutritional factors in 6-7 year old children.[article in spanish].* Aten Primaria 2007; 39(7):355-360.

Arnedo-Pena A, García-Marcos L, Fernández-Espinar JF, Bercedo-Sanz A, Aguinaga-Ontoso I, González-Díaz C, Carvajal-Urueña I, Busquet-Monge R, Suárez-Varela MM, de Andoín NG, Batlles-Garrido J, Blanco-Quirós A, López-Silvarrey Varela A, García-Hernández G *Sunny hours and variations in the prevalence of asthma in schoolchildren according to the International Study of Asthma and Allergies (ISAAC) Phase III in Spain* Int J Biometeorol 2011; 55(3): 423-434

The ISAAC Story

Birjand Centre

Phase Three			
Centre:		Birjand, Iran (Eastern Mediterranean)	
Principal Investigator:		Dr Mohammed-Reza Masjedi	
Age Groups:	13-14, 6-7	**Timeframe:**	May 1996 to May 1996
Sampling Frame:		All schools in Birjand city were included in the sampling frame	

Personnel

Dr Mohammed-Reza Masjedi

Masih Daneshvary Hospital
Dorabad
Shaheed Bahoner Ave
Darabad
Iran

Roles:

- National Coordinator for Iran
- Phase Three Principal Investigator for Birjand

Bishkek Centre

Phase Three			
Centre:		Bishkek, Kyrgyzstan (Northern and Eastern Europe)	
Principal Investigator:		Dr Imanalieva Cholpon	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to October 2002
Sampling Frame:		All schools in the Bishkek city district. Then boarding schools for handicapped children and schools with only grades 1-3 were excluded. After then every fourth school in every Bishkek city district was then chosen.	

Personnel

Moldogazieva Aigul

National centre of motherhood and childhood protection
Bishkek, Balykchi
Kyrgyzstan

Roles:

- Phase Three collaborator for Bishkek

Seitalieva Chiinara

National centre of motherhood and childhood protection
Balykchi
Kyrgyzstan

Roles:

- Phase Three collaborator for Bishkek

Dr Imanalieva Cholpon

Kyrgyz Scientific Research Institute of Obstetrics and Pediatrics
Flat 9, 136 Panfilov str.
Kyrgyzstan

Roles:

- National Coordinator for Kyrgyzstan
- Phase Three Principal Investigator for Bishkek

Boronbaeva Elnura

National centre of motherhood and childhood protection
Bishkek
Kyrgyzstan

Roles:

- Phase Three collaborator for Bishkek

Dr Najimidinova Gulmira

National Centre of Pediatrics and Child surgery
720020
Kyrgyzstan

Roles:

- Phase Three collaborator for Bishkek

Asankojoeva Janyl

National centre of motherhood and childhood protection
Balykchi
Kyrgyzstan

Roles:

- Phase Three collaborator for Bishkek

Djanuzakova Nurgul

National centre of motherhood and childhood protection
Bishkek
Kyrgyzstan

Roles:

- Phase Three collaborator for Bishkek

The questionnaire by ISAAC technique was conducted in 2002. Employees of the National centre of motherhood and childhood protection participated in research. The ISAAC team in Bishkek was: Imanalieva Cholon, Najimidinova Gulmira, Boronbaeva Elnura, Djanuzakova Nurgul and Moldogazieva Aigul. The ISAAC team in Balykchi was: Moldogazieva Aigul, Seitalieva Chiinara and Asankojoeva Janyl.

Local Publications

The following publications used ISAAC data from the Birjand centre:

Moghadam M, Jou S. *Prevalence of Asthma Symptoms among 13-14 years old Children in Birjand* TABIB-E-SHARGH Fall 2004; 6(3):183-192.

Philippa Ellwood's visit to Kygyzstan with Djanuzakova Nurgul, Imanalieva Cholpon, Moldogazieva Aigul, and collaborators.

Boronbaeva Elnura, discussing work in ISAAC research with Philippa Ellwood in Bishkek, Kyrgyzstan.background - Imanalieva Cholpon

Philippa Ellwood and Kyrgyzstan collaborators ,Bishkek, Kyrgyzstan

The ISAAC Story

Before the questionnaire study began, letters of support from the Ministry of Health and the Ministry of science, formation and culture of the Kyrgyz Republic had been prepared and these departments gave the consent to carry out the research. In Bishkek 8194 children were questioned. 3146 of them were at the age of 6-7 years and 5048 children were aged 13-14 years and attended comprehensive schools. In Balykchi 2111 children were surveyed in all the comprehensive schools of the city, 729 aged 6-7 years old and 1382 aged 13-14 years.

Participation in the research has given us the invaluable experience of performing a large questionnaire study under international standards. The data have helped to achieve a representation about the prevalence of allergic diseases in the Kyrgyz Republic. Some elements of the questionnaire have now been introduced in medical institutions for diagnostics of allergic diseases.

We wish ISAAC creative successes and well-being.

Bogotá Centre

Phase Three			
Centre:		Bogotá, Colombia (Latin America)	
Principal Investigator:		Dr Gustavo Aristizábal	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to August 2002
Sampling Frame:		Some schools in Bogata city area.	

Personnel

Dr Gustavo Aristizábal

Medical Director
Instituto de Enfermedades Respiratorias del Niño S.A.
Diagonal 84 No 28-09
Bogota
Colombia

Roles:

- Phase Three Principal Investigator for Bogotá

Mumbai (16) Centre

Phase One			
Centre:		Bombay (16), India (Indian Sub-Continent)	
Principal Investigator:		Dr Mohan Keshav Joshi	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to December 1995 6-7yr:December 1994 to December 1995
Sampling Frame:			
Phase Two			
Centre:		Mumbai (16), India (Indian Sub-Continent)	
Principal Investigator:		Dr Jayant Shah	
Age Groups:	10-11 yrs.,	**Timeframe:**	2000 and 2001.
Sampling Frame:		Municipal ward areas in which municipal doctors were working. Same study area as ISAAC Phase One (not sure which one – Bombay (16), (17), (18) – none of them fit this description well! May be better to treat Mumbai Phase Two as a separate centre (but combine in42 and in43 which is what we have done for the Phase Two papers. Currently Mumbai Phase Two is assigned to Bombay (16) Phase One centre in Eamon's database.)	
Phase Three			
Centre:		Mumbai (16), India (Indian Sub-Continent)	
Principal Investigator:		Dr Mohan Keshav Joshi	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2002 to March 2003
Sampling Frame:		All schools in Mahim and Dadar areas with the city limits of Bombay.	

Personnel

Dr Mohan Keshav Joshi

Panjat Hospital
1st Floor, Gehi Mansion
L.J. Road
India

Roles:

- Phase One Principal Investigator for Bombay (16)
- Phase Three Principal Investigator for Mumbai (16)

The ISAAC Story

Dr Raju Khubchandani

Jaslok Hospital & Research Centre
15, Dr. G. Deshmukh Marg
India

Roles:
- Phase Two collaborator for Mumbai (16)

Dr Sumant Narayan Mantri

C/- Dr J.R. Shah
Department of Pulmonary Medicine
Jaslok Hospital & Research Centre
15, G. Deshmukh Marg
India

Roles:
- Phase Two collaborator for Mumbai (16)

Dr Rajiv S Mathur

Department of Chest Diseases
Jaslok Hospital & Research Centre
15, Dr. G. Deshmukh Marg
India

Roles:
- Phase Two collaborator for Mumbai (16)

Dr Jayant Shah

Jaslok Hospital & Research Centre
15 - Dr. Deshmukh Marg
Pedder Road,
India

Roles:
- Regional Coordinator for Indian Sub-Continent
- National Coordinator for India
- Phase Two Principal Investigator for Mumbai (16)

Bombay (17) Centre

Phase One			
Centre:		Bombay (17), India (Indian Sub-Continent)	
Principal Investigator:		Dr Uday Anath Pai	
Age Groups:	13-14, 6-7	**Timeframe:**	March 1995 to March 1995
Sampling Frame:			

Personnel

Dr Uday Anath Pai

Consultant Pediatrician
Block no.1, Sai-Kutir
16th Road, Plot no 131, Maharastra
India

Roles:
- Phase One Principal Investigator for Bombay (17)

Borivali Centre

Phase One			
Centre:		Borivali, India (Indian Sub-Continent)	
Principal Investigator:		Dr Vasant A Khatav	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:December 1994 to March 1995 6-7yr:December 1994 to February 1995
Sampling Frame:			
Phase Three			
Centre:		Borivali, India (Indian Sub-Continent)	
Principal Investigator:		Dr Vasant A Khatav	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2003 to March 2003
Sampling Frame:		Private schools in Borivali Region, the same sampling frame as Phase One.	

Personnel

Dr Vasant A Khatav

Dr Khatav's Mother and Child Hospital
Arunoday Shopping Centre
Market Lane
Borivali (West)
India

Roles:
- Phase One Principal Investigator for Borivali
- Phase Three Principal Investigator for Borivali

The ISAAC Story

Boulmene Centre

Phase Three			
Centre:		Boulmene, Morocco (Africa)	
Principal Investigator:		Professor Zoubida Bouayad	
Age Groups:	13-14	**Timeframe:**	January 2002 to March 2002
Sampling Frame:		13-14yr: All Junior High Schools in Boulemene	

Personnel

Professor Zoubida Bouayad

Service des Maladies Respiratoires
Hôpital 20 Août
CHU Ibn Rochd
Morocco

Roles:

- National Coordinator for Morocco
- Phase Three Principal Investigator for Boulmene

Brasília Centre

Phase Three			
Centre:		Brasília, Brasil (Latin America)	
Principal Investigator:		Dr Wellington G Borges	
Age Groups:	13-14	**Timeframe:**	July 2002 to October 2002
Sampling Frame:		13-14yr: All schools in Brazilia area	

Personnel

Dr Wellington G Borges

Hospital de Base do Distrito Federal
SMPW Q12 Conj 03 Lote 02-C
Brasil

Roles:

- Phase Three Principal Investigator for Brasília

Brazzaville Centre

Phase Three			
Centre:		Brazzaville, Congo (Africa)	
Principal Investigator:		Professor Joseph M'Boussa	
Age Groups:	13-14	**Timeframe:**	November 2002 to March 2003
Sampling Frame:		13-14yr: Some schools in Brazzaville region	

Personnel

Professor Joseph M'Boussa

Centre Hospitalier Universitaire
Service de Pnuema-Phtisiologie
BP 32
Congo

Roles:

- Phase Three Principal Investigator for Brazzaville

Buenos Aires Centre

Phase One			
Centre:		Buenos Aires, Argentina (Latin America)	
Principal Investigator:		Dr Natalio Salmun	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:September 1995 to April 1996 6-7yr:August 1995 to April 1996
Sampling Frame:		13-14yr: All private and public schools in 11 districts from Buenos Aires Region (Federal District, Avellaneda, Lanus, Lomas de Zamora, Moron, Balcarce, La Plata, San Nicolas, Pergamino, Bahia Blanca). 6-7yr:All private and public schools in 13 districts from Buenos Aires Region (Federal District, Alte Brown, Gral. Villegas, La Plata, Mar del Plata, San Nicolas, Pergamino, Bahia Blanca).	

Personnel

Dr. Jose E. Fabiani

Director of Argentine Institute of Allergy, Asthma and Immunology
Avda. Meeks 15. 2nd floor.
Lomas de Zamora.
Prov. de Buenos Aires
Argentina

Roles:

- Phase One collaborator for Buenos Aires

Dr Ilda María Eudosia Guimaraes

Hospital de Atención Médica Primaria de Hurlingham
Alvear 738 (1714)
Ituzaingo
Argentina

Roles:
- Phase One collaborator for Buenos Aires

Dr. Marcelo Kohan.

Vicepresident 2nd of Fundaler.
Laprida 1520.
Buenos Aires. 1425
Argentina

Roles:
- Phase One collaborator for Buenos Aires

Dr. Jorge Nuñez.

Co director of the Argentine Institute of Allergy, Asthma and Immunology
Bulnes 1563.
Buenos Aires
Argentina

Roles:
- Phase One collaborator for Buenos Aires

Dr Natalio Salmun

Center of Allergy & Immunology
Billinghurst 2565. 3. A
Argentina

Roles:
- Phase One Principal Investigator for Buenos Aires

Dr. Wenceslao Sanchez de la Vega.

Vicepresident 1st of Fundaler.
Cerviño 3220.
Buenos Aires. 1425
Argentina

Roles:
- Phase One collaborator for Buenos Aires

Dra Marcela Soria.

Serv de Alergia. Hospital.... La Plata
Calle 73 y|129. Manzana 289
Club El Carmen. Gutierrez 1844
Prov. de Buenos Aires
Argentina

Roles:
- Phase One collaborator for Buenos Aires

Cádiz Centre

Phase One			
Centre:		Cádiz, Spain (Western Europe)	
Principal Investigator:		Dr Andrés Rabadán Asensio	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools of our district (88) and all children of 8th grade (4344).	

Personnel

Dr Andrés Rabadán-Asensio

Jefe de Servicio de Salud Consejería de Salud
Delegación Provincial de Cádiz
Junta de Andalucía
María Auxiliadora, 2
Spain

Roles:
- Phase One Principal Investigator for Cádiz

The ISAAC Story

Cairo University Children's Hospital

Cairo University Children's Hospital

Center for Social & Preventive Medicine (CSPM)

Cairo Centre

Phase Three			
Centre:		Cairo, Egypt (Eastern Mediterranean)	
Principal Investigator:		Dr Maggie Louis Naguib	
Age Groups:	13-14	**Timeframe:**	February 2002 to March 2002
Sampling Frame:		13-14yr: Randomly selected schools in Misr el Qadima school district	

Personnel

Dr Maggie Louis Naguib

Professor of Pediatrics & Pediatric Pulmonology
Cairo University Children's Hospital
Cairo University Faculty of Medicine
Egypt

Roles:

- Phase Three Principal Investigator for Cairo

Cairo University Children's Hospital at Kasr Al Aini Faculty of Medicine is the largest pediatric referral center in Egypt (http://www medicine.cu.edu.eg/beta/index.php?option=com_content&view=section&id=7&Itemid=9<=en).

Several studies were conducted concerning the epidemiology of childhood asthma and allergies in Egypt with growing concern over increasing prevalence rates; however none were incorporated into international data. I learned about the ISAAC phase III study during a working visit to the University of Michigan, USA and was very enthusiastic about the idea. Upon my return, I discussed with my colleagues and we decided to participate. We were further encouraged after contact with the team at the ISAAC International Data Centre who were very supportive.

Our team from the faculty of Medicine Cairo University, comprised members from the department of Pediatrics, the Center of Social and Preventive Medicine (CSPM) and the department of Public Health. Main tasks included organization and communication with the school district for selected schools, field work with questionnaire administration and data collection, processing and reporting.

Our selected area was the "Misr El Qadima" Old Cairo School district because it was a good example of a heavily populated urban community in Greater Cairo. It also falls within the area served by the CSPM.

Our participation in the phase III ISAAC study was a very positive experience. We learned a lot from it and enjoyed it as well. The study results were presented in many pediatric conferences and published in local scientific journals and currently serves as a recent reference for the prevalence of asthma and atopic diseases among school children in Egypt especially in Greater Cairo (of about 18,000,000 inhabitants).

I was privileged to be part of ISAAC international effort and hope that it will continue.

Calama Centre

Phase Three			
Centre:		Calama, Chile (Latin America)	
Principal Investigator:		Dr Luis Alberto Vera Benavides	
Age Groups:	13-14	**Timeframe:**	October 2002 to December 2002
Sampling Frame:		13-14yr: All schools in the city of Calama	

Personnel

Dr Luis Alberto Vera Benavides

Pedro Aguirre Cerda 231
Centro de Salud Familiar "Las Ánimas"
Chile

Roles:

- Phase Three Principal Investigator for Calama

The ISAAC Story

Cali Centre

Phase Three			
Centre:		Cali, Colombia (Latin America)	
Principal Investigator:		Dr Gustavo A Ordoñez	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2002 to June 2002
Sampling Frame:		13-14yr: All schools in Santiago de Cali area 6-7yr:All schools in Santiago de Cali Area	

Personnel

Dr Gustavo A Ordoñez

Pediatric Pulmonologist
FUN-AIRE
Calle 9 C # 50-25
Cali
Colombia

Roles:

- Phase Three Principal Investigator for Cali

Local Publications

The following publications used ISAAC data from the Cali centre:

González-Díaz SN, Del Río-Navarro BE, Pietropaolo-Cienfuegos DR, Escalante-Domínguez AJ, García-Almaraz RG, Mérida-Palacio V, Berber A *Factors associated with allergic rhinitis in children and adolescents from northern Mexico International Study of Asthma and Allergies in Childhood Phase IIIB* Allergy Asthma Proc 2010; 31(4): 53-62

Cape Town Centre

Phase One			
Centre:		Cape Town, South Africa (Africa)	
Principal Investigator:		Dr Hugo Nelson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Schools with black, coloured and white students in the Cape Town area.	

Phase Three			
Centre:		Cape Town, South Africa (Africa)	
Principal Investigator:		Professor Heather J Zar	
Age Groups:	13-14	**Timeframe:**	March 2002 to September 2002
Sampling Frame:		13-14yr: Random sampling of schools in geographical area stratified by ethnic group (historically defined as predominantly white, mixed race or black) as was done in ISAAC Phase One. Sampling frame exactly the same for both Phases.	

Personnel

Professor Rodney Ehrlich

School of Public Health and Family Medicine
Medical School Observatory 7925
University of Cape Town
South Africa

Roles:

- Phase One collaborator for Cape Town
- Phase Three collaborator for Cape Town

Dr Hugo Nelson

Flat 21, Block 14
Horsett Hospital
Rowley Rd, Grays
United Kingdom

Roles:

- Phase One Principal Investigator for Cape Town

Professor Heather J Zar

Red Cross Childrens Hospital
Klipfontein Road
7th floor ICH Building
South Africa

Roles:

- National Coordinator for South Africa
- Phase Three Principal Investigator for Cape Town

See the South Africa National page for details of ISAAC in Cape Town

Local Publications

The following publications used ISAAC data from the Cape Town centre:

Mercer MJ, Joubert G, Ehrlich RI, Nelson H, Poyser MA, Puterman A, Weinberg EG. *Socioeconomic status and prevalence of allergic rhinitis and atopic eczema symptoms in young adolescents.* Pediatr Allergy Immunol 2004; 15(3): 234-41.

Poyser MA, Nelson H, Ehrlich RI, Bateman ED, Parnell S, Putermanz A, Weinberg E. *Socioeconomic deprivation and asthma prevalence and severity in young adolescents.* Eur Respir J 2002; 19(5): 892-8.

Zar HJ, Ehrlich RI, Workman L, Weinberg EG. *The changing prevalence of asthma, allergic rhinitis and atopic eczema in African adolescents from 1995 to 2002.* Pediatr Allergy Immunol 2007; 18(7): 560-5.

The ISAAC Story

Caracas Centre

Phase Three			
Centre:		Caracas, Venezuela (Latin America)	
Principal Investigator:		Dr Oscar Aldrey	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to January 2003
Sampling Frame:		Schools of South-West region of Caracas-Venezuela	

Personnel

Dr Oscar Aldrey

Jefe del Instituto
Instituto de Inmunología
Avenida Roosevelt
Ciudad Universitaria, Instituto de Inmunología
Venezuela

Roles:

- National Coordinator for Venezuela
- Phase Three Principal Investigator for Caracas

Cartagena Centre

Phase One			
Centre:		Cartagena, Spain (Western Europe)	
Principal Investigator:		Professor Luis García-Marcos	
Age Groups:	13-14, 6-7	**Timeframe:**	October 1993 to November 1993
Sampling Frame:			

Phase Two			
Centre:		Cartagena, Spain (Western Europe)	
Principal Investigator:		Professor Luis García-Marcos	
Age Groups:	10-11 years,	**Timeframe:**	March 2000 to March 2001.
Sampling Frame:		All schools in the Cartagena administrative district. Same study area as ISAAC Phase One.	

Phase Three			
Centre:		Cartagena, Spain (Western Europe)	
Principal Investigator:		Professor Luis García-Marcos	
Age Groups:	13-14, 6-7	**Timeframe:**	December 2001 to May 2002
Sampling Frame:		All schools in Cartagena city district area (Spain). Same sampling frame as for Phase One.	

Personnel

Professor Luis García-Marcos

Respiratory Medicine and Allergy Units
'Virgen de la Arrixaca' University Children's Hospital
University of Murcia
Pabellón Docente HUVA, Campus Ciencias de la Salud
Spain

Roles:

- ISAAC Executive
- ISAAC Steering Committee
- National Coordinator for Spain
- Phase One Principal Investigator for Cartagena
- Phase Two Principal Investigator for Cartagena
- Phase Three Principal Investigator for Cartagena

The ISAAC Story

The ISAAC story in Cartagena (Spain)

Cartagena entered ISAAC as an individual centre and as the coordinator centre for Spain after some small local epidemiological studies which several young investigators carried out in the city in the late 80's. Those studies tried to establish the association between air pollution produced by several factories and respiratory diseases in children, especially asthma. This starting group of young researchers knew from a colleague from Barcelona about a new international survey on asthma in children that was being prepared. The group was specifically interested in the video-questionnaire. Very fortunately that colleague had a name and a mail address to ask for some information. A request letter was sent in February 1992 to Prof. Neil Pearce at the Wellington School of Medicine (New Zealand). Although the information took some time to arrive, as the study instruments were being developed, a letter from Wellington was received during the summer of 1992 in which Prof. Pearce advised to contact Prof. Weiland, at the University of Bochum (Germany), who was starting to coordinate five other centres in Europe (see attachment). After contacting Prof. Weiland the group joined the ISAAC study and started to organize the net in Spain.

The first task in Cartagena was to translate and back translate the original written questionnaire in English and to prepare the Spanish version of the video-questionnaire which arrived soon from Bochum after the first contact with Prof. Weiland in October 1992. Furthermore, a meeting in Madrid with researchers interested in the ISAAC study, previously contacted by phone from several parts of Spain, was organised. The meeting was held in Madrid in March 1993. Both Prof. Pearce (spending a sabbatical period at the University of Paris at that time) and Prof. Weiland attended, together with groups from Cartagena, Bilbao, Castellón, Pamplona, Valladolid, Barcelona and Huelva.

Phase One.

This phase was carried out in Cartagena during autumn and winter 1993 and all schools within the city district were invited to participate: only one of them declined entering. The two age groups (6-7 and 13-14 years) were surveyed and participation rate was very high in the older group; however, it was not so high in the younger one but fortunately still enough to be included in the international analyses. As no funding for fieldworkers was possible at that time the research team, composed by Drs. García-Marcos, Dr. Guillén Pérez, Dr. Ñíguez Carbonell, Dr. Guillén Marco, Mrs. Martínez-Torres, Mrs. Gomez-Segado, Mrs Sánchez de Val. Mrs. Saura Robles and Mr. Amoraga Bernal, dedicated part of their own time to the survey and was very excited with the results: data on the epidemiology on asthma, rhinitis and eczema was available for the first time in the area after a never ending process of double entry of the data.

Phase Two.

Cartagena was lucky to raise some funds from the Spanish Government in order to implement four centres of this Phase in Spain. However, that meant to be a central organizer for the four centres and to train fieldworkers not only locally but also for the rest of centres in the country. Phase Two was in itself a nightmare and was even worse because of the responsibilities of having additional centres to coordinate. The positive part was having funds enough for carrying out the project during 2000-2001. Also fortunate was the fact of having European funds for training and coordinating purposes at the University of Munster (Germany) and later at the University of Ulm (Germany). Prof. Garcia-Marcos attended to several of those training and coordination meetings during the late 90's an early 2000's and together with Mrs. Martínez Torres was responsible for performing the study in Cartagena for coordinating and training the other centres. The study was slow to perform as it included very extensive questionnaires and procedures, including prick test and blood extraction. Unfortunately, participation rate was slightly below 70% what meant some problems for prevalence publications; however more than 1500 children were surveyed and most of them had all modules completed. Cartagena did the test of bronchial hyperresponsiveness and the dust collection modules in a sub-sample of 100 healthy and 100 asthmatic children. The funniest part was sending the dust samples to the University of Utrecht in carbon dioxide snow inside a huge coffin-like polyurethane box which was given to us by a fish factory which used them to send frozen big tuna fishes to Japan!

Phase Three.

After Phase One and Two, phase Three was an easy task. Again Cartagena performed their own survey, in the same area as in Phase One, and coordinated all Spanish centres. As some new funds arrived for the project, some fieldworkers were hired and the process was smooth and quick, mainly occupying the spring of 2000. A new system of questionnaire scanning was also implemented which made the process even easier, making possible for the principal investigator to concentrate in publishing the results of both Phases Two and Three. Almost the same schools as in Phase One were surveyed and again participation rate was very high among adolescents and not so good among school-children. Anyway, for the first time Cartagena had data on the change of prevalence of asthma and allergies. Good.

Local Publications

The following publications used ISAAC data from Cartagena:

Arnedo-Pena A, García-Marcos L, Fernández-Espinar JF, Bercedo-Sanz A, Aguinaga-Ontoso I, González-Díaz C, Carvajal-Urueña I, Busquet-Monge R, Suárez-Varela MM, de Andoín NG, Batlles-Garrido J, Blanco-Quirós A, López-Silvarrey Varela A, García-Hernández G *Sunny hours and variations in the prevalence of asthma in schoolchildren according to the International Study of Asthma and Allergies (ISAAC) Phase III in Spain* Int J Biometeorol 2011; 55(3): 423-434

Blanco-Quirós A, García-Marcos L, Garrote JA, et al. *Antibody levels to Bordetella pertussis in 10-yr-old children with atopy and atopic asthma.* Pediatr Allergy Immunol 2005; 16(8):637-640.

García-Marcos L, Ruiz TR, García-Hernández G, Morales Suárez-Varela MM, Valverde-Molina J, Sánchez-Solis M. *Asthma and rhinoconjunctivitis comorbidity United airway disease or inherited target organs?* Pediatr Allergy Immunol 2010; 21 (1): e142-e148. E pub 7 Apr 2009.

Martin Fernández-Mayoralas D, Martin Caballero JM, García-Marcos AL. *Association between atopic dermatitis, allergic rhinitis and asthma in schoolchildren aged 13-14 years old.[article in spanish].* An Pediatr (Barc) 2004; 60(3):236-242.

Martin Fernández-Mayoralas D, Martin Caballero JM, García-Marcos AL. *Prevalence of atopic dermatitis in schoolchildren from Cartagena (Spain) and relationship with sex and pollution.[article in spanish].* An Pediatr (Barc) 2004; 60(6):555-560.

Morales Suárez-Varela MM, García-Marcos AL, González DC, et al. *Prevalence of atopic eczema and nutritional factors in 6-7 year old children.[article in spanish].* Aten Primaria 2007; 39(7):355-360.

The ISAAC Story

Local Publications

The following publications used ISAAC data from the Caruaru centre:

Franco JM, Gurgel R, Sole D, França VL, Brabin B and the Brazilian Isaac Group. *Socio-environmental conditions and geographical variability of asthma prevalence in Northeast Brazil* Allergol Immunopathol (Madr). 2009; 37(3):116-121

Caruaru Centre

Phase Three			
Centre:		Caruaru, Brasil (Latin America)	
Principal Investigator:		Assistant Professor Almerinda Silva	
Age Groups:	13-14	**Timeframe:**	September 2002 to December 2002
Sampling Frame:		13-14yr: All schools in Caruaru area (private and public schools).	

Personnel

Assistant Professor Almerinda Silva

UFPE
Rua Laurindo Coelho n 245 apt. 1202
Casa Forte
Recife - PE
Brasil

Roles:

- Phase Three Principal Investigator for Caruaru

Casablanca Centre

Phase One			
Centre:		Casablanca, Morocco (Africa)	
Principal Investigator:		Professor Zoubida Bouayad	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All public schools in the Casablanca area.	
Phase Three			
Centre:		Casablanca, Morocco (Africa)	
Principal Investigator:		Professor Zoubida Bouayad	
Age Groups:	13-14	**Timeframe:**	October 2001.
Sampling Frame:		13-14yr: Some schools in Casablance. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Professor Zoubida Bouayad

Service des Maladies Respiratoires
Hôpital 20 Août
CHU Ibn Rochd
Morocco

Roles:

- National Coordinator for Morocco
- Phase One Principal Investigator for Casablanca
- Phase Three Principal Investigator for Casablanca

Castellón Centre

Phase One			
Centre:		Castellón, Spain (Western Europe)	
Principal Investigator:		Dr Alberto Arnedo-Pena	
Age Groups:	13-14, 6-7	**Timeframe:**	January 1994 to May 1994
Sampling Frame:			
Phase Three			
Centre:		Castellón, Spain (Western Europe)	
Principal Investigator:		Dr Alberto Arnedo-Pena	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to June 2002
Sampling Frame:		All schools in Castellon and neighbouring municipalities, public and private schools. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Dr Alberto Arnedo-Pena

Sección de Epidemiología
Centro Salud Pública
Avda. del Mar, 12
Spain

Roles:

- Phase One Principal Investigator for Castellón
- Phase Three Principal Investigator for Castellón

Central Santiago Centre

Phase One			
Centre:		Central Santiago, Chile (Latin America)	
Principal Investigator:		Dr Ignacío Sanchez	
Age Groups:	13-14, 6-7	**Timeframe:**	August 1995 to August 1995
Sampling Frame:			

Personnel

Dr Ignacío Sanchez

Departamento de Pediatria
Pontificia Universidad Catolica de Chile
Casilla 114-D
Chile

Roles:

- Phase One Principal Investigator for Central Santiago

Chandigarh Centre

Phase One			
Centre:		Chandigarh, India (Indian Sub-Continent)	
Principal Investigator:		Professor Lata Kumar	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1994 to May 1995
Sampling Frame:			
Phase Three			
Centre:		Chandigarh, India (Indian Sub-Continent)	
Principal Investigator:		Dr Meenu Singh	
Age Groups:	13-14	**Timeframe:**	August 2001 to January 2002
Sampling Frame:		13-14yr: All schools in the Central area within the city limits of Chandigarh, the same sampling frame as Phase One.	

Personnel

Professor Lata Kumar

Professor & Former Head
Department of Pediatrics
#1543, Sector 38-B
India

Roles:

- Phase One Principal Investigator for Chandigarh

Dr Meenu Singh

Allergy and asthma Clinic
Postgraduate Institute of Medical Education and Research
Chandigarh
India

Roles:

- Phase Three Principal Investigator for Chandigarh

Chandigarh Centre

The Allergy and asthma Clinic was established in Postgraduate Institute o fMedical Education and Research, Chandigarh by Dr Lata Kumar. The centre has offered treatment facilities for thousands of children with asthma and allergic disorders. Community based epidemiological investigations and several studies on clinical and experimental aspects have been carried out in this centre. More than 9000 children are registered in this centre. Currently Dr Meenu Singh is looking after this clinic providing specialized services. Several studies funded by national agencies including a birth cohort study are in progress.

Impact

The ISAAC study has had a hypothesis generating impact on research in the Indian subcontinent. A task force to study the increasing prevalence of asthma in children was set up in India which also looked in to various protective influences responsible for lower prevalence of this disorder. Active research into environmental factors including aero allergens and food allergens is carried out.

The ISAAC Story

Chantaburi Centre

Phase Three			
Centre:		Chantaburi, Thailand (Asia-Pacific)	
Principal Investigator:		Dr Thanong Prasarnphanich	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2001 to December 2001
Sampling Frame:		All schools in Amphur Muang Chantaburi area.	

Personnel

Dr Thanong Prasarnphanich

Pediatrician
Prapokklao Hospital
Leabnern Road, Tambon Wat Mai
Amphur Maung
Thailand

Roles:
- Phase Three Principal Investigator for Chantaburi

Chapel Hill Centre

Phase Three			
Centre:		Chapel Hill, USA (North America)	
Principal Investigator:		Dr Karin Yeatts	
Age Groups:	13-14	**Timeframe:**	November 1999 to June 2000
Sampling Frame:		13-14yr: All public middle schools in the state of North Carolina.	

Personnel

Dr Stan Music

North Carolina Department of Health and Human Services
Chapel Hill, North Carolina
Usa

Roles:
- Phase Three collaborator for Chapel Hill

Mr Vic Rhodes

Department of Epidemiology
Chapel Hill, North Carolina
Usa

Roles:
- Phase Three collaborator for Chapel Hill

Dr Carl Shy

University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Usa

Roles:
- Phase Three collaborator for Chapel Hill

Dr Karin Yeatts

Research Assistant Professor
Department of Epidemiology, Gillings School of Global Public Health
University of North Carolina at Chapel Hill
Chapel Hill, North Carolina
Usa

Roles:
- Phase Three Principal Investigator for Chapel Hill

ISAAC Phase III in the US

I started working with the ISAAC survey for my doctoral research in 1994. Dr. Carl Shy, former Chair of the Department of Epidemiology at the University of North Carolina at Chapel Hill had recently obtained funding to implement the survey in approximately twelve Charlotte-Mecklenburg middle schools. Once that research was complete, Dr. Shy and I began collaborating with Dr. Stan Music at the North Carolina Department of Health and Human Services (NC DHHS) (the state health department.) State interest grew in our pilot data. We also collected data on asthma-related “health consequences” and health care utilization. Subsequently, we were funded by NC DHHS to conduct asthma surveillance across the state of North Carolina in all public middle schools (approximately 192,000 students) in 1999-2000. North Carolina had approximately 7 million people at the time. We used the basic ISAAC questions with additional questions as our survey instrument. We had 499 schools participated and we obtained good quality data from approximately 125,000 students. To thank the schools for participating, we created individual “asthma reports” for each of the participating 499 schools. In these reports, we included the local asthma and wheezing prevalence, the average surrounding county prevalence, and the state asthma prevalence as well as the health consequences (such as school absences due to asthma.) These reports were used by local community’s members, school administrations, and the state health department for both planning and public education on the health consequences of childhood asthma.

The ISAAC Story

Chiang Mai Centre

Phase One			
Centre:		Chiang Mai, Thailand (Asia-Pacific)	
Principal Investigator:		Associate Professor Muthita Trakultivakorn	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:September 1995 to November 1995 6-7yr:August 1995 to November 1995
Sampling Frame:		13-14yr: One third of the schools in Muang (Central) District and one school in San Kam Paeng District. 6-7yr:One fourth of the schools in Muang (Central) District, two schools in Mae Rim District and one school in San Kam Paeng District.	

Phase Three			
Centre:		Chiang Mai, Thailand (Asia-Pacific)	
Principal Investigator:		Associate Professor Muthita Trakultivakorn	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2001 to November 2001
Sampling Frame:		13-14yr: One third of the schools in Muang (Central District) and one school in San Kam Paeng District. (The same schools as in ISAAC Phase One with one additional new school which was the same school as one primary school both in Phase One and Phase Three.) 6-7yr:One third of all primary schools in Muang District, two schools in Mae Rim District and one school in San Kam Paeng District.	

Personnel

Associate Professor Muthita Trakultivakorn

Department of Pediatrics
Faculty of Medicine
Chiang Mai University
Thailand

Roles:

- Phase One Principal Investigator for Chiang Mai
- Phase Three Principal Investigator for Chiang Mai

Chiangrai Centre

Phase Three			
Centre:		Chiangrai, Thailand (Asia-Pacific)	
Principal Investigator:		Dr Rawee Nettagul	
Age Groups:	13-14, 6-7	**Timeframe:**	October 1995 to December 1995
Sampling Frame:		Schools in main district of Chiang Rai Province only	

Personnel

Dr Rawee Nettagul

230/7 Thanalai Road
Muang
Thailand

Roles:

- Phase Three Principal Investigator for Chiangrai

Chiang Rai Center, Thailand

One of the most common problems in daily pediatric practice is respiratory symptoms. A lot of them may have an underlying allergy. A long time ago, we knew nothing about asthma and allergy prevalence in Chiang Rai.

Chiang Rai is located in northern Thailand which is next to Myanmar. The population in this province is 1,000,000 approximately. The climate in this area varies a lot each day. Many people say we have three seasons in one day (Summer, Rainy and Winter) so a large amount of children suffered respiratory symptoms all year round.

The role of ISAAC coordinator was the first step for me to do further study in this interesting field. I thank Professor Dr Pakit Vichyanond who let me be a part of this work.

Local Publications

The following publications used ISAAC data from the Chiang Mai centre:

Trakultivakorn M. *Prevalence of asthma, rhinitis, and eczema in Northern Thai children from Chiang Mai (International Study of Asthma and Allergies in Childhood, ISAAC).* Asian Pac J Allergy Immunol 1999; 17(4): 243-8.

Chicago (3) Centre

Phase One			
Centre:		Chicago (3), USA (North America)	
Principal Investigator:		Professor Victoria Persky	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		The one high school in East Moline, Illinois and all 7th and 8th grade classes in East Moline.	

Personnel

Professor Victoria Persky

Division of Epidemiology and Biostatistics
University of Illinois at Chicago School of Public Health
Room 878a, 1603 Taylor St
Usa

Roles:

- Phase One Principal Investigator for Chicago (3)

Ms Julie A Slezak

Division of Epidemiology-Biostatistics
School of Public Health
The University of Illinois at Chicago
2121 West Taylor Street
Usa

Roles:

- Phase One collaborator for Chicago (3)

Chicago (4) Centre

Phase One			
Centre:		Chicago (4), USA (North America)	
Principal Investigator:		Professor Victoria Persky	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All metropolitan Chicago city public and Catholic grade schools.	

Personnel

Professor Victoria Persky

Division of Epidemiology and Biostatistics
University of Illinois at Chicago School of Public Health
Room 878a, 1603 Taylor St
Usa

Roles:

- Phase One Principal Investigator for Chicago (4)

Ms Julie A Slezak

Division of Epidemiology-Biostatistics
School of Public Health
The University of Illinois at Chicago
2121 West Taylor Street
Usa

Roles:

- Phase One collaborator for Chicago (4)

Chiloe Centre

Phase Three			
Centre:		Chiloe, Chile (Latin America)	
Principal Investigator:		Dra Amanda Contreras	
Age Groups:	13-14	**Timeframe:**	August 2002 to November 2002
Sampling Frame:		13-14yr: All uban schools in the island.	

Personnel

Dra Amanda Contreras

Head of Paediatrics Service, Hospital de Castro
National Health System, Ministry of Health
Serrano 459
Castro
Chile

Roles:

- Phase Three Principal Investigator for Chiloe

The ISAAC Story

Chongqing Centre

Phase One			
Centre:		Chongqing, China (Asia-Pacific)	
Principal Investigator:		Professor Kun-Hua Chen	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All school in the Chongqing Downtown - seventeen schools.	

Personnel

Professor Kun-Hua Chen

Children's Hospital
136 Zhongshan Road
Chongqing
China

Roles:

- Phase One Principal Investigator for Chongqing

Christchurch Centre

Phase One			
Centre:		Christchurch, New Zealand (Oceania)	
Principal Investigator:		Associate Professor Philip Pattemore	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1992 to August 1993 6-7yr:October 1992 to August 1993
Sampling Frame:			
Phase Three			
Centre:		Christchurch, New Zealand (Oceania)	
Principal Investigator:		Associate Professor Philip Pattemore	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2002 to August 2003
Sampling Frame:		All schools in the Christchurch City. The same sampling frame as Phase One.	

Personnel

Dr Rodney Ford

Community Paediatrician
Community Paediatric Unit
Hagley Hostel
Private Bag 4710
New Zealand

Roles:

- Phase One collaborator for Christchurch

Associate Professor Philip Pattemore

Department of Paediatrics
Christchurch School of Medicine
P O Box 4345
New Zealand

Roles:

- Phase One Principal Investigator for Christchurch
- Phase Three Principal Investigator for Christchurch

Local Publications

The following publications used ISAAC data from the Christchurch centre:

Wilkie AT, Ford RP, Pattemore P, Schluter PJ, Town I, Graham P. *Prevalence of childhood asthma symptoms in an industrial suburb of Christchurch.* NZ Med J 1995; 108(1000): 188-90.

Ciudad de México (1) Centre

Phase Three			
Centre:		Ciudad de México (1), Mexico (Latin America)	
Principal Investigator:		Dra Blanca E Del-Río-Navarro	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to December 2002
Sampling Frame:		All public schools from the north area of Mexico City (D.F.)	

Personnel

Dra Blanca E Del-Río-Navarro

Hospital Infantil de México Federico Gómez
Dr. Marquez #162. Col. Doctores, Del. Cuauhtemoc
Mexico City,
Mexico

Roles:

- Phase Three Principal Investigator for Ciudad de México (1)

Ciudad de Mexico (1)

Mexico City - North Zone Centre -

We started our participation with ISAAC in October 2002 during Phase III-b. Together with local authorities (Secretaría de Educación Pública and Gobierno del Distrito Federal) we applied the ISAAC questionnaire to local public and private schools, obtaining a total of 3243 children (6-7 years old group) and 3333 adolescents (13-14 years old group).

With such information we have cooperated to the better understanding of the prevalence and biological, and environmental factors of this complex multifactorial inflammatory airway disease.

We have been working with the collected data, and up to date we had published 7 original articles in different indexed journals. At the moment, we are working in the identification of potential risk factors associated to the presence of atopic symptoms, and we expect to publish such information in the next few months.

We are convinced of the relevance of knowledge generation within the field of asthma and allergies, as well as its opportune diffusion in order to improve prevention, recognition and management of such disorders.

Published articles:

"Asthma prevalence in children living in north Mexico City and a comparison with other Latin American cities and world regions" Del-Rio-Navarro B, MD., Del Rio-Chivardi JM, MD., Berber A, MD., Ph.D., Sienra-Monge JJL, MD., Rosas-Vargas MA, M.D. and Baeza-Bacab M, MD. (Mexico) Allergy Asthma Proc 2006; 27:334-340

"Identification of asthma risk factors in Mexico City in an International Study of Asthma and Allergy in Childhood survey" Del-Rio-Navarro B, MD., Berber A, MD., Ph.D., Blandón-Vijil V, MD., Ramírez-Aguilar M, MD., Ph.D., Romieu I, M.D., Ph.D., Ramírez-Chanona N, MD., Heras-Acevedo S, MD., Serrano Sierra A, MD., Barraza-Villareal A, MD., Baeza-Bacab M, MD., Sienra-Monge JJL, MD. (México) Allergy Asthma Proc 2006; 27:325-333

"Factors Associated With Allergic Rhinitis in Children From Northern Mexico City" Del-Río-Navarro BE, Luna-Pech JA,. Berber A, Zepeda-Ortega B, Avila-Castañon L, Del-Rio-Chivardi JM, Baeza-Bacab M, Sienra-Monge JJL. (México) J Investig Allergol Clin Immunol 2007; 17(2):77-84

"Factors associated with allergic rhinitis in children and adolescents from northern Mexico: International Study of Asthma and Allergies in Childhood Phase IIIB" González-Díaz SN, Ph.D., Del Río-Navarro BE, M.D., Pietropaolo-Cienfuegos DR, M.D., Escalante-Dominguez AJ, M.D., García-Almaráz RG, M.D., Mérida-Palacio V, M.D., and Berber A, M.D., Ph.D. Allergy Asthma Proc 2010; 31:e53-e62

"A comparative study of bronchodilator reversibility with albuterol, between asthma symptomatic and asymptomatic children according to ISAAC Questionnaire in Mexico City" Del Río-Navarro B.E., M.P. Hernández Román MP, Espinola Reyna G.,Berber A, Escalante-Dominguez A.J., Gonzalez-Reyes M., Rosas-Vargas M.A., Pérez-López J., Baeza-Bacab M. and Sienra-Monge J.J.L.. Allergol et Immunopathol 2004; 32(6):334-9

"Study of the Relationship Between Acetaminophen and Asthma in Mexican Children Aged 6 to 7 years in 3 Mexican Cities Using ISAAC Methodology" Del-Río-Navarro BE, Ito-Tsuchiya FM, Berber A., Zepeda-Ortega B., Sienra-Monge JJL, García-Almaráz R,. Baeza-Bacab M. J Investig Allergol Clin Immunol 2008; 18(3):194-201

"Obesity risk factors in the ISAAC (International Study of Asthma and Allergies in Childhood) in Mexico City" Violante R. del Río Navarro BE., Berber A., Ramirez Chanona N., Baeza Bacab M., Sienra Monge JJ. Rev Alerg Mex 2005; 52(4):141-5

Ciudad de México (3) Centre

Phase Three			
Centre:		Ciudad de México (3), Mexico (Latin America)	
Principal Investigator:		Dra Mercedes Barragán-Meijueiro	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2002 to November 2002
Sampling Frame:		Public schools in the southeast area of Mexico City.	

Personnel

Dra Mercedes Barragán-Meijueiro

Pediatric Allergist
CoMAAIPE
París 227
Colonia del Carmen
Mexico

Roles:

- Phase Three Principal Investigator for Ciudad de México (3)

Ciudad de México (4) Centre

Phase Three			
Centre:		Ciudad de México (4), Mexico (Latin America)	
Principal Investigator:		Dra Nelly Ramírez-Chanona	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2002 to November 2002
Sampling Frame:		All public schools from the north area of Mexico City (D.F).	

Personnel

Dra Nelly Ramírez-Chanona

Pediatric Allergist
CoMAIPE
Mérida No. 170 Planta baja
Mexico

Roles:

- Phase Three Principal Investigator for Ciudad de México (4)

Ciudad Victoria Centre

Phase Three			
Centre:		Ciudad Victoria, Mexico (Latin America)	
Principal Investigator:		Dr Roberto García-Almaráz	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2003 to April 2003
Sampling Frame:		Some schools in Ciudad Victoria City, located in Tamaoulipas state, in Mexico	

Personnel

Dr Roberto García-Almaráz

Hospital Infantil de Tamaulipas
15 Abasolo No. 277
Ciudad Victoria
Mexico

Roles:

- Phase Three Principal Investigator for Ciudad Victoria

Cluj Centre

Phase One			
Centre:		Cluj, Romania (Northern and Eastern Europe)	
Principal Investigator:		Professor Diana Deleanu	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Randomized schools in town Cluj (all schools enroled)	

Phase Three			
Centre:		Cluj, Romania (Northern and Eastern Europe)	
Principal Investigator:		Professor Diana Deleanu	
Age Groups:	13-14	**Timeframe:**	February 2001 to December 2001
Sampling Frame:		13-14yr: All schools in Cluj-Napoca area for the aged group of 13-14 years old children, the same sampling frame as in Phase One.	

Personnel

Dr Paraschiva Chereches Panta

University of Medicine & Pharmacy IULIU HATIEGANU
3rd Medical Clinic, Allergy – Immunology Dept.
Romania

Roles:

- Phase One collaborator for Cluj
- Phase Three collaborator for Cluj

Diana Church

University of Medicine & Pharmacy IULIU HATIEGANU
3rd Medical Clinic, Allergy – Immunology Dept.
Romania

Roles:

- Phase Three collaborator for Cluj

Professor Diana Deleanu

President of Romanian Society of Allergy and Clinical Immunology (SRAIC)
University of Medicine & Pharmacy IULIU HATIEGANU
3rd Medical Clinic, Allergy – Immunology Dept.
Croitorilor 19-23;
Romania

Roles:

- National Coordinator for Romania
- Phase One Principal Investigator for Cluj
- Phase Three Principal Investigator for Cluj

Local Publications

The following publications used ISAAC data from the Ciudad Victoria centre:

González-Díaz SN, Del Río-Navarro BE, Pietropaolo-Cienfuegos DR, Escalante-Domínguez AJ, García-Almaraz RG, Mérida-Palacio V, Berber A *Factors associated with allergic rhinitis in children and adolescents from northern Mexico International Study of Asthma and Allergies in Childhood Phase IIIB* Allergy Asthma Proc 2010; 31(4): 53-62

Local Publications

The following publications used ISAAC data from Cluj:

Chereches-Panta P, Man SC, Dumitrascu D, Mirestean I, Iacob D, Ichim GE, Nanulescu MV. *Epidemiological Survey 6 Years Apart Increased Prevalence of Asthma and Other Allergic Diseases in Schoolchildren Aged 13-14 Years in Cluj-Napoca, Romania (Based on Isaac Questionnaire)* Maedica 2011; 6(1): 10-16

Chereches-Panta P, Popa MD, Iacob D, Muresan M, Man SC, Farcau M, Indolean C, Ichim GE, Mirestean I, David L, Nanulescu MV. *[Increase of the prevalence of bronchial asthma and related symptoms in students in Cluj-Napoca.Epidemiologic study with a five-years interval].* Pneumologia.2004 Jan-Mar;53(1):47-52.

Nanulescu MV, Chereches-Panta P *Tendinta prevalentei astmului broncic la s colarul de vârsta 13-14 ani în municipiul Cluj-Napoca, în perioada 1994/1995-2000/2001. [Asthma prevalence trend in the school age 13-14 years in Cluj-Napoca, during 1994/1995 - 2000/2001]* J Rom Soc Allergol Clin Immunol 2005; 2(3): 26-31. (CNCSIS B+)

Professor Mircea Nanulescu

Chief of Pediatrics
Director of 3rd Pediatric Clinic
University of Medicine & Pharmacy IULIU HATIEGANU
Romania

Roles:

- Phase One collaborator for Cluj
- Phase Three collaborator for Cluj

The story of ISAAC in Cluj

In a hot summer day in Transylvania, an ordinary mail send to Professor Bengt Björkstén was the certificate of birth for ISAAC Cluj centre.

I was a young researcher in the field of medicine with a dream for allergy diseases. So I was looking for foreign collaboration (after many years of "iron curtain"). Professor Bengt Björkstén was very pleased with my "desire" for an epidemiological study in the field of allergic diseases (Romania was a white spot on Europe for allergy) – I was a resident in the allergy specialty at that time.

We did our collaboration during those years (beginning of 90's) by mail and after that on e-mail (which helped us a lot!).

It was difficult at the beginning but working on the project, things were moving one with a lot of enthusiasm. I was contacted by Professor Mircea Nanulescu, the chief of Pediatrics in our University, the director of 3rd Pediatric Clinic with a department for asthma, so we started an almost 20 years of collaboration. He also arranged for one of his youngest, optimistic collaborators – Paraschiva Chereches Panta (Pusa for friends) – to work at the study.

One year later I had the opportunity to met professor Bengt Björkstén, one of the most remarkable people I have known during these years. Working with the questionnaires we could see the good changes that were happening in our country: in schools, in hospitals. Pusa and I reached the title of specialty in allergy, and pediatrics respectively.

We organized a summer school in Cluj with EAACI and Ga2len and Tadd Clayton was one of our guests - speakers. He presented the phase three results from ISAAC.

Unhappily, it was difficult for us to organize the study for 6 years old children and video questionnaires. Also the phase two study was performed in only some of our responders.

But with new help we did the ISAAC phase three study: Diana Church joined us. We the ISAAC team "grew" with the study: I organized the study of allergy in our University, and became president of our Allergy Society, Pusa is one of the most famous doctors for asthmatic children, Diana Church is working in Southampton and Berlin in the field of allergy, Professor Mircea Nanulescu organized the Romanian Pediatric Society for Respiratory Diseases.

We are pleased that our work, the only one in our country is recognized by our colleagues as a priority in epidemiology of asthma and allergic diseases in Romania.

Coimbra Centre

Phase Three			
Centre:		Coimbra, Portugal (Western Europe)	
Principal Investigator:		Dr M Lourdes Chiera	
Age Groups:	13-14	**Timeframe:**	December 2001 to May 2002
Sampling Frame:		13-14yr: All schools in Coimbra area and two in F.Foz area, but in the same district.	

Personnel

Dr M Lourdes Chiera

Chief of Service
Hosp. Ped. Coimbra
AV. Bissaya Barreto
3041-853
Portugal

Roles:

- Phase Three Principal Investigator for Coimbra

Dr Emilia Faria

Serviço de Imunoalergologia
Hospitais da Universidade de Coimbra
Portugal

Roles:

- Phase Three collaborator for Coimbra

Regional
National
Local
Colleferro-Tivoli
Conakry
Córdoba

Colleferro-Tivoli Centre

Phase Three			
Centre:		Colleferro-Tivoli, Italy (Western Europe)	
Principal Investigator:		Dr Valerio Dell'Orco	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to March 2002
Sampling Frame:		All schools in the area of the Local Health Unit rm28 and rm 30	

Personnel

Dr Valerio Dell'Orco

Local Health Unit
ASL Rm/G
Corso Garibaldi 7
00034 Collefero
Italy

Roles:

- Phase Three Principal Investigator for Colleferro-Tivoli

Conakry Centre

Phase Three			
Centre:		Conakry, République de Guinée (Africa)	
Principal Investigator:		Professeur Oumou Younoussa Sow	
Age Groups:	13-14	**Timeframe:**	September 1996 to December 1997
Sampling Frame:		13-14yr: Public and Private schools in Conakry	

Personnel

Dr Camara Lansana Mady

Service de Pneumo-Phtisiologie
Centre Hospitalier Universitaire
B.P: 634
République De Guinée

Roles:

- Phase Three collaborator for Conakry

Professeur Oumou Younoussa Sow

Service de Pneumo-Phtisiologie
Centre Hospitalier Universitaire Ignace Deen
B.P: 634
République De Guinée

Roles:

- Phase Three Principal Investigator for Conakry

Córdoba Centre

Phase One			
Centre:		Córdoba, Argentina (Latin America)	
Principal Investigator:		Dr Carlos E Baena-Cagnani	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Municipality of Cordoba city area.	

Phase Three			
Centre:		Córdoba, Argentina (Latin America)	
Principal Investigator:		Dr Carlos E Baena-Cagnani	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2002 to April 2003
Sampling Frame:		Private and Public schools from Córdoba city. The same sampling frame as Phase One.	

Personnel

Dr Carlos E Baena-Cagnani

Faculty of Medicine
Catholic University of Córdoba
Santa Rosa 381
Argentina

Roles:

- National Coordinator for Argentina
- Phase One Principal Investigator for Córdoba
- Phase Three Principal Investigator for Córdoba

The ISAAC Story

Cosenza Centre

Phase One			
Centre:		Cosenza, Italy (Western Europe)	
Principal Investigator:		Dr Enea Bonci	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Local Health Autority	
Phase Three			
Centre:		Cosenza, Italy (Western Europe)	
Principal Investigator:		Dr Enea Bonci	
Age Groups:	13-14	**Timeframe:**	May 2002 to June 2002
Sampling Frame:		13-14yr: Local Health Authority (municipalities of Cosenza and Rende - the same of Phase One)	

Personnel

Dr Enea Bonci

Università degli Studi di Roma "La Sapienza"
Istituto di Clinica Pediatrica
Viale Regina Elena, 324
Italy

Roles:

- Phase One Principal Investigator for Cosenza
- Phase Three Principal Investigator for Cosenza

Costa Rica Centre

Phase One			
Centre:		Costa Rica, Costa Rica (Latin America)	
Principal Investigator:		Dr Manuel E Soto-Quirós	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1994 to September 1995
Sampling Frame:			
Phase Three			
Centre:		Costa Rica, Costa Rica (Latin America)	
Principal Investigator:		Dr Manuel E Soto-Quirós	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to March 2002
Sampling Frame:		Schools from central valley and North. The sampling frame is the same as the sampling frame for Phase One.	

Personnel

Dr Manuel E Soto-Quirós

Unidad de Enseñanza
Hospital Nacional de Niños
PO Box 1654-1000
Costa Rica

Roles:

- National Coordinator for Costa Rica
- Phase One Principal Investigator for Costa Rica
- Phase Three Principal Investigator for Costa Rica

Cremona Centre

Phase One			
Centre:		Cremona, Italy (Western Europe)	
Principal Investigator:		Mr Franca Rusconi	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to November 1994 6-7yr:October 1994 to November 1994
Sampling Frame:			

Personnel

Mr Franca Rusconi

Isituto di Clinica di Perfezionamento
Azienda Ospedaliera, Clinica Pediatrica "G. e D. De Marchi"
dell Università di Milano, Seconda Clinica
Via Commenda, 9
Italy

Roles:

- Phase One Principal Investigator for Cremona

The ISAAC Story

Crétail Centre

Phase Two			
Centre:		Crétail, France (Western Europe)	
Principal Investigator:		Dr Isabella Annesi-Maesano	
Age Groups:	10-11 yrs.,	**Timeframe:**	June 1996 to December 1996.
Sampling Frame:		All public elementary schools in the city of Crétail.	

Personnel

Dr Isabella Annesi-Maesano

EPAR Dept, INSERM, UMR- S 707
Faculté de Médecine Pierre et Marie Curie
Site Saint-Antoine
27 rue Chaligny 75571
France

Roles:

- National Coordinator for France
- Phase Two Principal Investigator for Crétail

Cuernavaca Centre

Phase One			
Centre:		Cuernavaca, Mexico (Latin America)	
Principal Investigator:		Professor Isabelle Romieu	
Age Groups:	13-14, 6-7	**Timeframe:**	September 1994 to July 1995
Sampling Frame:			

Phase Three			
Centre:		Cuernavaca, Mexico (Latin America)	
Principal Investigator:		Professor Isabelle Romieu	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2002 to June 2002
Sampling Frame:		All schools in Cuernavaca, Mexico. Same sampling frame as Phase One.	

Personnel

Dr Albino Barraza

Instituto Nacional de Salud Pública de México
Avenidad Universidad 655
Colonia Santa Maria Ahuacatitlán, C.P. 62,508
Mexico

Roles:

- Phase Three collaborator for Cuernavaca

Professor Isabelle Romieu

Head, Nutrition and Metabolism section
International Agency for Research on Cancer
150, cours Albert thomas,
69372 Lyon Cedex 08,
France

Roles:

- Phase One Principal Investigator for Cuernavaca
- Phase Three Principal Investigator for Cuernavaca

Curitiba Centre

Phase One			
Centre:		Curitiba, Brasil (Latin America)	
Principal Investigator:		Professor Nelson Rosário	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Curitiba district.	

Phase Three			
Centre:		Curitiba, Brasil (Latin America)	
Principal Investigator:		Professor Nelson Rosário	
Age Groups:	13-14	**Timeframe:**	May 2001 to June 2001
Sampling Frame:		13-14yr: Some private and public schools in Curitiba District. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Professor Nelson Rosário

Rua General Carneiro 181 14 andar
Parigot de Souza, 1861
Brasil

Roles:

- Phase One Principal Investigator for Curitiba
- Phase Three Principal Investigator for Curitiba

Local Publications

The following publications used ISAAC data from the Cuernavaca centre:

Tatto-Cano MI, Sanin-Aguirre LH, González V, Ruiz-Velasco S, Romieu I. *Prevalence of asthma, rhinitis and eczema in school children in the city of Cuernavaca, Mexico.[in Spanish].* Salud Publica Mex 1997; 39(6): 497-506.

Gutiérrez-Delgado RI, Barraza-Villarreal A, Escamilla-Núñez MC, Solano-González M, Moreno-Macías H, Romieu I. *Food consumption and asthma in school children in Cuernavaca, Morelos, Mexico. [Consumo de alimentos y asma en niños escolares de Cuernavaca]* Salud Publica Mex 2009; 51(3): 202-211.

Curitiba Group 2009

The ISAAC Story

Local Publications

The following publications used ISAAC data from Curitiba:

Ferrari FP, Rosário Filho NA, Ribas LF, Callefe LG. *[Prevalence of asthma in schoolchildren in Curitiba - ISAAC].* J Pediatr (Rio J). 1998 Jul-Aug;74(4):299-305.Portuguese.

Riedi CA, Rosario NA *Prevalence of allergic conjunctivitis a missed opportunity?* Allergy 2010; 65(1):131-132

Riedi CA, Rosário NA, Ribas LF, Backes AS, Kleiniibing GF, Popija M, Reisdorfer S. *Increase in prevalence of rhinoconjunctivitis but not asthma and atopic eczema in teenagers.* J Investig Allergol Clin Immunol.2005;15(3):183-8.

Solé D, Melo KC, Camelo-Nunes IC, Freitas LS, Britto M, Rosário NA, Jones M, Fischer GB, Naspitz CK. *Changes in the prevalence of asthma and allergic diseases among Brazilian schoolchildren (13-14 years old) comparison between ISAAC Phases One and Three.* J Trop Pediatr.2007 Feb;53(1):13-21.Epub Sep 2006.

Why was Curitiba selected for ISAAC

This is a well known University Center with teaching and research tradition, and previous involvement in national multicenter studies. ISAAC was the great opportunity for an ambitious multinational project. Curitiba is a prosperous metropolitan city with close to 2 million inhabitants, 4 medical schools and good public health care system.

Our experience of ISAAC

We participated in phases 1 and 3 with questionnaires only. The involvement of enthusiastic medical students (field workers), committed physicians and post-graduate students made the project well accepted by researchers, school personnel and children. Following the protocol was like playing music by partitur.

I have to mention as Professor of Pediatrics that co-authoring several ISAAC papers contributed to my CV and to the rank of our Institution among other medical schools in Brazil.

Davangere Centre

Phase Three			
Centre:		Davangere, India (Indian Sub-Continent)	
Principal Investigator:		Dr P S Suresh Babu	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2001 to August 2002
Sampling Frame:		All schools in Davangere City	

Personnel

Dr P S Suresh Babu

Bapuji Child Health Institute and Research Centre
J.J.M. Medical College
761, Chaitanya
P.J. Extension, 4th Main Road
India

Roles:

- Phase Three Principal Investigator for Davangere

David-Panamá Centre

Phase One			
Centre:		David-Panamá, Panamá (Latin America)	
Principal Investigator:		Dr Gherson Cukier	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:April 1995 to January 1996 6-7yr:June 1995 to February 1996
Sampling Frame:			
Phase Three			
Centre:		David-Panamá, Panamá (Latin America)	
Principal Investigator:		Dr Gherson Cukier	
Age Groups:	13-14, 6-7	**Timeframe:**	July 2001 to August 2002
Sampling Frame:		Some Private and Public schools in the Provinces of: Panama city, Chiriqu-David, Veraguas and Herrera. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Dr Gherson Cukier

Pulmonary and Bronchoscopy Pediatrics Section
Hospital Materno Infantil Jose Domingo de Obaldia
PO Box 662
Panamá

Roles:

- National Coordinator for Panamá
- Phase One Principal Investigator for David-Panamá
- Phase Three Principal Investigator for David-Panamá

Dresden Centre

Phase Two			
Centre:		Dresden, Germany (Western Europe)	
Principal Investigator:		Professor W Leopold	
Age Groups:	9-11,	**Timeframe:**	September 1995 to June 1996.
Sampling Frame:		A random sample of school classes in the 9-11-year age-group across Dresden.	

Personnel

Prof Dr Ulrich Keil

Institut für Epidemiologie und Sozialmedizin
Westfälische Wilhelms Universität
Domagkstrasse 3
Germany

Roles:

- Chairperson of the ISAAC Steering Committee
- ISAAC Steering Committee
- Director, ISAAC International Data Centre
- Regional Coordinator for Western Europe
- National Coordinator for Germany
- Phase Two collaborator for Dresden

Professor W Leopold

Universitätsklinikum Carl Gustav Carus
Klinik und Poliklinik für Kinder- und Jugendmedizin
Fetscherstr. 74,
Germany

Roles:

- Phase Two Principal Investigator for Dresden

Dr Christian Vogelberg MD

University of Dresden
Pediatric Department
Fetscherstr. 74
Germany

Roles:

- Phase Two collaborator for Dresden

Professor Erika von Mutius

Dr. von Haunersches University Children's Hospital
Ludwig-Maximilians University
Lindwurmstrasse 4
Germany

Roles:

- ISAAC Steering Committee
- Phase Two collaborator for Dresden

Local Publications

The following publications used ISAAC data from Dresden:

von Mutius E, Illi S, Hirsch T, Leupold W, Keil U, Weiland SK. *Frequency of infections and risk of asthma, atopy and airway hyperresponsiveness in children.* Eur Respir J.1999 Jul;14(1):4-11.

Hirsch T, Weiland SK, von Mutius E, Safeca AF, Grafe H, Csaplovics E, Duhme H, Keil U, Leupold W. *Inner city air pollution and respiratory health and atopy in children.* Eur Respir J.1999 Sep;14(3):669-77.

Beimfohr C, Maziak W, von Mutius E, Hense HW, Leupold W, Hirsch T, Keil U, Weiland SK. *The use of anti-asthmatic drugs in children: results of a community-based survey in Germany.* Pharmacoepidemiol Drug Saf.2001 Jun-Jul;10(4):315-21.

Kuhlisch W, Hirsch T, Olunczek U, Vollheim B, Gross B, Düring I, Weiland SK, Leupold W. *Validation and subjective reports of exposure to traffic by traffic count, NO2 dispersion modeling and measuring NO2 emissions.[article in german].* Soz Praventivmed.2002; 47(2): 116-23.

von Ehrenstein OS, Maier EM, Weiland SK, Carr D, Hirsch T, Nicolai T, Roscher AA, von Mutius E. *Alpha1 antitrypsin and the prevalence and severity of asthma.* Arch Dis Child.2004 Mar;89(3):230-1.

Pinto LA, Steudemann L, Depner M, Klopp N, Illig T, Weiland SK, von Mutius E, Kabesch M. *STAT1 gene variations, IgE regulation and atopy.* Allergy 2007 Dec; 62(12):1456-61.

Büchele G, Rzehak P, Weinmayr G, Keil U, Leupold W, von Mutius E, Weiland SK. *Assessing bronchial responsiveness to hypertonic saline using the stepwise protocol of Phase II of the International Study of Asthma and Allergiesin Childhood (ISAAC II).* Pediatr Pulmonol 2007 Feb;42(2):131-40.

Riu E, Dressel H, Windstetter D, Weinmayr G, Weiland S, Vogelberg C, Leupold W, von Mutius E, Nowak D, Radon K. *First months of employment and new onset of rhinitis in adolescents.* Eur Respir J.2007 Sep;30(3):549-55.Epub May 2007.

Cameron L, Depner M, Kormann M, Klopp N, Illig T, von Mutius E, Kabesch M. *Genetic variation in CRTh2 influences development of allergic phenotypes.* Allergy 2009; 64(10): 1478-1485.

Zeilinger S, Pinto LA, Nockher WA, Depner M, Klopp N, Illig T, von Mutius E, Renz H, Kabesch M. *The effect of BDNF gene variants on asthma in German children.* Allergy 2009 Dec; 64(12): 1790-1794

Pinto LA, Depner M, Klopp N, Illig T, Vogelberg C, von Mutius E, Kabesch M. *MMP-9 gene variants increase the risk for non- atopic asthma in children.* Respir Res Feb 2010; 11: 23

Local Publications

The following publications used ISAAC data from the Eldoret centre:

Esamai F, Anabwani GM. *Prevalence of asthma, allergic rhinitis and dermatitis in primary school children in Uasin Gishu district, Kenya.* E Afr Med J 1996; 73(7): 474-8.

Esamai F, Ayaya S, Nyandiko W. *Prevalence of asthma, allergic rhinitis and dermatitis in primary school children in Uasin Gishu district, Kenya.* E Afr Med J 2002; 79(10): 514-8.

Eldoret Centre

Phase One			
Centre:		Eldoret, Kenya (Africa)	
Principal Investigator:		Dr Fabian O Esamai	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in the Uasin Gishu District, Ainabkoi and Kapsaret divisions, that have a homogeneous ethnic Kalenjin population.	

Phase Three			
Centre:		Eldoret, Kenya (Africa)	
Principal Investigator:		Dr Fabian O Esamai	
Age Groups:	13-14	**Timeframe:**	February 2001 to April 2001
Sampling Frame:		13-14yr: All schools in Aiwabkoi, Kapsaret and Kesses Divisions in Uasin Gishu District. The same sampling frame as Phase One.	

Personnel

Dr Fabian O Esamai

Department of Child Health and Paediatrics
Moi University
PO Box 4606
Kenya

Roles:

- Phase One Principal Investigator for Eldoret
- Phase Three Principal Investigator for Eldoret

Eldoret Kenya ISAAC centre

The Eldoret centre is one of the two in Kenya and participated in Phase One of ISAAC as the rural centre while Nairobi was the urban centre. This enabled a rural – urban comparison on the prevalence of asthma, allergic rhinitis and allergic conjunctivitis. The researchers were based at the Moi University School of Medicine in the Department of Child Health and Paediatrics. Moi University School of Medicine was the second medical school in Kenya after the Nairobi Medical School. It applies the innovative problem based approach to medical education with a strong community based component.

The investigators for Phase One were Gabriel Anabwani, who was also the Regional Coordinator and Fabian Esamai, the Principal Investigator for the Eldoret centre in Kenya. Prof. Gabriel Anabwani has since 1997 left the Department for Botswana. Prof. Gabriel Anabwani was the Professor of Paediatrics in the department until his departure in 1997. Professor Fabian Esamai who was a Senior lecturer at the time of Phase One is the Professor of Paediatrics in the department since 2005. He has been in the department since the start of the Moi University Medical school in 1990. The field work for Phase One was conducted by Joel Kirinyet, the Chief technician in the department, as the coordinator of the field team.

ISAAC Phase One was the first rural study in Kenya to study the prevalence of asthma and allergies. Most earlier studies were urban and more so for adults.

The participants for Phase Three included Prof. Fabian Esamai, Dr. Samuel Ayaya and Dr. Winstone Nyandiko. This phase was conducted in 2001. ISAAC Phase Three was led by the Public Health team of the Uasin Gishu district Ministry of Health.

The prevalence of asthma remained unknown in Eastern Africa for decades as there were limited studies especially community based studies until about a decade ago when the International Study of Asthma and allergies in Children (ISAAC) was conducted worldwide. In East Africa two Kenyan centres (Nairobi and Eldoret) and Ethiopia were included in the phase I between 1994 and 1996. The Nairobi centre represented studies on urban children while the Eldoret centre represented the rural based children. Eldoret is situated in the Rify valley highlands of Kenya 340 kilometres west of Nairobi. The same study procedure was repeated 6 years later in the same locations and schools in Nairobi and Eldoret in a phase III to assess trends between 2001 and 2003. The ISAAC study in these centres included school children aged 13-14 years of age.

With the establishment of industries in urban and rural East African countries, the risk of allergic induced asthma and asthma related to industrial pollution is on the increase and could be responsible for the rise in both urban and rural asthma prevalence. The adoption of western lifestyles and associated improvement in living standards could be a contributor to the increasing prevalence of athma in children. Other risk factors include indoor pollution from smoke from cooking in poorly ventilated houses, indoor cigarette smoking by parents or guardians and indoor allergens like dust mites in the home. Allergies to pollens could be another risk factor especially with increase flower farming for export in the horticulture industry in which Kenya and other east African countries have extensively expanded over the last decade. Other risk factors includes keeping of pets and domestic animals like dogs, cats, chicken etc to which children develop allergy to their droppings, fur and other parts. Some children react to animal protein and with improved purchasing power, more children get exposed to these products. The use of processed and canned foods could have contributed to the development of allergies that predispose to asthma symptoms. The genetic risk factor has been known for years in developed and developing countries and still contributes to about 40% of all asthmatics among children. Asthma has been observed to run in families and therefore this should always be established from family interviews.

Avoidance of asthma triggers reduces the development of asthma symptoms and attacks and reduces the need for medications. Common asthma triggers include domestic dust mites, tobacco smoke, animal fur, cockroach allergens, outdoor pollens and molds, indoor mold and physical activity for exercise induced asthma.

Bed linens and blankets should be washed weekly in hot water and dried, pillows should be encased in pillow cases and avoid carpets or they should not be in sleeping rooms.
Children should be kept away from tobacco smoke and parents or guardians should not smoke.
Animals should be kept away from sleeping areas of the home.
Spray homes frequently to kill cockroaches using pesticides but in the absence of children.
Children should be kept away from farms during the period of pollination of crops and plants. Doors and windows should be closed during these periods.
Clean damp areas frequently and children with exercise induced asthma should avoid physical activity.

Emilia-Romagna Centre

Phase One			
Centre:		Emilia-Romagna, Italy (Western Europe)	
Principal Investigator:		Dr Marco Biocca	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:October 1994 to December 1994 6-7yr:October 1994 to March 1995
Sampling Frame:			

Phase Three			
Centre:		Emilia-Romagna, Italy (Western Europe)	
Principal Investigator:		Dr Claudia Galassi	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to March 2002
Sampling Frame:		All public schools in the Emilia-Romagna Region (the same as Phase One).	

Personnel

Dr Marco Biocca

CDS Aziende USL Città di Bologna
Via Gramsci, 12
Italy

Roles:
- Phase One Principal Investigator for Emilia-Romagna
- Phase Three collaborator for Emilia-Romagna

Dr Claudia Galassi

Servizio di Epidemiologia dei tumori
AO San Giovanni Battista - CPO Piedmont
Via Santena 7
Italy

Roles:
- Phase Three Principal Investigator for Emilia-Romagna

Ms Mariella Martini

Servizio Igiene Pubblica
Dipartimento di Prevenzione
Azienda USL di Reggio Emilia
Via Amendola, 2
Italy

Roles:
- Phase One collaborator for Emilia-Romagna

Empoli Centre

Phase One			
Centre:		Empoli, Italy (Western Europe)	
Principal Investigator:		Ms Lucia Chetoni	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1994 to December 1994
Sampling Frame:			
Phase Three			
Centre:		Empoli, Italy (Western Europe)	
Principal Investigator:		Dr M G Petronio	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to February 2002
Sampling Frame:		All public schools in the area of the Local Health Unit of Empoli (the same as Phase One).	

Personnel

Ms Lucia Chetoni

Italy

Roles:

- Phase One Principal Investigator for Empoli

Dr Maria Paola Di Pietro

Public Health Service
Local Health Authorithy ASL No. 11 Empoli
Piazza della Constituzione, 2
Italy

Roles:

- Phase Three collaborator for Empoli

Dr M G Petronio

Responsabile Struttura Operativa Salute/Ambiente
Az. USL 11 di Empoli
Piazza Costituzione n.1
San Romano
Italy

Roles:

- Phase Three Principal Investigator for Empoli

Feira de Santana Centre

Phase Three			
Centre:		Feira de Santana, Brasil (Latin America)	
Principal Investigator:		Associate Professor Leda de Freitas Souza	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2002 to August 2002
Sampling Frame:		All schools in Feira de Santana area.	

Personnel

Associate Professor Leda de Freitas Souza

Faculty of Medicine
Universidade Federal da Bahia
Rua Alm. Ernesto Mello Jr. 79 (Pituba)
Salvador 41820-060
Brasil

Roles:

- Phase Three Principal Investigator for Feira de Santana

Firenze Centre

Phase One			
Centre:		Firenze, Italy (Western Europe)	
Principal Investigator:		Dr Elisabetta Chellini	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:October 1994 to December 1994 6-7yr:November 1994 to December 1994
Sampling Frame:			
Phase Three			
Centre:		Firenze, Italy (Western Europe)	
Principal Investigator:		Dr Elisabetta Chellini	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to March 2002
Sampling Frame:		All public schools in the Florence Area (cities of Firenze, Prato, Campi, Calenzano, Scandicci and Sesto Fiorentino); the same of Phase One.	

Local Publications

The following publications used ISAAC data from the Feira de Santana centre:

Franco JM, Gurgel R, Sole D, França VL, Brabin B and the Brazilian Isaac Group. *Socio-environmental conditions and geographical variability of asthma prevalence in Northeast Brazil* Allergol Immunopathol (Madr). 2009; 37(3):116-121

The ISAAC Story

Personnel

Professor Annibale Biggeri

Dipartimento Statistico
Università di Firenze
Viale Morgagni, 59
Italy

Roles:

- Phase One collaborator for Firenze

Dr Elisabetta Chellini

Epidemiologist, MD
Unit of Environmental and Occupational Epidemiology
Cancer Prevention and Research Institute (ISPO)
Firenze
Italy

Roles:

- Phase One Principal Investigator for Firenze
- Phase Three Principal Investigator for Firenze

Why Firenze was chosen

Firenze Centre includes 6 Tuscan municipalities (about 713,000 inhabitants), located in Central Italy: Firenze, Calenzano, Campi Bisenzio, Scandicci, Sesto Fiorentino and Prato. The area is characterized by cold winters and hot summers, due to its location, inland in the River Arno's basin. Firenze Centre participated in two ISAAC Phases: Phase One and Phase Three. Firenze Centre was identified in relation to the presence in the area of an epidemiological study group (the Unit of Environmental and Occupational Epidemiology of the Cancer Prevention and Research Institute) that was responsible for the two cross sectional studies in the area. As well, the definition of the area/population of Firenze Centre was opportunistic in relation to the feasibility to carry out the study in collaboration with the Public Health services of the Local Health Administrations of Firenze and Prato. The opportunity to estimate the prevalence of asthma and allergies and known or suspected risks factors with a standardized procedure allowing comparisons with other areas in Italy and in other countries was considered a good stepfor further preventive activities.

Our experience in ISAAC

Since the beginning the participation was made possible through SIDRIA (ISAAC Phase One) and SIDRIA-2 (ISAAC Phase Three) study group, an Italian cooperative study group that applied standard ISAAC protocol in Italy. ISAAC questionnaires were translated and validated in the Italian setting. The Italian cooperative study group, that included also the personnel of the Firenze Centre, defined the operational standardized procedure to be applied in all Italian ISAAC Centres, from Northern to Southern Italy. Local funds were used to carry out the first ISAAC Phase, meanwhile the ISAAC Phase 3 was funded by the Italian Minister of Health. We had a high compliance: either the directors of the randomly selected schools either the parents were very compliant and we wish to thank all of them. The self administered questionnaires completed by parents were used since ISAAC Phase One to collect information not only on asthma and allergies histories but also on various known or suspected risk factors for respiratory and allergic diseases (i.e., parental smoking, family history of asthma and allergies, indoor mould and dampness, traffic in the residential areas) in Italian Centres characterized by different climate, latitude and level of urbanization. The results of the Firenze Centre together with the other Italian Centres cooperating in SIDRIA (ISAAC Phase One) and SIDRIA-2 (ISAAC Phase Three) were published in two supplements of an Italian epidemiological magazine: Epidemiol Prev , 1997, 21 (1 suppl) and Epidemiol Prev 2005, 29 (2 suppl). Other scientific papers have been also published on specific aspects, where Firenze Centre data have been pooled with the data of the other Italian Centres. The obtained results have been presented during local congresses too.

In conclusion, the involvement in ISAAC studies was a great occasion for personnel with different expertise (epidemiologists, paediatricians, lung specialists, biologists, environmental specialists, statisticians, youth workers) engaged in different public bodies to work together, in national and international epidemiological studies.

Frosinone Centre

Phase One			
Centre:		Frosinone, Italy (Western Europe)	
Principal Investigator:		Mr Roberto Ronchetti	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Local Health Autority	

Personnel

Mr Roberto Ronchetti

Università degli Studi di Roma "La Sapienza"
Istituto di Clinica Pediatrica
Policlinico Umberto I
Viale Regina Elena, 324
Italy

Roles:

- Phase One Principal Investigator for Frosinone

Fukuoka Centre

Phase One			
Centre:		Fukuoka, Japan (Asia-Pacific)	
Principal Investigator:		Professor Sankei Nishima	
Age Groups:	13-14, 6-7	**Timeframe:**	October 1994 to March 1995
Sampling Frame:		13-14yr: All public schools in Fukuoka city, second grade in junior high school. 6-7yr:All schools are in Fukuoka city as shown in next figure	

Phase Three			
Centre:		Fukuoka, Japan (Asia-Pacific)	
Principal Investigator:		Dr Hiroshi Odajima	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to November 2002
Sampling Frame:		All public schools in Fukuoka. Same sampling frame as Phase One.	

Personnel

Professor Sankei Nishima

Director of Pediatrics
The National Minami-Fukuoka Chest Hospital
Yakatabaru 4-39-1
Minami-ku
Japan

Roles:

- National Coordinator for Japan
- Phase One Principal Investigator for Fukuoka

Dr Hiroshi Odajima

Department of Pediatrics
The National Minami Fukuoka Chest Hospital
4-39-1 Yakatabaru Munami-kui
Fukuoka
Japan

Roles:

- Phase Three Principal Investigator for Fukuoka

Japan has been still in confusion due to the Eastern Japan Earthquake, tsunami disaster, and nuclear plant accident. However, the heart-warming support from all over the world has been helping Japan restore the country little by little. We deeply appreciate your warm support. ISAAC Fukuoka Centre is located at the western part of Japan, and therefore we didn't have damage from the earthquake. Fukuoka city is a center of southern part of Japan, Kyusyu area, with the population of 13 million, and is now having its ordinary activities.

Our Centre participated in ISAAC Phase ???. Recently, we have started the epidemiological survey for 35,000 elementary school children of 11 prefectures at western Japan. This survey was conducted in 1982, 1992, and 2002 in the same districts with the same methods, and this recent survey is the forth survey.

The prevalence of bronchial asthma has been a 2.1 increase compared with that of 1982 and 2002. Since 1992, we have done the survey of other childhood allergic diseases besides asthma. As a result, the prevalence of atopic dermatitis has been decreased, but the prevalence of allergic rhinitis and conjunctivitis has been increased. (Sankei Nishima et al; Surveys on the Prevalence of Pediatric Bronchial Asthma in Japan: A Comparison between the 1982,1992,and 2002 Surveys Conducted in the Same Region Using the Same Methodology, Allergology International. 2009; 58:37-53). The result of our recent forth survey will come out in 2012.

Also, this year, the total guideline for pediatric allergic diseases (BA,AR,AD,FA) has been established in Japan. Furthermore, Japanese Guideline for the Diagnosis and Treatment of Allergic Diseases 2010(JAGL 2010) is published in English in the latest Allergology International and is free to be viewed. All access are welcome.? http://www.jstage.jst.go.jp/browse/allergolint/60/2/_contents/-char/ja/?

The ISAAC Story

Funchal Centre

Phase One			
Centre:		Funchal, Portugal (Western Europe)	
Principal Investigator:		Dr Fernando D Borges	
Age Groups:	13-14, 6-7	**Timeframe:**	March 1995 to April 1995
Sampling Frame:			

Phase Three			
Centre:		Funchal, Portugal (Western Europe)	
Principal Investigator:		Dra Rita Câmara	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to July 2002
Sampling Frame:		All schools of urban and suburban Funchal area. Municipialities of Funchal, Camera de Lopes and Sata Cruz.	

Personnel

Dr Fernando D Borges

Serviço de Medicina
Centro Hospitilar do Funchal
Medicina II - CHF
Portugal

Roles:
- Phase One Principal Investigator for Funchal

Dra Rita Câmara

Serviço de Medicina
Centro Hospitilar do Funchal
Medicina II - CHF
Portugal

Roles:
- Phase Three Principal Investigator for Funchal

Grand Tunis Centre

Phase Three			
Centre:		Grand Tunis, Tunisia (Africa)	
Principal Investigator:		Professeur Faouzia Khaldi	
Age Groups:	13-14	**Timeframe:**	March 2001 to March 2001
Sampling Frame:		13-14yr: Some schools in the Grand Tunis	

Personnel

Professeur Faouzia Khaldi

Chef de Service de Médecine Infantile A
Hôpital d'Enfants Bab Saadoun
C.P. 1007
Tunisia

Roles:
- Phase Three Principal Investigator for Grand Tunis

Greifswald Centre

Phase One			
Centre:		Greifswald, Germany (Western Europe)	
Principal Investigator:		Professor Axel Kramer	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:May 1995 to May 1995 6-7yr:January 1995 to May 1995
Sampling Frame:			

Personnel

Prof Dr med Wolfgang Hoffmann

Institute for Community Medicine
Section Epidemiology of Health Care and Community Health
Ernst-Moritz-Arndt-University Greifswald
Ellernholzstr. 1/2
Germany

Roles:
- Phase One collaborator for Greifswald

Professor Axel Kramer

Institut für Hygiene und Umweltmedizin
Hainstrasse 26
Germany

Roles:
- Phase One Principal Investigator for Greifswald

Local Publications

The following publications used ISAAC data from the Guangzhou centre:

Ko FWS, Wang HY, Wong GWK, Leung TF, Hui DSC, Chan DPS, Zhong NS, Lai CKW. *Wheezing in Chinese schoolchildren disease severity distribution and management practices, a community-based study in Hong Kong and Guangzhou.* Clin Exp Allergy 2005; 35(11): 1449-56.

Wang HY, Zheng JP, Zhong NS. *[Time trends in the prevalence of asthma and allergic diseases over 7 years among adolescents in Guangzhou city].* Zhonghua Yi Xue Za Zhi.2006 Apr 18;86(15):1014-20.

Guangzhou Centre

Phase One			
Centre:		Guangzhou, China (Asia-Pacific)	
Principal Investigator:		Professor Nan-Shan Zhong	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in the Dongshan, Yuexiu, Liwan, Haizhu districts	

Phase Two			
Centre:		Guangzhou, China (Asia-Pacific)	
Principal Investigator:		Professor Nan-Shan Zhong	
Age Groups:	10-11,	**Timeframe:**	October 1997 to February 1998.
Sampling Frame:		A random sample of schools from the metropolitan area of Guangzhou.	

Phase Three			
Centre:		Guangzhou, China (Asia-Pacific)	
Principal Investigator:		Professor Nan-Shan Zhong	
Age Groups:	13-14	**Timeframe:**	November 2001 to December 2001
Sampling Frame:		13-14yr: All schools in the four central districts of Guangzhou city.	

Personnel

Professor Nan-Shan Zhong

Guangzhou Institute of Respiratory Disease
The First Affiliated Hospital of Guangzhou Medical College
151 Yangjiang Rd
PO 510120
China

Roles:

- Phase One Principal Investigator for Guangzhou
- Phase Two Principal Investigator for Guangzhou
- Phase Three Principal Investigator for Guangzhou

Guayaquil Centre

Phase Three			
Centre:		Guayaquil, Ecuador (Latin America)	
Principal Investigator:		Dr César Bustos	
Age Groups:	13-14	**Timeframe:**	September 2001 to November 2002
Sampling Frame:		13-14yr: Some schools in Guayaquil	

Personnel

Dr César Bustos Cajas

Pulmonologist
Chief of Service of Pneumology
Hospital Alcivar private university
Guayaquil
Ecuador

Roles:

- Phase Three Principal Investigator for Guayaquil

Rocío De Janón

Guayaquil
Ecuador

Roles:

- Phase Three collaborator for Guayaquil

Mireya Rodas Suárez

Guayaquil
Ecuador

Roles:

- Phase Three collaborator for Guayaquil

Alfredo Sierra Rabascal

Guayaquil
Ecuador

Roles:

- Phase Three collaborator for Guayaquil

Dr Jose Ulloa Correa

Guayaquil
Ecuador

Roles:

- Phase Three collaborator for Guayaquil

GUAYAQUIL ISAAC CENTER

Ecuador is a country of 14.3 million inhabitants, the most densely populated is Guayaquil with 2.3 million inhabitants. It is located in coastal region where the climate is tropical, with high temperatures most of the year, with an average of 25 ° C approximately. It has two seasons, winter or rainy season, which runs from January to May and summer or dry season from June to December.

The ISAAC Story

There was no specific epidemiological data of asthma or related diseases in our population before our participation in the ISAAC study. In our center with the principal investigator was Dr. Jose Ulloa Correa, Mireya Rodas Suárez, Rocío De Janón, Alfredo Sierra Rabascal, latter pediatric pulmonologist.

Through Dr. Javier Mallol, coordinator for Latin America of ISAAC, we had knowledge of the implementation of phase III of the study. We started our business on September 11, 2001 for two consecutive years. 3082 students were surveyed belonging to the group of 13-14 years.

The sample was chosen for convenience according to the school agreed to participate in the ISAAC study. We were always trying to cover diverse socioeconomic and different geographical areas of the city.

In this study also allowed us to establish data on the prevalence of asthma in our city, the environmental questionnaire allowed us to learn more about the relationship between feeding our young and bronchial asthma.

Guernsey Centre

Phase One			
Centre:		Guernsey, Channel Islands (Western Europe)	
Principal Investigator:		Dr David Jeffs	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools containing age-appropriate children on the island of Guernsey.	

Phase Three			
Centre:		Guernsey, Channel Islands (Western Europe)	
Principal Investigator:		Dr Peter Standring	
Age Groups:	13-14	**Timeframe:**	November 2001 to November 2001
Sampling Frame:		13-14yr: All schools in Guernsey containing age appropriate children on the Island.	

Personnel

Dr David Jeffs

Director of Public Health
John Henry House
St Martin's
Guernsey
United Kingdom

Roles:

- Phase One Principal Investigator for Guernsey
- Phase Three collaborator for Guernsey

Dr Peter Standring

Community Paediatrician
Princess Elizabeth Hospital
St Martins
Guernsey G74 6UU
United Kingdom

Roles:

- Phase Three Principal Investigator for Guernsey

Local Publications

The following publications used ISAAC data from the Guernsey centre:

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey.* BMJ 2004; 328(7447): 1052-3.

Jeffs D, Grainger R, Powell P. *Is childhood allergy more common amongst an island population?* J R Soc Health.2000 Dec;120(4):236-41.

Hamilton Centre

Phase One			
Centre:		Hamilton, Canada (North America)	
Principal Investigator:		Professor Malcolm R Sears	
Age Groups:	6-7	**Timeframe:**	May 1994 to October 1994
Sampling Frame:		6-7yr: All schools of Hamilton, Halton, Brant County Boards of Education (public schools) and all schools in separate School Boards of Hamilton-Wentworth, Halton and Brant County (Catholic schools), excluding 3 schools using the French language only.	

Personnel

Professor Malcolm R Sears

St. Joseph's Healthcare
Firestone Institute for Respiratory Health
Canada

Roles:

- National Coordinator for Canada
- Phase One Principal Investigator for Hamilton

Dr Hongyu Wang

Research Fellow of McMaster University
Firestone Institute for Respiratory Health
Juravinski Innovation Tower
Canada

Roles:

- Phase One collaborator for Hamilton

See the Canada country page for details of ISAAC in Hamilton

Local Publications

The following publications used ISAAC data from the Hamilton centre:

Habbick BF, Pizzichini MM, Taylor B, Rennie D, Senthilselvan A, Sears MR. *Prevalence of asthma, hay fever and eczema in children in two canadian cities the ISAAC study.* CMAJ 1999; 160: 1824-1829.

Pizzichini MM, Rennie D, Senthilselvan A, Taylor B, Habbick BF, Sears MR. *Limited agreement between written and video asthma symptom questionnaires.* Pediatr Pulmonol 2000; 30(4): 307-12.

Wang H-Y, Pizzichini MMM, Becker AB, Duncan JM, Ferguson AC, Greene JM, Rennie DC, Senthilselvan A, Taylor BW, Sears MR. *Disparate geographic prevalences of asthma, allergic rhinoconjunctivitis and atopic eczema among adolescents in five Canadian cities.* Pediatr Allergy Immunol 2010; 21(5): 867–877.

Local Publications

The following publications used ISAAC data from the Hawkes Bay centre:

Erwin EA, Wickens K, Custis NJ, Siebers R, Woodfolk J, Barry D, Crane J, Platts-Mills TA. *Cat and dust mite sensitivity and tolerance in relation to wheezing among children raised with high exposure to both allergens.* J Allergy Clin Immunol 2005; 115(1): 74-9.

Wickens K, Barry D, Friezema A, Rhodius R, Bone N, Purdie G, Crane J. *Fast foods - are they a risk factor for asthma?.* Allergy 2005; 60(12): 1537-41.

Wickens K, Barry D, Friezema A, Rhodius R, Bone N, Purdie G, Crane J. *Obesity and asthma in 11-12 year old New Zealand children in 1989 and 2000.* Thorax 2005; 60(1): 7-12.

Wickens K, Crane J, Kemp T, Lewis S, D'Souza W, Sawyer G, Stone L, Tohill S, Kennedy J, Slater T, Rains N, Pearce N. *A case-control study of risk factors for asthma in New Zealand children.* Aust N Z J Pub Health.2001;25(1):44-9.

Wickens K, Pearce N, Siebers R, Ellis I, Patchett K, Sawyer G, Stone L, Tohill S, Kennedy J, Slater T, Lewis S, Fitzharris P, Crane J. *Indoor environment, atopy and the risk of the asthma in children in New Zealand.* Pediatr Allergy Immunol.1999 Aug;10(3):199-208.

Hawkes Bay Centre

Phase One			
Centre:		Hawkes Bay, New Zealand (Oceania)	
Principal Investigator:		Dr David Barry	
Age Groups:	13-14, 6-7	**Timeframe:**	June 1993 to August 1993
Sampling Frame:			
Phase Two			
Centre:		Hawkes Bay, New Zealand (Oceania)	
Principal Investigator:		Professor Julian Crane	
Age Groups:	10.1-12.6 years,	**Timeframe:**	February 2000 to June 2000.
Sampling Frame:		All schools within the municipalities of Hastings and Havelock North.	

Personnel

Dr David Barry

Paediatrician
Hawke's Bay Regional Hospital
Private Bag 9014
New Zealand

Roles:

- Phase One Principal Investigator for Hawkes Bay
- Phase Two collaborator for Hawkes Bay

Professor Julian Crane

Wellington Asthma Research Group
Wellington School of Medicine,
University of Otago Wellington
P O Box 7343
Wellington South
New Zealand

Roles:

- ISAAC Steering Committee
- Phase Two Principal Investigator for Hawkes Bay

Dr Kristin Wickens

WARG
Wellington School of Medicine
P O Box 7343
New Zealand

Roles:

- Phase Two collaborator for Hawkes Bay

Phase Two in Hawke's Bay

We chose to undertake ISAAC Phase Two study in Hawke's Bay because it gave us an opportunity to undertake two studies using largely a single set of fieldwork, to provide data for ISAAC Phase Two and secondly we were able to use much of the same data to provide to repeat one of the first international asthma prevalence surveys that had been undertaken by Michael Burr and David Barry in the Hawke's Bay and Wales[Barry 1991], and later included South Africa and Sweden[Burr 1994], using the same schools, methodology and personnel to give us a comparison of prevalence over a 10 year period.

The study was run by Dr Kristin Wickens in the Hawkes Bay over the summer period 2000. We had excellent help from Dr Barry himself and also from one of his retired senior paediatric nurses – Ms Ngaire Bone. We were also fortunate to have two third year medical students join us from the Netherlands looking for a small student elective to undertake research and they provided excellent additional support for the field work and also got a publication from an add on project undertaking during the fieldwork[Rhodius 2002]. The study provided New Zealand data for ISAAC Phase Two, but also provided a number of spin-off studies that looked at fast foods and asthma and changes in obesity and their relationship to asthma over 10 years[Wickens 2005(1), Wickens 2005(2)]. The data also formed the basis for some interesting work on cat allergen[Erwin 2005] undertaken by Tom Platt-Mills and colleagues who also measured spIgE levels for the study.

The Hawkes Bay turned out to be an excellent place to undertake research like this and we had tremendous co-operation from the schools and from the surrounding community and also had enormous benefit from employing people who were well known in the community and were able to encourage both schools and parents to take part.

Also we undertook two forms of measurement of airway hyperresponsiveness, exercise and hypertonic saline. The exercise challenge used a five minute running test[Burr 1989] allowing us to compare this challenge with previous studies and with the UK centre which also used it. We also undertook a hypertonic saline challenge and again were fortunate to have a visiting research fellow to help us with this.

In this 8 to 12 age group we found the prevalence of wheezing in the last year was 22.0% and asthma ever, 35.7%. A positive exercise challenge (=15% fall in PEFR post exercise) was found in 8.4%. A positive skin prick test to any allergen was found in 34.7% of children. Interestingly when comparing the prevalence from 10 years before (restricted to just the 12 year old children) wheezing had increased from 17.7% to 23.3%, asthma ever from 16.9% to 37%, while a positive exercise response had fallen from 12.3% to 9.0%.

Regional
National
Local
Hawkes Bay
Helsinki
Ho Chi Minh City

References

1. Barry DM, Burr ML, Limb ES. Prevalence of asthma among 12 year old children in New Zealand and South Wales: a comparative survey. *Thorax*. 1991;46(6):405-9.
2. Burr M, Limb E, Andrae S, Barry D, Nagel F. Childhood asthma in four countries: A comparative survey. *Int J Epid*. 1994;23(2):341-7.
3. Rhodius R, Wickens K, Cheng S, Crane J. A comparison of skin test methodologies and allergens from two different manufacturers. *Ann Allergy Asthma and Immunol*. 2002;88:374-9.
4. Wickens K, Barry D, Friezema A, Rhodius R, Bone N, Purdie G, Crane J. Fast foods are they a risk factor for asthma. *Allergy*. 2005;60:1537-41.
5. Wickens K, Barry D, Friezema A, Rhodius R, Bone N, Purdie G, Crane J. Obesity and asthma in 11-12 year old New Zealand children in 1989 and 2000. *Thorax*. 2005;60:7-12.
6. Erwin E, Wickens K, Custis N, Siebers R, Woodfolk J, Barry D, Crane J, Platts-Mills T. Cat and dust mite sensitivity and tolerance in relation to wheezing among children raised with high exposure to both allergens. *J Allergy Clin Immunol*. 2005;115:74-9.
7. Burr ML, Butland BK, King S, Vaughan WE. Changes in asthma prevalence: two surveys 15 years apart. *Arch Dis Child*. 1989;64(10):1452-6.

Helsinki Centre

Phase One			
Centre:		Helsinki, Finland (Northern and Eastern Europe)	
Principal Investigator:		Dr Merja Kajosaari	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools from City of Helsinki, City of Espoo, City of Vantaa	

Personnel

Dr Merja Kajosaari

Department of Paediatrics
Helsinki University Central Hospital
Stenbäckinkatu 11
Finland

Roles:

- Phase One Principal Investigator for Helsinki

Ho Chi Minh City Centre

Phase Three			
Centre:		Ho Chi Minh City, Vietnam (Asia-Pacific)	
Principal Investigator:		Dr Baïch Vaên Cam	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to December 2001
Sampling Frame:		All schools in Ho Chi Minh city.	

Personnel

Dr Baïch Vaên Cam

Pediatric Hospital 1#
2 Su Van Hanh St
District 10
Vietnam

Roles:

- Phase Three Principal Investigator for Ho Chi Minh City

Local Publications

The following publications used ISAAC data from the Hong Kong 13-14 centre:

Lau YL, Karlberg J. *Prevalence and risk factors of childhood asthma, rhinitis and eczema in Hong Kong.* J Paediatr Ch Health 1998; 34(1): 47-52.

Leung R, Wong G, Lau J, Ho A, Chan JK, Choy D, Douglass C, Lai CK. *Prevalence of asthma and allergy in Hong Kong schoolchildren an ISAAC study.* Eur Respir J 1997; 10(2): 354-60.

Lee SL, Wong W, Lau YL. *Increasing prevalence of allergic rhinitis but not asthma among children in Hong Kong from 1995 to 2001 (Phase 3 International Study of Asthma and Allergies in Childhood).* Pediatr Allergy Immunol 2004; 15(1): 72-8.

Wong GWK, Leung TF, Ko FWS, Lee KKM, Lam P, Hui DSC, Fok TF, Lai CKW. *Declining asthma prevalence in Hong Kong Chinese schoolchildren.* Clin Exp Allergy 2004; 34(10): 1550-5.

Wong GWK, Hui DSC, Tam CM, Chan HH, Fok TF, Chan-Yeung M, Lai CKW. *Asthma, atopy and tuberculin responses in Chinese schoolchildren in Hong Kong.* Thorax 2001; 56(10): 770–773

Hong Kong 13-14 Centre

Phase One			
Centre:		Hong Kong 13-14, SAR China (Asia-Pacific)	
Principal Investigator:		Dr Christopher Lai	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Hong Kong	
Phase Two			
Centre:		Hong Kong, SAR China (Asia-Pacific)	
Principal Investigator:		Dr Christopher Lai	
Age Groups:	10-11,	**Timeframe:**	October 1997 to February 1998.
Sampling Frame:		A random sample of schools from the metropolitan area of Hong Kong.	
Phase Three			
Centre:		Hong Kong 13-14, SAR China (Asia-Pacific)	
Principal Investigator:		Professor Gary Wong	
Age Groups:	13-14	**Timeframe:**	April 2002 to June 2002
Sampling Frame:		13-14yr: All secondary schools in Hong Kong. Phase One and Phase Three Boundaries exactly the same.	

Personnel

Dr Christopher Lai

Department of Medicine and Therapeutics
The Chinese University of Hong Kong
Room 1403, Takshing House
20 Des Voeux Road Central
SAR China

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Asia-Pacific
- National Coordinator for SAR China
- Phase One Principal Investigator for Hong Kong 13-14
- Phase Two Principal Investigator for Hong Kong

Professor Gary Wong

Department of Paediatrics
Prince of Wales Hospital
Shatin, NT
Hong Kong Special Administrative Region
China

Roles:

- ISAAC Steering Committee
- Phase Three Principal Investigator for Hong Kong 13-14
- Phase Two collaborator for Hong Kong

I got involved in the ISAAC project when I was invited to the steering committee as the regional coordinator of Asia Pacific in the early 90's. At that time, Hong Kong already had some prevalence data on asthma, rhinitis and eczema, although these data were based on studies using different methodologies and included a wide range of subjects - children, adults and hospital patients. This makes comparison between studies from different time points and with other populations from different geographic locations difficult. The ISAAC study has allowed us to make valid comparisons with our counterparts in mainland China. The phase 1 data revealed a striking difference in the prevalence of asthma symptoms – up to a 4-fold difference – between schoolchildren in Hong Kong and those in mainland China. This, together with the demonstration that we have a relatively high asthma prevalence amongst our children, we were able to secure funding from the research grant funding bodies to further our research on asthma epidemiology.

The grants enabled us to conduct the phase 2 study not only in Hong Kong, but also in 2 mainland centres, Beijing and Guangzhou. This study identified certain environmental factors that could account for the difference in asthma prevalence between Hong Kong and its mainland counterparts. The data provided some insights to further research into the aetiology of asthma not only in China, but also in other parts of the world.

Our experience in the previous 2 phases of the study certainly helped us to conduct the phase 3 much more smoothly. We are pleasantly surprised to see the prevalence of asthma symptoms has declined though still not certain what was causing this change.

The ISAAC Story

During the time of our participation in the project, we have validated the video questionnaire on asthma symptoms[1] and the Chinese translated version of the ISAAC core questions for atopic eczema[2].

1. Lai CKW, Chan JKW, Chan A, Wong G, Ho A, Choy D, Lau J, Leung R. Comparision of the ISAAC video questionnaire (AVQ3.0) with the ISAAC written questionnaire for estimating asthma associated with bronchial hyperreactivity. *Clin Exp Allergy 1997, 27: 540-545*
2. Chan HH, Pei A, van Krevel C, Wong GWK, Lai CKW. Validation of the Chinese translated version of ISAAC core questions for atopic eczema. *Clin Exp Allergy 2001, 31: 903-907.*

Hong Kong 6-7 Centre

Phase One			
Centre:		Hong Kong 6-7, SAR China (Asia-Pacific)	
Principal Investigator:		Professor Yu Lung Lau	
Age Groups:	6-7	**Timeframe:**	March 1995 to May 1995
Sampling Frame:		6-7yr: All schools in Hong Kong.	
Phase Three			
Centre:		Hong Kong 6-7, SAR China (Asia-Pacific)	
Principal Investigator:		Professor Yu Lung Lau	
Age Groups:	6-7	**Timeframe:**	April 2001 to June 2001
Sampling Frame:		6-7yr: All schools in Hong Kong. Same sampling frame used for both Phase One and Phase Three.	

Personnel

Professor Yu Lung Lau

Department of Paediatrics & Adolescent Medicine
The University of Hong Kong
Queen Mary Hospital
Pokfulam Road
Sar China

Roles:

- Phase One Principal Investigator for Hong Kong 6-7
- Phase Three Principal Investigator for Hong Kong 6-7

Ibadan Centre

Phase One			
Centre:		Ibadan, Nigeria (Africa)	
Principal Investigator:		Professor Babatunde O Onadeko	
Age Groups:	13-14, 6-7	**Timeframe:**	
Sampling Frame:			
Phase Three			
Centre:		Ibadan, Nigeria (Africa)	
Principal Investigator:		Professor Babatunde O Onadeko	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2001 to June 2002
Sampling Frame:		All schools in Ibadan	

Personnel

Dr Adegoke Falade

U.C.H.,
Dept of Paediatrics
University College Hospital (UCH)
Nigeria

Roles:

- Phase Three collaborator for Ibadan

Professor Babatunde O Onadeko

P O Box 29279
Secretariat Post Office
Nigeria

Roles:

- Phase One Principal Investigator for Ibadan
- Phase Three Principal Investigator for Ibadan

Local Publications

The following publications used ISAAC data from the Ibadan centre:

Falade AG, Olawuyi F, Osinusi K, Onadeko BO. *Prevalence and severity of symptoms of asthma, allergic rhino-conjunctivitis and atopic eczema in secondary school children in Ibadan, Nigeria.* E Afr Med J 1998; 75(12): 695-8.

Falade AG, Olawuyi JF, Osinusi K, Onadeko BO. *Prevalence and severity of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema in 6- to 7 -year-old Nigerian primary school chldren The International study of Asthma and Allergies in Childhood.* Med Princ Pract 2004; 13(1): 20-25.

Falade AG, Ige OM, Yusuf BO, Onadeko MO, Onadeko BO. *Trends in the Prevalence and Severity of Symptoms of Asthma, Allergic Rhinoconjunctivitis, and Atopic Eczema.* J Natl Med Assoc.2009;101(5):414-418.

The ISAAC Story

Why was this centre selected for ISAAC?

Ibadan, the capital of Oyo State is located in southwestern Nigeria, 130 km inland from Lagos and is a prominent transit point between the coastal region and the areas to the northern Nigeria. The total area is 1,189.2 sq mi (3,080 km2). It is the third most populated city in Nigeria, behind Lagos and Kano. Indeed, its population rose to 2,550,593 according to 2006 Nigeria census results. Ibadan is divided into 11 local government areas (LGAs): 6 are urban and 5 periurban /rural. The possible adverse health effects of dense population and resultant outdoor air pollution due to the urbanisation informed the choice of this centre for the Phase One study.

The ISAAC phase 1 study involved two age groups: children 6 – 7 years old and adolescents 13 – 14 years old. The aims were to describe the prevalence and severity of asthma, allergic rhinitis and eczema in children in Ibadan using the ISAAC protocol and to obtain baseline measures for assessing future trends in the prevalence and severity of these diseases. We did not participate in phase 2 study. In phase 3, the aim of the study was to evaluate the changes in prevalence of symptoms of asthma and allergies by comparing the data from Phase One and Phase Three of the ISAAC surveys.

Our experience of ISAAC

Phase 1: The study populations were the children 6-7 year olds in primary schools, and the 13-14 year olds in secondary schools in Ibadan. Data was collected from 1,704 children (797 boys and 907 girls; M:F ratio 1:1.14); and 3,058 randomly selected children aged 13 -14 years(1,659 females and 1,399 males; M:F ratio 1:1.2).The study demonstrated a high prevalence of atopic conditions among children 6-7 years old (ref. 1) and the 13-14 years old (ref. 2).

Phase 3: This study was a comparison of cross-sectional data from ISAAC written questionnaire surveys carried out from January 1 to May 31, 1995 (phase I) and May 2001 to July 2002 (phase III). Detailed times of collection of data for the phase III being 11 May to 19 June, 2001 and 13 February to 18 June, 2002. These time frames were essentially within the months of January to June; as a result they did not constitute any significant difference in the months of collection of the data. The study populations were the children 6-7 year olds in primary schools, and the 13-14 year olds in secondary schools in Ibadan(ref. 3).

The random sampling methods were identical for the two surveys. Thirty one primary schools, 15 secondary schools (phase I), and 25 primary schools, 23 secondary schools (phase III) were selected in Ibadan. The ages of the children were ascertained from the class registers. Questionnaires were distributed to the children, who took them home for their parents or guardians to complete, then returned them to their teachers (6-7 year olds) or self completed(13-14 year olds) in the class rooms. The prevalence of current wheeze increased non-significantly in the 6-7 year age group (4.8% to 5.5%) and significantly in 13-14 year age group (10.7% to 13.0%) (p=0.249 and p=0.005, respectively). The 12-month prevalence of allergic rhinoconjuctivitis decreased insignificantly in the 6-7 year age group (p=0.833) but decreased significantly in the 13-14 year age group (p=0.001). Diagnosis of eczema decreased in both age groups. Whereas, eczema and rhinoconjunctivitis have decreased appreciably in the 13-14 year age group, only rhinoconjunctivitis increased in the 6-7 year age group (ref. 3). The current findings suggest that the “epidemic" of asthma is beginning in Nigeria.

References.

1. Falade AG, Olawuyi F, Osinusi K, Onadeko BO. (2004). Prevalence and severity of symptoms of asthma, allergic rhino-conjunctivitis and atopic eczema in 6 –7 year old Nigerian primary school children: the international study of asthma and allergies in childhood (ISAAC). Medical Principles and Practice 2004; 13: 20-25.
2. Falade AG, Olawuyi F, Osinusi K, Onadeko BO. Prevalence and severity of symptoms of asthma, allergic rhino-conjunctivitis and atopic eczema in secondary school children in Ibadan, Nigeria. East African Medical Journal 1998; 75: 695-698.
3. Falade AG, Ige OM, Yusuf BO, Onadeko MO, Onadeko BO. Trends in the prevalence and severity of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema. Journal of the National Medical Association 2009; 101:414- 418.

Acknowledgements

We are grateful to Chief Bode Akindele, Dr . Raymond Zard, management of Glaxo Wellcome, Nigeria for financial support. Our thanks also go to all the children, parents and school staff who helped in the surveys, as well as all our fieldworkers for their hard work throughout the studies.

The ISAAC Story

Ipoh Centre

Phase One			
Centre:		Ipoh, Malaysia (Asia-Pacific)	
Principal Investigator:		Dr Lim Wee Yeong	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:April 1995 to May 1995 6-7yr:May 1995 to May 1995
Sampling Frame:			

Personnel

Dr Lim Wee Yeong

33A, Jalan Sultan Azlan Shah Utara
31400 Ipoh
Malaysia

Roles:

- Phase One Principal Investigator for Ipoh

Islamabad Centre

Phase Three			
Centre:		Islamabad, Pakistan (Eastern Mediterranean)	
Principal Investigator:		Dr Mohammad Osman Yusuf	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to October 2002
Sampling Frame:		All schools in urban Islamabad (Capital city) area.	

Personnel

Dr Mohammad Osman Yusuf

The Allergy & Asthma Clinics
275 Gomal Road
Sector E-7
Pakistan

Roles:

- Phase Three Principal Investigator for Islamabad

Isle of Man Centre

Phase One			
Centre:		Isle of Man, Isle Of Man (Western Europe)	
Principal Investigator:		Dr Peter Powell	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		The Isle of Man.	
Phase Three			
Centre:		Isle of Man, Isle Of Man (Western Europe)	
Principal Investigator:		Dr Andreea Steriu	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to October 2002
Sampling Frame:		All schools in the Isle of Man. Same sampling frame used for both Phase One and Phase Three.	

Personnel

Dr Peter Powell

Health Services Division
Crookall House
Demesne Road
Douglas
United Kingdom

Roles:

- Phase One Principal Investigator for Isle of Man

Dr Andreea Steriu

Public Health Specialist, Information and Research
Joint Information Unit, Dept of Home Affairs
Homefield, 88 Woodbourne Road
Douglas
United Kingdom

Roles:

- Phase Three Principal Investigator for Isle of Man

Local Publications

The following publications used ISAAC data from the Isle of Man centre:

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey*. BMJ 2004; 328(7447): 1052-3.

Jeffs D, Grainger R, Powell P. *Is childhood allergy more common amongst an island population?* J R Soc Health.2000 Dec;120(4):236-41.

The ISAAC Story

Why was this centre selected for ISAAC?

Evidence suggested that the prevalence of respiratory and related disorders increased in the British Isles over the past six decades. The Isle of Man was no exception. Hay fever and allergic symptoms have caught the attention of health professionals, not only in their own right, but also as an indicator of their association with asthma. To address these problems, a major international research project, The International Study of Asthma and Allergies in Childhood (ISAAC), was established in 1991. The Steering Committee is based in New Zealand at the University of Auckland, and a range of countries, including the United Kingdom, began their research in 1995 when Phase One was carried out. The Isle of Man and the Channel Islands, although linked to the UK, carried out their surveys independently, also known as the offshore arm of the British study.

The Isle of Man is a Crown Dependency and lies in the middle of the Irish Sea. It has its own Government and the Parliament, Tynwald, is a Parliament with the longest continuous activity in the world. In 2009 this was established at 130 years. It has a population of about 80,000 inhabitants (last interim Census in 2006) and enjoys a varied economy with financial services and e-commerce, agriculture, fisheries and tourism being the most important economic activities. The Isle of Man is mostly known for the motorbike open road race TT (Tourist Trophee). This is unique in the world and annually visitors travel from all parts of the globe to watch the races and also enjoy festivities. Since 2009 a 'Green' race has been added to the race schedule, allowing for electric motorbikes to compete in the famous circuit race.

The Island's geography is stunning and the countryside is beautiful regardless the weather. Most population (about 50%) lives in the South-East, in the capital town of Douglas and surrounding villages. The highest peak is Snaefell and on a clear day "all surrounding kingdoms can be seen from the top of it: England, Scotland, Northern Ireland, Republic of Ireland, Wales, and the Kingdom of Mann.

Our Experience of ISAAC

The aim of Phase One in the Isle of Man was to describe the prevalence and severity of asthma and related disorders in 13/14 year-old children. Results were released in 1996 and revealed the distribution and frequency of asthma and related disorders. These rates were very similar to those observed elsewhere in the UK and the Channel Islands at the time. Results were used in service planning and considered a baseline to benchmark against any new surveys. Four out of the six secondary schools took part in this round. In Phase Two of the Study the Island took part with data collection aimed at environmental factors, particularly linked with air quality. Data for the Island on daily air temperature, annual rainfall and the prevalence of chemicals such as Nitrogen Dioxide and Sulphur Dioxide in the air were collected in 1998 specifically for this phase of the Study. The results were again similar to the readings reported in the UK and the Channel Islands, as reported at the time. Such readings were considered a 'baseline' and these would be again considered in the future. It is after all that emerging climate change and other environmental monitoring will be crucial in assisting the Isle of Man government with ensuring clean air for this small country which lays in the middle of the Irish Sea.

ISAAC Phase Three was carried out in October 2001. The main objective was to identify changes that may have occurred in the last six years in the frequency of respiratory and allergic conditions in children, to evaluate any association with air quality and other environmental factors and to assess the present situation. The Study was extended to younger children (6-8 year olds) to enable long-term comparisons to be made. The 6-8 year old survey was unique to the Isle of Man of all areas in the British Isles and results were published separately in the 6-8 year olds report. The Isle of Man study was carried out as an offshore-arm of the UK study and was led by Dr David Jeffs, Director of Public Health in Guernsey. Locally, the Principal Investigator for the Isle of Man obtained LREC approval for the study and used an opt-out consent form. The 6-8 year old study was a self-responding questionnaire for parents of primary school children. The 13-14 year olds self-responded to the questionnaire. There was no sampling carried out and all children of the right age were targeted to take part: in 34 primary schools and six secondary schools. They all took part with 1,086 (6-8 years) and 1,917 (13-14 years) students. A small team of researchers carried out delivery of questionnaires and return envelopes for parental responses in the 34 primary schools and almost 60% of the 6-8 year old target population and over 80% of the 13-14 year old target population were returned for processing. All forms, over 3,000 were posted to the UK Centre at St George's Hospital Medical School and were processed in standard format along with the other centres in the British Isles. National reports were published and a paper led by Prof. Ross H Anderson and co-authored by all British centres was published in the BMJ in 2004[1]. The Principal Investigator supplemented the study results with other information for this paper, such as hospital admissions and GP visits recorded during the same year the survey took place. The Isle of Man has not used any of the videos in the data collection.

The burden of self reported asthma and related disorders among adolescents has changed for the better in the recent years throughout the British Isles and the Isle of Man is no exception. ISAAC has provided much needed information for policy purposes, for example establishing the need for first aid and inhalers available in all schools. Methodologically the 6-8 year old questionnaire asked parents about the administration of paracetamol to their children and the

approach in the Isle of Man was to include in the questionnaires as many as known brand names of this over the counter drug. Pharmacies and supermarkets were approached and the most frequently sold paediatric brands were included in the questionnaire. The Island's data were used in the publication of a paper in the Lancet in 2009[2].

Acknowledgements

We gratefully acknowledge the financial support of the Isle of Man Government, Department of Health and Department of Local Government. We gratefully acknowledge the invaluable assistance of the offshore British Coordinator Dr David Jeffs, the UK Coordinators Prof. Ross H Anderson and David Strachan for their continuous support. As the Isle of Man Principal Investigator I am grateful for the invaluable assistance of the database management provided by the St George's Medical Hospital School Team for their help with the timely database setting and a continuous dialogue in assisting with the publication of our reports and indebted to all the children, parents and school staff who participated in the surveys. I wish to thank my fieldwork team for their enthusiasm and motivation throughout Phase Three of the Study.

Dr Andreea Steriu, Isle of Man ISAAC Phase Three Principal Investigator

References

1. The Anderson, H.R., Ruggles, R., Strachan, D.P., Austin, J.B., Burr, M., Jeffs, D., Standring, P., Steriu, A. And Goulding, R. *"Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002: questionnaire survey"*. BMJ 2004; 328:1052-53.
2. Beasley R, Clayton T, Crane J, von Mutius E, Lai CKW, Montefort S, Stewart A, for the ISAAC Phase Three Study Group. *Association between paracetamol use in infancy and childhood, and risk of asthma, rhinoconjunctivitis, and eczema in children aged 6-7 years: analysis from Phase Three of the ISAAC programme.* Lancet 2008; 372(9643): 1039-48.

Itajaí Centre

Phase Three			
Centre:	Itajaí, Brasil (Latin America)		
Principal Investigator:	Dr Cláudia dos Santos Dutra Bernhardt		
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to February 2003
Sampling Frame:	Some schools in the Itajaí area.		

Personnel

Dr Cláudia dos Santos Dutra Bernhardt

UNIVALI (Universidade do Vale do Itajaí)
R. Floriano Peixoto, 398/402
Cabeçudas
Itajaí
Brasil

Roles:

- Phase Three Principal Investigator for Itajaí

The ISAAC Story

Indian Centres

Using the video questionnaire in Jaipur, India

A school Assembly hall in Jaipur, India

Jaipur Centre

Phase Three			
Centre:		Jaipur, India (Indian Sub-Continent)	
Principal Investigator:		Professor Virendra Singh	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2001 to October 2001
Sampling Frame:		Randomised sample selected all schools of Jaipur city.	

Personnel

Professor Virendra Singh

Pulmonary Medicine Division
SMS Medical College
C-93, Shastri Nagar
India

Roles:

- Phase Three Principal Investigator for Jaipur

Almost a decade back an advertisement was published in the journal of association of physicians of India asking investigators to participate in an international study aimed to assess load of asthma and allergic diseases in childhood. Asthma is a disease which usually starts in early years and symptoms affect the child intermittently. An asthmatic child has to undergo cycles of well again and sick again. These cycles disrupts blissful childhood and the patient bear the twin agony of disease and apprehension of 'sick again' phase. I was interested in asthma research but during those days data of disease burden in India were scanty. Therefore I immediately volunteered to participate in the study. When our center was selected I realized paucity of funds in the study. But Indian Asthma Care Society provided us deficit resources.

We focused on the methodology of the study. ISAAC manual proved very useful in that. It provided stepwise solution of the problems encountered in the task. We contacted school administration and had mixed reactions. Some principals of the schools were very enthusiastic for participation while other's response was cold. The children were curious when questionnaires were distributed to them. Collection of completed questionnaires from parents in 6-7 yrs age group was a difficult task. Our workers had to go to schools many times to get the questionnaires. Video questionnaire in age 13-14 yrs age was quite interesting experience. "I am like that, when sick" - was the usual response to the video. But sometimes children got confused and would say, "I get wheeze and cough but not so severe as shown in video". After completion of the study the task of double entry of data was quite exciting. Our data entry person used to say "Why to waste double time when I am confident of entering data accurately".

At times we faced difficulty but coordination and support from the International Data Center was excellent. Major publications of Phase Three centers are now in print and we are realizing burden of asthma and other allergic diseases. The ISAAC meeting during the ERS provided an opportunity to interact with international colleagues of the study. Interesting publications showing relationship of asthma and allergy with paracetamol, vehicle pollution and environmental tobacco smoke are now known because of ISAAC.

In the end I wish to express my thanks to ISAAC committee and would like to say that the ISAAC undertaking was an exciting and pleasant experience down the memory lane.

Jalalabat Centre

Phase Three			
Centre:		Jalalabat, Kyrgyzstan (Northern and Eastern Europe)	
Principal Investigator:		Professor Shairbek Sulaimanov	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2003 to May 2003
Sampling Frame:		All Kyrgyz, Uzbek and Russian schoolchildren	

Personnel

Professor Shairbek Sulaimanov

Osh State University
Lenin Street, 331
715600 Kyrgyzstan
Kyrgyzstan

Roles:

- Phase Three Principal Investigator for Jalalabat

Dr Nurlan Toroev

Medical Faculty
Jalalabat State University (JASU)
Lenin Street, 57
Kyrgyzstan

Roles:

- Phase Three collaborator for Jalalabat

The ISAAC Story

Jersey Centre

Phase One			
Centre:		Jersey, Channel Islands (Western Europe)	
Principal Investigator:		Dr Richard Grainger	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All Jersey.	
Phase Three			
Centre:		Jersey, Channel Islands (Western Europe)	
Principal Investigator:		Ms Rosie Goulding	
Age Groups:	13-14	**Timeframe:**	February 2002 to March 2002
Sampling Frame:		13-14yr: All Secondary schools in Jersey. Same as Phase One.	

Personnel

Jill Birbeck

Jersey

Roles:
- Phase One collaborator for Jersey
- Phase Three collaborator for Jersey

Ms Rosie Goulding

Policy Principal
Social Security Department
Philip Le Feuvre House, PO BOX 55
La Motte Street, St Helier, JE4 8PE
United Kingdom

Roles:
- Phase Three Principal Investigator for Jersey

Dr Richard Grainger

Director of Public Health
Le Bas Centre
PO Box 421, St Saviours Road
St Helier, Jersey
United Kingdom

Roles:
- Phase One Principal Investigator for Jersey

Local Publications

The following publications used ISAAC data from the Jersey centre:

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey.* BMJ 2004; 328(7447): 1052-3.

Jeffs D, Grainger R, Powell P. *Is childhood allergy more common amongst an island population?* J R Soc Health.2000 Dec;120(4):236-41.

Jima Centre

Phase One			
Centre:		Jima, Ethiopia (Africa)	
Principal Investigator:		Professor Berhane Seyoum	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Jimma	

Personnel

Professor Berhane Seyoum

Department of Internal Medicine
Faculty of Medicine
Addis Ababa University
P O Box 1176
Ethiopia

Roles:
- Phase One Principal Investigator for Jima

Local Publications

The following publications used ISAAC data from the Jima centre:

Haileamlak A, Lewis SA, Britton J, Venn AJ, Woldemariam D, Hubbard R, Williams HC. *Validation of the International Study of Asthma and Allergies in Children (ISAAC) and U.K. Criteria for atopic eczema in Ethiopian children.* Br J Dermatol 2005; 152(4): 735-41.

Jodhpur Centre

Phase One			
Centre:		Jodhpur, India (Indian Sub-Continent)	
Principal Investigator:		Dr K C Jain	
Age Groups:	13-14, 6-7	**Timeframe:**	December 1994 to March 1995
Sampling Frame:			
Phase Three			
Centre:		Jodhpur, India (Indian Sub-Continent)	
Principal Investigator:		Dr K C Jain	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2003 to August 2003
Sampling Frame:		All schools in Jodhpur, the same sampling frame as Phase One.	

Personnel

Dr K C Jain

Pioneer Medical Centre
Subhash Chowk
Ratanada
Jodhpur 342 001
India

Roles:
- Phase One Principal Investigator for Jodhpur
- Phase Three Principal Investigator for Jodhpur

The ISAAC Story

Karachi Centre

Phase One			
Centre:		Karachi, Pakistan (Eastern Mediterranean)	
Principal Investigator:		Dr Zulfiqar A Bhutta	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in metropolitan Karachi.	

Phase Three			
Centre:		Karachi, Pakistan (Eastern Mediterranean)	
Principal Investigator:		Dr Naseeruddin Mahmood	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2001 to January 2002
Sampling Frame:		Private and Public schools in metropolitan Karachi city limits. Includes some segregated boys and girls schools as in Phase One. The same sampling frame was used for Phase One and Phase Three.	

Personnel

Dr Zulfiqar A Bhutta

The Aga Khan University
Faculty of Health Sciences
Stadium Road
P.O. Box 3500
Pakistan

Roles:

- Phase One Principal Investigator for Karachi
- Phase Three collaborator for Karachi

Dr Naseeruddin Mahmood

Department of Paediatrics
The Aga Khan University
PO Box 3500
Stadium Road
Pakistan

Roles:

- National Coordinator for Pakistan
- Phase Three Principal Investigator for Karachi

Kaunas Centre

Phase One			
Centre:		Kaunas, Lithuania (Northern and Eastern Europe)	
Principal Investigator:		Professor Jurgis Bojarskas	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:October 1995 to February 1996 6-7yr:October 1995 to January 1996
Sampling Frame:			

Phase Three			
Centre:		Kaunas, Lithuania (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Jolanta Kudzyte	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2001 to May 2002
Sampling Frame:		All schools in Kaunas	

Personnel

Professor Jurgis Bojarskas

Kaunas Medical University
Clinics of Children's Diseases
Eiveniu 2
Lithuania

Roles:

- Phase One Principal Investigator for Kaunas

Associate Professor Jolanta Kudzyte

Clinic of Children's Diseases
Kaunas Medical University
Eiveniu str. 2
Lithuania

Roles:

- National Coordinator for Lithuania
- Phase Three Principal Investigator for Kaunas

Dr Valdone Miseviciene

Kaunas Medical University
Clinic of Children's Diseases
Eiveniu str. 2
Lithuania

Roles:

- Phase Three collaborator for Kaunas

Local Publications

The following publications used ISAAC data from the Kaunas centre:

Kudzyte J, Griska E, Bojarskas J. *Time trends in the prevalence of asthma and allergy among 6-7-year-old children. Results from ISAAC phase I and III studies in Kaunas, Lithuania.* Medicina (Kaunas) 2008; 44(12):944-952

The ISAAC Story

Why our country joined ISAAC

We were late finding out about ongoing ISAAC studies, and so we were late with our Phase One results. Nevertheless, we were very eager to find out about the real situation concerning allergic diseases in Lithuania, especially among children, as being paediatric allergists and pulmonologists we saw the dramatically increasing numbers of allergic children. We selected the three biggest Lithuanian cities (Kaunas, Panevezys, Siauliai) as centres and examined all children from the secondary schools and kindergartens in them. Phase Three results were produced in time, as we already knew about the invitation to take part repeatedly in this survey. We were interested to see the dynamics of the prevalence of allergic diseases, which is why Kaunas centre completed repeat phases of ISAAC.

Impact of ISAAC in our country

Various lecturers (pediatric and adult) and even Health Ministry representatives quote our ISAAC data, when talking about the spreading of allergies in Lithuania. Then we are sitting proud, with our heads raised, as still there are no data about the prevalence of adult allergies in Lithuania. Some data from our Lithuanian ISAAC results were published in the most popular Lithuanian medical journal 'Medicina'.

Kharkiv Centre

Phase One			
Centre:		Kharkiv, Ukraine (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Viktor Ognev	
Age Groups:	13-14, 6-7	**Timeframe:**	
Sampling Frame:			
Phase Three			
Centre:		Kharkiv, Ukraine (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Viktor Ognev	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to May 2002
Sampling Frame:		All schools in Kharkiv centre 001 (very big industrial town, ecology polluted).	

Personnel

Associate Professor Viktor Ognev

Head, Department of Social Medicine
Organization and Economics of Public Health
Kharkov State Medical University
4 Lenin Avenue
Ukraine

Roles:

- National Coordinator for Ukraine
- Phase One Principal Investigator for Kharkiv
- Phase Three Principal Investigator for Kharkiv

Kharkiv

Kharkiv is the second largest city in Ukraine; its area is more than 300 km2. The city was founded in 1654. The population of the city is over 1.5 million people. In the city there is an international airport increasing a number of flights every year, railway and bus stations. A well-developed network of underground lines and other city transport (trolley buses, trams, buses, and taxis) provide transportation in the city. Kharkiv is a cultural centre. There are 10 theatres, concert halls, a city picture gallery, museums, about 80 libraries, art monuments, temples, a circus, the Chamber Music Hall, disco clubs. Kharkiv is a city of students. It takes one of the leading places in Ukraine in the number of higher educational establishments (31). Today 300,000 students are trained in higher educational establishments, including 11,800 from more than 106 nations of the world. Every year more than 30,000 young specialists graduate from higher educational establishments in Kharkiv. Kharkiv is the leading scientific center of Ukraine. There are 3 Nobel Prize winners from Kharkiv scientific school:

- Semen Abramovich Kuznets - in Economics;
- Ilya Ilyich Mechnikov - in Physiology and Medicine;
- Lev Davydovich Landau- in Physics.

The ISAAC Story

Department of social medicine, organization and economic of Public Health service.

History Department of social medicine, organization and economic of Public Health service of Kharkiv National medical university began from 27 of October 1923 and this department was first in Ukraine. Minister of Public Health service of Ukraine M.G. Gurevich was the founder of the Department.

It were 5 Heads of Department during the department's of social medicine, organization and economic of Public Health service work. There are: professor M.G. Gurevich (1923 – 1925), professor S.A. Tomilin (1925 – 1932), professor Z.A. Gurevich (1932 – 1974), professor N.A. Galicheva (1972 – 2002) and professor V.A. Ognev (from 2002 till now). The staff of teachers consist 16 persons. There are 3 professors (V.A. Ognev, N.A. Galicheva, K.M. Sokol), 3 vice professor and teachers. Many disciplines are studied by department. There are: History of medicine, Biostatistic, Public Health, Economy of Public Health. Over the years the department had issued 23 books, 5 textbooks and teaching aids, granted 8 patents. Since 1998, the Department is the national focal points of the international program "ISAAC" on the study of bronchial asthma in children in Ukraine. At the present stage of work the Department has taken part in international grant project "Intas", carrying the theme "Epidemiological study reproductive function of Ukraine's population, which is influenced by biologically persistent organochlorine compounds (dioxins) environment.

Khartoum Centre

Phase Three			
Centre:		Khartoum, Sudan (Africa)	
Principal Investigator:		Professor Omer Abdel Aziz Musa	
Age Groups:	13-14	**Timeframe:**	January 2003 to April 2003
Sampling Frame:		13-14yr: Some schools in Khartoum state, Sudan	

Personnel

Prof Omer Abdel Aziz Musa

Faculty of Medicine
National Ribat University
P.O. Box 193
P.C. 11111
Sudan

Roles:

- Phase Three Principal Investigator for Khartoum

ISAAC in Sudan

The International Study of Asthma and Allergies in Childhood (ISAAC) in Sudan was the first collaboration work between Dr Asma Elsony (Epi-Lab) and Pro Omer Musa (Ribat uinveristy). The preparation for ISAAC study started in 2002; the questionnaire was translated to Arabic by professional translator and checked, over 3000 copy were printed and Khartoum (the capital) was chosen as a research site.

The data collection took place between February-September 2003, number of student included in the in the study was 3000, their age was 13 to 14 and they were included from 55 school. Data was entered, and analyzed by Epi info 6. The collaboration between the Epi-Lab and Ribat university made it possible to carry the activities; the data was collected through the Ribat university and the data entry and analysis was done in the Epi-Lab; we have to mention here that when the data was submitted to the regional coordinator and analyzed it showed that Sudan had the highest percentage of heavy truck passing near the houses. This percentage appeared higher than expected, therefore we checked the questionnaire and we found that heavy truck was translated mistakenly in Arabic to a car. Consequently that question was eliminated from the analysis.

The most especial about the ISAAC in Sudan is that the partnership established between the Epi-Lab and Ribat University in 2002 continued up to date. The Epi-Lab and Ribat university together conducted 7 studies. Two of these studies used the same questionnaire and investigated asthma and allergies in children in rural areas (Atbra and Algadarif). The prevalence of asthma in rural areas is around 5% , a percentage much lower than that in Khartoum state (12.5%), the studies are not published. ISAAC questionnaire was later modified to study the prevalence of asthma in adult communities (five universities students in five sates) and consequently several papers were published in the International Journal of Tuberculosis and Lung Disease.

Regional
National
Local
Khon Kaen
Kinshasa

Khon Kaen Centre

Phase Three			
Centre:		Khon Kaen, Thailand (Asia-Pacific)	
Principal Investigator:		Associate Professor Jamaree Teeratakulpisarn	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1998 to May 1999
Sampling Frame:		13-14yr: All school located in the Central District that have a large number of children (>300), easy to access and have both sex. 6-7yr:All schools located in the Central district that have >100 children of target group and easy to access.	

Personnel

Associate Professor Jamaree Teeratakulpisarn

Department of Pediatrics
Faculty of Medicine
Khon Kaen University
Thailand

Roles:

- Phase Three Principal Investigator for Khon Kaen

ISAAC study in Khon Kaen, Thailand

Prof. Pakit Vichyanond, Thailand coordinator, contacted us (Dr.Srivieng Pairojkul and me) to participate in the ISAAC study phase 1. Because of the limitation of funding, we could not conduct the phase one survey and sent our results for publication on time. However, we conducted our first ISAAC survey, using the same questionnaires as the two previous surveys in Thailand, in 1998, which was later added to the Phase Three data. Our first survey showed higher prevalence of asthma (13.6%) than the two centers from Bangkok and Chiangmai. So, we conducted the second survey 5 years later in 2003 for confirming the high prevalence and determining the time trend. Although our results were similar to Chaingmai center that asthma prevalence was not increase within 5 years, but we confirmed the high prevalence of asthma and other allergic diseases of Thailand.

In Thailand, we have very few disease prevalence survey so we cannot predict or estimate how burden of the diseases to our health system. Allergic diseases have been taken into health personnel and public interested issue since the last decade. We thank Prof. Pakit Vichyanond, the ISAAC Committee and all of you who initiated and run these great works.

Jamaree Teeratakulpisarn, MD
Department of Pediatrics,
Faculty of Medicine,
Khon Kaen University, Thailand

Kinshasa Centre

Phase Three			
Centre:		Kinshasa, Republique Democratique du Congo (Africa)	
Principal Investigator:		Prof Dr Jean-Marie Kayembe	
Age Groups:	13-14	**Timeframe:**	May 2003 to May 2003
Sampling Frame:		13-14yr: Schools that had 13/14 year old pupils.	

Personnel

Prof Dr Jean-Marie Kayembe

Pneumologist, Deputy-Dean
Faculty of Medicine
Université de Kinshasa
Republique Democratique du Congo

Roles:

- Phase Three Principal Investigator for Kinshasa

Dr Henriette Wembanyama

Bureau National De La Tuberculose
BP 12706
Kinshasa Gombe
Republique Democratique du Congo

Roles:

- Phase Three collaborator for Kinshasa

ISAAC In Kinshasa

Kinshasa, the capital of D R Congo is a big country with almost ten million habitants. The ISAAC Phase Three survey was conducted under the supervision of the Faculty of Medicine (University of Kinshasa) and the Public health school of Kinshasa for statistical analyses.

This was the first survey on allergy in schoolchildren and the selected schools where chosen with the assistance of the ministry of education. Resident students in the last year at the faculty of medicine were included for data collection among schoolchildren and all the parts of the town were concerned. French is the teaching language but we encountered many difficulties due to a poor understanding of some questions which were translated in local languages. Some schools are very far from the centre and access is limited.

Local Publications

The following publications used ISAAC data from the Khon Kaen centre:

Teeratakulpisarn J, Pairojkul S, Heng S. *Survey of the prevalence of asthma, allergic rhinitis and eczema in schoolchildren from Khon Kaen, Northeast Thailand.an ISAAC study.International Study of Asthma and Allergies in Childhood.* Asian Pac J Allergy Immunol.2000 Dec;18(4):187-94.

Teeratakulpisarn J, Wiangnon S, Kosalaraksa P, Heng S. *Surveying the prevalence of asthma, allergic rhinitis and eczema in school-children in Khon Kaen, Northeastern Thailand using the ISAAC questionnaire phase III.* Asian Pac J Allergy Immunol.2004 Dec;22(3):175-81.

Data collected are very helpful and an ongoing study is now conducted by Dr Kapinga to analyze the level of asthma control in adults in Kinshasa. Three workshops have been organized in Kinshasa under the umbrella of pharmaceutical industry (Glaxo Smith Kline) and data from the ISAAC survey were presented.

We are interested in future collaboration at the level of all sub-saharan Africa and a survey on respiratory health will take place in Kinshasa next July
Prof J M Kayembe

Kintampo Centre

Phase Two			
Centre:		Kintampo, Ghana (Africa)	
Principal Investigator:		Dr Emmanuel OD Addo-Yobo	
Age Groups:	,	**Timeframe:**	February 2000 to July 2000.
Sampling Frame:		All schools in the town of Kintampo and surrounding rural villages.	

Personnel

Dr Emmanuel OD Addo-Yobo

Department of Child Health
Komfo Anokye Teaching Hospital (KATH)
P. O. Box 1934
Ghana

Roles:

- Phase Two Principal Investigator for Kintampo

Klang Valley Centre

Phase One			
Centre:		Klang Valley, Malaysia (Asia-Pacific)	
Principal Investigator:		Associate Professor Jessie de Bruyne	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:February 1995 to June 1995 6-7yr:February 1995 to April 1995
Sampling Frame:			
Phase Three			
Centre:		Klang Valley, Malaysia (Asia-Pacific)	
Principal Investigator:		Associate Professor Jessie de Bruyne	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2001 to September 2001
Sampling Frame:		All schools in Klang Valley, the same sampling frame as Phase One.	

Personnel

Associate Professor Jessie de Bruyne

Department of Paediatrics
Faculty of Medicine
University of Malaya
Malaysia

Roles:

- National Coordinator for Malaysia
- Phase One Principal Investigator for Klang Valley
- Phase Three Principal Investigator for Klang Valley

Regional
National
Local
Kota Bharu

Kota Bharu Centre

Phase One			
Centre:		Kota Bharu, Malaysia (Asia-Pacific)	
Principal Investigator:		Associate Professor Ban Seng Quah	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:April 1995 to July 1995 6-7yr:March 1995 to May 1995
Sampling Frame:			
Phase Three			
Centre:		Kota Bharu, Malaysia (Asia-Pacific)	
Principal Investigator:		Associate Professor Ban Seng Quah	
Age Groups:	13-14, 6-7	**Timeframe:**	July 2001 to August 2001
Sampling Frame:		All schools under the Ministry of Education, Malaysia. Same sampling frame used for both Phase One and Phase Three.	

Personnel

Dr. Mazidah Abdul Rasid

Department of Paediatrics,
School of Medical Sciences
Universiti Sains Malaysia,
16150 Kubang Kerian,
Kelantan
Malaysia

Roles:

- Phase Three collaborator for Kota Bharu
- Left Universiti Sains Malaysia in 2006 and is now working at Perdana Specialist Hospital, Jalan Bayam, 15200 Kota Bharu, Kelantan, Malaysia

Dr. Mohd Hashim Mohd Hassan

Department of Community Medicine
Universiti Sains Malaysia,
16150 Kubang Kerian,
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Malaysia

Roles:

- Phase One collaborator for Kota Bharu

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Department of Paediatrics, School of Medical Sciences
Universiti Sains Malaysia,
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Roles:

- Phase Three collaborator for Kota Bharu

Kol. (B) Dr. Wan Pauzi Wan Ibrahim

Department of Paediatrics,
School of Medical Sciences
Universiti Sains Malaysia,
16150 Kubang Kerian,
Kelantan
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Roles:

- Phase Three collaborator for Kota Bharu

Professor Ban Seng Quah

Department of Paediatrics,
School of Medical Sciences
Universiti Sains Malaysia,
16150 Kubang Kerian,
Kelantan
Malaysia

Roles:

- Phase One Principal Investigator for Kota Bharu
- Phase Three Principal Investigator for Kota Bharu
- Left Universiti Sains Malaysia in 2010 and is now working at: Melaka-Manipal Medical College, Jalan Batu Hampar, Bukit Baru, 75150 Melaka, Malaysia

Dr. Abdul Razif Abdul Razak

Department of Community Medicine
Universiti Sains Malaysia,
16150 Kubang Kerian,
Kelantan
Malaysia

Roles:

- Phase One collaborator for Kota Bharu
- Left Universiti Sains Malaysia in 1996 and is now working at: Kedah Medical Centre, Pumpong, 05250 Alor Setar, Kedah Darul Aman, Malaysia

Local Publications

The following publications used ISAAC data from the Kota Bharu centre:

Quah BS, Wan-Pauzi I, Ariffin N, Mazidah AR. *Prevalence of asthma, eczema and allergic rhinitis Two surveys, 6 years apart, in Kota Bharu, Malaysia.* Respirology 2005; 10(2):244-249.

Quah BS, Razak AR, Hassan MH *Prevalence of asthma, rhinitis and eczema among schoolchildren in Kelantan, Malaysia* Acta Paediatr Jpn. 1997;39(3):329-35

The ISAAC Story

Why was this centre selected for ISAAC?

Kota Bharu, situated in the northeastern part of peninsula Malaysia is the state capital of Kelantan. We were invited to participate in ISAAC by the national coordinator Associate Professor Jessie de Bruyne. As there were no studies on the prevalence of asthma and allergic diseases from this region, we were very enthusiastic to be part of ISAAC. It was also an opportunity to compare the prevalence of the asthma, eczema and allergic rhinitis in Kota Bharu with the more affluent and urban population in the west coast of the peninsular. The demographics of this state is also very different from that in the west coast as 95% of the population are ethnic Malays.

Our experience of ISAAC

In this multiracial country, a major problem was preparing the ISAAC questionnaire in different languages. As the majority of the population in Kota Bharu are Malays, the ISAAC questionnaire was translated to Malay which is also the national language. The translation was successfully done with the help of Dr. Abdul Razif along with the assistance of language teachers from the university. Several meetings were held with the national coordinator to discuss the Malay questionnaire so that a similar questionnaire could be used in all ISAAC centres in Malaysia. We also needed a Mandarin questionnaire to be used for the few Chinese schools in Kota Bharu district. But this was a minor problem as we adopted the Mandarin questionnaire from our colleagues in Singapore.

Permission from the Kelantan State Director of Education was obtained to conduct the surveys in the schools. We did not face any barriers during our visits to the schools and the teachers assisted by arranging a suitable venue for the video questionnaire. Logistically, it was not a difficult survey to carry out as the permission from the State Director of Education ensured that the students and teachers fulfilled our requests. This might explain the high rate of response of our questionnaires. The response rate for the written questionnaires was also surprisingly high which could be a reflection of the interest of parents.

Acknowledgements

We wish to thank Universiti Sains Malaysia for providing research grants, and also the Ministry of Education, Malaysia, for granting permission to perform both Phase One and Three surveys among school children in Kota Bharu district. We are also indebted to all children, parents and school staff who participated in the surveys.

Kottayam Centre

Phase One			
Centre:		Kottayam, India (Indian Sub-Continent)	
Principal Investigator:		Dr T U Sukumaran	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1994 to February 1995
Sampling Frame:			
Phase Three			
Centre:		Kottayam, India (Indian Sub-Continent)	
Principal Investigator:		Dr T U Sukumaran	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to December 2002
Sampling Frame:		Some schools in Kottayam, the same sampling frame as Phase One.	

Personnel

Dr T U Sukumaran

Institute of Child Health
Medical College Kottayam
Medical Supt, I.C.H.
Amalagiri P.O.
India

Roles:

- Phase One Principal Investigator for Kottayam
- Phase Three Principal Investigator for Kottayam

The ISAAC Story

Krakow (1993) Centre

Phase One			
Centre:		Krakow (1993), Poland (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Grzegorz Lis	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All elementary schools within the boundaries of Krakow centre.	

Personnel

Associate Professor Grzegorz Lis

Department of Pediatrics
Polish-American Children's Hospital
ul. Wielicka 265
Poland

Roles:

- National Coordinator for Poland
- Phase One Principal Investigator for Krakow (1993)

Kraków (1995) Centre

Phase One			
Centre:		Kraków (1995), Poland (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Grzegorz Lis	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:May 1995 to June 1995 6-7yr:September 1995 to September 1995
Sampling Frame:			
Phase Three			
Centre:		Kraków (1995), Poland (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Grzegorz Lis	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to June 2002
Sampling Frame:		13-14yr: All secondary schols with 1 grade (pupils 13/14 yr of age) in Krakow. Same boundaries for both Phases. 6-7yr:All elementary schools with 1 grade (pupils 6-7 yr of age) in Krakow	

Personnel

Associate Professor Grzegorz Lis

Department of Pediatrics
Polish-American Children's Hospital
ul. Wielicka 265
Poland

Roles:

- National Coordinator for Poland
- Phase One Principal Investigator for Kraków (1995)
- Phase Three Principal Investigator for Kraków (1995)

Kuopio County Centre

Phase One			
Centre:		Kuopio County, Finland (Northern and Eastern Europe)	
Principal Investigator:		Dr Juha Pekkanen	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Kuopio County	
Phase Three			
Centre:		Kuopio County, Finland (Northern and Eastern Europe)	
Principal Investigator:		Dr Juha Pekkanen	
Age Groups:	13-14	**Timeframe:**	November 2001 to January 2002
Sampling Frame:		13-14yr: All secondary schools in former Kuopio county area. Same sampling frame as Phase One.	

Personnel

Mr Matti Korppi

Kuopio University Hospital
Department of Paediatrics
Kaartokatu 9
Finland

Roles:

- Phase Three collaborator for Kuopio County

Dr Juha Pekkanen

Head, Department of Environmental Epidemiology
National Public Health Institute
KTL. P.O. Box 95
Finland

Roles:

- National Coordinator for Finland
- Phase One Principal Investigator for Kuopio County
- Phase Three Principal Investigator for Kuopio County

The ISAAC Story

Dr Sami Remes

Unit of Environmental Epidemiology
National Public Health Institute
PO Box 95
Finland

Roles:
- Phase Three collaborator for Kuopio County

Georgia

Kutaisi Centre

Phase One			
Centre:		Kutaisi, Georgia (Northern and Eastern Europe)	
Principal Investigator:		Dr Nino Khetsuriani	
Age Groups:	13-14, 6-7	**Timeframe:**	February 1996 to April 1996
Sampling Frame:			
Phase Three			
Centre:		Kutaisi, Georgia (Northern and Eastern Europe)	
Principal Investigator:		Dr Maia Gotua	
Age Groups:	13-14, 6-7	**Timeframe:**	December 2003 to December 2003
Sampling Frame:		All schools in Kutaisi, the same sampling frame as Phase One.	

Personnel

Dr Tamar Abramidze

Center of Allergy & Immunology
2/6 Lubliana str.
Georgia

Roles:
- Phase Three collaborator for Kutaisi

Professor Amiran Gamkrelidze

Scientific Adviser of the Center of Allergy and Immunology
Programme Coordinator of WHO Country Office in Georgia,
2/6 Lubliana Str, 0159
Tbilisi
Georgia

Roles:
- Phase Three collaborator for Kutaisi
- Scientific Advisor to Phases Two and Three

Dr Maia Gotua

Director
Center of Allergy & Immunology
2/6 Lubliana str.
Tbilisi
Georgia

Roles:
- National Coordinator for Georgia
- Phase Three Principal Investigator for Kutaisi

Lali Karsanidze

Tbilisi State Medical University
2/6 Lubliana Str, 0159
Georgia

Roles:
- Phase Three collaborator for Kutaisi

Dr Nino Khetsuriani

Centers for Disease Control
Mail Stop A34
1600 Clifton Rd, NE
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Roles:
- Phase One Principal Investigator for Kutaisi

Maia Kiladze

Center of Allergy & Immunology
2/6 Lubliana str.
Georgia

Roles:
- Phase Three collaborator for Kutaisi

The ISAAC Story

Dr Maia Rukahzde

Center of Allergy & Immunology
2/6 Lubliana str.
Georgia

Roles:

- Phase Three collaborator for Kutaisi

Background

Georgia, which former was one of the Soviet Union countries, gained its independence in 1990 and faced most complicated political situations and hard economic conditions. Despite the mentioned Georgia was always opened to new researches, including epidemiological studies. The ISAAC regional coordinator for Northern and Eastern Europe professor Bengt Bjorksten kindly invited Georgia to participate in ISAAC study in 1994. This participation was defined according to the following key points: the lack of any epidemiological data regarding markers of allergy diseases for that time in Georgia; the interest to confirm the purpose that the prevalence of these diseases in Georgia should be much lower than in country with market economy (as it was revealed in the other less industrialized formerly socialist countries); as well as personal contact with Prof. Gamkrelidze and his team of highly-qualified allergologists at the Tbilisi State Medical University and later staff of Center of Allergy and Immunology.

Impact of ISAAC

Involvement in a large global research project gave chance of new research, education and obtaining of practical experience to our country. It was extremely important for developing allergy and epidemiology fields in Georgia and learning new approaches of standardized high quality research. Participation in ISAAC expanded our professional contacts and was good opportunity for active exchanging of scientific knowledge with our colleagues in other countries.

Findings

ISAAC Phase I and as well as ISAAC Phase III were conducted in two cities of Georgia – Tbilisi and Kutaisi, characterized by different geographical and urban peculiarities. The prevalence of symptoms of allergic diseases in Georgia according to the results of ISAAC I survey mostly was less than 5%. The exception was the prevalence of wheezing 12 months among 6-7 yrs. Old children (Kutaisi – 9.3%, Tbilisi -5.4%), which possibly could be less related to allergy and more associated with infections in the younger children. The regional differences (between two study centers) in symptoms were not obvious among 13-14 yrs. Old children. The 12 month prevalence of wheezing and conjunctivitis were slightly higher in Kutaisi than in Tbilisi among the 6-7 yr olds children.

ISAAC Phase II was performed in Tbilisi, in 2001-2002. The prevalence rate of asthma became 9.2%, the prevalence rate of 12 months of itchy rash and flexural dermatitis were 7.6% and 5.9%, respectively, which was higher than the prevalence of eczema symptoms reported in Georgia 6-7 years ago (ISAAC Phase I – 1995-1996). The prevalence of current rhinoconjunctivitis was increased as well (6.3% vs. 4.7%). An interesting finding was that the family history of allergic diseases and damp spots on the wall was the main determinants for all types of allergic symptoms as well as high co-morbidity of allergic diseases.

ISAAC Phase III was conducted in May 2003 – December 2003 in two centers. Unfortunately, Tbilisi center was excluded from the global data analysis. That was caused by very low response rate (46% - 13/14 yrs old group, 56% - 6/7 yrs old group) during the fieldwork period, due to the difficult political situation inside the country (so-called “Rose Revolution" located in Tbilisi). In order to reveal tendency of changes of allergic symptoms prevalence in our country we analyzed both centers. The results of ISAAC phase III study indicate that the epidemiological features of asthma and allergies in Georgia are changing, although the causes are still uncertain. Considerable geographic variation in time trends of prevalence of symptoms of asthma and allergies can been seen in both age groups (6/7 and 13/14 yrs old). The prevalence changes, particularly the increasing pattern, more clearly expressed in Tbilisi than in Kutaisi centre. Among adolescences in Kutaisi center only “current wheezing” increased from 1996 (3,6% (95%CI 3.1-4.1)) to 2003 (5.1% (95%CI 4.3-5.9)), the prevalence of all other allergic diseases decreased or remained without changes. It should be noted, that the prevalence of current wheezing among 6-7 yrs old children, in contrast to other age group, decreased by 2,4% (9,3% (1996) and 6,9% (2003)), the symptoms of current rhino-conjunctivitis slightly decreased and symptoms of flexural dermatitis reduced by 2.8% ($p < 0.01$).

References

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2. Weinmayr G, Weiland SK, Björkstén B, Brunekreef B, Büchele G, Cookson WO, Garcia-Marcos L, Gotua M, Gratziou C, van Hage M, von Mutius E, Riikjärv MA, Rzehak P, Stein RT, Strachan DP, Tsanakas J, Wickens K, Wong GW; ISAAC Phase Two Study Group. Atopic sensitization and the international variation of asthma symptom prevalence in children. Am J Respir Crit Care Med. 2007 Sep 15; 176(6):565-74. Epub 2007 Jun 15.
3. Abramidze T, Gotua M, Rukhadze M, Gamkrelidze A. Prevalence of asthma and allergies among adolescences in Georgia: comparison between two surveys. Georgian Med News. 2007 Mar ;(144):38-41

Acknowledgment

We wish to thank Prof. Bengt Bjorksten for a supervision and great support in carrying out of all phases of ISAAC study in Georgia. Many thanks to ISAAC group of University of Ulm under the leadership of Prof. Stephan Weiland and ISAAC group in Auckland for supporting in data entry and analysis. We are also grateful to all the children, parents and school staff who participated in the surveys.

Kuwait Centre

Phase One			
Centre:		Kuwait, Kuwait (Eastern Mediterranean)	
Principal Investigator:		Dr Jawad A al-Momen	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Geographic area and specific language	
Phase Three			
Centre:		Kuwait, Kuwait (Eastern Mediterranean)	
Principal Investigator:		Dr Jawad A al-Momen	
Age Groups:	13-14	**Timeframe:**	January 2001 to June 2001
Sampling Frame:		13-14yr: The same sampling frame as Phase One.	

Personnel

Dr Jawad A al-Momen

Consultant Pediatrician
Al-Amiri Hospital
P.O Box 4077
Al Safat
Kuwait

Roles:

- Phase One Principal Investigator for Kuwait
- Phase Three Principal Investigator for Kuwait

Kärnten Centre

Phase One			
Centre:		Kärnten, Austria (Western Europe)	
Principal Investigator:		Associate Professor Gerald Haidinger	
Age Groups:	6-7	**Timeframe:**	April 1995 to January 1996
Sampling Frame:		6-7yr: All children attending pre-school classes or 1st and 2nd grade elementary school.	
Phase Three			
Centre:		Kärnten, Austria (Western Europe)	
Principal Investigator:		Associate Professor Gerald Haidinger	
Age Groups:	6-7	**Timeframe:**	February 2002 to July 2002
Sampling Frame:		6-7yr: All schools in the districts Klagenfurt, Spittal, and St Veit. Exactly the same sampling frame as in Phase One.	

Personnel

Associate Professor Gerald Haidinger

Department of Epidemiology
Centre of Public Health
Medical University of Vienna
Borschkegasse 8a, 1090 Vienna
Austria

Roles:

- National Coordinator for Austria
- Phase One Principal Investigator for Kärnten
- Phase Three Principal Investigator for Kärnten

Regional
National
Local
La Habana
Lappland Area
Lattakia

La Habana Centre

Phase Three			
Centre:		La Habana, Cuba (Latin America)	
Principal Investigator:		Dra Patricia Varona Peréz	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2002 to July 2002
Sampling Frame:		Some schools in Havana City (Urban).	

Personnel

Dra Patricia Varona Peréz

J'Grupo de Epidemiología de la División Epidemiología y Salud Publica de INHEM
Instituto Naconal de Higiene Epidemiología y Microbiología (INHEM)
Infanta # 1158 e/
Clavel y Llinás
Cuba

Roles:

- National Coordinator for Cuba
- Phase Three Principal Investigator for La Habana

Lappland Area Centre

Phase One			
Centre:		Lappland Area, Finland (Northern and Eastern Europe)	
Principal Investigator:		Dr Leena Soininen	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools of the municipalities of the southern part of Lapland (Kolari, Pello, Ylitornio, Tornio, Keminmaa, Kemi, Tervola, Simo, Ranua, Posio, Kemijarvi, Salla and City of Rovaniemi together with its rural district)	

Personnel

Dr Leena Soininen

Provincial State Office of Lappland
P O Box 8002
Finland

Roles:

- Phase One Principal Investigator for Lappland Area

Lattakia Centre

Phase Three			
Centre:		Lattakia, Syria (Eastern Mediterranean)	
Principal Investigator:		Professor Yousser Mohammad	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2001 to November 2002
Sampling Frame:		13-14yr: Some schools from the city of Lattakia 6-7yr:Some schools of the wealthy part of the city and others of the lowest socio-economic level.	

Personnel

Professor Yousser Mohammad

Head of Chest Diseases Division
Tishreen University
PO Box 1479
Syria

Roles:

- Phase Three Principal Investigator for Lattakia

Dr Fatima Yassine

Tishreen University
Syria

Roles:

- Phase Three collaborator for Lattakia

Local Publications

The following publications used ISAAC data from the Lattakia centre:

Mohammad Y, Tabbah K, Mohammad S, Yassine F, Clayton T and Hassan M *International Study of Asthma and Allergies in Childhood phase 3 in the Syrian Arab Republic* East Med Health J 2010; 16(7): 710-716

Lattakia, Syria

The ISAAC Story

Why was this centre selected for ISAAC?

ISAAC phase three in Syria, was the first tool of its kind to help understanding the prevalence of asthma in schools. Results followed the national system of informing to all ministries. We had been informed by the newsletter of the IUATLD about the ISAAC phase three survey, we became very excited In Tishreen University to participate. The same in Tartous center. The University Council of Tishreen University approved the participation by ministerial decree.

Our experience of ISAAC

With Aleppo and Tartous we translated the questionnaire to Arabic, The president of the university wrote to the Director of Education in Lattakia governorate, who accepted the survey in schools. All school directors we glorified to see that their pupils participated to the survey. We did not have barriers, parents were very compliant too, they considered that we are helping their children. We took the occasion to add questions about passive smoking in utero to the Environmental Questionnaire.

In 2005 a national group for Education for asthma and COPD have been decreed by the Tishreen University collaborating with Ministry of Health, to help educate patients on Asthma and COPD. One of our activities was to visit schools and ask on classrooms if any have wheezing episodes or if any family member has it, it was surprising to see the number of positive responders not aware of the link between asthma and wheezing. As ISAAC researchers, we believe these questions could help to carry on early diagnosis campaigns.

We wanted to publish our results in a regional journal, we choose the Eastern Mediterranean health journal, the WHO Journal. We thought that it should inform health ministers and universities of the region about ISAAC, we looked on the Isaac website to learn about publications rules, we understood that we should contact the IIDC, fortunately Dr.Tadd Clayton helped us, it was for us very impressing to be helped by the ISAAC center in New Zealand, University of Auckland. Now we will circulate this article via official channels from the university to health and education authorities in Syria.

ISAAC results are the national reference for our post graduate students thesis
We think that it is worthy to develop a program in schools, screening questionnaire of ISAAC followed by visiting doctor.

Lima Centre

Phase One			
Centre:		Lima, Peru (Latin America)	
Principal Investigator:		Dr Pascual Chiarella	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in 1 area (Santiago de Surco, district) chosen from the 52 district in Lima.	

Phase Three			
Centre:		Lima, Peru (Latin America)	
Principal Investigator:		Dr Pascual Chiarella	
Age Groups:	13-14, 6-7	**Timeframe:**	July 2001 to July 2001
Sampling Frame:		All schools registered in the Educational Supervision Unit of the district of Santiago de Surco in Lima, Perú. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Dr Pascual Chiarella

Universidad Peruana Cayetano Heredia
Departamento de Pediatria
Av. La Floresta 175 Dpto 302
Chacarilla, Surco
Peru

Roles:

- National Coordinator for Peru
- Phase One Principal Investigator for Lima
- Phase Three Principal Investigator for Lima

Dr Luis Vega-Briceño

Universidad Peruana Cayetano Heredia
Departamento de Pediatria
Av. La Floreste 175 Dpto 302
Peru

Roles:

- Phase Three collaborator for Lima

The ISAAC Story

ISAAC Study in Lima, Peru

On September 17, 1993, I received the invitation from Dr Javier Mallol, Regional Coordinator for Latin America, to participate in the ISAAC study as a National Coordinator for Peru. We gladly accepted a few days later, and since that time we have participated in this project; it is quite interesting to see how much time has gone by.

In 1994, we made all the arrangements to run the study in a district of Lima, Santiago de Surco; I must acknowledge the help of Drs. Eduardo Negron, Juanita Aching, Luis Vega, Aldo Navarro, and many other people. We are also thankful for the grant that Dr. Mallol gave us.

The ISAAC Phase I study was run between April and June1995, and the data for Lima was submitted in the second part of that year. Afterwards we submitted several Phase I publications, including national publications. After Phase I, we performed several smaller studies in Peru using the ISAAC methodology; while the numbers were smaller, we used the same methodology, and the results could provide some data for comparison with ISAAC.

ISAAC Phase III Data was collected in May to July 2001, with the help of Dr. Erick Forno. In both phases we used the written and video questionnaires.

The Lima Centre in Peru is known for its particularly high prevalence of asthma symptoms in 13–14 year-old children, but with mild symptoms. The discussion continues: why do wehave such high prevalence of asthmatic patients?

We want to thank Drs Mallol, Tadd Clayton, Innes Asher, Philippa Ellwood, and everyone who works on ISAAC for inviting and helping us all these years.

Linköping Centre

Phase One			
Centre:		Linköping, Sweden (Northern and Eastern Europe)	
Principal Investigator:		Professor N-I Max Kjellman	
Age Groups:	13-14, 6-7	**Timeframe:**	
Sampling Frame:			
Phase Two			
Centre:		Linköping, Sweden (Northern and Eastern Europe)	
Principal Investigator:		Dr Lennart Bråbäck	
Age Groups:	10-11,	**Timeframe:**	January 1997 to April 1997.
Sampling Frame:		A random sample of schools from the urban district of Linköping.	
Phase Three			
Centre:		Linköping, Sweden (Northern and Eastern Europe)	
Principal Investigator:		Dr Hartmut Vogt	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to May 2002
Sampling Frame:		All schools in the Linköping Area.	

Personnel

Dr Lennart Bråbäck

Sundsvall Hospital
Mid Sweden Research and Development Centre
Sweden

Roles:

- National Coordinator for Sweden
- Phase Two Principal Investigator for Linköping
- National Coordinator for Sweden Phase Two

Professor N-I Max Kjellman

Linköping University
Sweden

Roles:

- Phase One Principal Investigator for Linköping
- Phase Two collaborator for Linköping

Dr Hartmut Vogt

Department of Clinical and Experimental Medicine
Division of Pediatrics
Faculty of Health Sciences
Linköping Universily
Sweden

Roles:

- Phase Three Principal Investigator for Linköping

The ISAAC Story

Study sites in Sweden were Linköping in phase I, II and III and Östersund in phase II Linköping in Southern Sweden (latitude 588) is the fifth largest city in Sweden and is currently undergoing expansion with a university and several large sites of industry. At the time of ISAAC Phase II in 1997, the population was 132,089 (24% of whom were below 20 years of age). Östersund is an administrative center in Northern Sweden (latitude 618) with sparsely populated surroundings. In 1997, the total population in Östersund was 59,188 (23 % of whom were below 20 years of age).

As a member of the international steering committee and the regional coordinator in Eastern Europe, professor Bengt Björkstén had an important role as a promoter of the ISAAC studies in Sweden. The ISAAC study phase II was carried out in close cooperation with the study centres in Estonia and the field workers were trained together in skin prick test technique and bronchial hyperreactivity tests.

In phase II, clusters of children were randomly selected in each centre for the study, using schools as sampling units. In Linköping, the survey involved 15 schools and in Östersund all schools were selected due to the lower population. All 10-11 years old children (forms 4 and 5) were invited to participate in skin prick tests and parental questionnaires. Information on anthropometric measures at birth and pre- and perinatal exposures were collected from the medical birth registry. The local mass medias paid a great deal of attention to the study, particularly in Östersund. The participation rates in the questionnaire study were 82% in Linköping and 86% in Östersund. All children with a history of wheeze in the past 12 months as reported in the parental questionnaires and a random sample of non-wheezing children from the original cohorts were invited to a case-control study, which included parental questionnaire, examination for flexural dermatitis and bronchial challenge with hypertonic saline..

The sensitivity of hypertonic saline challenge test to detect asthma ever, current asthma and current atopic asthma was 62, 61 and 83%, and the specificity was 83, 81 and 60%, respectively. Also, the degree of bronchial hyperresponsiveness increased with the number of wheezy episodes. It was concluded that hypertonic saline provocation test is useful as a tool to detect asthma in epidemiological studies in children. Xiao-Mei Mai, a talented researcher, now working in Norway, wrote her thesis using data from ISAAC phase II and Professor Ulrich Wahn, Humboldt University Berlin, was her opponent.

For ISAAC III paediatrician Hartmut Vogt and the study nurses Kicki Helander and Lena Lindell were at all schools in the municipality of Linköping evaluating children for asthma and allergy. When watching different clips of the ISAAC video questionnaire, many of the children first laughed quietly at the children in the film clips but after a while some of them seemed to become aware that this was their own problems that were shown. In almost every school, several children stayed afterwards and discussed their health problems with our research group/staff and talked about the possibilities they had, to get rid of their symptoms. This was really a sudden insight for many of the children (and us). The photo, taken by the local newspaper, shows some children and one of our research nurses.

When comparing the results from ISAAC III with ISAAC I we could, for the first time, see a decrease in the incidence of asthma symptoms in Sweden. The 12-month prevalence of wheezing in Linköping decreased from 11.2% to 9.7% among 13-14 years old children. The prevalence of physician-diagnosed asthma increased between phase I and III from 10.0% to 12.0%.

Lisbon Centre

Phase One			
Centre:		Lisbon, Portugal (Western Europe)	
Principal Investigator:		Dr José E Rosado Pinto	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1993 to May 1994 6-7yr:April 1995 to October 1995
Sampling Frame:			
Phase Three			
Centre:		Lisbon, Portugal (Western Europe)	
Principal Investigator:		Dr José E Rosado Pinto	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2001 to March 2002
Sampling Frame:		Some schools of the Lisbon Metropolitan area (Lisbon city and neighbouring municipalities. The same area as in Phase One.	

Personnel

Ms Manuela Correia

Dept. de Estudos e Planamento da Saúde
Ministério da Saúde
Av. Alvares Cabral, 25
Portugal

Roles:

- Phase Three collaborator for Lisbon

The ISAAC Story

Dr José E Rosado Pinto

Immunoallergology Department,
Hospital da Luz,
Av Lusíadas n. 100,
1500-650 Lisboa
Portugal

Roles:

- National Coordinator for Portugal
- Phase One Principal Investigator for Lisbon
- Phase Three Principal Investigator for Lisbon

Ms Rita Vasconcelos

Depto. De Matemática
Universidade de Madeira Campus
Universitário da Penteada
Portugal

Roles:

- Phase Three collaborator for Lisbon

Portugal is one of the oldest countries in the world. It is independent since the XII century and and has a population around 10 million inhabitants. Lisbon, the capital, has around 2 million people living near the sea.

The ISAAC project arrived when I attended a paediatric allergology meeting in Upsala (Sweden) 1990. In this meeting some of the specialists were very excited about a new project called ISAAC. In few months I received an invitation from Auckland to organize the Lisbon ISAAC Centre.

As a member of the Allergology Department of the Paediatric Hospital Dona Estefania in Lisbon I started to organize the ISAAC project with the translation into Portuguese of the Phase One document; launched the burocratic procedures for the permission from the Education and Health Ministries to pass the questionnaires in the schools, and to get the collaboration of the colleagues of the primary health care sector to link with our hospital team. The hospital Epidemiological and Informatic departments of the Ministry of Health were also contacted in order to support the study. After this preparatory phase we started according to the rules with around 3000 13-14 and 6-7 years school children of different areas of the Lisbon District. The first results arrived in a few months (1991-92). For the first time in Portugal we could gather important data about prevalence and severity of asthma and allergic diseases in children.

Some months later I received a kind invitation from the ISAAC Spanish coordinator, Luis Garcia Marcos, to be present in Madrid to share our ISAAC/Lisbon experience with our Spanish colleagues. It was after this joint meeting that I realized the importance and dimension of ISAAC. Consequently, arriving home, I started to invite colleagues and friends from different regions of the country to be involved in such an important project. The basic structure was prepared, but extra financial support could not be promised. Thus different centres from the country (continental and islands) were involved: Lisboa, Porto, Portimão, Funchal (Madeira Island) in phases I and III, and Alentejo and Azores (island of São Miguel) in phase III. More than 35,000 children, 400 schools, hundreds of doctors, nurses and teachers were involved in the process. The great majority the schools and teams participated in phases I and III. The data analysis of phase III (around 20,000 children) was performed by the Department of Mathematics of Madeira University (head Rita Vasconcelos) with the financial support of GSK. Unfortunately Phase Two was only centralised in Lisbon and using only the questionnaires. In 2000 the regional authorities didn't allow the practice of skin prick tests in public schools and we lost the opportunity to develop more knowledge about asthma and allergic diseases.

During the period between Phase One and Three I had the opportunity to be present in important ISAAC Western Region meetings in Münster (Germany), organised by Ulrich Keil and the unforgettable Stephan Weiland, where the "spirit" of ISAAC was always present. With this "spirit" we organised with ISAAC Spain and Brazil (coordinator Dirceu Solé) several meetings, sharing experiences and data with the national, regional and other ISAAC members.

During these 20 years Portugal ISAAC data have been a reference in our allergology paediatric area. Epidemiological studies, research documents and thesis used ISAAC Portuguese documents and questionnaires.

In the near future we are preparing a paper and a meeting to celebrate the 20 years of ISAAC Portugal in order to remember the Portuguese contribution to one of the most exciting projects developed during the professional activity of many of us.

Lome Centre

Phase Three			
Centre:		Lome, Togo (Africa)	
Principal Investigator:		Professor Osseni Tidjani	
Age Groups:	13-14	**Timeframe:**	October 2001 to January 2002
Sampling Frame:		13-14yr: All schools in Lome Region	

The ISAAC Story

Personnel

Professor Osseni Tidjani

Service de Pneumologie
CHU Tokoin
BP. 7318
Togo

Roles:
Phase Three Principal Investigator for Lome

Local Publications

The following publications used ISAAC data from the Lucknow centre:

Awasthi S, Kalra E, Roy S, Awasthi S. *Prevalence and risk factors of asthma and wheeze in school-going children in Lucknow, North India.* Indian Pediatr 2004; 41: 1205-10.

Lucknow Centre

Phase Three			
Centre:		Lucknow, India (Indian Sub-Continent)	
Principal Investigator:		Professor Shally Awasthi	
Age Groups:	13-14, 6-7	**Timeframe:**	July 2001 to March 2002
Sampling Frame:		All schools in Lucknow Area.	

Personnel

Professor Shally Awasthi

Department of Pediatrics
King George's Medical College
India

Roles:
- Phase Three Principal Investigator for Lucknow

Ludhiana Centre

Phase Three			
Centre:		Ludhiana, India (Indian Sub-Continent)	
Principal Investigator:		Professor Jugesh Chhatwal	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to May 2002
Sampling Frame:		Some schools in Ludhiana City.	

Personnel

Professor Jugesh Chhatwal

Department of Pediatrics
Christian Medical College and Hospital
Ludhiana-141008
India

Roles:
- Phase Three Principal Investigator for Ludhiana

Maceió Centre

Phase Three			
Centre:		Maceió, Brasil (Latin America)	
Principal Investigator:		Professor Francisco José Passos	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2002 to November 2002
Sampling Frame:		All schools in the same health district.	

Personnel

Professor Francisco José Passos

Alagoas Federal University
St. Antônio F. Vasconcelos, 138
ap.301, Jatiuca
Brasil

Roles:
- Phase Three Principal Investigator for Maceió

Madras (2) Centre

Phase One			
Centre:		Madras (2), India (Indian Sub-Continent)	
Principal Investigator:		Dr Sarela Rajajee	
Age Groups:	13-14, 6-7	**Timeframe:**	October 1994 to March 1995
Sampling Frame:			

Personnel

Dr Sarela Rajajee

The Childs Trust Hospital
No. 12 A Nageswara Road
Nungambakrah
India

Roles:
- Phase One Principal Investigator for Madras (2)

The ISAAC Story

Chennai (3) Centre

Phase One			
Centre:		Madras (3), India (Indian Sub-Continent)	
Principal Investigator:		Dr N Somu	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to February 1995 6-7yr:October 1994 to February 1995
Sampling Frame:			

Phase Three			
Centre:		Chennai (3), India (Indian Sub-Continent)	
Principal Investigator:		Dr Gururaj Setty	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2001 to November 2002
Sampling Frame:		Schools in Egmore and Purujawalkam areas. The same sampling frame as Phase One.	

Personnel

Dr M P Jeyapaul

Department of Pulmonology
Institute of Child Health & Hospital For Children
35 Kanaka Pillai Street
Tondiarpet, Mannady
India

Roles:
- Phase Three collaborator for Chennai (3)

Dr Gururaj Setty

79 Silverbirch Close
India

Roles:
- Phase Three Principal Investigator for Chennai (3)

Dr N Somu

Department of Pulmonology,
Institute of Child Health & Hospital for Children
Egmore, Chennai –600 008
India

Roles:
- Phase One Principal Investigator for Madras (3)
- Phase Three collaborator for Chennai (3)

Dr D Vijaya Sekaran

110/3,(New No.54), New Street
Chennai - 600
India

Roles:
- Phase Three collaborator for Chennai (3)

Madrid Centre

Phase One			
Centre:		Madrid, Spain (Western Europe)	
Principal Investigator:		Dr Gloria García-Hernández	
Age Groups:	13-14, 6-7	**Timeframe:**	
Sampling Frame:			

Phase Two			
Centre:		Madrid, Spain (Western Europe)	
Principal Investigator:		Dr Gloria García-Hernández	
Age Groups:	10-11,	**Timeframe:**	February 2001 to April 2002.
Sampling Frame:		The 11th health district of Madrid: the catchment area for Hospital Universitario 12 de Octubre.	

Phase Three			
Centre:		Madrid, Spain (Western Europe)	
Principal Investigator:		Dr Gloria García-Hernández	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to November 2002
Sampling Frame:		All schools in 11th Health District of Madrid, Spain, The same sampling frame as Phase One.	

Madrid, Spain

The ISAAC Story

Personnel

Dr Gloria García-Hernández

Division of Paediatric Pulmonology and Allergy
Hospital Universitario 12 de Octubre
Avenida de Cordoba S/N
Spain

Roles:

- Phase One Principal Investigator for Madrid
- Phase Two Principal Investigator for Madrid
- Phase Three Principal Investigator for Madrid

Carmen Luna-Paredes

Hospital Doce de Octubre
Madrid
Spain

Roles:

- Phase Three collaborator for Madrid

Antonio Martínez

Hospital Doce de Octubre
Madrid
Spain

Roles:

- Phase Three collaborator for Madrid

ISAAC In Madrid

Although the first meeting for spanish researchers interested in ISAAC study was hosted in Madrid in 1993, it was not until 1996 that our centre entered the first Phase of this project, a unique opportunity to obtain epidemiological data on asthma and allergies in our paediatric population and the possibility to compare it to that of other regions and countries. Eager encouragement to participate came from our country coordinator, Profesor Luis García Marcos, and we felt we could not let pass this ongoing chance.

Phase One

Madrid was included in Phase One of ISAAC in 1996. Our centre included children of the two age groups. All schools within our sanitary area were invited to participate in the study. Since external funding was not available at the time, we had to count on good will from the members of the team, Dr. García Hernández, Dr Martínez Gimeno and Dr. Carmen Luna who dedicated their time and effort to ensure the study met deadlines. We were very proud of the results that came out of this first study and that helped us know more about the prevalence of asthma and allergies in our setting. An interesting finding was that our prevalence of asthma was higher than that of coastal centres.

Phase Two

Madrid was one of the four centres to participate in Phase Two of the study in Spain. We chose the 100 wheezers plus 100 non-wheezers option in the bronchial challenge test. Field workers had to be trained in atopic dermatitis evaluation, allergy tests (prick tests), pulmonary function tests and data collection following instructions from ISAAC. Funds obtained from the Spanish government, thanks to efforts by our country coordinator, allowed us to encourage our young collaborators in pursuing best results for the study. We found it was a very time consuming effort but the outcomes paid out for it.

Phase Three

This time, Madrid obtained individual funds to pursue this Phase of a study that was already well known all around the world. We surveyed almost the same schools that had participated previously in Phase One. After questionnaires were collected we had to send them to Cartagena (our country coordinating centre) so they could be scanned in order to undergo a new processing system that made data analysis faster and easier. Data from this study has allowed us to acknowledge changes in prevalence of asthma and allergies in our paediatric population in Madrid.

The ISAAC Story

Malta Centre

Phase One			
Centre:		Malta, Malta (Eastern Mediterranean)	
Principal Investigator:		Professor Stephen Montefort	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:February 1995 to October 1995 6-7yr:May 1994 to June 1994
Sampling Frame:		13-14yr: All state and private schools in Malta and island of Gozo. 6-7yr:All state schools in Malta and island of Gozo.	

Phase Three			
Centre:		Malta, Malta (Eastern Mediterranean)	
Principal Investigator:		Professor Stephen Montefort	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to June 2002
Sampling Frame:		All schools in Malta and Gozo.	

Personnel

Professor Stephen Montefort

Department of Medicine
University of Malta
Appt 121 Tas- Sellum
Residence
Malta

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Eastern Mediterranean
- National Coordinator for Malta
- Phase One Principal Investigator for Malta
- Phase Three Principal Investigator for Malta

ISAAC in Malta

This study was a first for our small country where we managed to gather a strong set of data which we could reliably compare to other countries. This was especially significant as the numbers required by ISAAC to be recruited were a good percentage of Maltese children in the chosen age-groups. The results have opened the eyes of the health authorities and the public to the very real problem our country has with childhood allergic conditions. We have managed to publish our findings and this was an added bonus to our medical department. So all in all our experience in ISAAC has certainly been very good. This should encourage us to partake in future similar international studies.

Findings

Malta seemed to have amongst the highest prevalences of allergic condition in the Mediterranean with the rate of rhinoconjunctivitis in 13 – 14 year olds being third highest in the world in phase 1 of the study. In the younger age group we have noticed that along the years between phase 1 and phase 3 we had a very significant increase in the prevalence of wheezing and rhinitis but not eczema. Thankfully this was also associated with better control and decresase in severity of the conditions studied. In the older age groups the prevalences tended to plateau and in the case of rhinitis and eczema, they actually decreased significantly.

Managua Centre

Phase Three			
Centre:		Managua, Nicaragua (Latin America)	
Principal Investigator:		Dr José Félix Sánchez	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2002 to June 2002
Sampling Frame:		Some schools in the 6th Health District of Health Ministry of Nicaragua	

Map of the capital city of Managua. Area of the study circled in black

Personnel

Martha Garcia

Licensed practical nurse
Villa Venezuela Health Center
Managua
Nicaragua

Roles:

- Phase Three collaborator for Managua

Dr Eduardo Parrales, M.D

Health Director of the VI District of Managua
Managua
Nicaragua

Roles:

- Phase Three collaborator for Managua
- Ministry of Health director of the area VI. Managua,and ISAAC Phase Three Collaborator

The ISAAC Story

Evaluation meeting at the end of the study with the school directors and teachers. From left to right: District 6 Ministry of Education Director, in the middle Eduardo Parrales, M.D. and at the right Jose Felix Sanchez, M.D.

Teachers and school directors that contributed in the study.

Sports utilities were given to the participating schools for their sports teams. At the left Jose Felix Sanchez, M.D.

Sports utilities were given to the participating schools for their sports teams. At the left Jose Felix Sanchez, M.D.

Dr. Jose Felix Sanchez received a recognition certificate from the authorities of the Nicaragua Ministry of Education for his work in the health and welfare of the school children and the community.

Dr. Jose Felix Sanchez received a recognition certificate from the authorities of the Nicaragua Ministry of Education for his work in the health and welfare of the school children and the community.

Dr José Félix Sánchez

Pediatric Pulmonologist,
Director of the Department of Medicine and Pulmonology
Children's Hospital "Manuel de Jesus Rivera",
National Referral Hospital of Pediatrics in Nicaragua
District V, Managua,
Nicaragua

Roles:

- National Coordinator for Nicaragua
- Phase Three Principal Investigator for Managua

Alba Sandoval

Licensed practical nurse
Villa Venezuela Health Center
Managua
Nicaragua

Roles:

- Phase Three collaborator for Managua

Why was this centre selected for ISAAC?

I found out about ISAACphase III by Dr. Manuel Soto Quiros, who was my mentor during my Pulmonology fellowship in Costa Rica. Dr Quiros and Dr. Lars Å Hanson, Department Clinical Immunology, Göteborg University, Sweden, both were involved in the decision that Nicaragua participated in the study. Nicaragua didn't count with prevalence studies of asthma or allergies. Our country could participate in the phase III of ISAAC thanks to their collaboration.

In the survey on Conditions of Life (EMNV'98) it was found that 64.8% of the families in Nicaragua live in situation of poverty, or extreme poverty and that only one out of four homes satisfies its basic necessities. Managua, as the capital of Nicaragua, have the major density population, were the industrial development is settled. However, behind the acute conditions the chronic diseases appear, but in the developing countries they are often not noticed, diagnosed and properly treated. Such diseases may, because of their chronic nature, severely impair growth and development as well as educational capacity in children. They will also affect the whole family in many ways, not least its economy. The hospitalization rates in children with asthma have been increasing in Nicaragua, and we didn't count with studies that that could measure the prevalence of symptoms and severity among our population.

The area of study was District VI of Managua (Ministry of Health), located in the eastern part of Managua (Fig 1). It has an area of 42 sq km. The total population is estimated to 146,050 inhabitants; of those 65,722 are children less than 15 years old.

The VI District of Managua was chosen because this is the city area where most of the poor people live, in "barrios" and settlements. The epidemiological profile shows a high incidence of respiratory diseases and acute diarrheas. There is a higher prevalence of malnutrition and parasitism. The sewer and drainage structures are deficient. There are unsuitable potable water services, with inappropriate liquid waste elimination. Many families do not have drain and waste water installation of the people use latrines. The garbage collection service is deficient. The electricity service is inappropriate. Their health care service is principally provided by the State.

Fig 1. Map of the capital city of Managua. Area of the study circled in black.

Our experience of ISAAC

The ISAAC core questionnaires were translated into Spanish, according to defined guidelines, including the familiar terminology of the local community, such as "silbido", "lira" referring to wheezing . At first we applied a pilot study for the questionnaires that was reviewed by Dr. Manuel Soto Quirós, Costa Rica National Coordinator for ISAAC. We didn't use the videos mode.

School Principals that participated were very enthusiastic and their collaboration was very important to achieve the study. We had good acceptance from families and children, 95% of questionnaires were sent back complete from parents.

Impact of ISAAC in our country

Before ISAAC data was insufficient, it was the first study for asthma and allergies in Nicaragua, and it marked the beginning for similar studies in other areas of our country, such as the rural areas. Evenly it initiated the development of health and education strategies for the accurate diagnose and treatment for these diseases.

The ISAAC Story

Acknowledgements

This study was conducted with the guidance of Dr. Manuel Soto-Quiros pediatric pulmonologist, from the National Children's Hospital of Costa Rica "Carlos Saenz" and Dr. Lars Å Hanson Department Clinical Immunology, Göteborg University, Sweden. Both were involved in the decision to develop the study, translation of the instrument, pilot study, school selection, monitoring collection of the questionnaires and finally the recording of the information according to the ISAAC protocol for the phase III.

For this study the technical and methodological quality were counted with the financial support of SAREC and VARDAL, both Swedish institutions that support scientific and development in Latin America.

For its realization we had the approval and collaboration of the Ministry of Health of Nicaragua and Ministry of Education of the government of Nicaragua.

Eduardo Parrales, M.D, was the Ministry of Health director of the area VI where we developed the study. He was a very important support to achieve the objectives.

For the collection of the questionnaires, we hired two registered nurses, Lic. Alba Sandoval and Lic. Martha Garcia who made an excellent work in the field.

We appreciate all the support and coordination of the school directors and teachers with the study. As well children and their families, they were very interested in the study and the results.

Click the link to the left to see our photos.

Manaus Amazonas Centre

Phase Three			
Centre:		Manaus Amazonas, Brasil (Latin America)	
Principal Investigator:		Dra Maria do Socorro Cardoso	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to November 2002
Sampling Frame:		All schools in Manaus area.	

Personnel

Dra Maria do Socorro Cardoso

Rua Paraiba, 1020 Apt. 401
Edificio Michellangelo
Brasil

Roles:

- Phase Three Principal Investigator for Manaus Amazonas

Mantova Centre

Phase Three			
Centre:		Mantova, Italy (Western Europe)	
Principal Investigator:		Dr Gabriele Giannella	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to March 2002
Sampling Frame:		All schools in the province of Mantova.	

Personnel

Dr Gabriele Giannella

Local Health Unit
Servizio Medicina Preventiva delle Communità
ASL Mantova
via Trento 6
Italy

Roles:

- Phase Three Principal Investigator for Mantova

Marrakech Centre

Phase One			
Centre:		Marrakech, Morocco (Africa)	
Principal Investigator:		Professor Zoubida Bouayad	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All public schools in the Marrakech area.	
Phase Three			
Centre:		Marrakech, Morocco (Africa)	
Principal Investigator:		Professor Zoubida Bouayad	
Age Groups:	13-14	**Timeframe:**	February 2002.
Sampling Frame:		13-14yr: The same sampling frame was used for Phase One and Phase Three.	

The ISAAC Story

Personnel

Professor Zoubida Bouayad

Service des Maladies Respiratoires
Hôpital 20 Août
CHU Ibn Rochd
Morocco

Roles:

- National Coordinator for Morocco
- Phase One Principal Investigator for Marrakech
- Phase Three Principal Investigator for Marrakech

Marseille Centre

Phase One			
Centre:		Marseille, France (Western Europe)	
Principal Investigator:		Professor Denis Charpin	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Schools were randomly chosen from 8 towns in the Fos L'Etang-de-Berre area.	

Personnel

Professor Denis Charpin

Service de Pneumologie-Allergologie
Hôpital Nord
France

Roles:

- National Coordinator for France
- Phase One Principal Investigator for Marseille

ISAAC phase 1 in the Marseille center has actually taken place in an industrial setting close to Marseille, called the « Fos l'Etang-de-Berre » area. This is a major industrial complex with petrochemicals facilities. The survey used a standardized ISAAC questionnaire,skin tests to common aero-allergens and, in atopic children, collection of a sample of mattress dust to measure mite-allergen contant. At that time, only gaseous air pollutants were considered. 2445 schoolchildren 13 and 14 years old were included in the study. The prevalence of asthma and asthmatics symptoms were related to mean ozone concentrations, whereas there was no consistent association with mean SO2 and NO2 mean levels (M. Ramadour el al. Prevalence of asthma and rhinitis in relation to long-term exposure to gaseous air pollutants. Allergy 2000 ; 55 : 1163-1169. In a concurrent study there was no significant association between gaseous air pollutant levels and the atopic score based on skin prick-tests results (D. Charpin et al. Gaseous air pollution and atopy. Clin Exp Allergy 1999 ; 29 : 1474-1480.

Local Publications

The following publications used ISAAC data from the Marseille centre:

Ramadour M, Burel C, Lanteaume A, Vervloet D, Charpin D, Dutau H, Brisse F *Prevalence of asthma and rhinitis in relation to long-term exposure to gaseous air pollutants* Allergy 2000; 55(12): 1163–1169

Melbourne Centre

Phase One			
Centre:		Melbourne, Australia (Oceania)	
Principal Investigator:		Professor Colin F Robertson	
Age Groups:	13-14, 6-7	**Timeframe:**	June 1993 to September 1993
Sampling Frame:			
Phase Three			
Centre:		Melbourne, Australia (Oceania)	
Principal Investigator:		Professor Colin F Robertson	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to August 2002
Sampling Frame:		13-14yr: Private Catholic schools within an approximate 20km radius from Central Melbourne. 6-7yr:All schools within an approximate 20km radius.	

Local Publications

The following publications used ISAAC data from the Melbourne centre:

Robertson CF, Roberts MF, Kappers JH. *Asthma prevalence in Melbourne schoolchildren have we reached the peak?* Med J Aust 2004; 180(6): 273-6.

Riedler J, Reade T, Dalton M, Holst D, Robertson CF. *Hypertonic saline challenge in an epidemiologic survey of asthma in children* Am J Respir Crit Care Med 1994; 150:1632-1639.

Personnel

Ms Jo Kappers

Department of Respiratory Medicine
Royal Children's Hospital
Flemington Road
Parkville
Australia

Roles:

- Phase One collaborator for Melbourne

Professor Colin F Robertson

Director, Department of Respiratory Medicine
Royal Children's Hospital
Flemington Rd (Affliation is: Murdoch Children's Research Institute, Melbourne)
Parkville, VIC 3052
Australia

Roles:

- ISAAC Steering Committee
- National Coordinator for Australia
- Phase One Principal Investigator for Melbourne
- Phase Three Principal Investigator for Melbourne

Mérida Centre

Phase Three			
Centre:		Mérida, Mexico (Latin America)	
Principal Investigator:		Dr Manuel Baeza-Bacab	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2002 to February 2003
Sampling Frame:		13-14yr: All schools in Merida Area 6-7yr:All schools in Merida area	

Personnel

Dr Manuel Baeza-Bacab

Facultad de Medicina
University Autónoma de Yucatán
Avenida Itzáes No. 498 por calle 59-A
Centro, Mérida
Mexico

Roles:
- National Coordinator for Mexico
- Phase Three Principal Investigator for Mérida

Metro Manila Centre

Phase One			
Centre:		Metro Manilla, Philippines (Asia-Pacific)	
Principal Investigator:		Professor Felicidad Cua-Lim	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:October 1994 to November 1994 6-7yr:September 1994 to November 1994
Sampling Frame:			

Phase Three			
Centre:		Metro Manila, Philippines (Asia-Pacific)	
Principal Investigator:		Professor Felicidad Cua-Lim	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2001 to October 2001
Sampling Frame:		All public and private, elementary schools in Manila. The same sampling frame as Phase One.	

Personnel

Professor Felicidad Cua-Lim

University of Santo Tomas
7 Roosevelt St. Green Hills West
San Juan
Philippines

Roles:
- National Coordinator for Philippines
- Phase One Principal Investigator for Metro Manilla
- Phase Three Principal Investigator for Metro Manila

Dr Manuel F Ferreria

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MCU Cpd
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Roles:
- Phase Three collaborator for Metro Manila

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Roles:
- Phase One collaborator for Metro Manilla
- Phase Three collaborator for Metro Manila

Dr Camilo Roa

Philippine General Hospital
Taft Ave
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Roles:
- Phase One collaborator for Metro Manilla
- Phase Three collaborator for Metro Manila

Dr Madelaine Sumpaico

Philippines

Roles:
- Phase Three collaborator for Metro Manila

The ISAAC Story

Why was this centre selected for ISAAC?

Our country was selected to participate in both ISAAC Phase I and Phase III of the study. It started on a meeting in an asian respiratory disease convention in Tokyo in 1994. Dr Chrisopher Lai invited Dr Felicidad Cua-Lim, then the President of the National Asthma Movement in the Philippines, to be the National Coordinator and Principal Investigator for the ISAAC study Phase I in the Philippines.

Our experience of ISAAC

For Phase I Dr Felicidad Cua-Lim assembled her team whose members included Drs Camilo Roa, Jose Pepito Amores, Manuel Fereria, and Madeleine Sumpaico. The questionnaires, with the help of a social scientist Nina Carandang, were translated and back translated to the local dialect – Tagalog. The study was implemented in schools in Metro Manila. Both the data for the 6-7 years old and 13-14 years old were accepted for inclusion in the Lancet publication for the global coverage of the ISAAC study.

In the phase III Dr Cua-Lim was again invited to participate in the study. Dr Rodolfo Pagcatipunan became a member of her team. Aside from the core questionnaires, an environmental questionnaire was included in this phase which was again translated and back translated to the local dialect. Only the 13-14 years old data was accepted by the data center. There were data integrity problems encountered in the 6-7 years old. This was attributed to the initially low number of returned questionnaires or drop-outs. Upon consultation with a statistician, these drop-outs were replaced by another set of responders to attain the desired sample size.

The data generated from the phase I and III studies became the source of prevalence data for asthma and allergy in children in the Philippines. It also triggered the implementation of the National Asthma Prevalence Study, an asthma prevalence study for both adult and children sponsored by the Department of Health of the Philippines.

Mexicali Valley Centre

Phase Three			
Centre:		Mexicali Valley, Mexico (Latin America)	
Principal Investigator:		Dr J Valente Merida-Palacio	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to November 2002
Sampling Frame:		All schools in Mexicali	

Personnel

Dr Juan Valente Merida-Palacio

Pediatric Allergist
Director of the Investigation Center for Allergic and Respiratory Diseases
Member of the board of the Ecology and Environment Control Department,
Air Quality section, for the city of Mexicali, Baja California, Mexico

Roles:

- Phase Three Principal Investigator for Mexicali Valley

Mexicali is a 1 million population city, located in the northwest of Mexico, border with Imperial Valley of California. It is a desert region, near to the Colorado River, surrounded by more than 2 million acres of agricultural land in both sides of the border.

Our city has a severe air pollution problem, mainly by PM_{10} and Carbon Monoxide (CO) pollutants, this is due to the mainly for the ground composition (geological material), ashes ((anthropological sources, mainly agricultural) and other natural components (silica, aluminum), and the lack of control of the motor engine vehicle emissions. These rates of PM_{10} on air accounted for more than 150,000 tons/year. For this reason Mexicali is considerate the most polluted city of Mexico regarding those particles.

The ISAAC Story

In consequence the morbidity and mortality rates of respiratory diseases are very high, among high risk population, mainly in the pediatric group.

Mexico has several prevalence studies for asthma and allergic rhinitis, but the methodology used is poorly reliable, it was limited to fewer cities, and they were not specific for the pediatric age group. We have not had any prevalence studies for eczema.

On the late 1990's, the ISAAC phase I was done in Cuernavaca city, as an investigation supported by the National Institute of Public Health, and directed by Prof Isabelle Romieu.

In the Mexican Collage of Pediatric Allergy and Immunology, we felt that we needed to open the project to the most cities as possible, to enlarge the information on different regions of our country.

In 2000 we met Dr Javier Mallol, Chairman for Latin America ISAAC project and talked about the possibility to develop in Mexico the ISAAC phase III, he agreed. The total of 9 centers were we divided the country, in Gulf of Mexico are: Cd. Victoria, Monterrey, Villahermosa, and Merida centers, center: Mexico city (3) and Toluca, and Northeast: Mexicali Valley were enrolled and coordinated by the epidemiology section for the MEXICAN COLLAGE OF PEDIATRIC ALLERGY AND IMMUNOLOGY to start the phase III of this project.

The information obtained ISAAC phase III in Mexicali Valley Center, has been incorporated to the official statistical data of our city. Gone to be used to plan strategies intended to control and diminish the severe air pollution of our area, helping to improve the air quality and the quality of life of the general population.

We are hoping to be participating in this great project and contribute to expand the knowledge of the allergic diseases in our pediatric population.

Milano Centre

Phase One			
Centre:		Milano, Italy (Western Europe)	
Principal Investigator:		Dr Luigi Bisanti	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to January 1995 6-7yr:November 1994 to December 1994
Sampling Frame:			

Phase Three			
Centre:		Milano, Italy (Western Europe)	
Principal Investigator:		Dr Luigi Bisanti	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to June 2002
Sampling Frame:		All schools in the city of Milan (Private schools excluded in Phase One). Sampling frame the same as Phase One.	

Personnel

Dr Luigi Bisanti

ASL Città di Milano
Servizio di Epidemiologia
Corso Italia, 19
Italy

Roles:

- Phase One Principal Investigator for Milano
- Phase Three Principal Investigator for Milano

Monterrey Centre

Phase Three			
Centre:		Monterrey, Mexico (Latin America)	
Principal Investigator:		Dr Sandra Nora González-Díaz	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2001 to June 2001
Sampling Frame:		13-14yr: Some public schools of the metropolitan area of Monterrey and some public schools of the six cities with most population in the Nuevo Leon state outside the metropolitan area of Monterrey City. 6-7yr:Some public schools of the metropolitan area of Monterrey and some public schools of the seven cities with most population in the Nuevo Leon state outside the metropolitan area of Monterrey City.	

Local Publications

The following publications used ISAAC data from the Monterrey centre:

González-Díaz SN, Del Río-Navarro BE, Pietropaolo-Cienfuegos DR, Escalante-Domínguez AJ, García-Almaraz RG, Mérida-Palacio V, Berber A *Factors associated with allergic rhinitis in children and adolescents from northern Mexico International Study of Asthma and Allergies in Childhood Phase IIIB* Allergy Asthma Proc 2010; 31(4): 53-62

The ISAAC Story

Personnel

Dr Alfredo Arias Cruz

Servicio de Alergia e Immunología Cliníca
Facultad de Medicina y Hospital Universitario "Dr. José Eleuterio González"
Universidad Autónoma de Nuevo León
Ave. Madero y Gonzalitos s/n, Col. Mitras Centro
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Roles:
- Phase Three collaborator for Monterrey

Dr Sandra Nora González-Díaz

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- Phase Three Principal Investigator for Monterrey

Ms Claudia Elizabeth González-Garza

Centro Regional Para la Prevención y el Tratamiento - C.R.P.T.E.A
University Hospital
Calzada Madero y Gonzalitos
SN, Col.Mitras Centro, C P. 64460
Mexico

Roles:
- Phase Three collaborator for Monterrey

Montevideo Centre

Phase One			
Centre:		Montevideo, Uruguay (Latin America)	
Principal Investigator:		Dra Dolores Holgado	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:September 1994 to August 1995 6-7yr:April 1994 to October 1995
Sampling Frame:			

Phase Three			
Centre:		Montevideo, Uruguay (Latin America)	
Principal Investigator:		Dra Dolores Holgado	
Age Groups:	13-14	**Timeframe:**	July 2002 to November 2002
Sampling Frame:		13-14yr: All schools in Montevideo Area, public and private ones	

Personnel

Dra Sylvia Brea

Pneumologist pediatrician.
Hospital Pereira Rossell
Uruguay

Roles:
- Phase One collaborator for Montevideo
- Phase Three collaborator for Montevideo

Dra Dolores Holgado

Facultad de Medicina
Cátedra de Pediatría “B”
Department of pulmology, allergy and immunology
Pediatrics hospital Pereira Rossell
Uruguay

Roles:
- National Coordinator for Uruguay
- Phase One Principal Investigator for Montevideo
- Phase Three Principal Investigator for Montevideo

Dra. María Julia Saráchaga

Pneumologist pediatrician.
Hospital Pereira Rossell
Uruguay

Roles:
- Phase One collaborator for Montevideo
- Phase Three collaborator for Montevideo

Dra Ester Spalter

Pediatrician.
Hospital Pereira Rossell
Uruguay

Roles:
- Phase One collaborator for Montevideo
- Phase Three collaborator for Montevideo

ISAAC in Montevideo

All of us know that since the 80’s there was an increasing asthma prevalence in many countries worldwide and also in our country, even considering that the several studies done between 1970 and 1990 had a different methodology and differences in the age of the samples. That was an important reason to join ISAAC. We were connected to ISAAC Steering Committee thanks to Dr. Fernando Martinez.

The ISAAC Story

Phase One

Montevideo was the only centre in Uruguay. It is a very small country with only 3. 000.000 inhabitants of which half of them lives in Montevideo, the capital city. It was impossible to get a sample of 3000 children in some other city. In Montevideo we could accomplished the two groups questionnaires and we also used the videoquestionnaire. It was difficult to succeed in getting the parental questionnaire fulfilled in the 6-7 years group, but we did it.

Phase three

At the beginning we had planned to participate with the two groups as in Phase One. We began with the 6-7 years group, but the difficulty to obtain the parental questionnaire completed in time, was the reason to abandon this group. We continued with the 13-14 years group including the videoquestionnaire.

Phase Three was carried out with a huge effort of all the colaborators. In 2002 Uruguay suffered an important financial crisis, so we did not had the same financial support than during Phase One. However after so many problems we were proud to have accomplished our task.

In spite the difficulties we had a second centre, with the generous participation of Dra Cristina Lapides as Principal Investigator in the city of Paysandú.

We gratefully acknowledge financial support from Glaxo Wellcome. We are also indebted to all children, parents and school staff who participated in the study and wish to thank our fieldwork team for their effort and enthusiasm throughout each study.

Montpellier Centre

Phase One			
Centre:		Montpellier, France (Western Europe)	
Principal Investigator:		Professor Philippe Godard	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools of the 13-14 year age group in the Montpellier Academy.	

Personnel

Professor Philippe Godard

Clinique des Maladies Respiratoires
Hôpital Arnaud de Villeneuve
555 route de Ganges
France

Roles:

- Phase One Principal Investigator for Montpellier

Moscow Centre

Phase One			
Centre:		Moscow, Russia (Northern and Eastern Europe)	
Principal Investigator:		Professor Rakhim M Khaitov, Director of the Institute of Immunology	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		21 schools in the following geographical regions of Moscow (including 2 satellites): Center — 2; South - 5; North-West — 6; North — 1; South-East — 3; South-West — 3; East – 1.	

Institute of Immunology, Moscow

Institute of Immunology, Moscow

Personnel

V.N. Androsov

Institute of Immunology
National Research Center
24-2 Kashirskoye Shosse
Moscow
Russia

Roles:

- Phase One collaborator for Moscow
-

K.R. Bokelovadze

Institute of Immunology
National Research Center
24-2 Kashirskoye Shosse
Moscow
Russia

Roles:

- Phase One collaborator for Moscow
-

The ISAAC Story

Local Publications

The following publications used ISAAC data from Moscow:

Khaitov RM, Luss LV, Aripova TU, Lysikova IV, Ilyina NI *Prevalence of bronchial asthma, allergic rhinitis and allergodermatitis symptoms in children by ISAAC criteria.* Allergy, asthma and clinical immunology 1998; 9: 58-69

Lysikova IV. *Prevalence of allergic diseases in children multicentre investigation results in the framework of International Study of Asthma and Allergies in Childhood (ISAAC).[Russian]* Medical sci candidate's thesis on speciality 14.00.36 (Allergology and immunology), Moscow, 1999.

Luss LV, Aripova TU, Ilyina NI, Lysikova IV. *Prevalence of bronchial asthma symptoms (ISAAC programme result).[Russian]* Asthma 2000; 1(1): 52–59

I.V. Danilycheva

Institute of Immunology
National Research Center
24-2 Kashirskoye Shosse
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Roles:

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-

S.M. Erokhina

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National Research Center
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Moscow
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Roles:

- Phase One collaborator for Moscow
-

Professor Rakhim M Khaitov

Director, Institute of Immunology
National Research Center
24-2 Kashirskoye Shosse
Moscow
Russia

Roles:

- National Coordinator for Russia
- Phase One Principal Investigator for Moscow

L.V. Luss

Institute of Immunology
National Research Center
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Russia

Roles:

- Phase One collaborator for Moscow
-

?.B. Smorodina

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National Research Center
24-2 Kashirskoye Shosse
Moscow
Russia

Roles:

- Phase One collaborator for Moscow
-

Dr Olga Zaikina

Institute of Immunology
National Research Center
24-2 Kashirskoye Shosse
Moscow
Russia

Roles:

- Phase One collaborator for Moscow
- Coordinator and leading Scientific Researcher

Why was this centre selected for ISAAC?

The Institute of Immunology, Moscow, has been founded in 1979 and since then up today deals with asthma and allergies, including those in children. The ISAAC methodology immediately interested Russian physicians, pediatricians, allergologists, asthmologists and immunologists. Due to ISAAC Programme, having been developed in the early 1990s to carry out an international epidemiological research on asthma, rhinitis and eczema according to the standardized methodology, we got an opportunity to compare our data with the data obtained in the other countries.

Moscow, the megalopolis with 10 mln population (today, in 2011, already 11.5 mln), was (and still is) an unfavourable area: a lot of transport and various enterprises, traffic exhaust and industrial smog explain the asthma and allergy increase, especially in children. The majority of previous generations of schoolchildren hadn't even know the words «asthma» and «allergy» and others had known it as a disease of their grandparents; but in the early 1990s Russian children were quite aware about asthma and allergy.

Report on Moscow Study on ISAAC Phase 1 (1993/1994)

First we translated the ISAAC questionnaire into Russian. Then a back translation was done, because it was very important to give an exact Russian version. We also compared our Russian version with Baltic Russian version which had been made to investigate Narva town (Estonia) and Riga city (Latvia), the places with predominantly Russian population. There were no significant differences in the Estonian translation from English into Russian in comparison to our version.

Six experienced allergologists from the Institute of Immunology visited schools, distributed the written questionnaires, showed video questionnaire to schoolchildren, explained how to fill forms and collected the filled questionnaires during October, 1993 — the beginning of April, 1994 (out of pollen season). Besides collecting schoolchildren's questionnaires the workers contacted with the teachers and parents of children who had health troubles.

Approximately about 4,000 ISAAC questionnaires (Russian version) were distributed among Moscow schoolchildren of 13–14 years old schoolchildren from randomly chosen 21 schools (including video questionnaire) to be filled. The schools had been chosen in the different geographical regions of Moscow: Center — 2; South — 5; North-West — 6; North — 1; South-East — 3; South-West —3; East — 1. By the end of March 3411 questionnaires were filled, collected and checked.

The ISAAC study of asthma and allergy in Moscow have showed that a lot of 13–14 year schoolchildren suffer from the breathing problems that interfere with their everyday life. More than 100 children had wheezing/whistling breathing or dry cough (not associated with a cold or lung infection): they had it during or after physical exercise or being woken at night. Tens of children even had severe attacks of wheezing/whistling breathing which limited their speech. More than 30 children already had the diagnosed asthma. In about hundred of cases the so-calledmild asthma or preasthma was diagnosed. Some children had sneezing or blocked nose not associated with cold or flu and other nose and eye problems (itching and watering) simultaneously. These problems usually occur in the certain months (pollen season) and are associated with allergy against some pollen. Several children had hay fever. Many children had itchy rash and other skin troubles connected not only with allergy, but also with psoriasis or gastrointestinal troubles. Very few suffered from atopic eczema. Many cases of allergy manifestation were associated with allergy against mites (home dust) and epidermal allergens (pets: cats and dogs). During interviewing the children were also asked them about the medicines they used. The list of used pharmaceuticals was: Becotide, Berotec, Ditec, Ifiral, Intal, Salbutamol, Ventolin, Zaditen, Beconase, Lomusol.

References (all in Russian)

1. Khaitov R.M., Luss L.V., Aripova T.U., Lysikova I.V., Ilyina N.I. Prevalence of bronchial asthma, allergic rhinitis and allergodermatitis symptoms in children by ISAAC criteria. // Allergy, asthma and clinical immunology. 1998, No 9, p. 58–69 (Rus).
2. Lysikova I.V. Prevalence of allergic diseases in children: multicentre investigation results in the framework of International Study of Asthma and Allergies in Childhood (ISAAC). Medical sci candidate's thesis on speciality 14.00.36 (Allergology and immunology), Moscow, 1999, (Rus).
3. Luss L.V., Aripova T.U., Ilyina N.I., Lysikova I.V. Prevalence of bronchial asthma symptoms (ISAAC programme result) // Asthma. 2000, v. 1, No 1, p. 52–59 (Rus).

Acknowledgements

We gratefully acknowledge the financial support from Glaxo pharmaceutical company (since 1995 GlaxoWellcome, since 2001 GlaxoSmithKline). We thank the school teachers and children, who participated in the surveys. We also thank the physicians and scientific researchers from the Institute of Immunology, Moscow, who took part in discussing the results.

Muar Centre

Phase One			
Centre:		Muar, Malaysia (Asia-Pacific)	
Principal Investigator:		Dr Kok Wai Chum	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:May 1995 to July 1995 6-7yr:April 1995 to August 1995
Sampling Frame:			

Personnel

Dr Kok Wai Chum

Johor Child Specialist Clinic
No. 15, Jalan Perwira 9
Taman Ungku Tun Aminah
Malaysia

Roles:

- Phase One Principal Investigator for Muar

Mumbai (18) Centre

Phase One			
Centre:		Bombay (18), India (Indian Sub-Continent)	
Principal Investigator:		Dr Kalyani Raghavan	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:December 1994 to July 1995 6-7yr:December 1994 to March 1995
Sampling Frame:			

Phase Three			
Centre:		Mumbai (18), India (Indian Sub-Continent)	
Principal Investigator:		Dr Asha Vijaykumar Pherwani	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to August 2002
Sampling Frame:		All schools in Sion, within the city limits of Mumbai. The same sampling frame as Phase One.	

Personnel

Dr Asha Vijaykumar Pherwani

P.D. Hinduja National Hospital
303, Samudra Mahal
Dr Annie Besant Road
Worli
India

Roles:

- Phase Three Principal Investigator for Mumbai (18)

Dr Kalyani Raghavan

India

Roles:

- Phase One Principal Investigator for Bombay (18)

ISAAC in Mumbai

I came to know about the ISAAC study by chance. Right from that time I wanted to be a part of this study, because though I had done research on many topics, they were not multi-centre studies. Therefore I requested Dr Shah from JASLOK Hospital to include me in the study.

The very systemic nature of the study impressed me so much that I passed an on-line examination for Principle Investigators course.

During the study we did find it difficult to access these children because some of the heads of the schools were not very keen on this study. We had to convince them and then could get one class at a time.

Our only regret is we could not follow them or treat them afterwards.

Mumbai (29) Centre

Phase Three			
Centre:		Mumbai (29), India (Indian Sub-Continent)	
Principal Investigator:		Dr Sumant Narayan Mantri	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2001 to October 2001
Sampling Frame:		Schools of the same geographic location within a diamter of 5 kms are chosen for sampling.	

Personnel

Dr Sumant Narayan Mantri

C/- Dr J.R. Shah
Department of Pulmonary Medicine
Jaslok Hospital & Research Centre
15, G. Deshmukh Marg
India

Roles:

- Phase Three Principal Investigator for Mumbai (29)

Munich Centre

Phase Two			
Centre:	Munich, Germany (Western Europe)		
Principal Investigator:	Professor Erika von Mutius		
Age Groups:	9-11,	**Timeframe:**	September 1995 to December 1996.
Sampling Frame:	A random sample of school classes in the 9-11-year age-group across Munich.		

Personnel

Professor Erika von Mutius

Dr. von Haunersches University Children's Hospital
Ludwig-Maximilians University
Lindwurmstrasse 4
Germany

Roles:

- ISAAC Steering Committee
- Phase Two Principal Investigator for Munich

Local Publications

The following publications used ISAAC data from Munich:

von Mutius E, Illi S, Hirsch T, Leupold W, Keil U, Weiland SK. *Frequency of infections and risk of asthma, atopy and airway hyperresponsiveness in children.* Eur Respir J.1999 Jul;14(1):4-11.

Wellie O, Duhme H, Streit U, von Mutius E, Keil U, Weiland SK. *Application of geographical information systems in epidemiological studies exemplified by the ISAAC study in Munich.* Gesundheitswesen.2000 Aug-Sep;62(8-9):423-30.German.

Beimfohr C, Maziak W, von Mutius E, Hense HW, Leupold W, Hirsch T, Keil U, Weiland SK. *The use of anti-asthmatic drugs in children: results of a community-based survey in Germany.* Pharmacoepidemiol Drug Saf.2001 Jun-Jul;10(4):315-21.

von Ehrenstein OS, Maier EM, Weiland SK, Carr D, Hirsch T, Nicolai T, Roscher AA, von Mutius E. *Alpha1 antitrypsin and the prevalence and severity of asthma.* Arch Dis Child.2004 Mar;89(3):230-1.

Bolte G, Kompauer I, Fobker M, Cullen P, Keil U, Mutius E, Weiland SK. *Fatty acids in serum cholesteryl esters in relation to asthma and lung function in children.* Clin Exp Allergy 2006 Mar;36(3):293-302.

Pinto LA, Steudemann L, Depner M, Klopp N, Illig T, Weiland SK, von Mutius E, Kabesch M. *STAT1 gene variations, IgE regulation and atopy.* Allergy 2007 Dec; 62(12):1456-61.

Büchele G, Rzehak P, Weinmayr G, Keil U, Leupold W, von Mutius E, Weiland SK. *Assessing bronchial responsiveness to hypertonic saline using the stepwise protocol of Phase II of the International Study of Asthma and Allergies in Childhood (ISAAC II).* Pediatr Pulmonol 2007 Feb;42(2):131-40.

Riu E, Dressel H, Windstetter D, Weinmayr G, Weiland S, Vogelberg C, Leupold W, von Mutius E, Nowak D, Radon K. *First months of employment and new onset of rhinitis in adolescents.* Eur Respir J.2007 Sep;30(3):549-55.Epub May 2007.

Schedel M, Pinto LA, Schaub B, Rosenstiel P, Cherkasov D, Cameron L, Klopp N,Illig T, Vogelberg C, Weiland SK, von Mutius E, Lohoff M, Kabesch M. *IRF-1 gene variations influence IgE regulation and atopy.* Am J Respir Crit Care Med.177(6):613-21, 2008 Mar 15.

Cameron L, Depner M, Kormann M, Klopp N, Illig T, von Mutius E, Kabesch M.*Genetic variation in CRTh2 influences development of allergic phenotypes.* Allergy 2009; 64(10): 1478-1485.

Zeilinger S, Pinto LA, Nockher WA, Depner M, Klopp N, Illig T, von Mutius E, Renz H, Kabesch M. *The effect of BDNF gene variants on asthma in German children.* Allergy 2009 Dec; 64(12): 1790-1794

Pinto LA, Depner M, Klopp N, Illig T, Vogelberg C, von Mutius E, Kabesch M. *MMP-9 gene variants increase the risk for non- atopic asthma in children.* Respir Res Feb 2010; 11: 23

Münster Centre

Phase One			
Centre:		Münster, Germany (Western Europe)	
Principal Investigator:		Prof Dr Ulrich Keil	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:August 1994 to January 1995 6-7yr:August 1994 to February 1995
Sampling Frame:			
Phase Three			
Centre:		Münster, Germany (Western Europe)	
Principal Investigator:		Prof Dr Ulrich Keil	
Age Groups:	13-14, 6-7	**Timeframe:**	September 1999 to December 1999
Sampling Frame:		Random selection of schools for age groups in basic and in special schools to meet calculated sample size (90% power for 1% difference) in each stratum (school type).	

Personnel

Prof Dr Ulrich Keil

Institut für Epidemiologie und Sozialmedizin
Westfälische Wilhelms Universität
Domagkstrasse 3
Germany

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Western Europe
- National Coordinator for Germany
- Phase One Principal Investigator for Münster
- Phase Three Principal Investigator for Münster

See Germany country page for details of the ISAAC study in Münster

Local Publications

The following publications used ISAAC data from Münster:

Duhme H, Weiland SK, Rudolph P, Wienke A, Kramer A, Keil U. *Asthma and allergies among children in West and East Germany: a comparison between Münster and Greifswald using the ISAAC phase I protocol.* Eur Respir J 1998; 11(4): 840-7.

Duhme H, Weiland SK, Keil U, Kraemer B, Schmid M, Stender M, Chambless L.*The association between self-reported symptoms of asthma and allergic rhinitis and self-reported traffic density on street of residence in adolescents.* Epidemiology 1996; 7(6): 578-82.

ISAAC. *ISAAC Phase II Modules.* Münster, Germany.May 1998.

Maziak W, Behrens T, Brasky TM, Duhme H, Rzehak P, Weiland SK, Keil U. *Are asthma and allergies in children and adolescents increasing? Results from ISAAC phase I and phase III surveys in Munster, Germany.* Allergy 2003; 58(7): 572-9.

Rzehak, P. *[Trends and Risk Factors for Asthma and Allergies in Young Persons in Münster: Methodological Aspects and Results of the ISAAC I and III Studies, 1994/1995 and 1999/2000].[in German].* Shaker Verlag, Aachen.ISBN 3-8322-3972-3.2005.

Behrens T, Taeger D, Maziak W, Duhme H, Rzehak P, Weiland SK, Keil U.*Self-reported traffic density and atopic disease in children.Results of the ISAAC Phase III survey in Muenster, Germany.* Pediatr Allergy Immunol 2004; 15(4): 331-9.

Behrens T, Maziak W, Weiland SK, Siebert E, Rzehak P, Keil U.*The use of synthetic bedding in children.Do strategies of change influence associations with asthma*? J Asthma 2005 Apr;42(3):203-6.

Regional
National
Local
Nagpur
Nairobi
Nakorn Pathom

Nagpur Centre

Phase Three			
Centre:		Nagpur, India (Indian Sub-Continent)	
Principal Investigator:		Dr Sundeep Salvi	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to November 2002
Sampling Frame:		13-14yr: Some schools in Nagpur city 6-7yr:All schools in Nagpur city	

Personnel

Dr Sundeep Salvi

Chest Research Foundation
Marigold Premises
Survey No. 15
Vadgaon Sheri
India

Roles:

- Phase Three Principal Investigator for Nagpur

Nairobi Centre

Phase One			
Centre:		Nairobi, Kenya (Africa)	
Principal Investigator:		Dr Joseph A Odhiambo	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All Grades 7 and 8 (13-14 year olds) attending primary schools administered by the City Council of Nairobi. About 10% of this age group attend private schools and were excluded from the sampling frame.	

Phase Three			
Centre:		Nairobi, Kenya (Africa)	
Principal Investigator:		Dr Lucy Ng'ang'a	
Age Groups:	13-14	**Timeframe:**	February 2001 to March 2001
Sampling Frame:		13-14yr: All Public schools under the jurisdiction of the school Board of the Nairobi City Council. The same sampling frame as Phase One.	

Personnel

Dr Lucy Ng'ang'a

Centres for Disease Control & Prevention (CDC)
C/O American Embassy
P.O. Box 9123
Kenya

Roles:

- National Coordinator for Kenya
- Phase Three Principal Investigator for Nairobi

Dr Joseph A Odhiambo

Centre for Respiratory Diseases Research,
Kenya Medical Research Institute (KEMRI)
P O Box 606
00621 Village Market
Kenya

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Africa
- Phase One Principal Investigator for Nairobi

Nakorn Pathom Centre

Phase Three			
Centre:		Nakorn Pathom, Thailand (Asia-Pacific)	
Principal Investigator:		Dr Aree Kongpanichkul	
Age Groups:	13-14, 6-7	**Timeframe:**	January 1996 to February 1996
Sampling Frame:		Schools in Nakorn Pathom Province	

Personnel

Dr Aree Kongpanichkul

Department of Pediatrics
Nakorn Pathom Hospital
Thailand

Roles:

- Phase Three Principal Investigator for Nakorn Pathom

The ISAAC Story

Narva Centre

Phase One			
Centre:		Narva, Estonia (Northern and Eastern Europe)	
Principal Investigator:		Dr Mall-Anne Riikjärv	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All Russian schools in Narva	

Personnel

Dr Triine Annus

Estonian ISAAC Phase 1 - 3 investigator pediatric allergist
Tallinn Children's Hospital
Central Policlinic
Ravi 27 10138
Tallinn
Estonia

Roles:

- Phase One collaborator for Narva

Dr Mall-Anne Riikjärv

Clinical Director
Tallinn Children's Hospital
Tervise, 28
Estonia

Roles:

- National Coordinator for Estonia
- Phase One Principal Investigator for Narva

ISAAC in Estonia (East Europa)

Estonia was a socialist country, which regained its independence in 1991. In these days Estonian pediatricians met prof. Bengt Björksten, who initiated the first epidemiological study of asthma and allergies in Estonian children. He encouraged us also to take part in the international study ISAAC, which we accepted with great enthusiasm. It was especially important for us that prof. Björksten found the resources for the study, as the economical situation in Estonia in these times was very difficult. The group of field workers was formed from pediatricians, who did the demanding field work in addition to their everyday clinical work. Such a study in schools was rather unusual, but the scool staff accepted the study group intervention into the everyday school activities rather calmly. In data processing we were pleased to receive help from an experienced statsitician, whose qualified collaboration enabled us to forward high quality data to the ISAAC center.

The positive experience from the ISAAC I encouraged us also to take part in the next phases of ISAAC. The ISAAC II study with it's multiple tasks and procedures was rather challenging for our small group of field workers . However, we don't remember any exceptional situations and the schoolchildren were always eager to get the reason to miss their lessons.

Participating in the ISAAC studies was an enriching experience in many ways for Estonian pediatrics. It was the first experince in the international scientific cooperation for us. Using the internationally accepted methods we got reliable data about the epidemiological situation on asthma and allergies in Estonian children. Several papers in international scientific journals and a doctoral thesis were based on the research data. We believe that the data from Estonia, a country in transition from socialism to the market economy, were a valuable addition to the international comparison. Such data gave the reason to the hypothesis that socialism protects from allergies.

We gratefully acknowledge prof. Bengt Björksten, who opened the door to the International allergy world for us and warranted the financial support for the studies. We also thank the schools and families of the participating children. Our study woudn't have been possible without enthusiastic team of pediatricians who bore the main burden .

The ISAAC Story

Nelson Centre

Phase One			
Centre:		Nelson, New Zealand (Oceania)	
Principal Investigator:		Dr Richard MacKay	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:July 1993 to August 1993 6-7yr:June 1993 to August 1993
Sampling Frame:			

Phase Three			
Centre:		Nelson, New Zealand (Oceania)	
Principal Investigator:		Dr Richard MacKay	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2003 to October 2003
Sampling Frame:		All schools in the Nelson Province. The same sampling frame as Phase One.	

Personnel

Dr Richard MacKay

Chemical Pathologist
Canterbury Health Laboratories
PO Box 151
New Zealand

Roles:
- Phase One Principal Investigator for Nelson
- Phase Three Principal Investigator for Nelson

Netherlands Centre

Phase Three			
Centre:		Netherlands, Netherlands (Western Europe)	
Principal Investigator:		Professor Rutger Engels	
Age Groups:	13-14	**Timeframe:**	January 2003 to March 2003
Sampling Frame:		13-14yr: Secondary schools in the four regions in the Netherlands (North/South/West/East).	

Personnel

Professor Rutger Engels

Behavioural science Institute
Radboud University, Nijmegen
PO Box 9102
Netherlands

Roles:
- Phase Three Principal Investigator for Netherlands

Mr Roy Otten

Institute of Family and Child Care Studies
University of Nijmegen
PO Box 9104
Netherlands

Roles:
- National Coordinator for Netherlands
- Phase Three collaborator for Netherlands

Netherlands (Utrecht) Centre

Phase Two			
Centre:		Netherlands (Utrecht), Netherlands (Western Europe)	
Principal Investigator:		Professor Bert Brunekreef, PhD	
Age Groups:	7-12,	**Timeframe:**	April 1997 to July 1998.
Sampling Frame:		The provinces of North Holland, South Holland, Utrecht and North Brabant, previously selected for air pollution studies.	

Personnel

Dr Francée Aarts

Dept. Environmental Sciences
WAU Dept. of Epidemiology
Environmental & Occupational Health
Netherlands

Roles:
- Phase Two collaborator for Netherlands (Utrecht)

Professor Bert Brunekreef

Institute for Risk Assessment Sciences
Universiteit Utrecht
PO Box 80176
3508 TD
Netherlands

Roles:
- ISAAC Steering Committee
- Phase Two Principal Investigator for Netherlands (Utrecht)

Neuquén Centre

Phase Three			
Centre:		Neuquén, Argentina (Latin America)	
Principal Investigator:		Professor Gustavo Enrique Zabert	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2002 to November 2002
Sampling Frame:		All schools in Neuquén city area	

Personnel

Professor Gustavo Enrique Zabert

Medicina y Cirugía-Escuela de Medicina-UNComahue
Presidente Asociacion Argentina de Medicina Respiratoria
Santa Fe 3553 7mo dpto 23
Argentina

Roles:

- Phase Three Principal Investigator for Neuquén

Local Publications

The following publications used ISAAC data from the New Delhi (7) centre:

Sharma SK, Banga A. *Prevalence and risk factors for wheezing in children from rural areas of north India.* Allergy Asthma Proc 2007; 28(6): 647-53.

New Delhi (7) Centre

Phase One			
Centre:		New Delhi (7), India (Indian Sub-Continent)	
Principal Investigator:		Dr Kamlesh Chopra	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to April 1995 6-7yr:October 1994 to May 1995
Sampling Frame:			
Phase Three			
Centre:		New Delhi (7), India (Indian Sub-Continent)	
Principal Investigator:		Professor S K Sharma	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2001 to February 2002
Sampling Frame:		All schools in the Delhi Area. The sampling frame is the same for both Phase One and Phase Three.	

Personnel

Dr Kamlesh Chopra

Maulana Azad Medical College
B2/85 Safdarjung Enclave
India

Roles:

- Phase One Principal Investigator for New Delhi (7)

Professor S K Sharma

Department of Medicine
All India Institute of Medical Sciences
Ansari Nagar
India

Roles:

- Phase Three Principal Investigator for New Delhi (7)

WHY OUR CENTRE WAS CHOSEN

All India Institute of Medical Sciences (AIIMS), New Delhi (India) was established by an Act of Parliament in 1956 as an institution of national importance. Its main objectives were to develop patterns of teaching in undergraduate and postgraduate medical education in all its branches, so as to demonstrate a high standard of medical education to all medical colleges and other allied institutions in India; to bring together in one place educational facilities of the highest order for the training of personnel in all important branches of health activity; and to attain self-sufficiency in postgraduate medical education. AIIMS has state-of-art facilities for teaching, research and patient care. Medical and paramedical courses are taught at AIIMS. The institution awards its own undergraduate, postgraduate and doctorate degrees. Teaching and research are conducted in 50 disciplines. AIIMS plays a leading role in the field of medical research, having more than 1300 research publications by its faculty and researchers in a year. AIIMS also has a College of Nursing, which awards B.Sc (Hons) Nursing and B.Sc Nursing (Post-certificate) degrees. Twenty-five clinical departments, including six superspecialty centres, manage practically all types of disease conditions with support from preclinical and para-clinical departments. AIIMS also runs a 60-bedded hospital at the Comprehensive Rural Health Centre at Ballabgarh in Haryana and provides health cover to about 7.7 lakh people through the Centre for Community Medicine.

The institute has main hospital with total bed strength of 2424 beds along with state-of-art intensive care units. It has 6 centers for superspecialties including Cardiology, Cardio-Thoracic surgery, Cardioradiology, Neurology, Neurosurgery, Trauma centre, De-addiction center and state of- art intensive care monitoring facilities. It has Rotary Cancer Hospital with 200 beds. Each center has approximately 200 beds. AIIMS was the first one to do cardiac transplantation in the country. In addition, it has a cardiac transplantation. In addition it has very successful renal, bone marrow transplantation facilities.

Division of Pulmonary Medicine has a special place in the Department of Internal Medicine since inception of the Institute. Since beginning it has state-of-art facilities for measurement of pulmonary diffusing capacity with single breath and steady state techniques, estimation of lung volumes with body plethysmography, measurement of acid-base. Over a period of time, state-of-art intensive care unit and sleep laboratories were developed. Division of Pulmonary, Critical care and Sleep Medicine has contributed significantly by performing outstanding research. Special interest of the Division includes bronchial asthma, interstitial lung disease, sarcoidosis, tuberculosis, HIV/TB, obstructive sleep apnea and venous thrombo-embolism. Because of this the Division was chosen for performing ISAAC Phase Three study.

IMPACT OF ISAAC IN OUR CENTRE

ISAAC Phase Three Study data are known to faculty, residents and medical students at AIIMS, New Delhi. However, attention is being paid to increase their awareness of the findings in teaching ward rounds, outpatient department and chest clinic.

FINDINGS FOR OUR CENTRE

Publication from ISAAC Phase Three Data collected in New Delhi

Prevalence and risk factors for wheezing in children from rural areas of north India Surendra K. Sharma, M.D., Ph.D., and Amit Banga, M.D. (Allergy Asthma Proc 28:647–653, 2007; doi: 10.2500/aap2007.28.3059)

The purpose of this study was to document the prevalence of asthma-associated symptoms in children residing in rural areas and to determine risk factors for its development. We studied 8470 school children, aged 6–7 years and 13–14 years, from 10 villages on the outskirts of Delhi, India, over a 6-month period. The study was performed using the Hindi translated version of Phase III of the ISAAC questionnaires. All of the questionnaires were self-reported by children and/or parents. Frequent passage of trucks through the street near home (odds ratio [OR]: 95% CI, 1.7 [1.2–2.4]), maternal smoking (OR: 95% CI, 1.5, [1.1–2.1]), paternal smoking (OR: 95%CI, 1.3 [1.0 –1.8]), total number of cigarettes smoked by both parents of more than seven per day (OR: 95% CI, 1.9 [1.3–2.7]), paracetamol intake of more than once a month (OR: 95%CI, 1.9 [1.4 –2.6]), and current exposure to cats (OR: 95% CI, 1.5 [1.1–1.9]) were independently associated with occurrence of recent wheezing (in the last 12 months), whereas fruit intake of more than twice a week had a protective effect (OR: 95% CI, 0.7 [0.5– 0.9]). There is a significant burden of asthma-associated symptoms in children of rural areas of north India. Occurrence of wheezing among children from rural areas of Delhi is determined by a complex interplay of environmental agents that induce allergic sensitization and are proinflammatory and environmental agents that supplement the antioxidant stores.

Common ISAAC Phase Three Study Publications

1. Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood: ISAAC Phases One and Three repeat multicountry cross-sectional surveys. Lancet 2006; 368:733–43 3. Worldwide trends in the prevalence of asthmasymptoms: phase III of the International Study of Asthma and Allergies in Childhood (ISAAC) Worldwide trends in the prevalence of asthma. Thorax 2007;62:757-65; originally published online 15 May 2007; doi:10.1136/thx.2006.070169
2. Association between paracetamol use in infancy and childhood, and risk of asthma, rhinoconjunctivitis, and eczema in children aged 6–7 years: analysis from Phase Three of the ISAAC programme. Lancet 2008;372:1039–48 Use of paracetamol in the first year of life and in later childhood, is associated with risk of asthma, rhinoconjunctivitis, and eczema at age 6 to 7 years. We suggest that exposure to paracetamol might be a risk factor for the development of asthma in childhood.
3. Worldwide time trends for symptoms of rhinitis and conjunctivitis: Phase III of the International study of asthma and allergies in childhood. Pediatr Allergy Immunol 2008; 19:110-24.
4. Is eczema really on the increase worldwide? J Allergy Clin Immunol 2008; 121:947-54.
5. Global map of the prevalence of symptoms rhinoconctivitis in children: the international study of asthma and allergies in childhood (ISAAC) phase three. Allergy 2009; 64:123-48.
6. Self Reported Truck Traffic on the Street of Residence and Symptoms of Asthma and Allergic Disease: A Global Relationship in ISAAC Phase Three. Environ Health Perspect 2009;117:1791-98.
7. Antibiotic use in infancy and risk of symptoms of asthma, hinoconjunctivitis and eczema in 6 to 7 year old children: ISAAC Phase Three. J Allergy Clin Immunol 2009;124:982-89.
8. Translation of questions: The International Study of Asthma and Allergies in Childhood (ISAAC) experience. Int J Tuberc Lung Dis. September 2009; 13: 1174-82
9. The impact of the method of consent on response rates in the ISAAC time trends study. Int J Tuberc Lung Dis 2010; 14:1059–65

The ISAAC Story

Neyveli Centre

Phase One			
Centre:		Neyveli, India (Indian Sub-Continent)	
Principal Investigator:		Dr G Jayaraj	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to October 1995 6-7yr:October 1994 to October 1995
Sampling Frame:			

Personnel

Dr K Janardhan

N.L.C. Hospital
Neyveli 607803
India

Roles:
- Phase One collaborator for Neyveli

Dr G Jayaraj

General Superintendant/Medical Services
N.L.C. Hospital
Neyveli House – First Floor, 135, EVR Preiar Road,
Neyveli 607803
India

Roles:
- Phase One Principal Investigator for Neyveli

Nis Centre

Phase Three			
Centre:		Nis, Serbia and Montenegro (Northern and Eastern Europe)	
Principal Investigator:		Asst Professor Snezana Zivanovic	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2001 to June 2001
Sampling Frame:		Some schools in Nis	

Personnel

Dr Sofija Brankovic

Health Care Center Nis
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Marija Conic

Medical School University of Nis
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Spomenka Kovacevic

Health Care Center Nis
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Radmila Mileusnic –Milenovic

Childrens University Clinic
Clinical Centre
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Snezana Nikolic

Health Care Center Nis
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Ljiljana Perovic

Childrens University Clinic
Clinical Centre
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Mile Z Randjelovic

Bulevar Nemanjica 60/8
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Maja Slavkovic-Jovanovic

Childrens University Clinic
Clinical Centre
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Dr Ljiljana Stojanovic-Milojkovic

Health Care Center Nis
Nis
Serbia

Roles:
- Phase Three collaborator for Nis

Local Publications

The following publications used ISAAC data from the Nis centre:

Živcovic Z. *Prevalence of childhood asthma, rhinitis and eczema in Belgrade area and Serbia.* Child Pulmonol 2002; 10(1-2): 27-43.

Živanovic S, Jovanovic-Slavkovic M, Mileusnic-Milenovic R, Perovic L, Nikolic S, Stojanovic-Milojkovic L, Kovacevic S, Brankovic S, Conic M. *Prevalence rate of asthma, rhinitis and eczema in children in Nis.* Child Pulmonol 2002; 10(1-2): 45-50.

Khaldi F, Fakhfakh R, Mattoussi N, Ben Ali B, Zouari S, Khemiri M. *Prevalence and severity of asthma, allergic rhinoconjunctivitis and atopic eczema in "Grand Tunis" schoolchildren ISAAC.* Tunis Med.2005 May;83(5):269-73.

Živkovic Z, Vukašinovic Z, Cerovic S, Radulovic S, Živanovic S, Panic E, Hadnadjev M and Adžovic O. *Prevalence of childhood asthma and allergies in Serbia and Montenegro.* World J Pediatr 2010; 6(4): 331-336 epub May

Map of Serbia and Nis

The ISAAC Story

Asst Professor Snezana Zivanovic

Asst Professor in Pediatrics
Clinic of Pediatrics
Clinical Centre of Nis
Faculty of Medicine University of Nis
Serbia

Roles:

- Phase Three Principal Investigator for Nis

ISAAC study in the Centre of Nis enrolled 2209 children in 20 down town schools and14 schools from suburbs. The investigation started in January 2011 while definite data entry and statistical analyses were finished in August 2002. The complete study was conducted by 8 physicans (Snezana Zivanovic, Ljiljana Perovic, Maja Slavkovic-Jovanovic, Radmila Mileusnic – Milenovic, Snezana Nikolic, Spomenka Kovacevic, Ljiljana-Stojanovic-Milojkovic, Sofija Brankovic and Marija Conic) from Children's Clinic Nis and Health Care Center Nis. Our results were published in the National Journal: Children's Pulmonology (Zivanovic S, Slavkovic-Jovanovic M, Mileusnic-Milenovic R, Perovic Lj, Nikolic S, Stojanovic-Milojkovic LJ, Kovacevic S, Brankovic and Conic Marija. Prevalence rate of Asthma, Rhinitis and Eczema in children in Nis. Children's Pulmonology 2002; 7: 45-50.)

Niue Island Centre

Phase Three			
Centre:		Niue Island, Niue (Oceania)	
Principal Investigator:		Ms Moka Magatogia	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2002 to October 2002
Sampling Frame:		Whole Island Study. There is only one High school and one primary school on the island.	

Personnel

Ms Moka Magatogia

Physiotherapist
Niue Foou Hospital
Niue

Roles:

- Phase Three Principal Investigator for Niue Island

Niue ISAAC Story

Contact was made by Dr Sunia Foliaki in 2002, for Niue to participate in the ISAAC Research. Niue participated in the ISAAC Phase Three, Group B, in October 2002. The survey was coordinated by Mrs. Moka Magatogia, assisted by Miss O'Mega Vai Chapman.

The children were recruited from the two only schools on the island. The 6/7 year olds from Niue Primary School and 13/14 year olds from Niue High School. With English being the second language and fluently spoken and understand by all, there was no need to translate the questionnaire to Niuean. Questionnaires were completed by the parents of 6/7 year olds, and the 13/14 year olds completed their own questionnaires together with the video questionnaire. All Data were collected, coded and transferred to IIDC Auckland, New Zealand.

A second part of the survey was completed in August 2003, again coordinated and assisted by the same people. This was the environment survey. There were some problems with transferring this data and before we were able to successfully transfer the data again Hurricane Heta hit the island. There were again further delays in getting the data transferred. However, all hard copies of our survey were safe and I managed to post all these over because computer access at that time was not possible.

Dr Sunia Foliaki also visited Niue in 2006 and was able to give an update on the ISAAC research to the staff of the Niue Health Department. I would like to thank the ISAAC Research Committee for funding this survey and making it possible for Niue to participate in this International Study.

North east and Yorkshire Centre

Phase One			
Centre:		North east and Yorkshire, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Northeast and Yorkshire counties and all schools from a random selection of 4 metropolitan districts from each of 2 metropolitan counties. Stratified by county\metropolitan district, followed by random sampling of one school from each area.	

The ISAAC Story

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for North east and Yorkshire

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for North east and Yorkshire

Dr Jan Poloniecki

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for North east and Yorkshire

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

Ross Anderson, David Strachan, 18 July 2011

North Gaza Centre

Phase Three			
Centre:		North Gaza, Palestine (Eastern Mediterranean)	
Principal Investigator:		Mr Shaban Mortaja	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to December 2001
Sampling Frame:		All schools in North Gaza District (public schools, UNRWA schools, and the private schools).	

Personnel

Mr Shaban Mortaja

Lecturer in Public Health, MPH
Alquds University –Faculty of Public Health, Gaza Campus
Tal EL HAWA PRCS Building
Gaza
P.O. Box 5314
Palestine

Roles:

- Phase Three Principal Investigator for North Gaza

Why was this centre selected for ISAAC?

In a personal communication, year 2000, with Professor Ameen Thalji, a researcher in Pediatric's health in the West Bank and Jerusalem, he reported a gradient increase of childhood infections as seen at the emergency rooms and hospitals' clinics in the past 10 years. Thalji and Abdeen agreed that a potential justification could be the increased effect of indoor allergen especially house dusts mites and smoking, and outdoor air pollution by traffic and allergens which were also believed to be the main risk factors for increasing asthma in the Palestinian children (Professor Ameen Thalji and Professor Hani Abdeen, personal communication, 2000). Similarly, a case control study in Gaza Strip at the refugees' camps (1) indicated that house dust mites were probably important allergens in the region and has a major role in asthma trends and its severity among children especially at the coastal areas. Also, kerosene use for heating and cooking was a strong potential risk factor for developing asthma symptoms in those children, in addition to the effect of smoking and house dust mites. Therefore, poverty and humidity in Palestine and especially in Gaza Strip were considered important risk factors for asthma too.

Until year 2000, there was no real work that described the real situation or explored the possible risk factors and determinants of asthma in Palestine. The urban-rural and inland-coastal area differences were not studied in depth. Therefore, we decided at Al Quds University-Palestine in cooperation with KULeven Belgium to initiate several studies in two selected area (West Bank and Gaza Strip) that provide a framework for further etiological research into lifestyle, environmental, genetic and medical care factors affecting asthma prevalence and incidence. Ramallah governorate, the inland area, and Gaza governorate, the coastal area, were chosen for implementing the series of studies that was planned according to ISAAC protocols (phase three and phase 2)

The ISAAC Story

ISAAC Phase Three studies:

This phase was done in two governorates: Gaza and Ramallah governorates. After a two-stage stratified systematic sampling, approximately 14,500 schoolchildren, from the first and second grades of elementary school (ages 5 to 8 years) and eighth and ninth school grades (ages 12 to 15 years), were invited to participate in a survey using ISAAC phase III questionnaires and protocols.

The main study results showed that younger children had a higher 12-month wheezing prevalence rate of 9.6% compared to older children (7.2%) and more physician-diagnosed asthma (8.4% and 5.9%, respectively). However, nocturnal cough and exercise-related wheezing were higher in the older age group compared with younger children. Younger children living in North Gaza district showed slightly higher prevalence rates for asthma and asthma symptoms, but older children had higher rates in Ramallah district. After adjustment using logistic regression analysis, male sex, living in inland areas, and younger age were shown to predict 12-month wheezing and physician-diagnosed asthma (2).

References

1. Mumcuoglu KY, Abed Y, Armenios B, et al. Asthma in Gaza refugee camp children and its relationship with house dust mites. **Ann.Allergy** 1994; **72**: 163-166.
2. El-Sharif NA, Nemery B, Barghuthy F, Mortaja S, Qasrawi R, Abdeen Z. Geographical variations of asthma and asthma symptoms among schoolchildren aged 5 to 8 years and 12 to 15 years in Palestine: the International Study of Asthma and Allergies in Childhood (ISAAC). Ann Allergy Asthma Immunol. 2003 Jan;90(1):63-71.

North Thames Centre

Phase One			
Centre:		North Thames, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in North Thames and part of London (2 inner districts and 2 outer districts north of River Thames). Stratified by county and 4 randomly sampled London boroughs (2 inner, 2 outer) followed by random sampling of schools in these areas.	

Phase Three			
Centre:		North Thames, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	January 2002 to March 2002
Sampling Frame:		13-14yr: Same area as ISAAC Phase One: Former North Thames Health Authority area. Schools that participated in ISAAC Phase One were used. If unable to particpate, then schools were selected at random from mixed state secondary schools with 100 or more pupils in the same Local Education Authority.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
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United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for North Thames
- Phase Three Principal Investigator for North Thames

Dr Balvinder Kaur

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Roles:

- Phase One collaborator for North Thames
- Phase Three collaborator for North Thames

Ms Vivienne Monk

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Roles:

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Dr Jan Poloniecki

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Roles:

- Phase One collaborator for North Thames

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

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North West Centre

Phase One			
Centre:		North West, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in North West counties and all schools from a random selection of 4 metropolitan districts from each of 2 metropolitan counties. Stratified by county and metropolitan district, followed by a random sample of schools from each countyj\metropolitan district.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for North West

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
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United Kingdom

Roles:

- Phase One collaborator for North West

Dr Jan Poloniecki

Department of Public Health Sciences
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United Kingdom

Roles:

- Phase One collaborator for North West

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

Ross Anderson, David Strachan, 18 July 2011

Nouvelle Caledonie Centre

Phase Three			
Centre:		Nouvelle Caledonie, Nouvelle Caledonie (Oceania)	
Principal Investigator:		Dr Isabella Annesi-Maesano	
Age Groups:	13-14	**Timeframe:**	June 1998 to September 1998
Sampling Frame:		13-14yr: All schools in Nouvelle Calédonie in order to represent all ethnic groups	

Personnel

Dr Isabella Annesi-Maesano

EPAR Dept, INSERM, UMR- S 707
Faculté de Médecine Pierre et Marie Curie
Site Saint-Antoine
27 rue Chaligny 75571
France

Roles:

- National Coordinator for France
- Phase Three Principal Investigator for Nouvelle Caledonie

Dr Bernard Granger

Service de Pediatrie Hospital
98735 Uturoa
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Roles:

- Phase Three collaborator for Nouvelle Caledonie

Nova Iguaçu Centre

Phase Three			
Centre:		Nova Iguaçu, Brasil (Latin America)	
Principal Investigator:		Associate Professor Antônio José Ledo Aves Cunha	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2002 to September 2002
Sampling Frame:		Some public and private schools in Nova Iguaçu District – State of Rio de Janeiro. We respect the original distribution of district population as according to geographic area and kind of school (2/3 public X 1/3 private).	

Personnel

Associate Professor Antônio José Ledo Aves Cunha

IPPMG-UFRJ
Rua Rodrigo de Brito 46/503
Brasil

Roles:

- Phase Three Principal Investigator for Nova Iguaçu

At the end of his lecture on gene-environment interactions in childhood asthma during the VIII Brazilian Congress of Pediatric Allergy, held in April 2001 in Rio de Janeiro, Professor Fernando Martinez urged the audience: "People are different, the factors are different, seek their own risk factors, regardless of the technology needed for this " (Fernando Martinez, Professor of Pediatrics and Director of the Center for Respiratory Diseases at the University of Arizona, United States, one of the creators of the Tucson Children's Respiratory Study, a major longitudinal study on the natural history of childhood asthma that started in 1980).

In due course a series of events favored the implementation of ISAAC in the municipality of Nova Iguaçu, located at the metropolitan area of Rio de Janeiro City, capital of Rio de Janeiro State, Brazil. The ISAAC project, then in its third phase, was recruiting new participating centres. The scarcity of epidemiological studies of asthma in our state and the prospect of cooperating with a study of this magnitude was crucial to seek ways to facilitate our participation.

At the time, as a Professor of Pediatrics from the Department of Pediatrics of the School of Medicine, located at the Institute of Pediatrics Martagão Gesteira (IPPMG-UFRJ), Federal University of Rio de Janeiro, I invited Dr. Fabio Kuschnir to participate in the study with me. That time Dr. Fabio had already finished his Master Thesis and was a graduate student enrolled in our Doctoral Program.

Thus with the support of Prof. Dirceu Solé, the national coordinator of the ISAAC study in Brazil, the city of Nova Iguaçu was inserted as the single participating ISAAC Phase III center in Rio de Janeiro in October 2001, with me as the principal investigator, and Dr. Fabio Kuschnir as the co-investigator. The study design, determining the completion of data collection in schools, and the sample size required were challenging.

In this context, the School Health Program of the Department of Civil Defense of the State of Rio de Janeiro (PSE), covering about 300 public schools throughout the state of Rio de Janeiro and with Dr. Fabio Kuschnir as one of its coordinator since 2001, became a cornerstone for the implementation of the study. With the support of the General Coordinator of the PSE, we formed a team consisting of four pediatricians trained in allergology, who worked in the PSE program itself, to help conduct the survey.

Data collection was completed in 2002, after four months of hard work. Four additional months were needed for entering data and cleaning the data set. Throughout this period, we maintained contact with the national ISAAC Coordinator and the ISAAC International Data centre, the latter located in Auckland, New Zealand, to help us follow the study protocol and clarify any doubts we had. All these steps were accompanied and supervised by me and Dr. Fabio Kuschnir. Participation in all stages of this project has brought us a huge experience. I refer not only to local knowledge about asthma or planning and conducting an epidemiological study of this size, but also the recognition that teamwork and partnership between different institutions are able to generate scientific knowledge of quality and to overcome technological and financial barriers so frequent in our context.

Among the products generated by this project, including several national and international publications, it is worth mentioning the conclusion of three master's theses and one doctoral dissertation, as well as a local prize to outstanding research projects. In conclusion, we were very fortunate to be able to respond to Prof. Martinez ‘call’ and we are grateful to the ISAAC family to have provided us with this opportunity.

Local Publications

The following publications used ISAAC data from the Novi Sad centre:

Živcovic Z. *Prevalence of childhood asthma, rhinitis and eczema in Belgrade area and Serbia.* Child Pulmonol 2002; 10(1-2): 27-43.

Hadnadjev M. *Frequency of children's asthma, allergic rhinitis and ezcema in Novi Sad.* Child Pulmonol 2002; 10(1-2): 51-55.

Živkovic Z, Vukašinovic Z, Cerovic S, Radulovic S, Živanovic S, Panic E, Hadnadjev M and Adžovic O. *Prevalence of childhood asthma and allergies in Serbia and Montenegro.* World J Pediatr 2010; 6(4): 331-336 epub May

Map of Novi Sad

Novi Sad

Novi Sad Map and photo

Department of school children health care 'Njegoševa 32'

Dr Mila Hadnadjev

Dr Mila Hadnadjev

Novi Sad Centre

Phase Three			
Centre:		Novi Sad, Serbia and Montenegro (Northern and Eastern Europe)	
Principal Investigator:		Dr Mila Hadnadjev	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to April 2002
Sampling Frame:		Some schools in the municipality of Novi Sad.	

Personnel

Ilijevic Aleksandra

Health Center "Novi Sad"
Children's Health Protection
Novi Sad
Serbia

Roles:
- Phase Three collaborator for Novi Sad

Mirjana Djurdjev

Health Center "Novi Sad"
Children's Health Protection
Novi Sad
Serbia

Roles:
- Phase Three collaborator for Novi Sad
- School Professor

Jelena Djurdjev

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Roles:
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- School Professor

Vlaovic-Ugljevicanin Dušanka

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Dr Mila Hadnadjev

Health Center "Novi Sad"
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Serbia

Roles:
- Phase Three Principal Investigator for Novi Sad

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Serbia

Roles:
- Phase Three collaborator for Novi Sad
- school pedagogue

Vera Pušic

Health Center "Novi Sad"
Children's Health Protection
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Serbia

Roles:

- Phase Three collaborator for Novi Sad
- Nurse

Memedovic Stana

Health Center "Novi Sad"
Children's Health Protection
Novi Sad
Serbia

Roles:

- Phase Three collaborator for Novi Sad
- Nurse

Vojvodina is a northern province of Serbia, whose capital is Novi Sad (350 000 inhabitants, the second biggest town in Serbia, after Belgrade, the capital of Serbia). Although Vojvodina is the most developed part of Serbia, the number of studies (including Serbia, too) about the prevalence of allergies were rather scarce.

The Health Center “Novi Sad” (www.dzns rs) in Novi Sad was founded on September 29, 1967. It has 59 objects, 1533 employed people, provides health care to 350,000 inhabitants and has 11 service units while its services account for 15 million.

I work at the Department of school children health care “Njegoševa 32”, at the center of the town, 32 Njegoševa St. Our service unit comprises 21 school departments and 21 smallchildren departments, in which 68 pediatricians work.

At the time I got involved in the ISAAC project for the first time, I had a diploma of the Faculty of Medicine, postgraduate studies, mental hygiene etc., but I passed the exam in pediatric allergology on June 08, 2004. I was a member of Headquarter for Ambrosia destroying, which was the team organized for coordination and monitoring of mowing ambrosia (ragweed) in the city parks of Novi Sad. It consisted of a president and seven members who were multidisciplinary leading experts of Novi Sad. Meetings were held at City Hall and attended by the City Council of the City of Novi Sad Municipal Utilities Authority, the City Administration for Environmental Protection, Public Utility Company "City Park" and professors of Natural Science Faculty and Medicine. Our contribution was a report on the impact of cutting on the prevalence of allergic diseases We followed morbidity of allergic diseases before and after Ambrosia mowing. It was formed in 2002 by the city mayor who had an allergic disease and when the new mayor was elected in 2005, HQ ceased to exist. Also in this time, I had many local educational lectures, going to many congresses (ERS congress in Belgrade, in organisation of Zorica Živkovic, in Palic) taking part in presentation on ISAAC data at Dedinje Pediatric meeting and I published many scientific papers. Prof. Dr Zorica Živkovic was the main publisher of “Children’s Pulmonology”, so all principal investigators published their ISAAC data in that journal.

Our ISAAC team was small but a successful one and consisted of pediatricians :
dr Mila Hadnadjev, dr Bratic Mirjana, dr Ilijevic Aleksandra, dr Vlaovic-Ugljevicanin Dušanka, dr Darka Hadnadjev
school pedagogue: Jelena Polak-Stefanovic
nurses: Vera Pušic, Memedovic Stana
two school professors: Mirjana Djurdjev and Jelena Djurdjev.

There are 52 schools in Novi Sad (30 elementary schools and 22 secondary schools). ISAAC questionnaires were very well accepted. We did not have any barriers; parents of the children in the kindergartens were also very cooperative, many of them considered that we were helping their children, but there were also many of them who did not want to admit that their child had diagnosis of asthma. We had shown pictures of eczema and urticaria for better understanding of the meaning of those words by school children.

We appreciated our contacts with Mrs Philippa Ellwood and Mr Tadd Clayton who helped us with their always useful and precious advice, so it was great opportunity to be in contact with ISAAC Center in New Zealand.

ISAAC results of asthma prevalence in our country are the only relevant information because there was no such universal project before ISAAC. Professor doctors of pediatric allergology continue to quote them as the most reliable data. The ISAAC screening questionnaire is unique and the most recognized one in the world, as it has proved itself to be!

The ISAAC Story

Novosibirsk

Novosibirsk Centre

Phase One			
Centre:		Novosibirsk, Russia (Northern and Eastern Europe)	
Principal Investigator:		Prof Dr Elena G Kondiourina	
Age Groups:	13-14, 6-7	**Timeframe:**	
Sampling Frame:			
Phase Three			
Centre:		Novosibirsk, Russia (Northern and Eastern Europe)	
Principal Investigator:		Prof Dr Elena G Kondiourina	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2002 to April 2002
Sampling Frame:		Some schools in each district of Novosibirsk city	

Personnel

Prof Dr Elena G Kondiourina

Chief of Pediatric Department
Novosibirsk State Medical Academy
Krasny Prospect, 52
Novosibirsk
Russia

Roles:

- Phase One Principal Investigator for Novosibirsk
- Phase Three Principal Investigator for Novosibirsk

Why was this centre selected for ISAAC?

Novosibirsk is a large industrial, administrative and geographical center of West Siberia. It is the center for highways and railways, it has a river port and international airport. The peculiar feature is its territory (the territory of the city was 483 square kilometers in 1995) and the significant difference in the state of environmental characteristics of different areas. The population of the Novosibirsk city was 1368,5 thousand people including 251,8 children during the survey. Being located in the South-East of the West-Siberian plain, on both banks of the river Ob the city has a continental climate and is characterized by the increased potential for air pollution. The main sources for the air pollution are fuel and energy industry, the industry which produce building materials, black and non-ferrous metal industries, radio-electronic industry, engineering industry, chemical industry, light and food industry, railway and automobile transport.

Our experience of ISAAC

Phase One:

7404 pupils from 30 schools in 10 Novosibirsk districts (3695 pupils at the age of 6-7 years old, 3709 pupils at the age of 13-14 years old) have been interviewed with the strict observance of all requirements of ISAAC protocol from January till April 1996.

The specific feature in the study of the bronchial asthma epidemiology in Novosibirsk which was carried out according to the ISAAC program was the linguistic adaptation of a written questionnaire in order to reproduce the original text. For this purpose, the questions have been translated and formulated in Russian and later translated into the English language. They have been compared with the original variant and the necessary corrections have been done. The number of examined first-year pupils in Novosibirsk was larger according to the ISAAC protocol than the number of pupils which our center provided as a result. This is due to the fact that mainly children at the age of 7-8 years old study at school and the prevalence of children at the age of 6 years old is less than 20%.

Phase Three:

6746 pupils (2868 pupils at the age of 6-7 years old, 3878 pupils at the age of 13-14 years old) have been interviewed in schools of Novosibirsk from January till April 2002.

The study has been carried at the same schools as we have done during the phase one. But, due to the demographic "collapse" which was characterized by the decline of birth, there weren't 3000 pupils at this schools. That is why we included children from other schools.

In comparison with the first stage the prevalence of the symptoms of the bronchial asthma, bronchial spasm of physical exertion, episodes of cough at night among the pupils of Novosibirsk decreased. The indications for the frequent exacerbation, frequent night symptoms remained stable, the diagnostics of bronchial asthma increased.

The ISAAC Story

Nuku alofa Centre

Phase Three			
Centre:		Nuku alofa, Tonga (Oceania)	
Principal Investigator:		Dr Sunia Foliaki	
Age Groups:	13-14	**Timeframe:**	April 2002 to October 2002
Sampling Frame:		13-14yr: All children attending schools in Tonga	

Personnel

Dr Sunia Foliaki

Director
Research Unit
Ministry of Health
P.O. Box 59
Kingdom Of Tonga

Roles:

- ISAAC Steering Committee
- Regional Coordinator for Oceania
- Phase Three Principal Investigator for Nuku alofa

Orissa Centre

Phase One			
Centre:		Orissa, India (Indian Sub-Continent)	
Principal Investigator:		Dr Pradeep Kumar Kar	
Age Groups:	13-14, 6-7	**Timeframe:**	March 1995 to July 1995
Sampling Frame:			

Personnel

Dr Pradeep Kumar Kar

Consultant pediatrics
qrs.no.-C/163
Sector-6
ROURKELA-769002
India

Roles:

- Phase One Principal Investigator for Orissa

Background

- Asthma, Allergic rhinitis, Dermatitis in childhood are the common issues of concern in pediatric O.P.D.
- Incidence, aetio-pathogenesis & treatments are often scientifically challenged where as, the rational practice in their management are far from real as on date. Consensus asthma management protocols by Indian Academy of Pediatrics (IAP) are yet to be popularized in the country. Asthma management varies from place to place. It is significantly dependant on the knowledge of the treating pediatrician, socio-economic & geographical accessibility and health seeking behavior of the concerned patient /caretaker.
- So, the issue appeared significant, need-based &challenging.

Constraints faced

1. Child health status is critical in Orissa (IMR is 97 per 1000 live births as per the 2002 census report).
2. The existing deficit health facility is geographically & socio-economically inaccessible to the rural poor in Orissa. Prevailing poverty, & illiteracy either delay or neglect the health seeking behavior.
3. The above project was taken up at Purnapani in Sundergarh district & was completed at Bolani in Keonjhar district in Orissa. Both were tribal dominated rural villages where I was working in the respective mines hospital. Patient care, social living, office practices were all in a primitive way.

Experiences

Nearly a decade has been passed since I submit my final report. Personal experiences written below are significant to me because they are fresh in my memory till date.

1. Answering to each & every letter, repeated visit to the concerned schools, communication to the students, teachers, parents, data compilation, format etc. & computer typing had consumed a lot of my personal time & money. For about two and a half years I had to cancel all my personal & family commitments.
2. Roads & communications in these areas are so poor that one may not imagine the risk unless & until one experiences it personally. During rainy days the fair weather roads make the movement impossible & risk taking as well. Schools were poorly attended during those days. More frequent visits were made to achieve the assigned 90% target or so. There was a Muslim girl's school run in the owner/principal's personal residence complex, which was the school with lowest number of enrollments.
3. Chinmaya Vidyalaya of Rourkela was the excellent among the lot. The principal & other teachers, the students, parents co-operated in the study in a much organized & disciplined manner. At the end, the entire team was specially thanked on behalf of the ISAAC member group. The senior students enjoyed the video clipping on asthma & asked many questions on the issue, which were answered. A student asked & noted the full form of ISAAC in his class note- book.
4. There was a primary school (for 6 to 7 years age group) near Bolani mines in a remote tribal village, the name I am forgetting now. The village had a few thatched hurts, some of them were without any roof top, placed discretely (very low population density, i.e. persons/square k m.). It was a government aided tribal school with provisions of free mid-day-meals for the enrolled students. Teachers of the school accommodate themselves in some of those local hurts & were utilising open-air field for their toilet & bath irrespective of their sex. The Government constructed tin-top school building did not have even a single window or door. The night time sheep & cattle-shed was utilized as a class- room by the poor young children. I wish, I could have taken photographs of the dirty class- room floor full of dry cow dung & animal excreta.

Final out come

My contribution to the entire investigation may be negligible. But personally I was benefited in many ways. The whole credit for this I would like to give to the team who designed the project text. The communication methodology and language advocated were distinct and universally accepted. Comprehensive social health communications, adopted during the event were well appreciated by the students, teachers and parents. This was in addition to the determination of incidence rate of Asthma, Allergic rhinitis etc. among the target groups. Hence, these personal observations should not be considered as the facts meant to dilute the main objectives of ISAAC studies. Subsequent community health communication ,events were organized with confidence and enthusiasm. Health promotional events were modified from time to time by the rich experience gathered during ISAAC phase –1 study. During the year 1999 & 2000, I was elected twice to the National Executive board (from East Zone) Indian Academy of Pediatrics (IAP). Pulse polio, Breast feeding promotion, Nutrition education, mass child health camp, health awareness building were few (worth mentioning) of such health promotional events. IAP Orissa State branch was energized by forming district branches, and encouraging and participating in various child health activities.

Palermo Centre

Phase Three			
Centre:		Palermo, Italy (Western Europe)	
Principal Investigator:		Dr Stefania La Grutta	
Age Groups:	13-14	**Timeframe:**	February 2002 to May 2002
Sampling Frame:		13-14yr: All schools in the city of Palermo	

Personnel

Dr Stefania La Grutta

University of Palermo
Professor of Pediatric Allergology, School of Pediatrics
Palermo
Italy

Roles:

- Phase Three Principal Investigator for Palermo

Palermo is a metropolitan city in the South of Italy, and no previous epidemiological study about allergies and asthma in children was done to evaluate the prevalence. For this reason we considered very important to join ISAAC through participation in the study SIDRIA-2 (Studio Italiano Disturbi Respiratori Infanzia Ambiente) in 2002, the italian section of ISAAC study. We thought it was a huge step that would let us have real data about asthma and allergies prevalence in our country and give us the opportunity of comparing our data with the data of other countries involved in this study.

In Phase Three Palermo was the only centre, it is the capital city of Sicily which has a population of about 900,000 inhabitants. In the whole country we are about 5,000,000 inhabitants. In the study 1015 children participated in the 6-7 years group and 1287 in the 13-14 years group. It was very important to have so a great number of participants to have a better idea of the prevalence of asthma and allergies in Sicily.

Pediatricians were aware about the importance of ISAAC and our data by attendingnational congresses and courses of MCE related with these diseases. They are now more committed with the management of asthma, which is contributing to a better treatment of the patients.

We wish to thank all parents, children and school staff who participated in the surveys and also our fieldworkers team for their enthusiasm and effort thoughout the study.

Pamplona Centre

Phase One			
Centre:		Pamplona, Spain (Western Europe)	
Principal Investigator:		Professor Francisco Guillén-Grima	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:December 1993 to April 1994 6-7yr:December 1993 to May 1994
Sampling Frame:			

Phase Three			
Centre:		Pamplona, Spain (Western Europe)	
Principal Investigator:		Professor Francisco Guillén-Grima	
Age Groups:	13-14, 6-7	**Timeframe:**	December 2000 to June 2001
Sampling Frame:		All the schools in Pamplona Metropolitan Area	

Personnel

Professor Francisco Guillén-Grima

Dept Ciencias de la Slaud
UPNA
Avda. Baranain sn
Spain

Roles:

- Phase One Principal Investigator for Pamplona
- Phase Three Principal Investigator for Pamplona

Local Publications

The following publications used ISAAC data from Pamplona:

Fernández Benitez M, Guillén F, Marin B, Pajaron MJ, Brun C, Aguinaga I, Esteban MA, García B, Martínez González MA, Notivol P, Santos MA, Zapata MA. *International study of asthma and allergies in childhood.Results of the first phase of the I.S.A.A. C.project in Pamplona, Spain.* J Investig Allergol Clin Immunol 1996; 6(5): 288-93.

Carvalho N, Fernández-Benitez M, Cascante L, Aguinaga I, Guillén F. *International Study of Asthma and Allergies in Childhood.Results on rhinitis of first phase in Pamplona, Spain.* Allergol Immunopathol (Madr). 2000 Jul-Aug;28(4):207-12.

Ibargoyen-Roteta N, Aguinaga-Ontoso I, Fernández-Benitez M, Marin-Fernández B, Guillén-Grima F, Serrano-Monzo I, Hermoso-de-mendoza J, Brun-Sandiumetge C, Ferrer-Nadal A, Irujo-Andueza A. *Role of the home environment in rhinoconjunctivitis and eczema in schoolchildren in Pamplona, Spain.* J Investig Allergol Clin Immunol 2007; 17(3): 137-44.

Fernandez-Benitez M, Antnon J, Grima FG. *Risk factors associated to the prevalence of asthma in adolescence.* Allergol Immunopathol (Madr). 2007; 35(5):193-196

Panevezys Centre

Phase Three			
Centre:		Panevezys, Lithuania (Northern and Eastern Europe)	
Principal Investigator:		Professor Jurgis Bojarskas	
Age Groups:	13-14, 6-7	**Timeframe:**	April 1997 to May 1997
Sampling Frame:		All schools in Panevezys centre	

Personnel

Professor Jurgis Bojarskas

Kaunas Medical University
Clinics of Children's Diseases
Eiveniu 2
Lithuania

Roles:

- Phase Three Principal Investigator for Panevezys

Why our country joined ISAAC

We were late finding out about ongoing ISAAC studies, and so we were late with our Phase One results. Nevertheless, we were very eager to find out about the real situation concerning allergic diseases in Lithuania, especially among children, as being paediatric allergists and pulmonologists we saw the dramatically increasing numbers of allergic children. We selected the three biggest Lithuanian cities (Kaunas, Panevezys, Siauliai) as centres and examined all children from the secondary schools and kindergartens in them. Phase Three results were produced in time, as we already knew about the invitation to take part repeatedly in this survey. We were interested to see the dynamics of the prevalence of allergic diseases, which is why Kaunas centre completed repeat phases of ISAAC.

Impact of ISAAC in our country

Various lecturers (pediatric and adult) and even Health Ministry representatives quote our ISAAC data, when talking about the spreading of allergies in Lithuania. Then we are sitting proud, with our heads raised, as still there are no data about the prevalence of adult allergies in Lithuania. Some data from our Lithuanian ISAAC results were published in the most popular Lithuanian medical journal 'Medicina'.

Passo Fundo Centre

Phase Three			
Centre:		Passo Fundo, Brasil (Latin America)	
Principal Investigator:		Dr Arnaldo C Porto Neto	
Age Groups:	13-14	**Timeframe:**	June 2002 to December 2002
Sampling Frame:		13-14yr: All schools in Passo Fundo area.	

Personnel

Dr Arnaldo C Porto Neto

Asthma and Allergic Clinic
Rua Moron 2113
Brasil

Roles:

- Phase Three Principal Investigator for Passo Fundo

Local Publications

The following publications used ISAAC data from the Passo Fundo centre:

Porto Neto AC, D'Agostini Annes R, Wolff NMM, Klein AP, dos Santos FC, Dullius JL, Gressler M, Muller LS, Angonese CF, Menna-Barreto S. *Prevalence and Severity of Asthma, Rhinitis, and Atopic Eczema in 13- to 14-Year-Old Schoolchildren from Southern Brazil.* Allergy Asthma Clin Immunol 2006; 2(1): 3-10

Paysandú Centre

Phase Three			
Centre:		Paysandú, Uruguay (Latin America)	
Principal Investigator:		Dra María Cristina Lapides	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2002 to November 2002
Sampling Frame:		Some Schools in Paysandú state	

Personnel

Dra María Cristina Lapides

Hospital Paysandú
Ayacucho 1123
Uruguay

Roles:

- Phase Three Principal Investigator for Paysandú

Perth Centre

Phase One			
Centre:		Perth, Australia (Oceania)	
Principal Investigator:		Professor Louis Landau	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:March 1994 to December 1994 6-7yr:October 1994 to December 1994
Sampling Frame:			

Personnel

Professor Louis Landau

Faculty of Medicine and Dentistry
The University of Western Australia
Queen Elizabeth II Medical Centre
Australia

Roles:

- Phase One Principal Investigator for Perth

Dr Lyle J Palmer

University Department of Paediatrics
The University of Western Australia
GPO Box 855
Australia

Roles:

- Phase One collaborator for Perth

Professor Peter Sly

TVW Telethon Institute for Child Health Research
P O Box 855
Australia

Roles:

- Phase One collaborator for Perth

Perth Centre.

Perth was very pleased to participate in ISAAC. There are a number of internationally recognized experts in asthma and allergy working in Perth, ranging from research in the basic sciences to clinical care and long term cohort studies. It was appreciated that participation in a world wide study of the relationships between asthma/allergy and environmental factors would be complementary and add value to the work being done.

ISAAC Experience.

Apart from the contribution of data to the world wide analyses and reports, 2 separate studies of the Perth data have been published. One study aimed to investigate the relationship between socio-economic factors and symptoms of asthma and atopy in the 6-7 year old ISAAC cohort in Western Australia. Parental questionnaire responses were obtained in 2,193 children in 34 randomly selected primary schools in the Perth metropolitan area. Children born in Australia had a significantly increased risk of current asthma (OR 2.37, p=0.001). Having a mother born in Australia was the only factor independently associated with an increased risk of current hay fever (OR 1.56, p=0.005). Increasing numbers of people living in the home were significantly associated with a multiplicative decrease in risk of current asthma (OR 0.88,p=0.02)and eczema (OR0.82, p=0.01). Houses made of fibrocement (OR2.40,p=0.02) and the presence of mats on less than half the floor area in the main bedroom (relative to wall to wall carpet) were associated with an increased risk of current eczema (OR3.50,p=0.003). All reported associations were independent of socioeconomic status, age and sex. This study suggested that household and country specific environmental factors are associated with asthma, hay fever and eczema risk in 6-7 year old children, and may have contributed to the increased prevalence of these diseases in Australia.

Local Publications

The following publications used ISAAC data from the Perth centre:

Palmer LJ, Valinsky L, Pikora T, Zubrick SR, Landau LI. *Environmental factors and asthma and allergy in schoolchildren from Western Australia.* Eur Resp J 1999; 14(6):1351-7.

Palmer LJ, Valinsky L, Pikora T, Landau LI. *Do regular check-ups and preventive drug use reduce asthma severity in school children?* Aust Fam Phys 2004; 33(7): 573-6.

Another study investigated whether regular check-ups and preventive drug use reduced asthma symptoms in 2,193 primary school children in 34 primary schools aged 6-7 years and 3,650 secondary school children aged 13-14 years in 9 secondary schools, selected at random by cluster sampling. Asthma severity in the past 12 months was measured by the number of attacks of wheezing, visits to a doctor for care of an exacerbation of symptoms, visits to a hospital emergency department and admissions to hospital for wheezing or asthma. Analysis by multivariate ordinal logistic regression indicated that regular general practitioner check ups were associated with reduced asthma severity. Regular use of prophylactic and bronchodilator medications were associated with reduced symptoms. Asthma action plans and peak flow meter usage were associated with reduced hospital admissions. If these associations prove to be causal, then regular GP check-ups are particularly effective in reducing the health consequences of asthma in children.

References.

Palmer LJ, Valinsky L, Pikora T, Zubrick SR, Landau LI. The association of environmental factors with asthma and allergy in a population based sample of school children from Western Australia. Eur Resp J 1999;14:351-7.
Palmer LJ, Valinsky L, Pikora T, Landau LI. Do regular check-ups and preventive drug use reduce asthma severity in school children? Aust Fam Phys 2004; 33:573-6.

Acknowlegements.

National Health and Medical Research Council.
School of Paediatrics and Child Health, The University of Western Australia.
Telethon Institute for child Health Research.
Princess Margaret Hospital for Children, Perth, Western Australia.
Children, parents and school staff who participated in the surveys.

Pessac Centre

Phase One			
Centre:		Pessac, France (Western Europe)	
Principal Investigator:		Professor André Taytard	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:December 1993 to June 1994 6-7yr:November 1993 to June 1994
Sampling Frame:			

Personnel

Dr Chantal Raherison

Service des Maladies Respiratoires
Centre Francois Magendie
CHU de Bordeaux
5 Avenue Magellan
France

Roles:
- Phase One collaborator for Pessac

Professor André Taytard

Centre Hospitalier Universitaire de Bordeaux
Service des Maladies Respiratoires
Hôpital du Haut Lévêque
5, avenue de Magellan
France

Roles:
- Phase One Principal Investigator for Pessac

Pichincha Centre

Phase Two			
Centre:		Pichincha, Ecuador (Latin America)	
Principal Investigator:		Dr Phillip Cooper	
Age Groups:	7-17,	**Timeframe:**	May 2001 to January 2002.
Sampling Frame:		Three contiguous rural districts (cantons) within the province of Pichincha.	

Personnel

Dr Phillip Cooper

Laboratorio de Investigaciones
Hospital Pedro Vicente Maldonado
Casilla 17-14-30
Ecuador

Roles:
- Phase Two Principal Investigator for Pichincha

The ISAAC Story

Pimpri Centre

Phase Three			
Centre:		Pimpri, India (Indian Sub-Continent)	
Principal Investigator:		Dr Sundeep Salvi	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to October 2002
Sampling Frame:		13-14yr: Some schools in Pimpri-Chinchwad city 6-7yr:All schools in Pimpri-Chinchwad city	

Personnel

Dr Sundeep Salvi

Chest Research Foundation
Marigold Premises
Survey No. 15
Vadgaon Sheri
India

Roles:

- Phase Three Principal Investigator for Pimpri

Podgorica Centre

Phase Three			
Centre:		Podgorica, Serbia and Montenegro (Northern and Eastern Europe)	
Principal Investigator:		Dr Omer Adzovic	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2002 to April 2003
Sampling Frame:		Some schools in Podgorica Region.	

Personnel

Dr Omer Adzovic

Chief of Pulmonology Department
Children's Hospital
Kruševac bb
81000 Podgorica
Montenegro

Roles:

- Phase Three Principal Investigator for Podgorica

Dr Suzana Radulovic

Pediatrics at Children's Hospital
Mitra Bakica 138
Montenegro

Roles:

- Phase Three collaborator for Podgorica

Polokwane Centre

Phase Three			
Centre:		Polokwane, South Africa (Africa)	
Principal Investigator:		Professor Kuku Voyi	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2004 to March 2005
Sampling Frame:		All schools in a radius of 60 kilometers from the Polokwane Central Business District (CBD) in the Limpopo Province of South Africa.	

Personnel

Ms Chantelle Maritz

Department of Environmental and Occupational Health
School of Health Systems and Public Health
CSIR Building 22, University of Pretoria
PO Box 667
South Africa

Roles:

- Phase Three collaborator for Polokwane

Professor Kuku Voyi

Head, Department of Environmental and Occupational Health
School of Health Systems and Public Health
Faculty of Health Sciences
Univeristy of Pretoria
South Africa

Roles:

- Phase Three Principal Investigator for Polokwane

Local Publications

The following publications used ISAAC data from the Podgorica centre:

Živkovic Z, Vukašinovic Z, Cerovic S, Radulovic S, Živanovic S, Panic E, Hadnadjev M and Adžovic O. *Prevalence of childhood asthma and allergies in Serbia and Montenegro.* World J Pediatr 2010; 6(4): 331-336 epub May

Local Publications

The following publications used ISAAC data from Polokwane:

Wichmann J, Wolvaardt JE, Maritz C, Voyi KVV. *Household conditions, eczema symptoms and rhinitis symptoms relationship with wheeze and severe wheeze in adolescents living in the Polokwane area, South Africa.* J Asthma 2007; 44(8): 659-66.

Wichmann J, Wolvaardt JE, Maritz C, Voyi KVV. *Association between children's household living conditions and eczema in the Polokwane area, South Africa.* Health Place.2008 Jun;14(2):323-35.Epub Aug 2007.

Wichmann J, Wolvaardt JE, Maritz C, Voyi KVV. *Household Conditions, Eczema Symptoms and Rhinitis Symptoms Relationship with Wheeze and Severe Wheeze in Children Living in the Polokwane Area, South Africa.* Matern Child Health J.2009; 13(1):107-118.Epub Jan 2008.

POLOKWANE ISAAC STUDY CENTRE

A record of decision from an Environmental Impact Assessment (EIA) for the expansion of a Platinum smelter in Polokwane was the driver to get more information about the prevalence of respiratory diseases in the area. The ISAAC toolkit was found to be the most suitable to use. This was to be the second ISAAC centre in South Africa following Cape Town. ISAAC in Auckland was contacted to register the study site and we were promptly accepted and given an identification number. We received videos to accompany the questionnaires.

The education department in the Limpopo Province gave us permission to do the research in the schools. We used the Phase Three questionnaires and attempted to use the video. The questionnaires were translated into North Sotho. We studied the 6-7 year olds and 13-14 year old children. The use of the video questionnaire was abandoned due to the lack of electricity in other parts of the centre. However, this did not interfere with the success of the study.

The results informed the decision of the EIA. In turn the interest in asthma and allergies in childhood increased in researchers and physicians in the province. We believe that the data from Polokwane contributed to the mapping of the disease worldwide. The results were published in a number of journals.

Asthma and childhood allergies are a concern in both the developing and developed world. The results of the ISAAC world map indicate that. We have an intention of mapping asthma and allergies in South Africa, this might take long, but there are two centres that have results already. We indicated interest in ISAAC Phase Five, but this phase is not officially supported and will not go ahead. We are not going to be deterred by this, there is a study in Gauteng Province that is being proposed and the university and the Provincial education department has given permission to proceed. In addition to the Phase Three questionnaire, this study will also use the clinical Phase Two methodology. The video questionnaire will also be used with this population.

The ISAAC questionnaire is a good basic tool to use in assessing allergies in childhood. The flexibility of adding questions depending on the intended results makes it a valuable scientific tool.

Polynesie Francaise Centre

Phase Three			
Centre:		Polynesie Francaise, French Polynesia (Oceania)	
Principal Investigator:		Dr Isabella Annesi-Maesano	
Age Groups:	13-14	**Timeframe:**	February 2000 to February 2000
Sampling Frame:		13-14yr: All schools in Polynésie Française in order to represent all ethnic groups.	

Personnel

Dr Isabella Annesi-Maesano

EPAR Dept, INSERM, UMR- S 707
Faculté de Médecine Pierre et Marie Curie
Site Saint-Antoine
27 rue Chaligny 75571
France

Roles:
- National Coordinator for France
- Phase Three Principal Investigator for Polynesie Francaise

Dr Bernard Granger

Service de Pediatrie Hospital
98735 Uturoa
French Polynesia

Roles:
- Phase Three collaborator for Polynesie Francaise

Port-Gentil Centre

Phase Three			
Centre:		Port-Gentil, Gabon (Africa)	
Principal Investigator:		Dr Isabelle Ekoume Hypolite	
Age Groups:	13-14	**Timeframe:**	May 2002 to June 2003
Sampling Frame:		13-14yr: All secondary schools and primary schools except one secondary and one primary schools where white children were the most important.	

Personnel

Dr Isabelle Ekoume Hypolite

BP 428
Gabon

Roles:
- National Coordinator for Gabon
- Phase Three Principal Investigator for Port-Gentil

The ISAAC Story

Portimao Centre

Phase One			
Centre:		Portimao, Portugal (Western Europe)	
Principal Investigator:		Dr Carlos Nunes	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:May 1994 to June 1994 6-7yr:May 1994 to December 1994
Sampling Frame:			

Phase Three			
Centre:		Portimao, Portugal (Western Europe)	
Principal Investigator:		Dr Carlos Nunes	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2001 to April 2002
Sampling Frame:		We have performed all schools in Portimao area (public and private). The same sampling frame as Phase One.	

Personnel

Dr Carlos Nunes

Center of Allergy and Immunology of Algarve
R. Jose Antonio Marques, 3C - 4
Portugal

Roles:

- Phase One Principal Investigator for Portimao
- Phase Three Principal Investigator for Portimao

Porto Centre

Phase One			
Centre:		Porto, Portugal (Western Europe)	
Principal Investigator:		Dr José M Lopes dos Santos	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Oporto and neighbouring municipalities.	

Phase Three			
Centre:		Porto, Portugal (Western Europe)	
Principal Investigator:		Dr José M Lopes dos Santos	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2002 to July 2002
Sampling Frame:		All schools of the Oporto Metropolitan area (Oporto city and neighbouring municipalities). The same sampling frame as for Phase One.	

Personnel

Dr José M Lopes dos Santos

Departameto de Pediatria
Hospital Pedro Hispano
Rua Dr Eduardo Torres
4460 Senhora da Hora
Portugal

Roles:

- Phase One Principal Investigator for Porto
- Phase Three Principal Investigator for Porto

Local Publications

The following publications used ISAAC data from the Porto centre:

Solé D, Melo KC, Camelo-Nunes IC, Freitas LS, Britto M, Rosário NA, Jones M, Fischer GB, Naspitz CK. *Changes in the prevalence of asthma and allergic diseases among Brazilian schoolchildren (13-14 years old) comparison between ISAAC Phases One and Three.* J Trop Pediatr.2007 Feb;53(1):13-21.Epub Sep 2006.

Porto Alegre Centre

Phase One			
Centre:		Porto Alegre, Brasil (Latin America)	
Principal Investigator:		Professor Renato Stein	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:June 1994 to December 1994 6-7yr:June 1994 to September 1995
Sampling Frame:			

Phase Three			
Centre:		Porto Alegre, Brasil (Latin America)	
Principal Investigator:		Dr Gilberto B Fischer	
Age Groups:	13-14	**Timeframe:**	June 2002 to April 2003
Sampling Frame:		13-14yr: Schools in the Municipal area of Porto Alegre. Same sampling frame as Phase One.	

Local Publications

The following publications used ISAAC data from the Porto Alegre centre:

Solé D, Melo KC, Camelo-Nunes IC, Freitas LS, Britto M, Rosário NA, Jones M, Fischer GB, Naspitz CK. *Changes in the prevalence of asthma and allergic diseases among Brazilian schoolchildren (13-14 years old) comparison between ISAAC Phases One and Three.* J Trop Pediatr.2007 Feb;53(1):13-21.Epub Sep 2006.

The ISAAC Story

Personnel

Dr Gilberto B Fischer

Fundaçao Faculdade
Federal de Ciências Médicas de Porto Alegre
Rua Coronel Bordini 830/509
CEP 90440=003
Brasil

Roles:

- Phase Three Principal Investigator for Porto Alegre

Professor Renato Stein

Pediatric Pulmonary Unit
Department of Pediatrics
Pontificia Universidade Catolica RS
Av Ipiranga, 6690 conj. 420
Brasil

Roles:

- Phase One Principal Investigator for Porto Alegre
- Phase Three collaborator for Porto Alegre

In 2001 I had an invitation to proceed the Phase III of ISAAC study in Porto Alegre. I looked for help in my University (Universidade Federal de Ciencias da Saúde of Porto Alegre) in order to get funds to do it. Unfortunately I couldn't get it at that time. So I wrote an advertisement in the walls of the university looking for medical students to help me with that task. Seven of them came for an interview. Five agreed to participate with no payment. So I added a student of psychology to join the group. Some weeks later the group was trained and prepared to start the study. I managed to get free bus tickets for the visits to the schools and we finally started with the study. We included private and public schools in different areas of the city. Unfortunately we reached only 45% of the goal (3000 students 13-14y) by the end of that year. With the holidays period we had to wait until March of 2003 to finish the study. Three of the medical students had to leave it because they started their internship at that year. So we had to train other students. The same group was responsible for typing the data. When we finished the study we presented some basic results to the schools (mainly for those which asked for it in advance). Interestingly the schools directors where surprised with the prevalence (around 20%), which is above the national average. This is our brief story of ISAAC III in Porto Alegre

Poznan Centre

Phase One			
Centre:		Poznan, Poland (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Anna Brêborowicz	
Age Groups:	13-14, 6-7	**Timeframe:**	October 1994 to January 1995
Sampling Frame:			
Phase Three			
Centre:		Poznan, Poland (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Anna Brêborowicz	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to October 2002
Sampling Frame:		All school in Poznan and surroundings. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Associate Professor Anna Brêborowicz

Institute of Pediatrics
University of Medical Sciences
Str. Szpitalna 27/33
Poland

Roles:

- Phase One Principal Investigator for Poznan
- Phase Three Principal Investigator for Poznan

Local Publications

The following publications used ISAAC data from Poznan:

Lis G, Brêborowicz A, Swiatly A, Pietrzyk JJ, Alkiewicz J, Moczko J. *Prevalence of allergic diseases in schoolchildren in Krakow and Poznan (based on a standardized ISAAC questionnaire).[in Polish].* Pneumonol Alergol Pol.1997; 65(9-10): 621-7.

Lis G, Brêborowicz A, Cichocka-Jarosz E, Swiatly A, Glodzik I, Gazurek D, Sobkowiak P, Alkiewicz J, Pietrzyk JJ. *[Increasing prevalence of asthma in school children--ISAAC study (International Study of Asthma and Allergies in Children)].* Pneumonol Alergol Pol.2003;71(7-8):336-43.Polish.

Lis G, Brêborowicz A, Cichocka-Jarosz E, Sobkowiak P, Gazurek D, Swiatly A, Alkiewicz J, Pietrzyk JJ. *[The prevalence of allergic rhinitis and conjunctivitis in school children from Krakow and Poznan--ISAAC study (International Study of Asthma and Allergies in Childhood)].[Polish].[English Abstract.Journal Article.Multicenter Study].* Otolaryngol Pol.58(6):1103-9, 2004.

Provincial Korea Centre

Phase One			
Centre:		Provincial Korea, South Korea (Asia-Pacific)	
Principal Investigator:		Dr Sang-Il Lee	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:September 1995 to October 1995 6-7yr:September 1995 to December 1995
Sampling Frame:			

Phase Three			
Centre:		Provincial Korea, South Korea (Asia-Pacific)	
Principal Investigator:		Professor Ha-Baik Lee	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2000 to December 2000
Sampling Frame:		We obtained a complete school list from the Ministry of Education. We randomly sampled 24 schools in Provincial Korea area. We sampled 150 children from each grade. In Phase 3 study, we finish the study in the same school which had been participated in the Phase One study. Same sampling frame for both Phases, same schools used.	

Personnel

Dr. Kangmo Ahn

Department of Pediatrics
Samsung Medical Center
Sungkyunkwan University School of Medicine
50 Irwon-dong, Gangnam-gu, Seoul,
Korea

Roles:
- Phase One collaborator for Provincial Korea

Dr Soo-Jong Hong

Department of Pediatrics
Hanyang University College of Medicine
17 Haengdang-Dong
Sungdong-Ku
South Korea

Roles:
- Phase Three collaborator for Provincial Korea

Dr Sang-Il Lee

Samsung Medical Center
Dept. of Pediatrics
50 Irwon-Dong
Gangnam-gu
South Korea

Roles:
- Phase One Principal Investigator for Provincial Korea

Professor Ha-Baik Lee

Department of Pediatrics
Hanyang University College of Medicine
17 Haengdang-Dong
Sungdong-Ku
South Korea

Roles:
- National Coordinator for South Korea
- Phase Three Principal Investigator for Provincial Korea

Pune Centre

Phase One			
Centre:		Pune, India (Indian Sub-Continent)	
Principal Investigator:		Dr Neeta Milind Hanumante	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1994 to January 1995
Sampling Frame:			

Phase Three			
Centre:		Pune, India (Indian Sub-Continent)	
Principal Investigator:		Dr Neeta Milind Hanumante	
Age Groups:	13-14, 6-7	**Timeframe:**	July 2001 to September 2002
Sampling Frame:		All schools in Kothrud area, Pune. The same sampling frame as Phase One.	

Personnel

Dr Neeta Milind Hanumante

Ruby Hall Clinic
8, Avantili Apts
Happy Colony
Kothrud
India

Roles:
- Phase One Principal Investigator for Pune
- Phase Three Principal Investigator for Pune

The ISAAC Story

Punta Arenas Centre

Phase One			
Centre:		Punta Arenas, Chile (Latin America)	
Principal Investigator:		Dr Lidia Amarales	
Age Groups:	13-14, 6-7	**Timeframe:**	July 1994 to December 1994
Sampling Frame:			

Phase Three			
Centre:		Punta Arenas, Chile (Latin America)	
Principal Investigator:		Dr Lidia Amarales	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to December 2001
Sampling Frame:		All schools in Punta Arenas, the same sampling frame as Phase One.	

Personnel

Dr Lidia Amarales

Children Respiratory Service
Regional Hospital "Lautaro Navarro"
Av Colon 1144 Ofic 3
Chile

Roles:

- Phase One Principal Investigator for Punta Arenas
- Phase Three Principal Investigator for Punta Arenas

Dr Vanessa Reveco

Av. Bulnes
01641
Chile

Roles:

- Phase Three collaborator for Punta Arenas

Quito, Ecuador Coordinates: 00.15´00”S 78.35´00”W 2800 m. above sea level Population: 1,400,000 habits

Logo of the Ecuadorian Society of Allergy, Immunology and Allied Sciences (SEAICA)

Map of the city of Quito

Quito Centre

Phase Three			
Centre:		Quito, Ecuador (Latin America)	
Principal Investigator:		Dr Sergio Barba	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2003 to July 2003
Sampling Frame:		All schools in the urban area of Quito, grouped by socio-economic levels.	

Personnel

Dr Sergio Barba

Ecuadorian Allergy and Asthma Association
260 Vozandes
AXXIS-Medical centre of. 509
Ecuador

Roles:

- National Coordinator for Ecuador
- Phase Three Principal Investigator for Quito

WHY QUITO AND ISAAC?

SOCIEDAD ECUATORIANA DE ALERGOLOGÍA
INMUNOLOGÍA Y CIENCIAS AFINES (SEAICA)
FUNDADA EN 1961 - CASILLA 8884 - QUITO - ECUADOR

Like others places in the world, the study of allergic diseases until the last century were tailored with anarchic protocols and we felt that all were segmental and with many biases, which prevented correlation with other studies performed in other countries.

On behalf of the Ecuadorian Society of Allergy, Immunology and Allied Sciences (SEAICA), Dr. Sergio Barba MD, the President, contacted Javier Mallol MD, Regional Coordinator of ISAAC and through him with the International Program obtained the best support to undertake the ISAAC Three-b study since we had not participated in ISAAC Phase One. The first action was to make an adaptation to Ecuadorian terms the questionnaire implemented in the regional study. Then we made contact with researchers of Mind Marketing, an Institution that had experience with us in other studies of allergies in our country.

The ISAAC Story

With them, we planned the ISAAC WORK PLAN: we asked the Ministry of Education for the database of the primary and secondary schools of the urban area of the city, then separated the city into three sectors: North, Center and South and with socio-economic information of INEC (National Institute of Statistics and Census) we chose 40 establishments that represented the city demographically. Then we had an interview with rectors, directors and scholar physicians; we trained teachers about the questions of the poll, started the survey and sent the questions to parents of children aged 6-7 years old. With the teen's group, we gathered the students in a classroom and displayed the video. When they answered the questionnaire, with the help of an ISAAC investigator, they completed the second part of the document.
As an initiative of the SEAICA, we donated to the participating schools a First Aid Kit to thank them for their participation in the study.

The survey was finished in about 7 weeks, and then it was analyzed and sent to the ISAAC International Data Centre. Subsequently we made a few clarifications and successfully completed Phase Three-b in Quito, whose local coordinator was appointed as National Coordinator for this research.

It is important to acknowledge the support provided by the ISAAC international Data Centre. I believe that is important to emphasize that we do not receive financial aid from any pharmaceutical group to complete the work. We currently have the desire to make a new study (10 years later), and to be involved in the ISAAC Phase IV.

Rabat Centre

Phase One			
Centre:		Rabat, Morocco (Africa)	
Principal Investigator:		Professor Abedelkrim Bennis	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		The study was done in the town of Rabat. Sampling frame: All schools with school years containing the highest proportion of 13-14 years children, excepted those for handicaped children (3 schools).	

Personnel

Professor Abedelkrim Bennis

Résidence du Minaret
Angle rue Ammane-Yougoslavie (A coté du Cinéma Royal)
Numéro 24
2 ème étage
Morocco

Roles:

- Phase One Principal Investigator for Rabat

Ramallah Centre

Phase Two			
Centre:		Ramallah, Palestine (Eastern Mediterranean)	
Principal Investigator:		Dr Nuha El Sharif	
Age Groups:	6-12,	**Timeframe:**	September 2000.
Sampling Frame:		A two-stage sample of schools from Ramallah district, part of West Bank.	

Phase Three			
Centre:		Ramallah, Palestine (Eastern Mediterranean)	
Principal Investigator:		Dr Nuha El Sharif	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2000 to April 2001
Sampling Frame:		All schools in Ramallah District (public schools, UNRWA schools, and the private schools).	

Personnel

Dr Nuha El Sharif

Associate professor of Medical Sciences-Epidemiology
Alquds University, Faculty of Public Health
Abu Dies Camp PO Box 51915
Jerusalem
Palestine

Roles:

- National Coordinator for Palestine
- Phase Two Principal Investigator for Ramallah
- Phase Three Principal Investigator for Ramallah

Local Publications

El-Sharif N, Abdeen Z, Qasrawi R, Moens G, Nemery B. *Asthma prevalence in children living in villages, cities and refugee camps in Palestine.* Eur Respir J 2002; 19(6):1026-34.

El-Sharif N, Abdeen Z, Barghuthy F, Nemery B. *Familial and environmental determinants for wheezing and asthma in a case-control study of school children in Palestine.* Clin Exp Allergy 2003; 33(2): 176-86.

El Sharif N, Douwes J, Hoet PH, Doekes G, Nemery B. *Concentrations of domestic mite and pet allergens and endotoxin in Palestine.* Allergy 2004; 59(6): 623-31.

El-Sharif N, Douwes J, Hoet P, Nemery B. *Childhood asthma and indoor aeroallergens and endotoxin in Palestine a case-control study.* J Asthma 2006; 43(3): 241-7.

The ISAAC Story

Professor Benoit Nemery

KULeuven- Occupational, Environmental and Insurance Medicine
Afdeling Pneumologie
O&N I Herestraat 49
bus 00706-B-3000 Leuven
Belguim

Roles:

- Phase Three collaborator for Ramallah
- ISAAC Palestine adviser, Phase three and Phase Two

Why was this centre selected for ISAAC?

In a personal communication, year 2000, with Professor Ameen Thalji, a researcher in Pediatric's health in the West Bank and Jerusalem, he reported a gradient increase of childhood infections as seen at the emergency rooms and hospitals' clinics in the past 10 years. Thalji and Abdeen agreed that a potential justification could be the increased effect of indoor allergen especially house dusts mites and smoking, and outdoor air pollution by traffic and allergens which were also believed to be the main risk factors for increasing asthma in the Palestinian children (Professor Ameen Thalji and Professor Hani Abdeen, personal communication, 2000). Similarly, a case control study in Gaza Strip at the refugees' camps (1) indicated that house dust mites were probably important allergens in the region and has a major role in asthma trends and its severity among children especially at the coastal areas. Also, kerosene use for heating and cooking was a strong potential risk factor for developing asthma symptoms in those children, in addition to the effect of smoking and house dust mites. Therefore, poverty and humidity in Palestine and especially in Gaza Strip were considered important risk factors for asthma too.

Until year 2000, there was no real work that described the real situation or explored the possible risk factors and determinants of asthma in Palestine. The urban-rural and inland-coastal area differences were not studied in depth. Therefore, we decided at Al Quds University-Palestine in cooperation with KULeven Belgium to initiate several studies in two selected area (West Bank and Gaza Strip) that provide a framework for further etiological research into lifestyle, environmental, genetic and medical care factors affecting asthma prevalence and incidence. Ramallah governorate, the inland area, and Gaza governorate, the coastal area, were chosen for implementing the series of studies that was planned according to ISAAC protocols (phase three and phase 2).

ISAAC studies were used as a research that led to obtaining my own PhD, Nuha El Sharif PhD, from the K.U.Leuven.

Center findings
ISAAC Phase Three studies:

This phase was done in two governorates: Gaza and Ramallah governorates. After a two-stage stratified systematic sampling, approximately 14,500 schoolchildren, from the first and second grades of elementary school (ages 5 to 8 years) and eighth and ninth school grades (ages 12 to 15 years), were invited to participate in a survey using ISAAC phase III questionnaires and protocols.

The main study results showed that younger children had a higher 12-month wheezing prevalence rate of 9.6% compared to older children (7.2%) and more physician-diagnosed asthma (8.4% and 5.9%, respectively). However, nocturnal cough and exerciserelated wheezing were higher in the older age group compared with younger children. Younger children living in North Gaza district showed slightly higher prevalence rates for asthma and asthma symptoms, but older children had higher rates in Ramallah district. After adjustment using logistic regression analysis, male sex, living in inland areas, and younger age were shown to predict 12-month wheezing and physician-diagnosed asthma (2).

ISAAC phase 2

In the fall of 2000, 3382 schoolchildren aged 6-12 year were surveyed in 12 schools in Ramallah governorate, using ISAAC-phase III, parents-administered translated questionnaire. The crude prevalence rates for "wheezing ever", "wheezing in the previous 12 months", and "physician-diagnosed asthma"' were 17.1%, 8.8% and 9.4% respectively, with urban areas having higher prevalence rates than rural areas. Within urban areas, refugee camps had higher prevalence rates than cities. Yet, within the rural areas, the 12 months prevalence was lower in the deprived villages than other residence. Place of residence remained significant for asthma and asthma symptoms, after adjusting for gender, age, and place of birth (3).

To investigate the role of familial, early days' exposures, and indoor environmental determinants for asthma in children in Palestine, ISAAC phase 2 protocols were used. From the population of our previous study (3), a group of 273 children with wheeze in the past 12 months (of whom 99 children had physician-diagnosed asthma) were matched with an equal number of non-wheezing controls. This case-control study involved a parental questionnaire; skin prick testing (SPT) with mixed house dust mites, cat and dog dander, mixed grass, mixed trees pollen, Alternaria, olives tree, and cockroach extracts, and serum for total and specific IgE for the same 8 allergens (4). Moreover, to evaluate the relationship between wheezing or sensitization and concentrations of mites, cat and dog allergens, and bacterial endotoxin samples were taken from the mattress and floor dust of a 110 children's houses with reported wheezing and without wheezing (5,6).

The results showed that paternal asthma and maternal hay fever significantly tripled the risk for their children to have wheezing. Previous diagnoses of bronchial allergy, bronchitis, pneumonia, or whooping cough, and positive SPT for house dust mites and cockroaches were significantly more likely among wheezing and asthmatic children than controls. Specific IgE levels for house dust mites and cat allergens showed significantly higher risk to report wheezing. Domestic damp spots and visible moulds were reported more for both wheezing and asthmatic children. After adjustment for several environmental and socio-demographic factors using multivariate logistic regression analysis, paternal asthma, maternal hay fever, damp houses, and cockroach allergen positivity proved to be strong predictors for wheezing symptoms (4).

No consistent associations between allergen levels and either wheeze or specific atopic sensitization were found. Furthermore, no clear associations between mattress endotoxin levels and wheeze or atopy were found. Endotoxin in floor dust was inversely associated with atopic sensitization and wheeze, statistically significant only for atopic wheeze. Finally, a non-significant inverse association was observed between living room endotoxin and atopy within the non-wheezing control group (5,6).

The conclusion of phase 2 confirmed that familial "atopic" diseases are significant predictors of childhood asthma. Moreover, indoor environment such as domestic moulds also appears to play a role. Also, results suggest that endotoxin on living room floors might protect against atopic wheeze in the Palestinian children.

References

1. Mumcuoglu KY, Abed Y, Armenios B, et al. Asthma in Gaza refugee camp children and its relationship with house dust mites. **Ann.Allergy** 1994; **72**: 163-166.
2. El-Sharif NA, Nemery B, Barghuthy F, Mortaja S, Qasrawi R, Abdeen Z. Geographical variations of asthma and asthma symptoms among schoolchildren aged 5 to 8 years and 12 to 15 years in Palestine: the International Study of Asthma and Allergies in Childhood (ISAAC). Ann Allergy Asthma Immunol. 2003 Jan;90(1):63-71.
3. El-Sharif N, Abdeen Z, Qasrawi R, Moens G, Nemery B. Asthma prevalence in children living in villages, cities and refugee camps in Palestine. Eur Respir J. 2002 Jun;19(6):1026-34.
4. El-Sharif N, Abdeen Z, Barghuthy F, Nemery B. Familial and environmental determinants for wheezing and asthma in a case-control study of school children in Palestine. Clin Exp Allergy. 2003 Feb;33(2):176-86.
5. El Sharif N, Douwes J, Hoet PH, Doekes G, Nemery B. Concentrations of domestic mite and pet allergens and endotoxin in Palestine. Allergy. 2004 Jun;59(6):623-31.
6. El-Sharif N, Douwes J, Hoet P, Nemery B. Childhood asthma and indoor aeroallergens and endotoxin in Palestine: a case-control study. J Asthma. 2006 Apr;43(3):241-7.

Rarotonga Centre

Phase Three			
Centre:		Rarotonga, Cook Islands (Oceania)	
Principal Investigator:		Dr Roro Daniel	
Age Groups:	13-14	**Timeframe:**	February 2003 to February 2003
Sampling Frame:		13-14yr: All schools in the Cook Islands.	

Personnel

Dr Roro Daniel

Health Manager
Ministry of Health, Cook Islands
Box 109
Avarua
Cook Islands

Roles:

- National Coordinator for Cook Islands
- Phase Three Principal Investigator for Rarotonga

Dr Teariki Tamarua

Ministry of Health
PO Box 109
Rarotonga
Cook Island

Roles:

- Phase Three collaborator for Rarotonga

Local Publications

The following publications used ISAAC data from the Rasht centre:

Fadaizadeh L, Salek S, Najafizadeh K, Masjedi MR *Prevalence and Severity of Asthma Symptoms in Students of Tehran and Rasht Phase III ISAAC Study* Tanaffos (2008) 7(3), 31-36

Najafizadeh K, Fadaizadeh L, Salek S *Prevalence and Severity of Asthmatic Symptoms in Rasht Students A Report from ISAAC Study.* TANAFFOS 2008; 7(1):40-46.

Recife

Rasht Centre

Phase One			
Centre:		Rasht, Iran (Eastern Mediterranean)	
Principal Investigator:		Dr Mohammed-Reza Masjedi	
Age Groups:	13-14, 6-7	**Timeframe:**	October 1995 to November 1995
Sampling Frame:			

Phase Three			
Centre:		Rasht, Iran (Eastern Mediterranean)	
Principal Investigator:		Dr Mohammed-Reza Masjedi	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2002 to April 2002
Sampling Frame:		All schools in Rasht Urban region, same sampling frame as Phase One.	

Personnel

Dr Mohammed-Reza Masjedi

Masih Daneshvary Hospital
Dorabad
Shaheed Bahoner Ave
Darabad
Iran

Roles:

- National Coordinator for Iran
- Phase One Principal Investigator for Rasht
- Phase Three Principal Investigator for Rasht

Rasta Peth Centre

Phase Three			
Centre:		Rasta Peth, India (Indian Sub-Continent)	
Principal Investigator:		Associate Professor Sheila Bhave	
Age Groups:	13-14, 6-7	**Timeframe:**	July 2001 to October 2002
Sampling Frame:		Some schools in Rasta Peth, Pune area - English, and Marathi schools.	

Personnel

Associate Professor Sheila Bhave

Department of Pediatrics
KEM Hospital Research Centre
Sardar Moodliar Road
Rasta Peth
India

Roles:

- Phase Three Principal Investigator for Rasta Peth

Recife Centre

Phase One			
Centre:		Recife, Brasil (Latin America)	
Principal Investigator:		Dr Patricia Gomes M Bezerra	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to December 1995 6-7yr:November 1994 to November 1994
Sampling Frame:			

Phase Three			
Centre:		Recife, Brasil (Latin America)	
Principal Investigator:		Dr Murilo de Britto	
Age Groups:	13-14	**Timeframe:**	September 2002 to December 2002
Sampling Frame:		13-14yr: Public and private schools in the metropolitan region of Recife. The same sampling frame as Phase One.	

Personnel

Dr Patricia Gomes M Bezerra

Rua Sebastião Malta Arcoverde, 157
Brasil

Roles:

- Phase One Principal Investigator for Recife

Dr Murilo de Britto

Roles:

- Phase Three Principal Investigator for Recife

Coordinator
IMIP
Rua dos Coelhos
300 Boa Vista
Brasil

The ISAAC Story

Recife Centre

Founded in Recife, Brazil in 1960 by Fernando Figueira, the “Instituto de Medicina Integral Prof. Fernando Figueira – IMIP" is philanthropic organization acting in health care, professional health education and research, directed especially to the poor communities of the State of Pernambuco, Northeast Brazil. The IMIP´s hospital was the first in Brazil to receive the title "Baby Friendly Hospital", awarded by the World Health Organization / UNICEF / Ministry of Health. The pediatric sector of IMIP performs more than 900 outpatient visits and 30,000 hospitalizations per month. The department of respiratory diseases performs about 400 outpatient visits a month, mostly asthmatics. It is the state referral center for cystic fibrosis and other paediatric pulmonary diseases of greater complexity.

ISAAC Project allowed, in a comparative way with other centers in Brazil and abroad, knowledge of the prevalence of asthma, rhinitis and other allergies in our region. It also allowed the development of research on risk factors, such as the relationship of asthma with poverty. In the population of Recife, consisting of individuals with high racial miscegenation and still high incidence of poverty and social inequality, the prevalence of symptoms of asthma and rhinitis in schoolchildren reach about 20%.

Republic of Ireland Centre

Phase One			
Centre:		Republic of Ireland, Republic of Ireland (Western Europe)	
Principal Investigator:		Professor Luke Clancy	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		National survey of Ireland.	

Phase Three			
Centre:		Republic of Ireland, Republic of Ireland (Western Europe)	
Principal Investigator:		Professor Luke Clancy	
Age Groups:	13-14	**Timeframe:**	November 2002 to April 2003
Sampling Frame:		13-14yr: All secondary schools in the Republic of Ireland, excluding special schools (e.g. mentally handicapped)	

Personnel

Professor Luke Clancy

Director General,
Tobacco Free Research Institute,
Digital Depot
Dublin
Republic Of Ireland

See Republic of Ireland Country page

Roles:

- Phase One Principal Investigator for Republic of Ireland
- Phase Three Principal Investigator for Republic of Ireland

Reunion Island Centre

Phase Three			
Centre:		Reunion Island, Reunion Island (Africa)	
Principal Investigator:		Dr Isabella Annesi-Maesano	
Age Groups:	13-14	**Timeframe:**	May 2000 to May 2000
Sampling Frame:		13-14yr: Random sample of state junior high schools. Private junior high schools were not included.	

Personnel

Dr Isabella Annesi-Maesano

EPAR Dept, INSERM, UMR- S 707
Faculté de Médecine Pierre et Marie Curie
Site Saint-Antoine
27 rue Chaligny 75571
France

Roles:

- National Coordinator for France
- Phase Three Principal Investigator for Reunion Island

Dr Bernard Granger

Service de Pediatrie Hospital
98735 Uturoa
French Polynesia

Roles:

- Phase Three collaborator for Reunion Island

Local Publications

The following publications used ISAAC data from Recife:

De Britto MC, Bezerra PG, Ferreira OS, Maranhao IC, Trigueiro GA. *Asthma prevalence in schoolchildren in a city in north-east Brazil.* Ann Trop Paediatr.2000 Jun;20(2):95-100.

Britto MCA, Bezerra P, Giovannino Ciccone M, Brito RCCM, Rego JC, Burity EF, Alves JGB. *Asthma in schoolchildren from Recife, Brazil.Prevalence comparison 1994-95 and 2002.* J Pediatr (Rio J) 2004; 80(5):391-400.

Solé D, Melo KC, Camelo-Nunes IC, Freitas LS, Britto M, Rosário NA, Jones M, Fischer GB, Naspitz CK. *Changes in the prevalence of asthma and allergic diseases among Brazilian schoolchildren (13-14 years old) comparison between ISAAC Phases One and Three.* J Trop Pediatr.2007 Feb;53(1):13-21.Epub Sep 2006.

Franco JM, Gurgel R, Sole D, França VL, Brabin B and the Brazilian Isaac Group. *Socio-environmental conditions and geographical variability of asthma prevalence in Northeast Brazil* Allergol Immunopathol (Madr). 2009; 37(3):116-121

Brito RdCCM, da Silva GAP, Motta MEFA Brito MCA. *The association of rhinoconjunctivitis and asthma symptoms in adolescents* Rev Port Pneumol 2009; 15(4): 613-628

Local Publications

The following publications used ISAAC data from the Reykjavik centre:

Clausen M, Kristjansson S, Haraldsson A, Björkstén B. *High prevalence of allergic diseases and sensitization in a low allergen country.* Acta Paediatr.2008 Jul 9; 97(9): 1216-1220.

Reykjavik Centre

Phase Two			
Centre:		Reykjavik, Iceland (Northern and Eastern Europe)	
Principal Investigator:		Dr Michael Clausen	
Age Groups:	,	**Timeframe:**	May 2000.
Sampling Frame:		All children in the fifth grade year in Reykjavik and the adjacent areas of Kópavogur and Garóabær.	

Personnel

Dr Michael Clausen

Landspitalinn Hákskólasjúkrahus
Department of Paediatrics
600 Akureyri
Iceland

Roles:
- Phase Two Principal Investigator for Reykjavik

Riga Centre

Phase One			
Centre:		Riga, Latvia (Northern and Eastern Europe)	
Principal Investigator:		Dr Marcis Leja	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:May 1994 to February 1995 6-7yr:October 1994 to October 1995
Sampling Frame:			

Phase Two			
Centre:		Riga, Latvia (Northern and Eastern Europe)	
Principal Investigator:		Dr Vija Svabe	
Age Groups:	10-11 years,	**Timeframe:**	May 1999 to November 1999.
Sampling Frame:		A random sample of 11 Latvian-speaking schools within the capital city.	

Phase Three			
Centre:		Riga, Latvia (Northern and Eastern Europe)	
Principal Investigator:		Dr Vija Svabe	
Age Groups:	13-14	**Timeframe:**	January 2004 to May 2004
Sampling Frame:		13-14yr: All schools in Riga (Administrative Territory of the City). The same sampling frame as Phase One.	

Personnel

Linda Bagrade

Children Clinical University Hospital
Riga
Latvia

Roles:
- Phase Two collaborator for Riga

Guna Casno

Children Clinical University Hospital
Riga
Latvia

Roles:
- Phase Two collaborator for Riga

Dr Marcis Leja

Associate professor at the Faculty of Medicine, University of Latvia
Head of the Dept. of Research, Riga East University hospital
Latvia

Roles:
- Phase One Principal Investigator for Riga

Inga Novikova

Children Clinical University Hospital
Riga
Latvia

Roles:
- Phase Two collaborator for Riga

Dina Sebre

Children Clinical University Hospital
Riga
Latvia

Roles:
- Phase Two collaborator for Riga
- Phase Three collaborator for Riga

Assistant Professor Vija Svabe

Pediatrics Chair, Riga Stradins University
Paediatrician, pulmonologist, allergologist
Pulmonology department, Children Clinical University Hospital
Riga
Latvia

Roles:
- Phase Two Principal Investigator for Riga
- Phase Three Principal Investigator for Riga

The ISAAC Story

In the ninetieths, last century, something happened in Latvia – or maybe in the whole world? We, children pulmonologists and allergologists, noticed that prevalence of asthma in children is increasing. There was new theoretical basis, new asthma clinical criteria and medicine. We ourselves made National Asthma Guidelines, taking example from other countries and begun to teach new allergologists. But we did not organise prevalence studies.

And then arrived professor Bjorksten – with offer to take part in International Study of Asthma and Allergy in Children. **ISAAC Phase One** was performed by Marcis Leja, who organised special institution for that purpose – Human Ecology Institute. From 1994 till 1995 with help of paediatricians in two centres – Riga and Rural Latvia two age groups of children completed questionnaires about asthma and allergies.

ISAAC PHASE ONE IN LATVIA

Having been involved in number of ecology-related epidemiology projects in our country, we got excited of the ISAAC Project idea as well as the possibility for our country to participate in the project. We have been impressed by the enthusiasm of our later regional co-ordinator Professor Bengt Björksten and were happy to work with him as well as other ISAAC investigators. Close to half of the population of our country is concentrated in and around its capital – Riga. By considering the potential disease epidemiology differences between urban and rural regions we decided to achieve the maximum goal – to run a centre either in Riga or in the rural part of the country. And we were happy indeed that the set goal was achieved! There are three major issues to be pointed out – the expertise, the epidemiology, and the involvement.

THE EXPERTISE

For Latvia, having been separated from the western world for many years by the Soviet Union, this was one of the first great opportunities to get involved in a well-designed truly global research project. The design of the study, thorough translation process of the questionnaires to the local language, data entry and many other issues – all this was a great educational process for ourselves to apply this knowledge for further study design by ourselves already following the involvement to ISAAC.

THE EPIDEMIOLOGY

I recall the provocative statement of our regional co-ordinator Bengt Björksten that the key to the pathogenesis of allergies is laying in the Baltic region due to rapid changes in the lifestyle being determined by the political situation. Once westernized Baltic States were forced to accept the Soviet lifestyle in the 20-ies of the previous century; and then once more rapid changes to the westernized style of life by 90-ies – this has definitely left an influence. Even though the pathogenesis of allergic and many other diseases have not been finally elucidated until today, there is much truth in this consideration. We do find differences in the prevalence not only in allergic disease, but also other diseases, including inflammatory bowel disease, Barrett's oesophagus, etc.; in addition we observe changing epidemiology of these diseases. And there is much space and need to run well-designed epidemiology studies with these and other diseases – similar to what ISAAC has completed in asthma and allergy.

THE INVOLVEMENT

Although this was a great chance for Latvia to run ISAAC, the practical issues behind this were completely different. This was the time when the government had cut down the funding for research to close than nothing, and this was requiring huge energy and a little bit of success to get the study completed. We acknowledge our sponsors, in particular, the Riga Commercial Port as well as Latvian Council of Science to get the project on track. Nevertheless this would not have been possible without the active involvement of a group of enthusiastic people, at that time being joined by the ECO club of the former Riga Medical Institute. My special thanks to paediatrician-allergologist Ieva C?rule and our technical manager – Uldis Ziedi?š.

M?rcis Leja
National co-ordinator of ISAAC Phase I in Latvia
Associate professor at the Faculty of Medicine, University of Latvia
Head of the Dept. of Research, Riga East University hospital

ISAAC PHASE TWO & THREE IN LATVIA

The next stage was, when Marcis Leja decided to become a gastroenterologist and not to continue with ISAAC. Our colleges in Latvian Children Clinical University Hospital trusted me to attend instruction about ISAAC Phase Two in Linkoping and further – all organisations.

Professor Bengt Bjorksten, regional coordinator of ISAAC for Northern and Eastern Europe, certified me as a national coordinator in Latvia of ISAAC Phase 2 and 3 studies. He told that European Union decided to support the ISAAC studies as a Concerted Action and there will be funds to cover the costs for skin prick reagents and we may borrow the necessary equipment from Linkoping University Hospital Pulmonology department that will allow as performing lung function tests with hypertonic saline. That information answered all essential questions and confirmed that it is considered as important to include Riga in this major European and Global collaborative effort.

In **ISAAC Phase Two** we had one centre – Riga, we worked from 1999 till 2001 in11 schools and collaborators were: Dina Sebre, Guna Casno, Inga Novikova, Linda Bagrade, all – postgraduate students in paediatrics, from Children Clinical University Hospital, Riga, Vienibas gatve 45. Parents completed questionnaires, skin was examined, skin prick tests performed and bronchial responsiveness to hypertonic saline examined.

ISAAC Phase Three in Latvia (year 2004) was as repetition of Phase One, but not so successful. Only one collaborator helped me – Dina Sebre – now paediatrician – allergologist . She hoped that study could be part of her thesis, but she did not continue. 1354 13 – 14 year olds were involved and 425 6 – 7 year olds (but they were no accepted), so we have results only about adolescents. It is interesting, that prevalence of asthma has a very small increase – in ten years – from 8.3% to 10, 5%. I suppose – maybe it is because of poorly developed industry in Latvia and it is good?

Now we are using GINA Guidelines for asthma diagnosing and treatment. But our most serious problem is “wheezing disorders in preschool children” and my personal (as pulmonologist) – cystic fibrosis.

Vija Svabe
Docent (or assistant professor)
Pediatrics Chair, Riga Stradins University
Dzirciema str 16, Riga, LATVIA
Paediatrician, pulmonologist, allergologist
Pulmonology department, Children Clinical University Hospital

Rijeka Centre

Phase Three			
Centre:		Rijeka, Croatia (Northern and Eastern Europe)	
Principal Investigator:		Dr Kristina Lah Tomulic	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2001 to December 2002
Sampling Frame:		Some schools in Rijeka region	

Personnel

Dr Kristina Lah Tomulic

Clinical Hospital Center Rijeka
Children Hospital Kantrida
Istarska 43
Croatia

Roles:

- Phase Three Principal Investigator for Rijeka

Roma Centre

Phase One			
Centre:		Roma, Italy (Western Europe)	
Principal Investigator:		Dr Francesco Forastiere	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1994 to March 1995 6-7yr:October 1994 to May 1995
Sampling Frame:			

Phase Two			
Centre:		Roma, Italy (Western Europe)	
Principal Investigator:		Dr Francesco Forastiere	
Age Groups:	9-11,	**Timeframe:**	October 2000 to April 2001.
Sampling Frame:		The metropolitan area of Rome (municipalities of Roma and Fiumicino). Same study area as ISAAC Phase One.	

Phase Three			
Centre:		Roma, Italy (Western Europe)	
Principal Investigator:		Dr Francesco Forastiere	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to May 2002
Sampling Frame:		All schools in the city of Rome. The same sampling frame as Phase One.	

Personnel

Mr Guiseppe Corbo

Servizio di Fisiopatologia Respiratoria
Università Cattolica del Sacro Cuore
Largo F. Vito 1
Italy

Roles:

- Phase Two collaborator for Roma

Dr Francesco Forastiere

Department of Epidemiology
Rome E Health Authority 00198
Roma
Via Santa Costanza 53
Italy

Roles:

- ISAAC Steering Committee
- National Coordinator for Italy
- Phase One Principal Investigator for Roma
- Phase Two Principal Investigator for Roma
- Phase Three Principal Investigator for Roma

Dr Riccardo Pistelli

Università Cattolica Sacro Cuore
Servizio Fisiopatologia Respiratoria
Complesso Integrato Columbus
Via Moscati 31
Italy

Roles:

- Phase Two collaborator for Roma

Dr Giovanni Viegi

Istituto di Fisiologia Clinica
Consiglio Nationale delle Ricerche
Via Trieste, 41
Italy

Roles:

- Phase One collaborator for Roma
- Phase Three collaborator for Roma

See Italy country page for details of ISAAC in Rome

Rosario Centre

Phase One			
Centre:		Rosario, Argentina (Latin America)	
Principal Investigator:		Dr Natalio Salmun	
Age Groups:	13-14, 6-7	**Timeframe:**	August 1995 to November 1995
Sampling Frame:			

Personnel

Dr Ricardo Ensinck

Allergy Service.
Hospital de Niños de Rosario
San Luis 3472.
Rosario, Prov. De Santa fe
Argentina

Roles:

- Phase One collaborator for Rosario

Dr. Dario Josviack

Colon 254.
Rafaela.
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Argentina

Roles:

- Phase One collaborator for Rosario

The ISAAC Story

Dr Hugo Neffen

Centro de Alergia e Inmunologia
Children's Hospital "Orlando Alassia"
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Roles:
- Phase One collaborator for Rosario

Dr Natalio Salmun

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Argentina

Roles:
- Phase One Principal Investigator for Rosario

Dr. Lorenzo Fernandez Viña

Alvear 116
San Nicolas.
Prov. de Buenos Aires
Argentina

Roles:
- Phase One collaborator for Rosario

Rosario City Centre

Phase Three			
Centre:		Rosario City, Argentina (Latin America)	
Principal Investigator:		Prof Dr Carlos D Crisci	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to November 2001
Sampling Frame:		Some schools in Rosario Urban area	

Personnel

Prof Dr Carlos D Crisci

Department of Medical Pathology
School of Medicine
National University of Rosario
España 931
Argentina

Roles:
- Phase Three Principal Investigator for Rosario City

Dr Ricardo Ensinck

Allergy Service.
Hospital de Niños de Rosario
San Luis 3472.
Rosario, Prov. De Santa fe
Argentina

Roles:
- Phase Three collaborator for Rosario City

Rural Kharkiv Centre

Phase Three			
Centre:		Rural Kharkiv, Ukraine (Northern and Eastern Europe)	
Principal Investigator:		Associate Professor Viktor Ognev	
Age Groups:	13-14, 6-7	**Timeframe:**	February 1998 to November 1999
Sampling Frame:		Rural Towns and villages in Kharkov centre 002 - ecology clean districts.	

Personnel

Associate Professor Viktor Ognev

Head, Department of Social Medicine
Organization and Economics of Public Health
Kharkov State Medical University
4 Lenin Avenue
Ukraine

Roles:
- National Coordinator for Ukraine
- Phase Three Principal Investigator for Rural Kharkiv

See Kharkiv page for details

Rural Latvia Centre

Phase One			
Centre:		Rural Latvia, Latvia (Northern and Eastern Europe)	
Principal Investigator:		Dr Marcis Leja	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		4 administrative regions (less polluted) N part of Latvia.	

The ISAAC Story

Personnel

Dr Marcis Leja

Associate professor at the Faculty of Medicine, University of Latvia
Head of the Dept. of Research, Riga East University hospital
Latvia

See Riga page for details

Roles:

- Phase One Principal Investigator for Rural Latvia

Rural Santa Maria Centre

Phase Three			
Centre:		Rural Santa Maria, Brasil (Latin America)	
Principal Investigator:		Professor Dirceu Solé	
Age Groups:	13-14	**Timeframe:**	May 2003 to August 2003
Sampling Frame:		13-14yr: All schools in 20 cities from 25 to 100 Km from Santa Maria. The cities had less than 20,000 inhabitants.	

Personnel

Dr Vitor Emanuel Cassol

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- Phase Three PI for Santa Maria and Rural Santa Maria Deceased 2008

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Professor Dirceu Solé

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Roles:

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- Phase Three Principal Investigator for Rural Santa Maria

Dr Stefania Teche

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Roles:

- Phase Three collaborator for Rural Santa Maria

When ISAAC phase 1 had begun, in the middle of the 1990's, the standard written questionnaire (WQ) had not yet been validated for Portuguese language (Brazilian culture). After been validated (1,2,3) the ISAAC WQ was used by several investigators, independently to be involved with ISAAC Project.

In phase 1 had participated 7 Brazilian centers including São Paulo (4), five of them had participated in both phases 1 and 3 (5,6). São Paulo is the largest city in Brazil. More than 12 million of people live in São Paulo, so obtain homogeneous sample of schoolchildren as recommended by the ISAAC protocol, was not possible. Therefore, we limited the study to two parts of the city: southern and western. In the southern region lies second airport of Brazil in terms of traffic and in the western region there are several roads with jam traffic. In São Paulo we could analyze the influence of exposure to photochemical pollutants on the prevalence of asthma and allergic diseases (7). In part of the students evaluated we applied the complementary questionnaire and risk factors associated with the expression of asthma and allergic diseases were analyzed (8). The comparison between the prevalence of asthma and allergic diseases obtained in phase 1 and phase 3 showed to be constant (6). Other interesting issue was the genetic background impact on the expression of asthma and atopic diseases. Although we have evaluated schoolchildren with asthma and similar socio-economic level, there were differences according to risk factors for presentation of asthma in children born from exclusively Japanese progeny and native Brazilian children. These data reinforces the idea that asthma in Brazilian children is more than a single disease.

The ISAAC study in Santa Maria (Rio Grande do Sul, Brazil) was performed by Dr Victor E. Cassol and when the data collection was finished, several investigations were carried out. Considering that population of Santa Maria was theoretically homogeneous and with few miscegenation, the prevalence of asthma and allergic diseases was evaluated according to local characteristics like living in urban or rural areas, which allowed a more appropriate comparison of the environment influence on the expression of asthma and allergic diseases. Other interesting study was about the relationship between obesity and prevalence and severity of asthma among adolescents. Both studies were published (9,10,11) in peer reviewed journals and after the decease of Dr Cassol, I assumed the coordination of the centers in Santa Maria.

References

1. Solé D, Vanna AT, Yamada E, Rizzo MC, Naspitz CK. International Study of Asthma and Allergies in Childhood (ISAAC) written questionnaire: validation of the asthma component among Brazilian children. J Investig Allergol Clin Immunol. 1998;8(6):376-82.
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3. Yamada E, Vanna AT, Naspitz CK, Solé D. International Study of Asthma and Allergies in Childhood (ISAAC): validation of the written questionnaire (eczema component) and prevalence of atopic eczema among Brazilian children.J Investig Allergol Clin Immunol. 2002;12(1):34-41.
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5. Solé D, Camelo-Nunes IC, Wandalsen GF, Sarinho E, Sarinho S, Britto M, et al. Ecological correlation among prevalence of asthma symptoms, rhinoconjunctivitis and atopic eczema with notifications of tuberculosis and measles in the Brazilian population. Pediatr Allergy Immunol. 2005;16(7):582-6.
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8. Pastorino AC, Rimazza RD, Leone C, Castro AP, Solé D, Jacob CM. Risk factors for asthma in adolescents in a large urban region of Brazil. J Asthma. 2006;43(9):695-700.
9. Cassol VE, Rizzato TM, Teche SP, Basso DF, Hirakata VN, Maldonado M, et al. Prevalence and severity of asthma among adolescents and their relationship with the body mass index. J Pediatr (Rio J). 2005;81(4):305-9.
10. Cassol VE, Rizzato TM, Teche SP, Basso DF, Centenaro DF, Maldonado M, et al. - Obesity and its relationship with asthma prevalence and severity in adolescents from southern Brazil. J Asthma. 2006;43(1):57-60.
11. Solé D, Cassol VE, Silva AR, Teche SP, Rizzato TM, Bandim LC, et al. - Prevalence of symptoms of asthma, rhinitis, and atopic eczema among adolescents living in urban and rural areas in different regions of Brazil. Allergol Immunopathol (Madr). 2007;35(6):248-53.

Local Publications

The following publications used ISAAC data from the Salta centre:

Gómez M, Vollmer WM, Caceres ME, Jossen R, Baena-Cagnani CE. *Adolescent smokers are at greater risk for current asthma and rhinitis* Int J Tuberc Lung Dis 2009; 13(8):1023-1028

Salta

Salta Centre

Phase Three			
Centre:	Salta, Argentina (Latin America)		
Principal Investigator:	Dr Maximiliano Gómez		
Age Groups:	13-14	**Timeframe:**	September 2002 to October 2002
Sampling Frame:	13-14yr: ALL SCHOOLS INSIDE THE LIMITS OF SALTA CITY		

Personnel

Dra Maria E. Caceres

Hospital San Bernardo,
Salta,
Argentina.

Roles:
- Phase Three collaborator for Salta
- Sub Investigator

Dr R. Maximiliano Gómez

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Dean Funes 924
Salta
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Roles:
- Phase Three Principal Investigator for Salta

Ms Leonor Guitián

Hospital San Bernardo,
Salta,
Argentina.

Roles:
- Phase Three collaborator for Salta

The ISAAC Story

Ms Josefa Martinez

Hospital San Bernardo,
Salta,
Argentina.

Roles:

- Phase Three collaborator for Salta
- Collaborator in field and logistic.

Why Salta was chosen?

Salta is a valley located in the north of Argentina, limiting with Chile and Bolivia, having half a million inhabitants who are Aboriginal and European descendents. Like other developing cities, in a developing country, it was expected that allergic diseases were becoming more frequently recognized, but no reliable data was available. It was the northern site from Argentina that took part in this Phase III ISAAC study.

Our experience

All people involved in the survey were really enthusiastic, since we had a response rate higher than 95%.

The national coordination by Prof. Carlos E. Baena-Cagnani let the argentinean centers contributing to the data of Latin America situation in atopic diseases, where the hygiene hypothesis seems to have a marginal effect. References (1 – 2) are interesting to read about that.

Besides, in our place we added to the original questionnaire some questions regarding smoking status, both personal and passive, as we interviewed students of 13-14 years old. This data demonstrate a significant association of smoking with asthma and rhinitis symptoms, reinforcing the harmful effects on them (3).

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1. Solé D, Mallol J, Wandalsen GF, Aguirre V; Latin American ISAAC Phase 3 Study Group. Prevalence of symptoms of eczema in Latin America: results of the International Study of Asthma and Allergies in Childhood (ISAAC) Phase 3. J Investig Allergol Clin Immunol. 2010;20(4):311-23.
2. 7.47) Mallol J, Solé D, Baeza-Bacab M, Aguirre-Camposano V, Soto-Quiros M, Baena-Cagnani C; Latin American ISAAC Group. Regional variation in asthma symptom prevalence in Latin American children. J Asthma. 2010 Aug;47(6):644-50.
3. Gómez M, Vollmer WM, Caceres ME, Jossen R, Baena-Cagnani CE. Adolescent smokers are at greater risk for current asthma and rhinitis. Int J Tuberc Lung Dis. 2009 Aug; 13(8):1023-28.

Salvador Centre

Phase One			
Centre:		Salvador, Brasil (Latin America)	
Principal Investigator:		Associate Professor Leda de Freitas Souza	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in the urban area of Salvador.	
Phase Three			
Centre:		Salvador, Brasil (Latin America)	
Principal Investigator:		Associate Professor Leda de Freitas Souza	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2001 to September 2002
Sampling Frame:		All schools in the Salvador area.	

Personnel

Associate Professor Leda de Freitas Souza

Faculty of Medicine
Universidade Federal da Bahia
Rua Alm. Ernesto Mello Jr. 79 (Pituba)
Salvador 41820-060
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Roles:

- Phase One Principal Investigator for Salvador
- Phase Three Principal Investigator for Salvador

Local Publications

The following publications used ISAAC data from the Salvador centre:

Solé D, Melo KC, Camelo-Nunes IC, Freitas LS, Britto M, Rosário NA, Jones M, Fischer GB, Naspitz CK. *Changes in the prevalence of asthma and allergic diseases among Brazilian schoolchildren (13-14 years old) comparison between ISAAC Phases One and Three.* J Trop Pediatr.2007 Feb;53(1):13-21.Epub Sep 2006.

Franco JM, Gurgel R, Sole D, França VL, Brabin B and the Brazilian Isaac Group. *Socio-environmental conditions and geographical variability of asthma prevalence in Northeast Brazil* Allergol Immunopathol (Madr). 2009; 37(3):116-121

The ISAAC Story

Local Publications

The following publications used ISAAC data from the Salzburg centre:

Eder W, Gamper A, Oberfeld G, Riedler J. *Prevalence and severity of bronchial asthma, allergic rhinitis and atopic dermatitis in Salzburg school children.[German].* Wien Klin Wochenschr.1998; 110(19): 669-77.

Riedler J, Gamper A, Eder W, Oberfeld G. *Prevalence of bronchial hyperresponsiveness to 4.5% saline and its relation to asthma and allergy symptoms in Austrian children* Eur Respir J 1998; 11: 355–360

Eder W, A Gamper, G Oberfeld, J Riedler. *Clinical follow-up of an epidemiological study of asthma and allergies in children [Klinische Nachuntersuchung einer epidemiologischen Studie über Asthma und Allergien im Kindesalter.](article in German).* Wien Klin Wochenschr 1998; 110(19):678-685.

Salzburg Centre

Phase One			
Centre:		Salzburg, Austria (Western Europe)	
Principal Investigator:		Dr Josef Riedler	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:March 1995 to April 1995 6-7yr:February 1995 to February 1995
Sampling Frame:			

Personnel

Univ.Prof.Dr. Josef Riedler

Kardinal Schwarzenberg"sches Krankenhaus
Abteilung für Kinder- und Jugendheilkunde
Kardinal-Schwarzenberg-Straße 2-6
A-5620 Schwarzach im Pongau
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Roles:

- Phase One Principal Investigator for Salzburg

Salzburg Centre

During his research fellowship at the RCH in Melbourne Josef Riedler was intensively involved in the standardisation of airway challenge tests for epidemiological surveys, particularly for ISAAC. Together with Colin Robertson and Sandra Anderson he worked out a field protocol and manual for the 4.5% hypertonic saline challenge test to be used in children and adolescents. This test was then chosen by the ISAAC steering committee for Phase2 investigations all over the world. After his return to Salzburg, Josef Riedler was appointed ISAAC-National coordinator for Austria and performed Phase 1 studies in children 6-7 yr and 13-14 yr.

The prevalence studies in ISAAC-Phase 1 in Salzburg were the first epidemiological studies on asthma and allergies in children in Austria and built a platform for further international collaborative investigations into risk and protective factors for the development of asthma and allergies in children. Until 2004 in Salzburg and since then in Schwarzach, Josef Riedler and his research team have been heavily involved in large studies in the farming population (ALEX-, PARSIFAL-, FORALLVENT-, PASTURE-, EFRAIM-Study).

Samarkand Centre

Phase One			
Centre:		Samarkand, Uzbekistan (Northern and Eastern Europe)	
Principal Investigator:		Professor Tamara Aripova	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All Samarkand schools.	

Personnel

Professor Tamara Aripova

c/- Prof Ruslan M Ruzibakiev
Institute of Immunology of AcSci Ruz
74, Y.GULYAMOV Street
Uzbekistan

Roles:

- Phase One Principal Investigator for Samarkand

San Pedro Sula Centre

Phase Three			
Centre:		San Pedro Sula, Honduras (Latin America)	
Principal Investigator:		Dr Agustin Bueso-Engelhardt	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2002 to October 2002
Sampling Frame:		Some private and public schools of San Pedro Sula area.	

Personnel

Dr Agustin Bueso-Engelhardt

Centro de Neumología y Alergia Siglo XXI
Edificio CNA
Entrada a Col.
Los Laureles
Honduras

Roles:

- National Coordinator for Honduras
- Phase Three Principal Investigator for San Pedro Sula

Regional
National
Local
San Salvador
San Sebastián

San Salvador Centre

Phase Three			
Centre:		San Salvador, El Salvador (Latin America)	
Principal Investigator:		Dr Margarita Figueroa Colorado	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2003 to July 2003
Sampling Frame:		Schools in the San Salvador Geographic area	

Personnel

Dr Margarita Figueroa Colorado

Hospital Nacional San Rafael
Insituto de Ojos Blvd.
Tutunichapa N 326
El Salvador

Roles:
- National Coordinator for El Salvador
- Phase Three Principal Investigator for San Salvador

Mauricio Flores

Pediatric Allergist
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William Hoyos

Researcher
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Insituto de Ojos Blvd.
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Pablo Salazar

Researcher
Hospital Nacional San Rafael
Insituto de Ojos Blvd.
El Salvador

Roles:
- Phase Three collaborator for San Salvador

In September 1994, I knew the ISAAC project an its protocol to determine the incidence of Asthma and Allergy in the world. IN 2001 the ERS Congress in Berlin, Phillippa Ellwood, Innes Asher; Javier Mallol, was presented as Coordinator for Latin America for the ISAAC III.

Since that time it was a challenge for me, develop the study to determine first the Incidence of Asthma and Allergies in my country El Salvador. Start with the planning of the survey, supported by the University Doctor José Matías Delgado, with Dr. Clifton Huang and his group of enthusiastic students who conducted the survey.

Today our group has grown and consolidates. In the picture, in the front: Coordinator: Margarita Figueroa, William Hoyos, Reseacher , behind , Pablo Salazar, Reseacher, Mauricio Flores, Pediatric Allergist.

San Sebastián Centre

Phase Three			
Centre:		San Sebastián, Spain (Western Europe)	
Principal Investigator:		Professor Eduardo G Pérez-Yarza	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2002 to December 2002
Sampling Frame:		All schools in the Donestia County.	

Personnel

Professor Eduardo G Pérez-Yarza

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Roles:
- Phase Three Principal Investigator for San Sebastián

The ISAAC Story

We develop our daily medical attention, medical research and teaching in Division of Respiratory Medicine, Department of Pediatrics in Donostia University Hospital, San Sebastian, Spain. Furthermore, we belong to the School of Medicine, University of the Basque Country (UPV/EHU).

We are very grateful for having the opportunity to take part in ISAAC phase III. To participate actively in this unique worldwide epidemiological research programme has been a fantastic experience for our group. Moreover, it gave us the chance to improve our research abilities. Finally, we had the opportunity to share knowledge and experiences with colleagues from different parts of the world.

Santacruz

Santacruz

Santacruz

Santa Cruz Centre

Phase Three			
Centre:		Santa Cruz, Bolivia (Latin America)	
Principal Investigator:		Dr Rosario Pinto-Vargas	
Age Groups:	13-14	**Timeframe:**	June 2002 to November 2002
Sampling Frame:		13-14yr: Some schools in the 4 - 9 - 10 - 11 Districts in Santa Cruz - Bolivia (See map).	

Personnel

Dra. Janet Aguirre

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OMS-OPS
Santa Cruz
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Roles:
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Roles:
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Roles:
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Dra. Esther Serrate

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Roles:
- Phase Three collaborator for Santa Cruz

Dr. Pitias Suárez

PEDIATRA
HOSPITAL UNIVERSITARIO SANTA CRUZ CPS
Santa Cruz
Bolivia

Roles:
- Phase Three collaborator for Santa Cruz

The ISAAC Story

Santa Cruz

For the first time Bolivia is part of an international study of the magnitude of ISAAC Phase III. It was during the Latin American Congress of Pediatric Pulmonology in Central America, we received the invitation of Dr. Javier Mallol, International Coordinator of ISAAC Phase III for Latin American, and we gladly accepted the challenge.

Our intention was to have two teams, one team that covers the western Bolivia, La Paz, city over 3500 meters above sea level and eastern Bolivia, Santa Cruz de la Sierra, less than 400 m (asl), geographical areas with different environmental as well as different feeding habits. We got in contact with the Society of Pediatric located in La Paz, the Andean region, to propose a study, but this could not be completed on time.

THE STATE OF BOLIVIA, in central South America. (In red), department of Santa Cruz. Santa Cruz is the largest recipient of migrants from other departments, currently has 1,678,849 inhabitants

'The city of **Santa Cruz de la Sierra** is located in the eastern part of Bolivia (17°45', South, 63°14', West) at 416m above sea level. It is part of the province of Andrés Ibáñez and the capital of the department of Santa Cruz' (from Wikipedia:Santa Cruz de la Sierra http://en.wikipedia.org/wiki/Santa_Cruz_de_la_Sierra#Geography

BOLIVIA SANTA CRUZ

To finalize the project we asked for the cooperation and sponsorship of various institutions and the formation of a multidisciplinary team of professionals who are motivated only by their scientific interest.

Strictly fulfilling the criteria issued by ISAAC in the selection of schools and children from 13 to 14 years, we interviewed 3292 (three thousand two hundred ninety-two) students in 120 schools (one hundred twenty) of the city of Santa Cruz de la Sierra. After adapting the survey in Spanish to the used language and local customs, and completed the legal procedures we initiated the surveys.

- The question that apparently caused the most concern to the students Surveyed was about whether they had ever smoked. Most did not want to answer to the questionnaire until we assured them those responses would not be known either by their teachers nor by their parents.
- Among the key findings of the study was that many students reported having had wheezing without an asthma diagnosis and those who reported having or having had wheezing without an established diagnosis of asthma was about twice of those who were diagnosed.
- The study also showed that there was a significant association between rhinitis and asthma, which also was related to having adult smokers at home.

AGRADECIMIENTOS:

NUESTRO AGRADECIMIENTO A TODOS LOS COLEGAS QUE DIERON SU TIEMPO INCONDICIONAL PARA LLEVAR A CABO ESTE ESTUDIO, A TODAS LAS INSTITUCIONES QUE TRABAJARON COORDINADAMENTE CON NOSOTROS: COLEGIO MEDICO DEPARTAMENTAL –SANTA CRUZ, UNIVERSIDAD CRISTIANA DE BOLIVIA, SOCIEDAD BOLIVIANA DE PEDIATRIA, SECRETARIA DE EDUCACION–GOBERNACION SANTA CRUZ, A LOS PROFESORES Y ALUMNOS QUE APORTARON CON SUS DATOS, AL PROFESOR JAVIER MALLOL NUESTRO COORDINADOR INTERNACIONAL; EAMON ELLWOOD, PROFESOR INES ASHER STEERING COMMITTEE NUESTROS TUTORES DE AUCKLAND QUE NOS MANTUVIERON SIEMPRE INFORMADOS SOBRE TODOS LOS AVANCES Y PUBLICACIONES DEL ESTUDIO Y A NUESTRO CO AUSPICIADOR LABORATORIO GLAXO.

Santa Maria Centre

Phase Three			
Centre:		Santa Maria, Brasil (Latin America)	
Principal Investigator:		Professor Dirceu Solé	
Age Groups:	13-14	**Timeframe:**	March 2003 to June 2003
Sampling Frame:		13-14yr: All schools in Santa Maria area.	

Personnel

Dr Vitor Emanuel Cassol

Head of Department of Pediatric Pneuology
University Hospital of Santa Maria
Federal University of Santa Maria
Ceci Leite Costa Street 715
Brasil

Roles:

- Phase Three collaborator for Santa Maria
- Phase Three PI for Santa Maria and Rural Santa Maria Deceased 2008

Local Publications

The following publications used ISAAC data from the Santa Maria centre:

Cassol VE, Rizzato TM, Teche SP, Basso DF, Hirakata VN, Maldonado M, Colpo E, Solé D. *[Prevalence and severity of asthma among adolescents and their relationship with the body mass index].* J Pediatr (Rio J). 2005 Jul-Aug;81(4):305-9.Portuguese.

The ISAAC Story

Dr Thiago Moraes Rizzato

Luiz Antonio Maffini Street 45/03
Brasil

Roles:
- Phase Three collaborator for Santa Maria

Professor Dirceu Solé

Professor of Allergy, Clinical Immunology and Rheumatology
Dept of Pediatrics
Federal University of São Paulo-Escola Paulista de Medicina
São Paulo
Brasil

Roles:
- National Coordinator for Brasil
- Phase Three Principal Investigator for Santa Maria

Dr Stefania Teche

Federal University of São Paulo-Escola Paulista de Medicina
São Paulo
Brasil

Roles:
- Phase Three collaborator for Santa Maria

When ISAAC phase 1 had begun, in the middle of the 1990's, the standard written questionnaire (WQ) had not yet been validated for Portuguese language (Brazilian culture). After been validated (1,2,3) the ISAAC WQ was used by several investigators, independently to be involved with ISAAC Project.

In phase 1 had participated 7 Brazilian centers including São Paulo (4), five of them had participated in both phases 1 and 3 (5,6). São Paulo is the largest city in Brazil. More than 12 million of people live in São Paulo, so obtain homogeneous sample of schoolchildren as recommended by the ISAAC protocol, was not possible. Therefore, we limited the study to two parts of the city: southern and western. In the southern region lies second airport of Brazil in terms of traffic and in the western region there are several roads with jam traffic. In São Paulo we could analyze the influence of exposure to photochemical pollutants on the prevalence of asthma and allergic diseases (7). In part of the students evaluated we applied the complementary questionnaire and risk factors associated with the expression of asthma and allergic diseases were analyzed (8). The comparison between the prevalence of asthma and allergic diseases obtained in phase 1 and phase 3 showed to be constant (6). Other interesting issue was the genetic background impact on the expression of asthma and atopic diseases. Although we have evaluated schoolchildren with asthma and similar socio-economic level, there were differences according to risk factors for presentation of asthma in children born from exclusively Japanese progeny and native Brazilian children. These data reinforces the idea that asthma in Brazilian children is more than a single disease.

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References

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Santo Andre Centre

Phase Three			
Centre:		Santo Andre, Brasil (Latin America)	
Principal Investigator:		Associate Professor Neusa Wandalsen	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2000 to July 2001
Sampling Frame:		13-14yr: All schools in Santo Andre city 6-7yr:All schools in Santo Andre City	

Personnel

Associate Professor Neusa Wandalsen

Faculdadade de Medicina do ABC
Department of Paediatrics
Alameda dos Aicás no. 1053 apto.61
Brasil

Roles:

- Phase Three Principal Investigator for Santo Andre

The ISAAC Story

São Paulo Centre

Phase One			
Centre:		São Paulo, Brasil (Latin America)	
Principal Investigator:		Professor Dirceu Solé	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:June 1995 to September 1995 6-7yr:June 1995 to October 1995
Sampling Frame:			
Phase Three			
Centre:		São Paulo, Brasil (Latin America)	
Principal Investigator:		Professor Dirceu Solé	
Age Groups:	13-14, 6-7	**Timeframe:**	August 2001 to November 2002
Sampling Frame:		All schools are in south-centre in São Paulo. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Professor Dirceu Solé

Professor of Allergy, Clinical Immunology and Rheumatology
Dept of Pediatrics
Federal University of São Paulo-Escola Paulista de Medicina
São Paulo
Brasil

Roles:

- National Coordinator for Brasil
- Phase One Principal Investigator for São Paulo
- Phase Three Principal Investigator for São Paulo

Why was this centre selected for ISAAC?

The city of São Paulo is the largest city in Brazil. Its population exceeds 12 million and it is a large industrial centre with a high level of air pollution. The population of São Paulo brings together people from all over Brazil and the world, so there is a high degree of miscegenation that hinders genetic studies. Considering the dimensions of the city, it would be impossible to comply with the ISAAC protocol with respect to obtaining a representative sample of children and adolescents living in São Paulo. Because of this we decided to study the southern region (Phases One and Three) and the western region of the city (Phase Three). The first one is characterized for hosting the second airport of the country in terms of air traffic, and the second region was defined because it has roads leading to rural areas of São Paulo.

The ISAAC's standardized written questionnaire was translated into Portuguese and validated (Brazilian culture) in São Paulo centre for both age periods and it was possible to verify that if the clinical diagnosis of asthma was used to identify asthmatic patients, the result would be an underdiagnosed disease. The above mentioned validated tool was used for several other epidemiological researches on asthma in children.

On the other hand, in Santa Maria, in addition to reduced levels of air pollution exposure, the city is smaller and there is a low degree of miscegenation that provides an apparently more homogeneous genetic population than the rest of Brazil. Localized in the middle of Rio Grande do Sul, Santa Maria has lower annual mean temperature. Moreover, the availability of people with more homogeneous genetic background allows us to assess the action of environment on the expression of asthma and allergic diseases (urban x rural). These centers were coordinated by Prof Vitor E Cassol until his death in 2008. After this I assumed them.

Our experience of ISAAC

As a national coordinator I have tried to disseminate the knowledge obtained in those centres and in Brazil trying to publish several papers telling about the main characteristics of asthma and allergic diseases in Brazil.

Acknowledgements

We gratefully acknowledge to all local coordinators that obtained financial support to participate in Phases One and/or Three. We are also indebted to all the children, parents and school staff who participated in the surveys.

Regional
National
Local
São Paulo West
Sarasota
Saskatoon

São Paulo West Centre

Phase Three			
Centre:		São Paulo West, Brasil (Latin America)	
Principal Investigator:		Dr Antonio Carlos Pastorino	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to September 2002
Sampling Frame:		13-14yr: Some public schools in the West area of São Paulo city. 6-7yr:Some Public schools in the West area of São Paulo city.	

Personnel

Dr Antonio Carlos Pastorino

Rua Capote Valente
439 cj 11 Jardim America
Brasil

Roles:

- Phase Three Principal Investigator for São Paulo West

Sarasota Centre

Phase Three			
Centre:		Sarasota, USA (North America)	
Principal Investigator:		Dr Hugh H Windom	
Age Groups:	13-14	**Timeframe:**	December 2002 to April 2002
Sampling Frame:		13-14yr: Public schools in Sarasota County	

Personnel

Dr Hugh H Windom

Medical Director
Asthma and Allergy Research Center
4040 Sawyer Road
Usa

Roles:

- Phase Three Principal Investigator for Sarasota

Saskatoon Centre

Phase One			
Centre:		Saskatoon, Canada (North America)	
Principal Investigator:		Dr Brett Taylor	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:January 1994 to March 1994 6-7yr:March 1994 to March 1994
Sampling Frame:			

Phase Three			
Centre:		Saskatoon, Canada (North America)	
Principal Investigator:		Professor Donna Rennie	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2003 to December 2003
Sampling Frame:		All schools in Saskatoon, the same sampling frame as Phase One.	

Personnel

Dr Brian Habbick

University of Saskatchewan
Saskatoon
Canada

Roles:

- Phase One collaborator for Saskatoon
- Co-Investigator for Phase One

Dr Josh Lawson

University of Saskatchewan
Saskatoon
Canada

Roles:

- Phase Three collaborator for Saskatoon

Professor Donna Rennie

College of Nursing/Canadian Centre for health and Safety in Agriculture
University of Saskatchewan
Saskatoon
Canada

Roles:

- Phase Three Principal Investigator for Saskatoon
- Phase One collaborator for Saskatoon

Dr A Senthilselvan

Department of Community Health and Epidemiology
University of Saskatchewan
Saskatoon
Canada

Roles:

- Phase One collaborator for Saskatoon
- Phase Three collaborator for Saskatoon

The ISAAC Story

Dr Brett Taylor

Director of Emergency Medicine
IWK Health Centre
Saskatoon
Canada

Roles:

- Phase One Principal Investigator for Saskatoon

ISAAC in Saskatoon

Saskatoon participated in the first and third phases of ISAAC. Our involvement in Phase I of ISAAC was an exciting time as we had limited knowledge before this study of what was the prevalence of asthma in Canadian cities and a belief that unless we employed standardized questionnaires in identifying asthma, we would not be able to understand the relative importance of our findings. Under the leadership of Drs. Brian Habbick and Brett Taylor we completed Phase I in 1993. Dr A. Senthilselvan and Donna Rennie were co-investigators. For Phase I we worked closely with Dr. Malcolm Sears and his group from McMasters University. This Canadian collaboration resulted in two publications on the prevalence of asthma, rhinitis and hay fever and assessment of the validity of the video questionnaire with Canadian populations.

Our interest in ISAAC continued with participation in Phase 3 in 2003. Again, working with Dr. Sears from McMaster University, and several other Canadian sites we launched a much wider study of the Candian prevalence of childhood asthma, rhinitis and eczema. Unfortunately, unlike the 1993 study, response rates in all of the study sites in Phase 3 were low and results from many of the participating Canadian Centres could not be used in ISAAC Phase 3 analyses. However, we have since published on our findings from the Canadian sites and this publication definitely adds to the understanding of the importance of asthma for Canadian children. The research team at the Saskatoon site for Phase 3 included Dr. Rennie as principal investigator and Drs. Josh Lawson, University of Saskatchewan and Dr. A. Senthilselvan, University of Alberta as co-investigators. It has been a pleasure and an honor to be part of the ISAAC team.

Our work continues and many of the researchers who gained research experience through ISAAC teams have continued to work together on other research projects related to childhood asthma.

Local Publications

The following publications used ISAAC data from the Scotland centre:

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey*. BMJ 2004; 328(7447): 1052-3.

Scotland Centre

Phase One			
Centre:		Scotland, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Scotland including Glasgow and Edinburgh, stratified by region and Glasgow and Edinburgh followed by random sampling of schools.	

Phase Three			
Centre:		Scotland, United Kingdom (Western Europe)	
Principal Investigator:		Dr Jane B Austin	
Age Groups:	13-14	**Timeframe:**	January 2002 to March 2002
Sampling Frame:		13-14yr: The same schools were invited as in 1995 so sampling frames not used in 2002. In 1995 Scotland was part of the UK study, i.e. sampling frames for each of the Regions of Scotland plus one each for the Metropolitan areas of Edinburgh and Glasgow. One school selected from each sampling frame. Mixed sex state schools with over 100 pupils in each school year were included in the sampling frames.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
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Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for Scotland

Dr Jane B Austin

Whitehills Health and Community Care Centre
dd8,3dy
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Forfar
United Kingdom

Roles:

- Phase Three Principal Investigator for Scotland
- Phase One collaborator for Scotland

The ISAAC Story

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for Scotland

Why was Scotland selected

I was a paediatrician based at that time in Inverness, with an interest in the epidemiology of allergic disease. I was particularly delighted to be invited by Professor Anderson to be a collaborator for Phase I for 13-14 year olds for Scotland, as we were concerned by thehigh prevalence rates for allergic diseases we had found in our local studies in the Highlands of Scotland in 1992.. It was therefore of interest to study the national Scottish prevalence rates. Subsequently I was the principal investigator for Scotland Phase III. Scotland did not partake in Phase II.

Our experience of ISAAC

The phase III study was based at the Centre for Rural Health in Inverness. The study was undertaken across mainland Scotland and the islands – the Western Isles, Skye, Orkney and Shetland. We were funded by a grant from by the Chief Scientists Office, Edinburgh. Our team of researchers were based through out Scotland. The schools were very supportive especially in rural areas and participation rates by schools and pupils were good with few changes from the 1995 sampling frame.

The study was completed with a few adventures on the way - adverse weather in March delaying flights to the Islands and the researchers car in Edinburgh going on fireas she returned from a school -thankfully the boot remained intact with all the completed questionnaires.

References

Austin JB, Russell G, et al The Prevalence of asthma and wheeze in the Highlands of Scotland. Arch Dis Child. 1994; 71:211-16.

Acknowledgements

We are grateful to the Scottish Office for funding and especially to all the schools and pupils who made the study such a success.

Seattle Centre

Phase One			
Centre:		Seattle, USA (North America)	
Principal Investigator:		Professor Gregory J Redding	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All middle schools within the Seattle Public School District	
Phase Three			
Centre:		Seattle, USA (North America)	
Principal Investigator:		Professor Gregory J Redding	
Age Groups:	13-14	**Timeframe:**	June 2003 to June 2003
Sampling Frame:		13-14yr: All middle schools in the Seattle School District. Same sampling frame as Phase One.	

Personnel

Professor Gregory J Redding

Seattle Children's Hospital & Regional Medical Center
Pulmonary Division 3D-4
4800 Sand Point Way NE
P O Box 5371/ 3D-4
Usa

Roles:

- Phase One Principal Investigator for Seattle
- Phase Three Principal Investigator for Seattle

The ISAAC Experience

The United States joined the ISAAC network of centers late in the process, conducting school-based surveys with 2,330 students and through parental reports of 925 69 year old children in 1995. The former were added in the ISAAC database; the latter group was also asked about indoor allergens and irritants and published separately in 1997.

As part of an initial descriptive study about chronic respiratory symptoms among indigenous arctic populations, we amended the ISAAC survey to include a question on chronicproductive cough. The survey among 365 Yupik Eskimo children in middle schools found that 40% had chronic respiratory symptoms, half with asthma and half with chronic productive cough or bronchitis. Asthma prevalences between Native Alaskan and American Indian children in Washington state were then compared using the ISAAC survey.

Local Publications

The following publications used ISAAC data from the Seattle centre:

Maier WC, Arrighi HM, Morray B, Llewellyn C, Redding GJ. *Indoor risk factors for asthma and wheezing among Seattle school children.* Environ Health Perspec 1997; 105(2):208-14.

Debley JS, Carter ER, Redding GJ. *Prevalence and impact of gastroesophageal reflux in adolescents with asthma a population-based study.* Pediatr Pulmonol 2006 May;41(5):475-81.

Carter E, Debley J, Redding G. *Chronic productive cough in school children prevalence and associations with asthma and environmental tobacco smoke exposure.* Cough 2006, 2:11

Carter E, Debley J, Redding G. *Changes in asthma prevalence and impact on health and function in Seattle middle-school children 1995 versus 2003.* Ann Allergy Asthma Immunol 2005; 94(6):634-639.

The ISAAC Story

In a parallel effort, we used the ISAAC survey tool to evaluate the presence of asthma and asthma symptoms among 5495 5-11 year old Vietnamese children in Hanoi and identified environmental features associated with atopic and asthma symptoms.

During Phase III of the ISAAC project, we repeated the Phase I survey among 2,398 middle school children in Seattle but added to the survey questions regarding symptoms associated with gastro-esophageal reflux and also chronic productive cough. We found upon comparison with the Phase I data that diagnoses of asthma became more common but outcomes of asthma, once diagnosed, were no different. We also found that symptoms of gastro-esophageal reflux were more common among children with current asthma symptoms and that the frequency of symptoms of gastro-esophageal reflux correlated with medical care utilization among children with asthma. .

By adding a question regarding chronic productive cough among non-native children in Seattle, we could compare our previous data among Eskimo children to an urban mixed race cohort of the same age. The prevalence of chronic productive cough among Seattle middle school children in 2003 was 3% and was associated with tobacco smoke exposure, gastro-esophageal reflux, and a diagnosis of asthma.

Lessons Learned.

The information provided by the ISAAC surveys has been invaluable in raising the awareness of the policy makers in Washington about the persistence and impact of asthma among school children. Using additional questions in the survey has allowed up to sample large groups of children to assess the importance of self-reported chronic bronchitis and gastro-esophageal reflux among school children of different cultures in the Unites States. This has in turn led to additional research about these additional conditions.

Semarang Centre

Phase Three			
Centre:		Semarang, Indonesia (Asia-Pacific)	
Principal Investigator:		Dr Winarto Suprihati	
Age Groups:	13-14	**Timeframe:**	September 2001 to May 2002
Sampling Frame:		13-14yr: Some Government and private junior high schools in Semarang district, Central Java.	

Personnel

Dr Allan Darwis

Klinik Alergi & Imunologi
Prof DR Dr Karnen Baratawidjaja
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Indonesia

Roles:

- Phase Three collaborator for Semarang

Dr Winarto Suprihati

ENT Department
Faculty of Medicine
Diponegoro University
Jl Menoreh Utara IV / 5
Indonesia

Roles:

- Phase Three Principal Investigator for Semarang

Seoul Centre

Phase One			
Centre:		Seoul, South Korea (Asia-Pacific)	
Principal Investigator:		Dr Sang-Il Lee	
Age Groups:	13-14, 6-7	**Timeframe:**	September 1995 to October 1995
Sampling Frame:			
Phase Three			
Centre:		Seoul, South Korea (Asia-Pacific)	
Principal Investigator:		Professor Ha-Baik Lee	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2000 to December 2000
Sampling Frame:		We obtained a complete school list from the Ministry of Education. We randomly sampled 10 elementary schools in Seoul area. We sampled 150 children from each grade. In Phase 3 study, we finish the study in the same school which had been participated in the Phase One study. Same sampling frame for both Phases, same schools used.	

The ISAAC Story

Personnel

Dr. Kangmo Ahn

Department of Pediatrics
Samsung Medical Center
Sungkyunkwan University School of Medicine
50 Irwon-dong, Gangnam-gu, Seoul,
Korea

Roles:
- Phase One collaborator for Seoul

Dr Soo-Jong Hong

Department of Pediatrics
Hanyang University College of Medicine
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Sungdong-Ku
South Korea

Roles:
- Phase Three collaborator for Seoul

Dr Sang-Il Lee

Samsung Medical Center
Dept. of Pediatrics
50 Irwon-Dong
Gangnam-gu
South Korea

Roles:
- Phase One Principal Investigator for Seoul

Professor Ha-Baik Lee

Department of Pediatrics
Hanyang University College of Medicine
17 Haengdang-Dong
Sungdong-Ku
South Korea

Roles:
- National Coordinator for South Korea
- Phase Three Principal Investigator for Seoul

Shanghai Centre

Phase One			
Centre:		Shanghai, China (Asia-Pacific)	
Principal Investigator:		Dr Mao Bao-Shan	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in the Zhabei district	

Personnel

Dr Mao Bao-Shan

The Central Hospital of Zhabei
District of Shanghai
619 Zhong Hua Xin Lu
China

Roles:
- Phase One Principal Investigator for Shanghai

Siauliai Centre

Phase Three			
Centre:		Siauliai, Lithuania (Northern and Eastern Europe)	
Principal Investigator:		Professor Jurgis Bojarskas	
Age Groups:	13-14, 6-7	**Timeframe:**	
Sampling Frame:		All schools in Siauliai Centre	

Personnel

Professor Jurgis Bojarskas

Kaunas Medical University
Clinics of Children's Diseases
Eiveniu 2
Lithuania

Roles:
- Phase Three Principal Investigator for Siauliai

Why our country joined ISAAC

We were late finding out about ongoing ISAAC studies, and so we were late with our Phase One results. Nevertheless, we were very eager to find out about the real situation concerning allergic diseases in Lithuania, especially among children, as being paediatric allergists and pulmonologists we saw the dramatically increasing numbers of allergic children. We selected the three biggest Lithuanian cities (Kaunas, Panevezys, Siauliai) as centres and examined all children from the secondary schools and kindergartens in them. Phase Three results were produced in time, as we already knew about the invitation to take part repeatedly in this survey. We were interested to see the dynamics of the prevalence of allergic diseases, which is why Kaunas centre completed repeat phases of ISAAC.

The ISAAC Story

Impact of ISAAC in our country

Various lecturers (pediatric and adult) and even Health Ministry representatives quote our ISAAC data, when talking about the spreading of allergies in Lithuania. Then we are sitting proud, with our heads raised, as still there are no data about the prevalence of adult allergies in Lithuania. Some data from our Lithuanian ISAAC results were published in the most popular Lithuanian medical journal 'Medicina'.

Siena Centre

Phase One			
Centre:		Siena, Italy (Western Europe)	
Principal Investigator:		Ms Elisabetta Renzoni	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Province	
Phase Three			
Centre:		Siena, Italy (Western Europe)	
Principal Investigator:		Dr Piersante Sestini	
Age Groups:	13-14	**Timeframe:**	February 2002 to November 2002
Sampling Frame:		13-14yr: Schools in the province of Siena.	

Personnel

Ms Elisabetta Renzoni

Istituto Malattie Respiratorie
Università di Siena
Ospedale Le Scotte
Viale Bracci, 3
Italy

Roles:

- Phase One Principal Investigator for Siena

Dr Piersante Sestini

Institute of Respiratory Diseases
University of Siena
Viale Bracci 3
Italy

Roles:

- Phase Three Principal Investigator for Siena

Singapore Centre

Phase One			
Centre:		Singapore, Singapore (Asia-Pacific)	
Principal Investigator:		Professor Bee-Wah Lee	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:February 1994 to November 1994 6-7yr:February 1994 to May 1994
Sampling Frame:			
Phase Three			
Centre:		Singapore, Singapore (Asia-Pacific)	
Principal Investigator:		Associate Professor Daniel Yam Thiam Goh	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2001 to November 2001
Sampling Frame:		All schools in Singapore. Same sampling frame as Phase One.	

Personnel

Associate Professor Daniel Yam Thiam Goh

The Children's Medical Institute
National University of Singapore
National University Hospital
5 Lower Kent Ridge Road
Singapore

Roles:

- Phase Three Principal Investigator for Singapore

Professor Bee-Wah Lee

Children's Medical Center
National University Hospital
5 Lower Kent Ridge Rd
Singapore

Roles:

- National Coordinator for Singapore
- Phase One Principal Investigator for Singapore

Local Publications

The following publications used ISAAC data from the Singapore centre:

Goh DY, Chew FT, Quek SC, Lee BW. *Prevalence and severity of asthma, rhinitis, and eczema in Singapore schoolchildren.* Arch Dis Child 1996; 74(2): 131-5.

Wang XS, Shek LP, Ma S, Soh SE, Lee BW, Goh DYT. *Time trends of co-existing atopic conditions in Singapore school children prevalence and related factors.* Pediatr Allergy Immunol 2010; 21 (1): e137-e141. E pub 21 Apr 2009.

Regional
National
Local
Singapore
Skopje

The Singapore ISAAC Centre

As Singapore is a small city state, our ISAAC centre was also the national centre.

It provided us with important national epidemiology data on asthma, allergic rhinitis and eczema, which hitherto, was unavailable. The prevalence data has provided us with an important reference point for the planning of educational and awareness programs, medical programs for asthma and allergies in children, as well as scientific studies.

The ISAAC prevalence obtained for Singapore was very similar urban and developed communities in the Asian region, such as Japan and Korea, and were the highest for the Asia Pacific region. For example, the prevalence for Phase one survey on current wheeze for 6-7 years old was 13.3 in Korea, 15.7 in Singapore and 17.4 in Japan.

The team acknowledges the contribution of the many student helpers that contributed to the success of these studies.

Skopje Centre

Phase Three			
Centre:		Skopje, Republic of Macedonia (Northern and Eastern Europe)	
Principal Investigator:		Assoc Prof Emilija Vlaski	
Age Groups:	13-14	**Timeframe:**	December 2001 to March 2002
Sampling Frame:		13-14yr: All schools in Skopje area	

Skopje, Macedonia

Skopje, Macedonia

Personnel

Professor Rozalinda Isjanovska

Professor of Epidemiology
Institute of Epidemiology and Biostatistics with Medical Informatics
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The Republic of Macedonia (FYROM)

Roles:
- Phase Three collaborator for Skopje

Dr. Milica Kimovska

Department of Pulmonology and Allergology
University Children's Clinic
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The Republic of Macedonia (FYROM)

Roles:
- Phase Three collaborator for Skopje

Associate professor Aco Kostovski

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Department of Gastroenterology
University Children's Clinic
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The Republic of Macedonia (FYROM)

Roles:
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Dr Lidija Seckova

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Roles:
- Phase Three collaborator for Skopje

Dr Katerina Stavric

Assistant to Professor of Pediatrics
Department of Immunology
University Children's Clinic
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The Republic of Macedonia (FYROM)

Roles:
- Phase Three collaborator for Skopje

Assoc Prof Emilija Vlaski

Department of Pulmonology and Allergology
University Children's Hospital
Vodnjanska 17
1000 Skopje
Republic of Macedonia

Roles:
- National Coordinator for Republic of Macedonia
- Phase Three Principal Investigator for Skopje

The ISAAC Story

WHY WAS SKOPJE SELECTED FOR ISAAC?

The epidemiological data about the prevalence and severity of asthma and allergies in childhood in the Republic of Macedonia (FYROM) before the ISAAC Phase Three was scarce, although seen in the physician practise more frequently in the last decade. As well there was a lack of data about the influence of environmental factors on these diseases. R. Macedonia is a developing country in which some aggravating as well some preventive factors for allergic diseases are highly present. For example, the prevalence of ETS has been demonstrated to be very high. On the other hand, dietary antioxidants intake has been documented to be high as well, which may be explained by the geographical area where our country is situated and its climate.

Skopje was chosen as an investigational centre as a capital of R. Macedonia with almost one third of the inhabitants in our small country (600.000 out of around 2 millions inhabitants) and 55 primary schools with 10934 children 13-14 years old in 2001, which enabled at least 3000 respondents at this age group from randomly selected primary schools to be investigated. Contrary, other towns in R. Macedonia are much smaller with less than 3000 schoolchildren of the same age group. Compared to the rest of the country, in Skopje all proposed environmental risk factors for asthma and rhinitis and eczema, especially air pollution, are mostly present.

IMPACT OF ISAAC IN SKOPJE

The conduction of ISAAC Phase Three and the report of its data from Skopje have actualized the problem of childhood asthma, rhinoconjuncticitis and eczema as diseases with an increase in R. Macedonia.

Compared to the asthma, rhinoconjuncticitis and eczema prevalence rates worldwide, R. Macedonia i.e. Skopje in 2001/2002 appeared to have a moderately low prevalence of asthma and low prevalence rates of rhinitis and eczema symptoms. The much lower prevalence of ever-diagnosed asthma in contrast to the prevalence rates of current wheeze, current exercise-induced wheeze and dry night cough apart from chest infection suggested under-diagnosis of asthma and/or underreporting of the diagnosis by the young adolescents in our country. In contrast, ever-diagnosed hay fever and eczema seemed to be over-diagnosed and/or over-reported. Some environmental risk factors associated with these diseases were identified in our country.

With intention to get an information about the same problem for the biger part of the country, another study on local level using the same methodology and the ISAAC Phase Three questionnaires was performed in 2005/2006 in 7 cities in R. Macedonia, including 1000 respondents from each city. Skopje was one of the investigational centres in this study again. The two cross-sectional surveys 4-yr apart in Skopje showed a decrease in asthma symptoms accompanied with an increase in ever-diagnosed asthma, which seems to be a result to the improved awareness, diagnosis and treatment of asthma. However, the partial control i.e. under-treatment of severe asthma in the capital of our country is still present (an increase of severe asthma symptoms).

Acknowledgments

We would like to thank children for their participation and the principals, psychologists, teachers for their collaboration in the ISAAC Phase Three survey. The Ministry of Education and Science of The Republic of Macedonia provided financial support for the study.

Sofia Centre

Phase Three			
Centre:		Sofia, Bulgaria (Northern and Eastern Europe)	
Principal Investigator:		Dr Todor Popov	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to December 2002
Sampling Frame:		Randomly selected schools in the district of Sophia	

Personnel

Dr Tihomir B Mustakov

Clinical Centre of Allergology
University Hospital 'Alexandrovska'
1, Sv. Georgy Sofiiski' Street
Sofia 1431
Bulgaria

Roles:

- Phase Three collaborator for Sofia

Dr Todor Popov

Clinical Centre of Allergology
SUH ‘Alexandrovska’ Medical University
1, 'Georgy Sofiyski' St.
Bulgaria

Roles:

- National Coordinator for Bulgaria
- Phase Three Principal Investigator for Sofia

Regional
National
Local
Sombor
Sousse
South and West

Sombor Centre

Phase Three			
Centre:		Sombor, Serbia and Montenegro (Northern and Eastern Europe)	
Principal Investigator:		Dr Eva Panic	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2002 to April 2002
Sampling Frame:		All elementary schools (both urban and rural) in Sombor municipality	

Personnel

Dr Eva Panic

Regional Health Care Centre
28/I Kralja Petra I Street
25 000
Serbia

Roles:

- Phase Three Principal Investigator for Sombor

Sousse Centre

Phase One			
Centre:		Sousse, Tunisia (Africa)	
Principal Investigator:		Professeur Mohamed Jerray	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Sousse region teaching in Arabic	

Phase Three			
Centre:		Sousse, Tunisia (Africa)	
Principal Investigator:		Professeur Mohamed Jerray	
Age Groups:	13-14	**Timeframe:**	March 2001.
Sampling Frame:		13-14yr: All college schools in Sousse area	

Personnel

Professeur Mohamed Jerray

Service de Pneumo-Allergologie
Hopital Universitaire F. Hached
CHU F.Hached
Tunisia

Roles:

- Phase One Principal Investigator for Sousse
- Phase Three Principal Investigator for Sousse

South and West Centre

Phase One			
Centre:		South and West, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in South and West region. Stratified by county, followed by a random sample of one school from each county.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for South and West

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for South and West

Local Publications

The following publications used ISAAC data from the Sombor centre:

Živcovic Z. *Prevalence of childhood asthma, rhinitis and eczema in Belgrade area and Serbia.* Child Pulmonol 2002; 10(1-2): 27-43.

Živkovic Z, Vukašinovic Z, Cerovic S, Radulovic S, Živanovic S, Panic E, Hadnadjev M and Adžovic O. *Prevalence of childhood asthma and allergies in Serbia and Montenegro.* World J Pediatr 2010; 6(4): 331-336 epub May

Dr Jan Poloniecki

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for South and West

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

Ross Anderson, David Strachan, 18 July 2011

South Santiago Centre

Phase One			
Centre:		South Santiago, Chile (Latin America)	
Principal Investigator:		Dra Eliana Cortez	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:May 1995 to September 1995 6-7yr:May 1994 to April 1995
Sampling Frame:			
Phase Three			
Centre:		South Santiago, Chile (Latin America)	
Principal Investigator:		Dr Pedro Aguilar	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2001 to November 2001
Sampling Frame:		All schools in San Bernardo area. Same sampling frame as Phase One.	

Personnel

Dr Pedro Aguilar

Broncopulmonar Infantil
Hospital CRS El Pino
Avda. Los Morros 13560
San Bernardo
Chile

Roles:

- Phase Three Principal Investigator for South Santiago

Dra Eliana Cortez

Departamento de Medicina Respiratoria
Infantil Hospital CRS El Pino
Universidad de Santiago de Chile (USACH)
Av. Los Morros 13560, San Bernardo
Chile

Roles:

- Phase One Principal Investigator for South Santiago

South Thames Centre

Phase One			
Centre:		South Thames, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in South Thames region and part of London (2 inner districts and 2 outer districts south of River Thames). Stratified by county or London district followed by random sampling on one school from each area.	
Phase Three			
Centre:		South Thames, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	January 2002 to April 2002
Sampling Frame:		13-14yr: Same area as ISAAC Phase One: Former South Thames Health Authority area. Schools that participated in ISAAC Phase One were used. If unable to particpate, then schools were selected at random from mixed state secondary schools with 100 or more pupils in the same Local Education Authority.	

The ISAAC Story

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for South Thames
- Phase Three Principal Investigator for South Thames

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for South Thames
- Phase Three collaborator for South Thames

Ms Vivienne Monk

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United Kingdom

Roles:

- Phase Three collaborator for South Thames

Dr Jan Poloniecki

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St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for South Thames

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

Ross Anderson, David Strachan, 18 July 2011

Sri Lanka Centre

Phase Three			
Centre:		Sri Lanka, Sri Lanka (Indian Sub-Continent)	
Principal Investigator:		Dr Kirthi D Gunasekera	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2001 to October 2002
Sampling Frame:		Classes of government schools which were randomly selected within geographic area.	

Personnel

Dr Kirthi D Gunasekera

Consultant Chest Physician
Respiratory Disease Control Programme
Chest Clinic
Ministry of Health, General Hospital Badulla
Sri Lanka

Roles:

- National Coordinator for Sri Lanka
- Phase Three Principal Investigator for Sri Lanka

St Augustine Centre

Phase Three			
Centre:		St Augustine, Trinidad and Tobago (North America)	
Principal Investigator:		Dr Michelle A Monteil	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2002 to December 2002
Sampling Frame:		All secondary schools and all primary schools in Trinidad- not including senior comprehensive schools with pupils of 15 years and over.	

Personnel

Dr Michelle A Monteil

Department of Paraclinical Sciences
Faculty of Medical Sciences, University of the West Indies
Eric Williams Medical Sciences Complex
Uriah Butler Highway, Champs Fleur
Trinidad And Tobago

Roles:

- Phase Three Principal Investigator for St Augustine

Stockholm/Uppsala Centre

Phase One			
Centre:		Stockholm/Uppsala, Sweden (Northern and Eastern Europe)	
Principal Investigator:		Dr Tony Foucard	
Age Groups:	13-14, 6-7	**Timeframe:**	Study dates not supplied
Sampling Frame:			

Personnel

Dr Tony Foucard

Department of Pediatrics
Uppsala University Children's Hospital
Sweden

Roles:
- Phase One Principal Investigator for Stockholm/Uppsala

Strasbourg Centre

Phase One			
Centre:		Strasbourg, France (Western Europe)	
Principal Investigator:		Dr Christine Kopferschmitt-Kubler	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All colleges of a University town (Strasbourg) were chosen.	

Personnel

Dr Christine Kopferschmitt-Kubler

Service de Pneumologie
Hôpital Lyautey
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Professor Elisabeth Quoix

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Roles:
- Phase One collaborator for Strasbourg

Sunderland Centre

Phase One			
Centre:		Sunderland, United Kingdom (Western Europe)	
Principal Investigator:		Dr Mohammad H Shamssain	
Age Groups:	13-14, 6-7	**Timeframe:**	October 1995 to July 1996
Sampling Frame:			
Phase Three			
Centre:		Sunderland, United Kingdom (Western Europe)	
Principal Investigator:		Dr Mohammad H Shamssain	
Age Groups:	13-14, 6-7	**Timeframe:**	October 2000 to February 2003
Sampling Frame:		All schools in Sunderland, Gateshead and New Castle. Washington was included in Phase One, however Washington Town is a part of the City of Sunderland and the exclusion of Washington does not affect the sampling frame.	

Personnel

Dr Mohammad H Shamssain

Dept of Pharmacy, Health and Wellbeing
University of Sunderland
Darwin Building 123
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United Kingdom

Roles:
- Phase One Principal Investigator for Sunderland
- Phase Three Principal Investigator for Sunderland

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

Ross Anderson, David Strachan, 18 July 2011

The ISAAC Story

Surrey/Sussex Centre

Phase One			
Centre:		Surrey/Sussex, United Kingdom (Western Europe)	
Principal Investigator:		Professor David Strachan	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All state secondary schools in Mid Downs and Surrey and N.E. Hants.	

Phase Two			
Centre:		West Sussex, United Kingdom (Western Europe)	
Principal Investigator:		Professor David Strachan	
Age Groups:	,	**Timeframe:**	October 1998 to July 1999.
Sampling Frame:		The north educational division of the administrative county of West Sussex. This area was used for pilot studies in preparation for ISAAC Phase One, and forms part of the area covered by the Surrey & Sussex centre in ISAAC Phase One.	

Phase Three			
Centre:		Surrey/Sussex, United Kingdom (Western Europe)	
Principal Investigator:		Professor David Strachan	
Age Groups:	13-14	**Timeframe:**	March 2002 to July 2002
Sampling Frame:		13-14yr: Same geographical area as in ISAAC Phase One survey. West Sussex, all state secondary schools in North Education District with more than 100 pupils/year: AND: North West Surrey, random selection of mixed state secondary schools with more than 100 pupils/year.	

Personnel

Professor H Ross Anderson

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United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One collaborator for Surrey/Sussex

Pauline Lanridge

Senior registrar in public health medicine
St Georges University of London
Cranmer Terrace,
London SW17 0RE, UK.
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Roles:

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Ruth Ruggles

Specialist registrar in public health
St George's University of London,
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Roles:

- Phase One collaborator for Surrey/Sussex

Professor David Strachan

Professor of Epidemiology
Division of Community Health Sciences
St George's, University of London
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Roles:

- ISAAC Executive
- ISAAC Steering Committee
- Phase One Principal Investigator for Surrey/Sussex
- Phase Two Principal Investigator for West Sussex
- Phase Three Principal Investigator for Surrey/Sussex

The ISAAC Story

Why was this centre selected for ISAAC?

As the ISAAC methodology was being developed in the early 1990s, there was interest from local public health physicians in the possible adverse health effects of air pollution around London Gatwick Airport. The West Sussex area, which includes the airport, was therefore chosen for pilot studies of the ISAAC video [ref 1] and subsequently expanded to include parts of the neighbouring county of Surrey, for the Phase One study.

These areas lie outside the Greater London conurbation and consist of small towns, with a high proportion of commuters, and intervening areas of farmland and forest. Compared to the UK as a whole, and to the whole of south-eastern England, this is a relatively prosperous area.

Our Phase One study was designed specifically to investigate two other methodological issues: firstly, whether the prevalence of symptoms, as obtained by the ISAAC written questionnaire, varied with season of administration of the survey; and secondly, whether the prevalence differed between child responses and parental responses in the same age group.

Our Phase Two studies were restricted to the West Sussex area which had been used for the earlier pilot studies. In Phase Three, the larger Surrey & Sussex area was used, as in Phase One.

Our experience of ISAAC

Pilot studies: The earlier version of the ISAAC video (mainly white ethnic children) was used. It was generally well accepted, but fieldworkers remarked that some children found the scene of severe asthma distressing. This was perhaps to be expected, as the scene depicts a potentially life-threatening asthma attack. This scene was eventually retained in the Phase One video questionnaire (both versions), and has been very widely used.

Phase One: As ISAAC Phase One included a separately funded nationwide survey of over 27,500 teenage children in 93 schools across England, Scotland, Wales and outlying islands, which took place over a whole school year, we concentrated the Surrey & Sussex study on addressing the possibility that the prevalence of symptoms might be affected by the season of the survey. Thus, we ensured that a balanced selection of schools from each part of the study area were visited in each of the three school terms (autumn, spring and summer). Only 13-14-year-old children were included, but in a random sample of two-thirds of these children, we also sent questionnaires (based on the ISAAC core questionnaire for 6-7-year-olds) to the parents. This allowed for comparisons between the responses by children and by parents at the level of the individual child, and the population as a whole. By omitting the parental questionnaire from a random one-third of the children, we were able to consider the possibility of response bias among the children whose parents had been mailed.

Phase Two: Our Phase Two fieldwork followed the core ISAAC Phase Two protocols, with hypertonic saline challenge, blood sampling and dust collection confined to a stratified sample of wheezers and non-wheezers. However, we also performed a bronchial challenge with exercise using Michael Burr's protocol in all children at the time they attended for skin prick tests and skin examination (several weeks before the hypertonic saline challenge). The exercise and saline challenge results showed a limited degree of correlation at the level of individual children, but both generated a much higher prevalence of bronchial hyperreactivity in West Sussex than in a comparable study carried out by our collaborator Alfred Priftanji in Tirana, Albania. These comparisons, between two centres at the extremes of the worldwide range of wheeze prevalence in Phase One, were published in the Lancet in 2001 [ref2]. During the fieldwork, we were puzzled about the high proportion of West Sussex children who responded with a fall in FEV1 early in saline challenge, and became concerned that there might be a flaw in our survey technique. Francine Aarts, who had recently completed the Phase Two fieldwork in the Netherlands, kindly visited West Sussex during our fieldwork and did not find anything particularly unusual about our methods, but commented that the proportion of responsive children seemed a lot higher than in the Dutch study. Later, we exchanged ultrasonic nebulisers with the Spanish Phase Two centres to check whether there was something unusual about our equipment, but did not find any major differences. When we later compared West Sussex and Tirana using the results of the hypertonic saline challenge, they differed greatly in the prevalence of bronchial hyperreactivity [ref 3]. This similarity of results using two different bronchial challenges offers supporting evidence that there is truly a high prevalence of responsive airways in West Sussex. (Due to the proximity to Gatwick Airport, we sometimes called this the "British Airways" phenomenon.)

Phase Three: Originally we had planned to focus Phase Three on the West Sussex schools which had participated in the pilot study of the asthma written and video questionnaires in 1991 [ref 1]. There was initially slow recruitment of schools in West Sussex, so sampling was extended to West Surrey. Both areas correspond to the "Surrey & Sussex" Centre in ISAAC Phase One. Several pupils commented on the question about mother's level of education (in the environmental questionnaire) saying it was "too personal" and some pupils were offended by the question. An extra question was included in the environmental questionnaire (placed at the end after ISAAC questions): *Have you ever smoked a cigarette? Yes / No. If yes, how often do you smoke nowadays? At least once a day on average / less than once a day, but at least once a week / less than once a week / I do not smoke at all nowadays.* This was included because in the nationwide ISAAC UK Phase One, this question had been used and proved to be strongly associated with wheezing in the 13-14-year-olds.

Regional
National
Local
Surrey/ Sussex
Suva
Svábhegy

References

1. Pearce N, Weiland S, Keil U, Langridge P, Anderson HR, Strachan D, Bauman A, Young L, Gluyas P, Ruffin D, Crane J, Beasley R. Self-reported prevalence of asthma symptoms in children in Australia, England, Germany and New Zealand: an international comparison using the ISAAC written and video questionnaires. Eur Respir J 1993;6:1455-1461. PMID: 8112438
2. Priftanji A, Strachan D, Burr M, Sinamati J, Shkurti A, Grabocka E, Kaur B, Fitzpatrick S. Asthma and allergy in Albania and the UK. Lancet 2001;358:1426-1427. PMID: 11705492
3. Büchele G, Genuneit J, Weinmayr G, Björkstén B, Gehring U, von Mutius E, Priftanji A, Stein RT, Addo-Yobo EO, Priftis KN, Shah JR, Forastiere F, Svabe V, Crane J, Nystad W, García-Marcos L, Saraçlar Y, El-Sharif N, Strachan DP; ISAAC Phase Two Study Group. International variations in bronchial responsiveness in children: findings from ISAAC Phase Two. Pediatr Pulmonol 2010;45:796-806. PMID: 20597079

Acknowledgements

We gratefully acknowledge financial support from the National Asthma Campaign (Phase One), the SW Thames Regional Research & Development Scheme (Phase Two), and the European Union (Phase Two centralised laboratory analyses). We are also indebted to all the children, parents and school staff who participated in the surveys, and wish to thank our fieldwork teams for their enthusiasm and diligence throughout each study.

Suva Centre

Phase Three			
Centre:		Suva, Fiji (Oceania)	
Principal Investigator:		Dr Rosalina Sa'aga-Banuve	
Age Groups:	13-14	**Timeframe:**	November 2002 to November 2002
Sampling Frame:		13-14yr: All schools in the Suva Rewa and Tailevu subdivisions.	

Personnel

Dr Rosalina Sa'aga-Banuve

APO Health and Nutrition
UNICEF
3 & 5 Floors, Fiji Development Bank Building
360 Victoria Drive
Fiji

Roles:

- Phase Three Principal Investigator for Suva

Dr Lepani Waqatakirewa

Children's Hospital
Government Buildings
PO Box 2223
Fiji

Roles:

- Phase Three collaborator for Suva

Svábhegy Centre

Phase Three			
Centre:		Svábhegy, Hungary (Northern and Eastern Europe)	
Principal Investigator:		Dr Györgyi Zsigmond	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2003 to April 2003
Sampling Frame:		All schools in “Komárom-Esztergom” county, Hungary, except schools in settlements with less than 1000 inhabitants	

Personnel

Dr Györgyi Zsigmond

Senior Consultant Pediatrician,
Pediatric Pulmonologist,
Svabhegy Institute,
Budapest,
Hungary

See the Hungary country page for details

Roles:

- National Coordinator for Hungary
- Phase Three Principal Investigator for Svábhegy

Regional
National
Local
Sydney 13-14
Sydney 6-7
Szeged

Sydney 13-14 Centre

Phase One			
Centre:		Sydney 13-14, Australia (Oceania)	
Principal Investigator:		Professor Adrian Bauman	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		This study comes from a geographic area, being a region in South Western Sydney with a total population of 800,000 residents. The survey covered a random sample of schools within this geographical area. The geographical area is based on a regional health district in NSW, and is one of the larger such health districts.	

Personnel

Professor Adrian Bauman

Epidemiology Unit
Australia

Roles:
- Phase One Principal Investigator for Sydney 13-14

Sydney 6-7 Centre

Phase One			
Centre:		Sydney 6-7, Australia (Oceania)	
Principal Investigator:		Dr Jennifer Peat	
Age Groups:	6-7	**Timeframe:**	April 1993 to June 1993
Sampling Frame:		6-7yr: All state, Catholic and Independent primary schools within a 10km radius of the General Post Office of Sydney, were eligible for inclusion.	

Personnel

Dr Jennifer Peat

Clinical Epidemiology Unit
The Children's Hospital at Westmead
PO Box 3515
Australia

Roles:
- Phase One Principal Investigator for Sydney 6-7

Szeged Centre

Phase Three			
Centre:		Szeged, Hungary (Northern and Eastern Europe)	
Principal Investigator:		Dr Zoltán Novák	
Age Groups:	13-14	**Timeframe:**	March 2003 to June 2003
Sampling Frame:		13-14yr: All schools in two cities, Szeged and Vasarhely	

Personnel

Dr Károly Berényi

Hungary

Roles:
- Phase Three collaborator for Szeged

Dr Marianne Kovács

Hungary

Roles:
- Phase Three collaborator for Szeged

Dr Ildikó Kovács

Hungary

Roles:
- Phase Three collaborator for Szeged

Dr Zoltán Novák

Pediatrician, Pediatric Pulmonologist, Head of Pulmonary Division, President of Hungarian Pediatric Society of Pulmonology
Department of Pediatrics
University of Szeged
Hungary

Roles:
- Phase Three Principal Investigator for Szeged

See the Hungary country page for details

The ISAAC Story

Taipei Centre

Phase One			
Centre:		Taipei, Taiwan (Asia-Pacific)	
Principal Investigator:		Professor Kue-Hsiung Hsieh DECEASED	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:October 1995 to October 1995 6-7yr:October 1994 to November 1994
Sampling Frame:			
Phase Three			
Centre:		Taipei, Taiwan (Asia-Pacific)	
Principal Investigator:		Dr Jing-Long Huang	
Age Groups:	13-14, 6-7	**Timeframe:**	December 2001 to January 2002
Sampling Frame:		The study sample included all children within these age groups from a random sample of public schools (cluster sampling, using schools as the sampling unit). Twenty four secondary and 24 Primary schools were randomly chosen in the 12 districts of Taipei city.	

Personnel

Professor Kue-Hsiung Hsieh

Director, Chang Gung Children's Hospital
5, Fu-Hsiang
Taiwan

Roles:

- Phase One Principal Investigator for Taipei

Dr Jing-Long Huang

Chief, Department of Pediatrics
Chang Gung Children's Hospital
5, Fu-Hsin Street
Kweishan
Taiwan

Roles:

- National Coordinator for Taiwan
- Phase Three Principal Investigator for Taipei

ISAAC story - Taipei center

It is a pleasure to share with you our experience of ISAAC phase 3 surveys in Taipei Center. Taipei is a rapidly growing city, both in economics and public health. We are very interested in the time trend of prevalence of allergic diseases in Taipei city during its development.

Yan DC, et al. from the Division of Allergy, Asthma, and Rheumatology, Department of Pediatrics, Chang Gung Memorial Hospital and Chang Gung University organized and conducted ISAAC phase III survey between December 1, 2001 and January 31, 2002. Two junior high schools in each of the 12 school districts in Taipei city were randomly chosen to enter the study. Our data showed that the prevalence of asthma, allergic rhinitis, and atopic eczema in the past 12 months during the study period in 13- to 14-year-old children increased by 37%, 51%, and 193%, respectively, when compared to our previous study 7 years ago. It is clear that allergic diseases have become a huge impact and burden on the health system in Taipei.

Dr. Kuo-Wei Yeh and Dr. Jing-Long Huang organized and started a national public asthma education program directing at 5000 school nurses, 1500 daycare center teachers, near 600 public health nurses and 500 pharmacists since 1999. Our goal was to train a group of healthcare professionals who are alert to the symptoms of allergic diseases as well as familiar with the various rescue medication of asthma. They will be able to monitor and provide immediate help for the children in case of emergency. During the past 10 years, the asthma education program team visited more than 100 towns and cities beyond Taipei, including the rural and urban areas of Taiwan and also some outlying islands. Through the ISAAC phase III data, the government also became more concerned about the issue and allocated more resource for it. And Chang Gung Memorial Hospital also gave support and funding for this national and continuing program.

In conclusion, ISAAC phase III survey has given us more information about allergic diseases in Taipei city. With a collaborative work from the government, researchers and healthcare professionals, we will work out a plan not only to understand allergic diseases, but also to help those who need assistance.

Local Publications

The following publications used ISAAC data from the Taipei centre:

Yan DC, Ou LS, Tsai TL, Wu WF, Huang JL. *Prevalence and severity of symptoms of asthma, rhinitis, and eczema in 13- to 14-year-old children in Taipei, Taiwan.* Ann Allergy Asthma Immunol.2005 Dec;95(6):579-85.

Taipei

Local Publications

The following publications used ISAAC data from the Tallinn centre:

Riikjärv MA, Annus T, Bråbäck L, Rahu K, Björkstén B. *Similar prevalence of respiratory symptoms and atopy in Estonian schoolchildren with changing life style over 4 years.* Eur Respir J 2000; 16(1): 86-90.

Annus T, Riikjärv MA, Rahu K, Björkstén B. *Modest increase in seasonal allergic rhinitis and eczema over 8 years among Estonian schoolchildren.* Pediatr Allergy Immunol 2005; 16(4): 315-20.

Annus T, Montgomery SM, Riikjärv MA, Björkstén B. *Atopic disorders among Estonian schoolchildren in relation to tuberculin reactivity and the age at BCG vaccination.* Allergy 2004; 59(10): 1068–1073.

A view of Tallinn with a school roof in the left

A school from the beginning of XX century with a modern rebuilding (gymnastics hall and swimming pool)

A school from the 1930-ies in Tallinn in winter (with Estonian and Tallinn flags)

A school from XIX century

Tallinn Centre

Phase One			
Centre:		Tallinn, Estonia (Northern and Eastern Europe)	
Principal Investigator:		Dr Mall-Anne Riikjärv	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:December 1993 to April 1994 6-7yr:December 1993 to October 1994
Sampling Frame:			

Phase Two			
Centre:		Tallinn, Estonia (Northern and Eastern Europe)	
Principal Investigator:		Dr Mall-Anne Riikjärv	
Age Groups:	10,	**Timeframe:**	December 1996 to February 1997.
Sampling Frame:		A random sample of Estonian-speaking schools throughout Tallinn.	

Phase Three			
Centre:		Tallinn, Estonia (Northern and Eastern Europe)	
Principal Investigator:		Dr Mall-Anne Riikjärv	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2001 to April 2002
Sampling Frame:		All Estonian Language schools in Tallinn	

Personnel

Dr Triine Annus

Estonian ISAAC Phase 1 - 3 investigator pediatric allergist
Tallinn Children's Hospital
Central Policlinic
Ravi 27 10138
Tallinn
Estonia

Roles:

- Phase One collaborator for Tallinn
- Phase Three collaborator for Tallinn

Dr Mall-Anne Riikjärv

Clinical Director
Tallinn Children's Hospital
Tervise, 28
Estonia

Roles:

- National Coordinator for Estonia
- Phase One Principal Investigator for Tallinn
- Phase Two Principal Investigator for Tallinn
- Phase Three Principal Investigator for Tallinn

ISAAC in Estonia (East Europa)

Estonia was a socialist country, which regained its independence in 1991. In these days Estonian pediatricians met prof. Bengt Björksten, who initiated the first epidemiological study of asthma and allergies in Estonian children. He encouraged us also to take part in the international study ISAAC, which we accepted with great enthusiasm. It was especially important for us that prof. Björksten found the resources for the study, as the economical situation in Estonia in these times was very difficult. The group of field workers was formed from pediatricians, who did the demanding field work in addition to their everyday clinical work. Such a study in schools was rather unusual, but the scool staff accepted the study group intervention into the everyday school activities rather calmly. In data processing we were pleased to receive help from an experienced statsitician, whose qualified collaboration enabled us to forward high quality data to the ISAAC center.

The positive experience from the ISAAC I encouraged us also to take part in the next phases of ISAAC. The ISAAC II study with it's multiple tasks and procedures was rather challenging for our small group of field workers . However, we don't remember any exceptional situations and the schoolchildren were always eager to get the reason to miss their lessons.

Participating in the ISAAC studies was an enriching experience in many ways for Estonian pediatrics. It was the first experince in the international scientific cooperation for us. Using the internationally accepted methods we got reliable data about the epidemiological situation on asthma and allergies in Estonian children. Several papers in international scientific journals and a doctoral thesis were based on the research data. We believe that the data from Estonia, a country in transition from socialism to the market economy, were a valuable addition to the international comparison. Such data gave the reason to the hypothesis that socialism protects from allergies.

We gratefully acknowledge prof. Bengt Björksten, who opened the door to the International allergy world for us and warranted the financial support for the studies. We also thank the schools and families of the participating children. Our study woudn't have been possible without enthusiastic team of pediatricians who bore the main burden .

Taoyuan Centre

Phase Three			
Centre:		Taoyuan, Taiwan (Asia-Pacific)	
Principal Investigator:		Dr Chun-Chieh Kao	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to June 2002
Sampling Frame:		Some schools in Taoyuan county, Taiwan	

Personnel

Dr Chun-Chieh Kao

Department of Pediatrics
Li-Shin Hospital
77, Kuang-Tai Road
Ping-Chen City
Taiwan

Roles:

- Phase Three Principal Investigator for Taoyuan

Why was Taoyuan selected for ISAAC?

In Taiwan, there was limited literature to disclose the prevalence, severity, and seasonal variations of allergic diseases, especially the seasonal variations in a large-scale survey in recent years. The aim of the present study was to use the ISAAC protocol to investigate the prevalence, severity, demographic and seasonal variations of asthma and other allergic diseases in Taiwan in a county sample of school children aged 6-7 years and 13-14 years. Besides, we also wanted to know the prevalence and severity about Taiwanese aborigines in Taoyuan County of Taiwan (Taoyuan Center).

Our experience of ISAAC

The ISAAC Phase Three parents-administered translated questionnaire for children aged 6 to 7 years, was used for children in the first grade in the elementary school. The same questionnaire, with some changes to fit with ISAAC Phase Three recommended version for children aged 13 to 14 years, was used for children in the eighth grade in the junior high school. The ISAAC standard questionnaire consisted of three main sections, each involving questions relating to the prevalence and severity of wheezing, rhinitis, and eczema respectively. These questionnaires had been validated in previous studies. The questions concentrated mainly on past and current wheezing episodes, frequency of wheezing attacks, sleep disturbance and speech limitation during attacks, acute severe wheezing episodes, exercise-induced wheezing, night-time cough unrelated to respiratory infection and a doctor's diagnosis of asthma. The core questionnaires for rhinitis and eczema followed a similar format. As all the schoolchildren and parents speak Mandarian fluently in Taiwan, they were given to answer a Chinese version of the questionnaire despite a small number of Aborigine in the Taoyuan County of Taiwan. The Chinese version of the questionnaire had been back-translated as a validity check, according to defined guidelines. We opted to add several questions about seasonal variations of asthma to explore the connection with asthma and hospital admissions for asthma.

Sampling and Data Collection

The studied area was Taoyuan County, northern Taiwan, and grade 1 or grade 8 children were recruited. According to ISAAC protocol, school was the sampling unit and twenty-five schools were stratified cluster selected from 10 districts in Taoyuan County . The eighth-grade children (aged 13-14 years) filled the questionnaires during class hours under the supervision of their class teacher, and first-grade children (aged 6-7 years) took the questionnaires home to have it filled in by their parents or guardian and returned it within a week. For children who missed the school during our visit, a questionnaire was given another day. This study protocol, sampling method, data had submitted to ISAAC and permission was obtained (area code 113003).

A total of 6771 questionnaires were supposed to be collected between May and June of 2002 and 6483 questionnaires were returned with a total response rate of 95.7% (92.7% in the younger age group, and 99.1% in the older children). Excluding 21 due to ineligible age and 275 dueto missing answers in the diagnosed questions on either asthma, rhinitis, or eczema, a total of 6187 school children were included for this study. Our results had been published in the Journal of Pediatric Allergy and Immunoloy(PAI).

We gratefully acknowledge all members in the work team from Taipei center and Lishin hospital in Taoyuan center. We wish to thank all parents, children and school staff who participated in the surveys and also our fieldworkers team for their enthusiasm and effort thoughout each study.

Local Publications

The following publications used ISAAC data from the Tartous centre:

Mohammad Y, Tabbah K, Mohammad S, Yassine F, Clayton T and Hassan M *International Study of Asthma and Allergies in Childhood phase 3 in the Syrian Arab Republic* East Med Health J 2010; 16(7): 710-716

Georgia

Tartous Centre

Phase Three			
Centre:		Tartous, Syria (Eastern Mediterranean)	
Principal Investigator:		Dr Samira Mohammad	
Age Groups:	13-14, 6-7	**Timeframe:**	April 2001 to October 2002
Sampling Frame:		Random sampling but the areas were divided into highly polluted around the oil refinery, the power station and the cement factory… etc and low polluted areas in the country and the city.	

Personnel

Dr Samira Mohammad

Head of Paediatrics Department
PO Box 2500
Syria

Roles:

- National Coordinator for Syria
- Phase Three Principal Investigator for Tartous

Tashkent Centre

Phase One			
Centre:		Tashkent, Uzbekistan (Northern and Eastern Europe)	
Principal Investigator:		Professor Tamara Aripova	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All Tashkent schools.	

Personnel

Professor Tamara Aripova

c/- Prof Ruslan M Ruzibakiev
Institute of Immunology of AcSci Ruz
74, Y.GULYAMOV Street
Uzbekistan

Roles:

- Phase One Principal Investigator for Tashkent

Tbilisi Centre

Phase One			
Centre:		Tbilisi, Georgia (Northern and Eastern Europe)	
Principal Investigator:		Professor Amiran Gamkrelidze	
Age Groups:	13-14, 6-7	**Timeframe:**	February 1995 to April 1995
Sampling Frame:			
Phase Two			
Centre:		Tbilisi, Georgia (Northern and Eastern Europe)	
Principal Investigator:		Dr Maia Gotua	
Age Groups:	10-11 years,	**Timeframe:**	March 2001 to June 2002.
Sampling Frame:		Random sample of schools from five districts (rayons) of the capital city. Same study area as ISAAC Phase One.	

Personnel

Dr Tamar Abramidze

Center of Allergy & Immunology
2/6 Lubliana str.
Georgia

Roles:

- Phase Two collaborator for Tbilisi

Professor Amiran Gamkrelidze

Scientific Adviser of the Center of Allergy and Immunology
Programme Coordinator of WHO Country Office in Georgia,
2/6 Lubliana Str, 0159
Tbilisi
Georgia

Roles:

- Phase One Principal Investigator for Tbilisi
- Phase Two collaborator for Tbilisi
- Scientific Advisor to Phases Two and Three

The ISAAC Story

Dr Maia Gotua

Director
Center of Allergy & Immunology
2/6 Lubliana str.
Tbilisi
Georgia

Roles:
- National Coordinator for Georgia
- Phase Two Principal Investigator for Tbilisi
- Phase One collaborator for Tbilisi

Dr Natela Gunia

Tbilisi State Medical University
2/6 Lubliana Str, 0159
Georgia

Roles:
- Phase One collaborator for Tbilisi

Lali Karsanidze

Tbilisi State Medical University
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Georgia

Roles:
- Phase One collaborator for Tbilisi

Maia Kiladze

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Georgia

Roles:
- Phase Two collaborator for Tbilisi

Izo Kvachadze

Center of Allergy & Immunology
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Georgia

Roles:
- Phase Two collaborator for Tbilisi

Dr Maia Rukahzde

Center of Allergy & Immunology
2/6 Lubliana str.
Georgia

Roles:
- Phase Two collaborator for Tbilisi

Background

Georgia, which former was one of the Soviet Union countries, gained its independence in 1990 and faced most complicated political situations and hard economic conditions. Despite the mentioned Georgia was always opened to new researches, including epidemiological studies. The ISAAC regional coordinator for Northern and Eastern Europe professor Bengt Bjorksten kindly invited Georgia to participate in ISAAC study in 1994. This participation was defined according to the following key points: the lack of any epidemiological data regarding markers of allergy diseases for that time in Georgia; the interest to confirm the purpose that the prevalence of these diseases in Georgia should be much lower than in country with market economy (as it was revealed in the other less industrialized formerly socialist countries); as well as personal contact with Prof. Gamkrelidze and his team of highly-qualified allergologists at the Tbilisi State Medical University and later staff of Center of Allergy and Immunology.

Impact of ISAAC

Involvement in a large global research project gave chance of new research, education and obtaining of practical experience to our country. It was extremely important for developing allergy and epidemiology fields in Georgia and learning new approaches of standardized high quality research. Participation in ISAAC expanded our professional contacts and was good opportunity for active exchanging of scientific knowledge with our colleagues in other countries.

Findings

ISAAC Phase I and as well as ISAAC Phase III were conducted in two cities of Georgia – Tbilisi and Kutaisi, characterized by different geographical and urban peculiarities. The prevalence of symptoms of allergic diseases in Georgia according to the results of ISAAC I survey mostly was less than 5%. The exception was the prevalence of wheezing 12 months among 6-7 yrs. Old children (Kutaisi – 9.3%, Tbilisi -5.4%), which possibly could be less related to allergy and more associated with infections in the younger children. The regional differences (between two study centers) in symptoms were not obvious among 13-14 yrs. Old children. The 12 month prevalence of wheezing and conjunctivitis were slightly higher in Kutaisi than in Tbilisi among the 6-7 yr olds children.

ISAAC Phase II was performed in Tbilisi, in 2001-2002. The prevalence rate of asthma became 9.2%, the prevalence rate of 12 months of itchy rash and flexural dermatitis were 7.6% and 5.9%, respectively, which was higher than the prevalence of eczema symptoms reported in Georgia 6-7 years ago (ISAAC Phase I – 1995-1996). The prevalence of current rhinoconjunctivitis was increased as well (6.3% vs. 4.7%). An interesting finding was that the family history of allergic diseases and damp spots on the wall was the main determinants for all types of allergic symptoms as well as high co-morbidity of allergic diseases.

ISAAC Phase III was conducted in May 2003 – December 2003 in two centers. Unfortunately, Tbilisi center was excluded from the global data analysis. That was caused by very low response rate (46% - 13/14 yrs old group, 56% - 6/7 yrs old group) during the fieldwork period, due to the difficult political situation inside the country (so-called "Rose Revolution" located in Tbilisi). In order to reveal tendency of changes of allergic symptoms prevalence in our country we analyzed both centers. The results of ISAAC phase III study indicate that the epidemiological features of asthma and allergies in Georgia are changing, although the causes are still uncertain. Considerable geographic variation in time trends of prevalence of symptoms of asthma and allergies can been seen in both age groups (6/7 and 13/14 yrs old). The prevalence changes, particularly the increasing pattern, more clearly expressed in Tbilisi than in Kutaisi centre. Among adolescences in Kutaisi center only "current wheezing" increased from 1996 (3,6% (95%CI 3.1-4.1)) to 2003 (5.1% (95%CI 4.3-5.9)), the prevalence of all other allergic diseases decreased or remained without changes. It should be noted, that the prevalence of current wheezing among 6-7 yrs old children, in contrast to other age group, decreased by 2,4% (9,3% (1996) and 6,9% (2003)), the symptoms of current rhino-conjunctivitis slightly decreased and symptoms of flexural dermatitis reduced by 2.8% ($p < 0.01$).

References

1. Björkstén B, Dumitrascu D, Foucard T, Khetsuriani N, Khaitov R, Leja M, Lis G, Pekkanen J, Priftanji A, Riikjärv MA. Prevalence of childhood asthma, rhinitis and eczema in Scandinavia and Eastern Europe. Eur Respir J. 1998 Aug; 12(2):432-7.
2. Weinmayr G, Weiland SK, Björkstén B, Brunekreef B, Büchele G, Cookson WO, Garcia-Marcos L, Gotua M, Gratziou C, van Hage M, von Mutius E, Riikjärv MA, Rzehak P, Stein RT, Strachan DP, Tsanakas J, Wickens K, Wong GW; ISAAC Phase Two Study Group. Atopic sensitization and the international variation of asthma symptom prevalence in children. Am J Respir Crit Care Med. 2007 Sep 15; 176(6):565-74. Epub 2007 Jun 15.
3. Abramidze T, Gotua M, Rukhadze M, Gamkrelidze A. Prevalence of asthma and allergies among adolescences in Georgia: comparison between two surveys. Georgian Med News. 2007 Mar ;(144):38-41

Acknowledgment

We wish to thank Prof. Bengt Bjorksten for a supervision and great support in carrying out of all phases of ISAAC study in Georgia. Many thanks to ISAAC group of University of Ulm under the leadership of Prof. Stephan Weiland and ISAAC group in Auckland for supporting in data entry and analysis. We are also grateful to all the children, parents and school staff who participated in the surveys.

Tehran Centre

Phase One			
Centre:		Tehran, Iran (Eastern Mediterranean)	
Principal Investigator:		Dr Mohammed-Reza Masjedi	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:May 1995 to June 1995 6-7yr:May 1995 to September 1995
Sampling Frame:			

Phase Three			
Centre:		Tehran, Iran (Eastern Mediterranean)	
Principal Investigator:		Dr Mohammed-Reza Masjedi	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2001 to June 2001
Sampling Frame:		All schools in Tehran urban region.	

Personnel

Dr Mohammed-Reza Masjedi

Masih Daneshvary Hospital
Dorabad
Shaheed Bahoner Ave
Darabad
Iran

Roles:

- National Coordinator for Iran
- Phase One Principal Investigator for Tehran
- Phase Three Principal Investigator for Tehran

Local Publications

The following publications used ISAAC data from Tehran:

Masjedi MR, Fadaizadeh L, Najafizadeh K, Dokouhaki P. *Prevalence and Severity of Asthma Symptoms in Children of Tehran- International Study of Asthma and Allergies in Childhood (ISAAC).* Iran J Allergy Asthma Immunol.2004 Mar;3(1):25-30.

Masjedi MR, Fadaizadeh L, Najafizadeh K, Dokouhaki P *Prevalence and Severity of Asthma Symptoms in Children of the Tehran-ISAAC Study* Pediatric Asthma, Allergy and Immunology. Winter 2004, 17(4): 244-250.

Masjedi MR, Fadaizadeh L, Najafizadeh K, Dokouhaki P *A Study of the Prevalence and Severity of Rhinitis in Children in Tehran: ISAAC Study* Journal of Isfahan Medical School (I.U.M.S) Spring 2005; 23(76):36-41.

Fadaizadeh L, Salek S, Najafizadeh K, Masjedi MR *Prevalence and Severity of Asthma Symptoms in Students of Tehran and Rasht: Phase III ISAAC Study* Tanaffos (2008) 7(3), 31-36

Fadaizadeh L, Keyvan S, Najafizadeh K, Masjedi MR *Evaluation of Agreement between Video and Written Questionnaires for Asthma Symptoms Amoung Children of Tehran: ISAAC Study.* Journal of Shahid Sadoughi University of Medical Sciences and Health Services, summer 2008; 16(2):36-43.

Thessaloniki Centre

Phase Two			
Centre:		Thessaloniki, Greece (Western Europe)	
Principal Investigator:		Associate Professor John Tsanakas	
Age Groups:	10-11,	**Timeframe:**	September 2001 to November 2001.
Sampling Frame:		A sample of 40 schools selected in random order from the city centre and suburbs.	
Phase Three			
Centre:		Thessaloniki, Greece (Western Europe)	
Principal Investigator:		Associate Professor John Tsanakas	
Age Groups:	6-7	**Timeframe:**	November 2000 to February 2001
Sampling Frame:		13-14yr: Some schools in Thessaloniki	

Personnel

Associate Professor John Tsanakas

Paediatric Respiratory Unit
3rd Department of Paediatrics
Hippokration General Hospital
49 Kostantinoupoleos Street
Greece

Roles:

- Phase Two Principal Investigator for Thessaloniki
- Phase Three Principal Investigator for Thessaloniki

There were several epidemiological studies about paediatric asthma in Greece since 1978; they had different methodology regarding questionnaires and the age of the samples. In the different asthma prevalence studies that had been done between 1970 and 1990, even taking into account that they had different methodology, we could see that there was a concerning increase in asthma prevalence. For this reason we considered it very important to join ISAAC.

Dr Christine Gratziou, our National Co-ordinator in ISAAC study, was the liaison person who organized participation of Greece in ISAAC phase One study in 1994. In phase One Greece participated in ISAAC study with one centre, collecting date from two big cities: Athens and Thessaloniki. At that time I was in charge of the Paediatric Pulmonology Unit of Aristotle University of Thessaloniki.Dr Gratziou suggested me to participate in the next phases of ISAAC (II and III). So I undertook the role of Principal Investigator in Thessaloniki Center for phase Two and Three. In Phase Two and Three a second centre was added 1510 children from 36 schools participated in the 6-7 years group and. It was very important to have a second centre within an area far from the capital, to have a better idea of the prevalence of asthma and allergies in Greece.

Since Greece has participated in ISAAC, we think that there has been a growing concern about asthma in the physician community. Paediatricians now recognize asthma symptoms more easily and treat asthma more effectively. Besides, participating in ISAAC has given us the opportunity to compare our data with the data of other countries involved in this study, as well as to estimate the change of asthma prevalence in Greece over time.

We would like to thank all parents, children and school staff who participated in the surveys and also our fieldworkers team for their enthusiasm and effort throughout each study.

Local Publications

The following publications used ISAAC data from the Thessaloniki centre:

Papadopoulou A, Hatziagorou E, Matziou VN , Grigoropoulou DD, Panagiotakos DB, Tsanakas JN, Gratziou C, Priftis KN *Comparison in asthma and allergy prevalence in the two major cities in Greece the ISAAC phase II survey* Allergol Immunopathol(Madr).2011; epub ahead of print

The ISAAC Story

Tibet Centre

Phase Three			
Centre:		Tibet, China (Asia-Pacific)	
Principal Investigator:		Assistant Professor Osamu Kunii	
Age Groups:	13-14	**Timeframe:**	September 2001 to December 2001
Sampling Frame:		13-14yr: All public middle schools (junior high schools) in Lhasa city, Tibet, China.	

Personnel

Assistant Professor Osamu Kunii

Department of International Community Health
Graduate School of Medicine
University of Tokyo
7-3-1 Hongo, Bunkyo-ku
Japan

Roles:

- Phase Three Principal Investigator for Tibet

Tiranë Centre

Phase One			
Centre:		Tiranë, Albania (Northern and Eastern Europe)	
Principal Investigator:		Professor Alfred Priftanji	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1995 to February 1996
Sampling Frame:			
Phase Two			
Centre:		Tiranë, Albania (Northern and Eastern Europe)	
Principal Investigator:		Professor Alfred Priftanji	
Age Groups:	10-11 y. old,	**Timeframe:**	February 1999 to April 1999.
Sampling Frame:		Ten schools randomly selected from the city of Tirana. Same study area as ISAAC Phase One.	
Phase Three			
Centre:		Tiranë, Albania (Northern and Eastern Europe)	
Principal Investigator:		Professor Alfred Priftanji	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2001 to April 2001
Sampling Frame:		All schools in the city of Tirana. The same sampling frame was used for Phases One and Three.	

Personnel

Professor Alfred Priftanji

Faculty of Medicine, University of Tirana
Head, Department of Allergology and Clinical Immunology
University Hospital Center “Mother Theresa”
Tiranë
Albania

Roles:

- National Coordinator for Albania
- Phase One Principal Investigator for Tiranë
- Phase Two Principal Investigator for Tiranë
- Phase Three Principal Investigator for Tiranë

Why we were chosen for the ISAAC study

Albania is a small European country with approximately 3 million people. Until 1990 we were under an extremely closed communist regime. Later on, we understood that the Albanian population, as an isolated community, with a very simple lifestyle, different from “western” lifestyle, was an ideal sample for the Strachan Hygiene Hypothesis.

In 1992, Dr. Jane Layzell, a collaborator of Dr. Michael Burr in the ECRHS in Cardiff, came to Albania as part of “Feed the Children” programme. She proposed that I apply for epidemiological surveys of asthma & allergies in Tirana. In 1994 I recieved an EU grant and started the ECRHS in Albania, so called Albanian Respiratory Health Survey (ARHS). Dr. Michael Burr was appointed as a coordinator. Our center took part actively in this study and we got the first prevalence ever for adult asthma in Albania and in Balkan areas.

The ISAAC Story

At the same period, with the recommendation of Dr. Michael Burr and Dr. Jane Layzell, we applied and were accepted in the ISAAC Phase One Study. The prevalence of asthma & allergies were the lowest in Europe and it was postulated that our population was not exposed to the risk factors present in the western countries. After that we were part of ISAAC family and participated in all phases of ISAAC.

The factors associated with asthma & allergy in Albania were therefore of particular interest. Prof. Alfred Priftanji and his team were supported in all other ISAAC Phases by ISAAC Steering Committee members like Prof. Stefan Weiland, Prof. David Strachan, Prof. Bengt Björkstén, Dr. Michael Burr, Prof. Erika Von Mutius, etc. The Albanian team worked meticulously and hard in order to be an active, reliable partner in this study. So, for the first time in Albania & Balkan we achieved a plausible data base for the prevalence, the risk factors of the asthma & allergic diseases in children and we had the opportunity to compare these data with the other centers worldwide.

Albania took part also in ISAAC phases Two and Three. Outstanding work was done from the teams of each phase and the primary investigator on fulfilling the work and persuading the children and the parents in order to take part in the study. The data we received from ISAAC surveys helped us to raise the awareness of the medical community, health policy makers for asthma & allergies as a growing problem.

We are very proud that Albania, a small country, thanks to all our work was able to participate in equal terms in this enormous study. We had the opportunity to work with eminent names in this field and we are grateful for to all the scientists that supported our involvement.

Now, in September 2011, with financial support from GlaxoSmithKline we will repeat the protocol of ISAAC phase One and partially phase Two in Tirana. In these 16 years the Albanian people have adopted the western lifestyle, so have been exposed to the same risk factors as in all other parts of Europe. We are really enthusiastic for this study because we are very curious to see the trend of asthma and allergic diseases and also evaluate the role of risk factors after 16 years.

Our acknowledgement goes to the team of ISAAC-Albania:

Primary Investigator: Prof. Alfred Priftanji.
Doctors: Anila Shkurti, Juventila Sinemati, Edi Grabocka, Anxhela Gurakuqi, Sokol Agolli, Kastriot Shytaj, Mira Ziçishti, Xhilda Raço.
Nurses: Frasete Kasemi, Loreta Laho.
Secretary: Margarita Doci

Tobago Centre

Phase Three			
Centre:		Tobago, Trinidad and Tobago (North America)	
Principal Investigator:		Dr Michelle A Monteil	
Age Groups:	13-14, 6-7	**Timeframe:**	November 2002 to November 2002
Sampling Frame:		All schools in Tobago	

Personnel

Dr Michelle A Monteil

Department of Paraclinical Sciences
Faculty of Medical Sciences, University of the West Indies
Eric Williams Medical Sciences Complex
Uriah Butler Highway, Champs Fleur
Trinidad And Tobago

Roles:

- Phase Three Principal Investigator for Tobago

Tochigi Centre

Phase Three			
Centre:		Tochigi, Japan (Asia-Pacific)	
Principal Investigator:		Professor Makino Sohei	
Age Groups:	13-14	**Timeframe:**	September 1995 to March 1996
Sampling Frame:		13-14yr: All schools in Utsunomiya city and Tochigi city in Tochigi prefecture.	

Personnel

Professor Makino Sohei

Dept of Pulmonary Medicine & Clinical Immunology
Dokkyo University School of Medicine
Mibu
Japan

Roles:

- Phase Three Principal Investigator for Tochigi

Dr Kumiya Sugiyama

Department of Medicine and Clinical Immunology
Dokkyo University School of Medicine
Mibu
Japan

Roles:

- Phase Three collaborator for Tochigi

Local Publications

The following publications used ISAAC data from the Tochigi centre:

Sugiyama S, Sugiyama T, Toda M, Yukawa T, Makino S, Fukuda T. *Prevalence of asthma, rhinitis and eczema among 13–14-year-old schoolchildren in Tochigi, Japan.* Allergol Int 2000; 49(3): 205–211.

Sugiyama T, Sugiyama K, Toda M, Yukawa T, Makino S, Fukuda T. *Risk factors for asthma and allergic diseases among 13–14-year-old schoolchildren in Japan.* Allergol Int 2002; 51(2): 139–150.

The ISAAC Story

Tokelau

Tokelau

Tokelau

Fakaofo island - Tokelau averge island

Tokelau Centre

Phase Three			
Centre:		Tokelau, Tokelau (Oceania)	
Principal Investigator:		Dr Tekie Iosefa	
Age Groups:	13-14	**Timeframe:**	June 2003 to June 2003
Sampling Frame:		13-14yr: All schools in Tokelau	

Personnel

Dr Tekie Iosefa

Chief Health Advisor
Ministry of Health
Tokelau

Roles:

- National Coordinator for Tokelau
- Phase Three Principal Investigator for Tokelau

Toluca Centre

Phase Three			
Centre:		Toluca, Mexico (Latin America)	
Principal Investigator:		Dr Francisco J Linares-Zapién	
Age Groups:	13-14, 6-7	**Timeframe:**	September 2002 to October 2002
Sampling Frame:		All public schools in Toluca area	

Personnel

Dr Francisco J Linares-Zapién

Facultad de Medicina
Universidad Autónoma del Estado de México
Hidalgo Poniente 1052, Interior "D"
Colonia San Bernardino
Mexico

Roles:

- Phase Three Principal Investigator for Toluca

Tong Zhou Centre

Phase Three			
Centre:		Tong Zhou, China (Asia-Pacific)	
Principal Investigator:		Professor Yu-Zhi Chen	
Age Groups:	13-14	**Timeframe:**	November 2001 to January 2002
Sampling Frame:		13-14yr: Some schools in Tongzhou	

Personnel

Professor Yu-Zhi Chen

Capital Institute of Pediatrics
No 2 Ya Bao Road
Beijing
China

Roles:

- National Coordinator for China
- Phase Three Principal Investigator for Tong Zhou

ISAAC in China

China is a very large country, and there were several studies about asthma prevalence in1990 and also in 2000. A nationwide and randomized survey on the prevalence of childhood asthma in 2000, compared with the same study in 1990, covered 31 provinces and 43 cities, including a population of 437873 children aged 0-14 years. The results show us that there was a concerning increase in asthma prevalence. But they had a different methodology than ISAAC Study. For this reason we considered it very important to join ISAAC. We thought joining the ISAAC study would let us get data about asthma and allergies prevalence in different cities in China and give us the opportunity of comparing our data with the data of other countries involved in this study. With ISAAC we also expected to achieve a better understanding and treatment of our patients.

When we knew that an international study about asthma and allergies was being prepared. We were very enthusiastic about including 5 cities of mainland China in that study in 1994 ISAAC Phase One. The 5 cities were Beijing, Shanghai, GuangZhou, Chongqing and Urumuqi, and we worked very hard do the study.

In ISAAC Phase Two study, as the study was more difficult than Phase One, and only needed a few centres to take part in it, we chose 2 centres, Beijing and Guangzhou, to join the Phase Two study. Expecially, our team did a lot of difficult work in the study. For example, in the dust collection work, you could imagine how hard it was to go to 200 children's home when the pupils were dismissed from school, and to get the dust from those children's bed, floor, etc.

The ISAAC Story

In Phase Three China, a new centre, Tongzhou (Beijing rural) was added to the study in the 13-14 years group. Tongzhou is an area about 50km away from the Beijing urban city that included children from farmland. It was very important to have the centre within the study, so we could compare the result of Tongzhou with Beijing urban city, and to have a better understanding of the prevalence and machanism of asthma and allergic diseases. And finally, we found that the wheezing and allergic diseases prevalence were much lower in rural Beijing students than in urban Beijing students, and also the prevalence of positive allergy of SPT was much lower in rural Beijing students than in urban Beijing students.

Overall, in 12 years of ISAAC Study from Phase I to Phase III, about 90,000 chinesechildren joined the study, and 25,000 Beijing children joined the study.

And more, for the I-III ISAAC Study, we got the award of "Science and Technology Advancement Prize" awarded by the Beijing Municipal Government in 2006, and recieved 20000 RMB prize.

Torino Centre

Phase One			
Centre:		Torino, Italy (Western Europe)	
Principal Investigator:		Dr Giovannino Ciccone	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1994 to December 1994
Sampling Frame:			

Phase Three			
Centre:		Torino, Italy (Western Europe)	
Principal Investigator:		Dr Giovannino Ciccone	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to April 2002
Sampling Frame:		All schools in the city of Turin (the same sampling frame for Phase One).	

Personnel

Dr Giovannino Ciccone

Epidemiologia dei Tumori
S. Giovanni Battista Hospital
CPO Piemonte
Via Santena, 7
Italy

Roles:

- Phase One Principal Investigator for Torino
- Phase Three Principal Investigator for Torino

Trent Centre

Phase One			
Centre:		Trent, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in North West region and all schools from a random selection of 4 metropolitan districts from the metropolitan county. Stratified by county\metropolitan district, followed by random sampling of one school from each area.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for Trent

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for Trent

Dr Jan Poloniecki

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for Trent

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

The ISAAC Story

Map of Trento

Map of Trento

Map of Italy

Dolomite mountains, Trento, Italy

Dolomite mountains, Trento, Italy

Trento Centre

Phase One			
Centre:		Trento, Italy (Western Europe)	
Principal Investigator:		Dr Silvano Piffer	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Province	
Phase Three			
Centre:		Trento, Italy (Western Europe)	
Principal Investigator:		Dr Silvano Piffer	
Age Groups:	13-14, 6-7	**Timeframe:**	February 2002 to March 2002
Sampling Frame:		All schools in Trento Province (the same as Phase One).	

Personnel

Mr Antonio Chistofolini

Servizio Medicina del Lavoro
Somial 1
Via Brennero, 286/6
Italy

Roles:

- Phase Three collaborator for Trento

Dr Silvano Piffer

Epidemiologist, Osservatorio Epidemiologico
Azienda Provinciale per I Servizi Sanitari
Centro per i Servizi Sanitari
Viale Verona, 38123 Trento
Italy

Roles:

- Phase One Principal Investigator for Trento
- Phase Three Principal Investigator for Trento

Trentino Province Coordinator ISAAC II (Sidria 1) e ISAAC III (Sidria 2)

Trentino province (north Italy) was a partner of Italian network of ISAAC Phase One and Three. The name of the Italian network was SIDRIA 1 and SIDRIA 2 (Studi Italiani sui Disturbi Respiratori nell'Infanzia e l'Ambiente). SIDRIA 1 took place in 1995-96 and in Trentino province exclusively involved all boys/girls attending the third year of 2° primary school (13-14 year). SIDRIA 2 took place in 2001-2002 and in Trentino (as in other Italian SIDRIA/ISAAC centers) involved a sample of 6-7 years boys/girls and a sample of 13-14 years boys/girls.

Trentino province is a highly mountainous area, where People do not think there are some problems with asthma and allergies. The studies about allergies and asthma prevalence in the general population (adult and/or childhood) were so very scarce.

In SIDRIA 1 (1995-96) We studied 4426 subjects 13-14 years old. Not considering the publications of national data on Italian and international medical journals as SIDRIA Group, we locally spread the data, to general population and healthcare professionals, starting from 1997. A great interest has been raised especially by pediatricians and pneumologist who arranged for the first time data on asthma and allergy at the population level. The data of SIDRIA 1 were also used and presented during a refresher course for pediatrician held in Trento in 1998-99.

In SIDRIA 2 (2001-02) We studied a sample of 2.359 subjects 6-7 years old and a sample of 1362 subjects 13-14 years old. Not considering the publications of national data on Italian and international medical journals as SIDRIA Group (second Phase), we locally spread the data, to general population and healthcare professionals, starting from 2003. Locally the data of SIDRIA 2 were used jointly with Trento University (Mathematics Institute) for doing spatial evaluation in association or not with the distribution of environmental pollutants. A great interest has been raised especially by hygienist so that the data were also used for exploring the association to specified point source pollution. The data of SIDRIA 2 were also used and presented during a local refresher course for hygienist held in Trento, by the Local Health Authority, in 2004-2005.

Finally SIDRIA 1 and SIDRIA 2 represented a unique opportunity for Department of Epidemiology of Trento to explore and increase the knowledge about the theme of the epidemiology of asthma and allergies in childhood.

Regional
National
Local
Trento
Tromsø
Turku and Pori County
Urban Cote d Ivoire

SOME GEOGRAPHIC CHARACTERISTICS OF TRENTINO PROVINCE

- Total resident population: 520,000 (12.31.2009)
- Provincie surface: 6,206,88 SqKm
- Total Municipalities: 223
- The province in highly mountainous
- Habitats and nature reserve: about 30% total surface
- Forests: about 50% d total surface
- Unproductive area: 16 %
- Urbanized area: 3.27%

Dolomites (right) are the mountains for which the Province of Trento is well known in the world

Tromsø Centre

Phase Two			
Centre:	Tromsø, Norway (Western Europe)		
Principal Investigator:	Dr Wenche Nystad		
Age Groups:	9-11,	**Timeframe:**	March 2000 to June 2000.
Sampling Frame:	All schools in the counties of Troms and Finnmark.		

Personnel

Dr Wenche Nystad

Section of Epidemiology
Department of Health & Society
National Institute of Public Health
P O Box 4404, Torshov
Norway

Roles:

- Phase Two Principal Investigator for Tromsø

Turku and Pori County Centre

Phase One			
Centre:	Turku and Pori County, Finland (Northern and Eastern Europe)		
Principal Investigator:	Dr Turku Antti Koivikko		
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:	All schools in Turku and Pori County		

Personnel

Dr Turku Antti Koivikko

Department of Paediatrics
Turku University Hospital
Kiinanmyllynkatu 4-7
Finland

Roles:

- Phase One Principal Investigator for Turku and Pori County

Urban Cote d Ivoire Centre

Phase Three			
Centre:	Urban Cote d Ivoire, Cote d'Ivoire (Africa)		
Principal Investigator:	Dr Bernard Ngoran Koffi		
Age Groups:	13-14	**Timeframe:**	May 2001 to June 2001
Sampling Frame:	13-14yr: All children in the schools except white children		

Personnel

Dr Bernard Ngoran Koffi

27 BP 340
Côte D'Ivoire

Roles:

- National Coordinator for Côte D'Ivoire
- Phase Three Principal Investigator for Urban Cote d Ivoire

The ISAAC Story

Urfahr-Umgebung Centre

Phase One			
Centre:		Urfahr-Umgebung, Austria (Western Europe)	
Principal Investigator:		Associate Professor Gerald Haidinger	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:November 1995 to February 1996 6-7yr:May 1995 to May 1995
Sampling Frame:		13-14yr: All children attending the 3rd and 4th grade of secondary school. 6-7yr:All children attending pre-school classes or 1st and 2nd grade elementary school.	

Phase Three			
Centre:		Urfahr-Umgebung, Austria (Western Europe)	
Principal Investigator:		Associate Professor Gerald Haidinger	
Age Groups:	13-14, 6-7	**Timeframe:**	January 2003 to March 2003
Sampling Frame:		All schools in the district Urfahr-Umgebung	

Personnel

Associate Professor Gerald Haidinger

Department of Epidemiology
Centre of Public Health
Medical University of Vienna
Borschkegasse 8a, 1090 Vienna
Austria

Roles:

- National Coordinator for Austria
- Phase One Principal Investigator for Urfahr-Umgebung
- Phase Three Principal Investigator for Urfahr-Umgebung

Uruguaiana Centre

Phase Two			
Centre:		Uruguaiana, Brasil (Latin America)	
Principal Investigator:		Professor Renato Stein	
Age Groups:	,	**Timeframe:**	March 2003 to March 2004.
Sampling Frame:		A randomly chosen sample of children enrolled in the fourth and fifth middle-school levels of the public system of a small town, Uruguaiana, in the extreme south of Brazil.	

Personnel

Professor Renato Stein

Pediatric Pulmonary Unit
Department of Pediatrics
Pontificia Universidade Catolica RS
Av Ipiranga, 6690 conj. 420
Brasil

Roles:

- Phase Two Principal Investigator for Uruguaiana

Valdivia Centre

Phase One			
Centre:		Valdivia, Chile (Latin America)	
Principal Investigator:		Dr Mario A Calvo	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:April 1994 to May 1995 6-7yr:April 1994 to July 1995
Sampling Frame:			

Phase Three			
Centre:		Valdivia, Chile (Latin America)	
Principal Investigator:		Dr Mario A Calvo	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2001 to April 2002
Sampling Frame:		All schools inside urban valdivia (Phase One included three cities, Valdivia, Osorno, Pueto Montt). "I think that our data correspond to phase III. Though our data in 1994 included threee cities (Valdivia, Osorno and Puerto Montt) these three cities are geographically in the same area, share the same kind of climate and genetically the same type of population. In that opportunity results were similar when contrasting one city with the other showing no difference among them. Therefore according to my knowledge I consider that they should be analized as Phase III	

Local Publications

The following publications used ISAAC data from the Uruguaiana centre:

da Silva ER, Sly PD, de Pereira MU, Pinto LA, Jones MH, Pitrez PM, Stein RT. *Intestinal helminth infestation is associated with increased bronchial responsiveness in children.* Pediatr Pulmonol 2008; 43(7):662–665.

The ISAAC Story

Personnel

Pamela Arellano

Nurse
Chile

Roles:
- Phase One collaborator for Valdivia
- Phase Three collaborator for Valdivia

Dr Mario A Calvo

Professor of Pediatrics
Instituto de Pediatria
Facultad de Medicina
Universidad Austral de Chile
Chile

Roles:
- Phase One Principal Investigator for Valdivia
- Phase Three Principal Investigator for Valdivia

Maria Ines Guarda

Secretary
Chile

Roles:
- Phase One collaborator for Valdivia
- Phase Three collaborator for Valdivia

Dr Adriana Kyling

Chile

Roles:
- Phase One collaborator for Valdivia
- Phase Three collaborator for Valdivia

Francisco Marin

statistician
Chile

Roles:
- Phase One collaborator for Valdivia
- Phase Three collaborator for Valdivia

Dr Maria Ines Sanhueza

Chile

Roles:
- Phase One collaborator for Valdivia
- Phase Three collaborator for Valdivia

Dr Alexis Strickler

Chile

Roles:
- Phase One collaborator for Valdivia
- Phase Three collaborator for Valdivia

The city of Valdivia is located 850 Km south of Santiago, the capital of Chile. We learned about the ISAAC project Phase I, from Javier Mallol, MD, Project Coordinator in Chile who contacted and motivated us to get involved in the project. It was quite appealing for us to participate in a study using the same methodology and a validated questionnaire, to assess and to confirm the data the daily practice was providing us: the high frequency of the allergic diseases and their impact in the quality of life of those who suffered them. We quickly understood the importance of this Project and together with Nurse Pamela Arellano, planned the work. In that period, the population of Valdivia was about 140,000 inhabitants without centralized information on the number of students attending school and on the number of students with the required age to be included in the Project (6-7 years and 13-14 years).

The only way to obtain the required data was to visit every school, and then we thought that we would not have the minimum number of patients required in each age group (3,000 each). Therefore, we contacted colleagues in neighboring cities of Valdivia with similar population group regarding ethnic, cultural end economical characteristics. In Osorno Adriana Kyling, MD and Maria Ines Sanhueza, MD and in Puerto Montt, Alexis Strickler, MD. actively participated in the project.

Our enthusiasm and the excellent support and collaboration of the colleagues who directed and direct the Project allowed us to succeed. The collaboration of teachers, parents and students who participated in the project was fundamental to carry out the interviews to the parents attending to the class meetings and to the students within their school schedules.

The incorporation of the collected data into the program was possible due to the orientation provided by Francisco Marin, statistician and to the work of Maria Ines Guarda, secretary.

The study in phase III, carried out 8 years later, encountered a different reality in our city. There was centralized information about the number of students and their age group that allowed us to plan the work in Valdivia, exclusively. Phase III was carried out the same as the previous Phase I and with the same group of professionals. The very good collaboration of the participants in phase I was similar in this phase of the project, thus facilitating the adequate accomplishment of the project's goals.

Data obtained in this very important study was made available to the authorities and it has influenced positively in the planning of different sanitary policies. The investigators participating in the project feel that we have acquired great training on planning and carrying out research works.

The research team participating in the ISAAC project wishes to thank to all of those who have led it and that allowed us to participate in it.

The ISAAC Story

Local Publications

The following publications used ISAAC data from the Valencia centre:

Morales Suárez-Varela MM, González AL, Martínez Selva MI. *Socioeconomic risk factors in the prevalence of asthma and other atopic diseases in children 6 to 7 years old in Valencia Spain.* Eur J Epidemiol 1999; 15(1): 35-40.

García-Marcos L, Ruiz TR, García-Hernández G, Morales Suárez-Varela MM, Valverde-Molina J, Sánchez-Solis M. *Asthma and rhinoconjunctivitis comorbidity United airway disease or inherited target organs?* Pediatr Allergy Immunol 2010; 21 (1): e142-e148. E pub 7 Apr 2009.

Morales Suárez-Varela MM, García-Marcos AL, González DC, et al. *Prevalence of atopic eczema and nutritional factors in 6-7 year old children.[article in spanish].* Aten Primaria 2007; 39(7):355-360.

Arnedo-Pena A, García-Marcos L, Fernández-Espinar JF, Bercedo-Sanz A, Aguinaga-Ontoso I, González-Díaz C, Carvajal-Urueña I, Busquet-Monge R, Suárez-Varela MM, de Andoín NG, Batlles-Garrido J, Blanco-Quirós A, López-Silvarrey Varela A, García-Hernández G *Sunny hours and variations in the prevalence of asthma in schoolchildren according to the International Study of Asthma and Allergies (ISAAC) Phase III in Spain* Int J Biometeorol 2011; 55(3): 423-434

Valencia Centre

Phase One			
Centre:		Valencia, Spain (Western Europe)	
Principal Investigator:		Professor Maria M. Morales-Suárez-Varela	
Age Groups:	13-14, 6-7	**Timeframe:**	June 1994 to December 1994
Sampling Frame:			
Phase Two			
Centre:		Valencia, Spain (Western Europe)	
Principal Investigator:		Professor Maria M. Morales-Suárez-Varela	
Age Groups:	10-11 years,	**Timeframe:**	December 2000 to December 2001.
Sampling Frame:		A geographic sampling frame was based on the Valencia city district.	
Phase Three			
Centre:		Valencia, Spain (Western Europe)	
Principal Investigator:		Professor Maria M. Morales-Suárez-Varela	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2002 to December 2002
Sampling Frame:		All schools in Valencian City area. Same Sampling frame used in Phase One.	

Personnel

Professor Maria M. Morales Suárez-Varela

Professor of Epidemiology and Public Health
Unit of Public Health, Hygiene, and Environmental care
Department of Preventive Medicine,
University of Valencia,
Spain

Roles:

- Phase One Principal Investigator for Valencia
- Phase Two Principal Investigator for Valencia
- Phase Three Principal Investigator for Valencia

Why was this centre selected for ISAAC?

The International Study of Asthma and Allergies in Childhood (ISAAC) (ISAAC Group 1998) revealed substantial regional and seasonal variations in the frequency of atopic diseases. A potential role of climatic conditions in the aetiology of atopic diseases has long been suspected. Some studies on the effects of climate have investigated the association of variations in climate or meteorological conditions with the occurrence or severity of symptoms of atopic diseases (Charpin et al. 1988, 1991; Vocks et al. 2001; Weiland et al. 2004). In Spain, there are three climactic regions (Atlantic, Mediterranean and Continental) and a homogeneous population. Valencia is a Mediterranean region, which can be compared with the different climatic areas of Spain with the standardised methodology of ISAAC.

Our experience of ISAAC

In the study area (Valencia), there were 286 schools for schoolchildren aged 6-7 and 13-14 years. Of the 286 schools, 98 participated in the ISAAC study.

References

1. ISAAC (1998) The International Study of Asthma and Allergies in Childhood (ISAAC). Steering Committee. Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema: ISAAC. Lancet 1998 351: 1225-1232.
2. Charpin D, Kleisbauer J, Lanteaume A (1988) Asthma and allergy to house dust mites in populations living in high altitudes. Chest 93: 758-761
3. Charpin D, Birnbaum J, Haddi E (1991) Altitude and allergy to house dust mites. Am Rev Respir Dis 143: 983-986
4. Vocks E, Busch R, Frohlich C, Borelli S, Mayer H, Ring J (2001) Influence of weather and climate on subjective symptom intensity in atopic eczema. Int J Biometeorol 45: 27-33
5. Weiland SK, Hüsing A, Strachan DP, Rzehak P, Pearce N (2004) Climate and the prevalence of symptoms of asthma, allergic rhinitis, and atopic eczema in children. Occup Environ Med 61: 609-615

Acknowledgements

We wish to thank the Spanish Ministry of Health and Consumer Affairs, the International Luis Vives Rotary Foundation (Valencia), the General Public Health Office of the Regional Valencian Government and all the parents who kindly participated and gave us some of their time.

Regional
National
Local
Valladolid
Vancouver
Verona
Villahermosa

Valladolid Centre

Phase One			
Centre:		Valladolid, Spain (Western Europe)	
Principal Investigator:		Professor Alfredo Blanco-Quirós	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Random selection of schools according the urban and country childhood population of Valledolid	

Phase Three			
Centre:		Valladolid, Spain (Western Europe)	
Principal Investigator:		Professor Alfredo Blanco-Quirós	
Age Groups:	13-14	**Timeframe:**	January 2002 to November 2002
Sampling Frame:		13-14yr: All schools in Valladolid region (Spain)	

Personnel

Professor Alfredo Blanco-Quirós

Departamento de Pediatría
Facultad de Medicina
Ramón y Cajal, 7.
Spain

Roles:

- Phase One Principal Investigator for Valladolid
- Phase Three Principal Investigator for Valladolid

Local Publications

The following publications used ISAAC data from the Valladolid centre:

Arnedo-Pena A, García-Marcos L, Fernández-Espinar JF, Bercedo-Sanz A, Aguinaga-Ontoso I, González-Díaz C, Carvajal-Urueña I, Busquet-Monge R, Suárez-Varela MM, de Andoín NG, Batlles-Garrido J, Blanco-Quirós A, López-Silvarrey Varela A, García-Hernández G *Sunny hours and variations in the prevalence of asthma in schoolchildren according to the International Study of Asthma and Allergies (ISAAC) Phase III in Spain* Int J Biometeorol 2011; 55(3): 423-434

Vancouver Centre

Phase Three			
Centre:		Vancouver, Canada (North America)	
Principal Investigator:		Professor Alex Ferguson	
Age Groups:	13-14	**Timeframe:**	May 2003 to June 2003
Sampling Frame:		13-14yr: All schools in Vancouver area	

Personnel

Professor Alex Ferguson

Department of Pediatrics
University of British Columbia
Canada

Roles:

- Phase Three Principal Investigator for Vancouver

Local Publications

The following publications used ISAAC data from the Vancouver centre:

Wang H-Y, Pizzichini MMM, Becker AB, Duncan JM, Ferguson AC, Greene JM, Rennie DC, Senthilselvan A, Taylor BW, Sears MR. *Disparate geographic prevalences of asthma, allergic rhinoconjunctivitis and atopic eczema among adolescents in five Canadian cities.* Pediatr Allergy Immunol 2010; 21(5): 867–877.

Verona Centre

Phase One			
Centre:		Verona, Italy (Western Europe)	
Principal Investigator:		Professor Attilio Boner	
Age Groups:	13-14, 6-7	**Timeframe:**	13-14yr:March 1994 to March 1994 6-7yr:March 1994 to April 1994
Sampling Frame:			

Personnel

Professor Attilio Boner

Clinica Pediatrica
Università di Verona
Policlinico Borgo Roma
Via delle Menegone
Italy

Roles:

- Phase One Principal Investigator for Verona

Local Publications

The following publications used ISAAC data from the Verona centre:

Peroni DG, Piacentini GL, Zizzo MG, Boner Al. *Prevalence of asthma and respiratory symptoms in childhood in an urban area of north-east Italy.* Monaldi Arch Chest Dis.1998 Apr;53(2):134-7.

Villahermosa Centre

Phase Three			
Centre:		Villahermosa, Mexico (Latin America)	
Principal Investigator:		Dr Sergio Romero-Tapia	
Age Groups:	13-14, 6-7	**Timeframe:**	June 2002 to June 2003
Sampling Frame:		13-14yr: Some schools are public and private, in Villahermosa, Tabasco. México. 6-7yr:All schools in Villahermosa Area.	

The ISAAC Story

Personnel

Dr Sergio Romero-Tapia

Hospital del Niño "Dr. Rodolfo Nieto Padrón"
Avenida Gregoria Mendez Magaña No. 2832
Col. Tamulte
CP 86,100 Villahermosa
Mexico

Roles:

- Phase Three Principal Investigator for Villahermosa

Viterbo Centre

Phase One			
Centre:		Viterbo, Italy (Western Europe)	
Principal Investigator:		Mr Guiseppe Corbo	
Age Groups:	6-7	**Timeframe:**	November 1994 to December 1994
Sampling Frame:		6-7yr: Local Health Autority	

Personnel

Mr Guiseppe Corbo

Servizio di Fisiopatologia Respiratoria
Università Cattolica del Sacro Cuore
Largo F. Vito 1
Italy

Roles:

- Phase One Principal Investigator for Viterbo

Vitória da Conquista Centre

Phase Three			
Centre:		Vitória da Conquista, Brasil (Latin America)	
Principal Investigator:		Associate Professor Leda de Freitas Souza	
Age Groups:	13-14, 6-7	**Timeframe:**	May 2002 to August 2002
Sampling Frame:		All schools in Vitória da Conquista area	

Personnel

Associate Professor Leda de Freitas Souza

Faculty of Medicine
Universidade Federal da Bahia
Rua Alm. Ernesto Mello Jr. 79 (Pituba)
Salvador 41820-060
Brasil

Roles:

- Phase Three Principal Investigator for Vitória da Conquista

Wales Centre

Phase One			
Centre:		Wales, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in Wales, stratified by county.	
Phase Three			
Centre:		Wales, United Kingdom (Western Europe)	
Principal Investigator:		Dr Michael Burr	
Age Groups:	13-14	**Timeframe:**	February 2002 to March 2002
Sampling Frame:		13-14yr: Comprehensive schools in Wales. Same schools chosen and 5 of the original schools agreed, 3 refused, so 3 more schools randomly selected.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for Wales

Dr Michael Burr

Department of Primary Care & Public Health
Cardiff University Neuadd Meirionnydd
Heath Park
United Kingdom

Roles:

- Phase Three Principal Investigator for Wales

Local Publications

The following publications used ISAAC data from the Wales centre:

Anderson HR, Ruggles R, Strachan DP, Austin JB, Burr M, Jeffs D, Standring P, Steriu A, Goulding R. *Trends in prevalence of symptoms of asthma, hay fever, and eczema in 12-14 year olds in the British Isles, 1995-2002 a questionnaire survey.* BMJ 2004; 328(7447): 1052-3.

The ISAAC Story

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:
- Phase One collaborator for Wales

Dr Jan Poloniecki

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:
- Phase One collaborator for Wales

Why this centre was chosen

In ISAAC Phase 1, Wales was included as part of the United Kingdom centre, whereas in Phase 3 it functioned as a distinct centre. The age group (13-14 years), the sampling frame, the method of selecting schools (one comprehensive school from each education authority area in Wales) and the survey procedure were the same on both occasions, so the findings are comparable, and reflect the situation across the whole of Wales rather than in one area.

Wales was selected as a centre partly because it is a distinct part of the UK, with its own cultural traditions, and partly because several other epidemiological studies of asthma have been conducted here, including repeat surveys of asthma in schoolchildren and the European Community Respiratory Health Survey in young adults.

Our experience of ISAAC

There is a widespread belief in Wales that asthma is particularly common and severe here. This belief was advantageous to us, in that most of the schools were interested and co-operative in the survey, as addressing a topic that the staff saw as important.

We also used the opportunity to conduct a subsidiary survey on children with symptoms of eczema. The ISAAC questionnaire that we used contained a supplementary questionnaire for children who had experienced an itchy rash or eczema in the last 12 months. This presented a list of 19 factors for which there is some evidence of favourable or unfavourable effects on eczema, and the children were asked to indicate whether each factor made the rash better, if it made it worse, if had no effect, or if they did not know its effects. They were also asked to report any other factors that they thought might influence the rash. So far as we know, this is the first population-based survey of children's perceptions of exacerbating and relieving factors in eczema, as distinct from studies in special groups such as hospital patients. It therefore provides information about the whole range of the disease.

Findings for this centre

Contrary to the local belief, the prevalence of wheeze in Wales is not markedly different from that reported from other parts of the UK, although it is in relation to many other parts of the world. There are also no gross disparities in the indices of severity between Wales and South-east England or Scotland.

Comparison with Phase 1 data showed that the 12-month prevalence of wheeze fell from 33.6% in 1995 to 27.5% in 2002, although lifetime prevalence of reported asthma rose from 21.8% to 27.1%. Another repeat survey of schoolchildren in the Cardiff area showed that wheeze in the past 12 months rose from 15.2% in 1988 to 19.7% in 2003, and "wheeze ever" from 22.3% to 28.0%. Thus, while both studies show a rise in lifetime prevalence, there is some apparent conflict as to whether the 12-month prevalence of asthma has recently been increasing or decreasing. Possible explanations might involve the following considerations:

- The prevalence of asthma symptoms may have peaked in the mid-1990s.
- Year-on-year fluctuations in the prevalence of wheeze, due to differences in the incidence of virus infections or bad weather, could falsely suggest a temporal trend when surveys in two different years are compared.
- Children in the Cardiff survey were younger (aged 11-12 years) than those in the ISAAC survey; perhaps teenagers are tending to grow out of asthma symptoms earlier.

The supplementary questionnaire about factors that children believe aggravate or alleviate eczema was answered by 90% (225 out of 250) of those who reported eczema symptoms. Sweating from exercise, fabrics (especially wool) and hot weather were the exacerbating factors most often identified (by about 40% of responders in each case), while steroid creams, moisturizers/makeup and medicines/tablets were the three principal relievers. Only 5% of responders believed that symptoms were aggravated by certain foods or drinks, which is somewhat surprising, given the widespread belief that food allergy is an important component of atopic eczema.

Although these findings do not demonstrate the extent to which various factors actually influence eczema, they suggest their relative importance, particularly as perceived by affected children.

The ISAAC Story

Local Publications

The following publications used ISAAC data from the Wellington centre:

Wickens KL, Crane J, Kemp TJ, Lewis SJ, D'Souza WJ, Sawyer GM, Stone ML, Tohill SJ, Kennedy JC, Slater TM, Pearce NE. *Family Size, Infections, and Asthma Prevalence in New Zealand Children.* Epidemiology 1999;10:699-705.

Ellison-Loschmann L, Gray M, Cheng S, Pearce N. *Follow-up study of asthma severity in Maori adolescents.* Aust Epidemiol September 2008; 15(2): 4-10.

Wellington Centre

Phase One			
Centre:		Wellington, New Zealand (Oceania)	
Principal Investigator:		Professor Julian Crane	
Age Groups:	13-14, 6-7	**Timeframe:**	November 1992 to August 1993
Sampling Frame:			

Phase Three			
Centre:		Wellington, New Zealand (Oceania)	
Principal Investigator:		Professor Neil Pearce	
Age Groups:	13-14, 6-7	**Timeframe:**	March 2001 to March 2002
Sampling Frame:		All schools in the Wellington City, Porirua City and Lower Hutt City Areas. The same sampling frame was used for both Phase One and Phase Three.	

Personnel

Soo Cheng

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New Zealand

Roles:
- Phase Three collaborator for Wellington

Professor Julian Crane

Wellington Asthma Research Group
Wellington School of Medicine, University of Otago Wellington
P O Box 7343
Wellington South
New Zealand

Roles:
- ISAAC Steering Committee
- Phase One Principal Investigator for Wellington

Dr Wendyl D'Souza

23 John St
Clifton Hill
Australia

Roles:
- Phase One collaborator for Wellington

Dr Lis Ellison-Loschmann

Centre for Public Health Research
Massey University - Wellington Campus
Private Bag 756
New Zealand

Roles:
- Phase Three collaborator for Wellington

Dr Sunia Foliaki

Director
Research Unit
Ministry of Health
P.O. Box 59
Kingdom Of Tonga

Roles:
- ISAAC Steering Committee
- Regional Coordinator for Oceania
- Phase Three collaborator for Wellington

Pip Hall

Centre for Public Health Research
Massey University - Wellington Campus
New Zealand

Roles:
- Phase Three collaborator for Wellington

Ben Harding

Centre for Public Health Research
Massey University - Wellington Campus
New Zealand

Roles:
- Phase Three collaborator for Wellington

Nyk Huntington

Centre for Public Health Research
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Roles:
- Phase Three collaborator for Wellington

Clare Macdonald

Centre for Public Health Research
Massey University - Wellington Campus
New Zealand

Roles:
- Phase Three collaborator for Wellington

The ISAAC Story

Professor Neil Pearce

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Massey University - Wellington Campus
Private Bag 756
Courier Address: 102 Adelaide Rd
New Zealand

Roles:

- ISAAC Executive
- ISAAC Steering Committee
- Phase Three Principal Investigator for Wellington

Phase Three

The Massey University Centre for Public Health Research was created in 2000. It was headed by Professor Neil Pearce (ISAAC Executive and Steering Committee member) and accordingly it was decided that CPHR would conduct the Phase III survey in Wellington. Lis Ellison-Loschmann included the ISAAC Phase III findings in her PhD on asthma in Maori - the first PhD in epidemiology (anywhere in the world) to be completed by an indigenous health researcher.

Phase One

The staff of the Wellington Asthma Research Group were involved in the development of ISAAC even before it was ISAAC! Initially we were developing the video asthma questionnaire for use in various surveys and were invited to the initial meeting in Bochum which was the pre-birthplace of ISAAC in order to primarily talk about the video questionnaire's use.

We were involved in piloting the video questionnaire in schools prior to undertaking the ISAAC study piloting both the written questionnaire versions together with the video questionnaire and then looking at the ability of both to predict airway hyper responsiveness as a marker of asthma. We had a number of staff working on the Wellington data centre in particular, Dr Wendyl D'Souza who ran the Wellington component of the study in the field and he together with two or three other staff visited the schools and organised both the parental completion for the 6-7-year-olds and the video and written components of the 13-14-year-olds. In many ways we had an additional interest and enthusiasm for the study in its early stages because of the novel questionnaire we were developing and because of our early commitment to the whole idea of undertaking international comparisons using simple tools. We had already run the ECRHS study in three centres in New Zealand, and further studies of children made a lot of sense.

One issue that I do recall either in the very early days of the ISAAC fieldwork or in a pre-testing phase where we were showing the video and comparing it with the written we came back from one school having completed the questionnaires and shown the video only to find an urgent message to be in touch with our local hospital Ethics Committee chairperson. It turned out that we had one particular school in Wellington where we had shown the video questionnaire to a group of children that included two children from a particularly strict religious sect who did not routinely use television or watch films in any form and the parents were upset that we had done this. This is something we had not contemplated during the development of the study although it did lead us to ask whether there were any children in future surveys whose parents did not allow them to watch television or see video images and these children had to be excluded – there were very few but it was the first time I had realised that there could be ethical issues showing a video questionnaire. In the end the issue was resolved and the parents understanding of our intentions.

Dr D'Souza who undertook these studies went on to use this data for his PhD, the initial study thus being an extremely useful contribution to his academic development as well as our involvement in the ISAAC project.

Julian Crane
Wellington Asthma Research Group
Wellington

Wilaya of Algiers Centre

Phase One			
Centre:		West Algiers, Algeria (Africa)	
Principal Investigator:		professor Badia Benhabylès	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		A random sample of all middle schools in Wilaya of Algiers.	

Phase Three			
Centre:		Wilaya of Algiers, Algeria (Africa)	
Principal Investigator:		Professor Badia Benhabylès	
Age Groups:	13-14	**Timeframe:**	April 2002 to May 2002
Sampling Frame:		13-14yr: A random sample of middle schools in Algiers Department. The sampling frame is exactly the same as the sampling frame in Phase One.	

The ISAAC Story

Personnel

Professor Badia Benhabylès

Professeur en Epidémiologie
CHU Mustapha
Semep
CHU Mustapha, place du 1 er mai
Algeria

Roles:

- Phase One Principal Investigator for West Algiers
- Phase Three Principal Investigator for Wilaya of Algiers

On the proposal of Mrs. Professor Ait Khaled, I was involved with my team to ISAAC Phase Three. It was a great adventure team. After obtaining the permission of those responsible for education and health, I had an interview with the director of each school. They all showed great interest in the study and collaborated in programming. I attended school health physicians in the Wilaya of Algiers. Many of them participated in the study with my team. Teachers were also a contribution especially for the discipline in the classroom. To avoid problems we asked all students in each class covered by the study. They all answered the questions as if it were a game. I am happy to have participated in the study whose results serve as reference for the prevalence of asthma in children in Algéria.

West Marne Centre

Phase One			
Centre:		West Marne, France (Western Europe)	
Principal Investigator:		Dr Isabella Annesi-Maesano	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		The region of West Marne as academically and administratively defined.	

Personnel

Dr Isabella Annesi-Maesano

EPAR Dept, INSERM, UMR- S 707
Faculté de Médecine Pierre et Marie Curie
Site Saint-Antoine
27 rue Chaligny 75571
France

Roles:

- National Coordinator for France
- Phase One Principal Investigator for West Marne

West Midlands Centre

Phase One			
Centre:		West Midlands, United Kingdom (Western Europe)	
Principal Investigator:		Professor H Ross Anderson	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		All schools in West Midland counties and all schools from a random selection of 4 metropolitan districts from the metropolitan county. Stratified by each county\district followed by a random sample of one school from each one.	

Personnel

Professor H Ross Anderson

Division of Community Health Sciences
St George's, University of London and MRC Centre for Environment and Health
Cranmer Terrace
Tooting
United Kingdom

Roles:

- ISAAC Steering Committee
- National Coordinator for United Kingdom
- Phase One Principal Investigator for West Midlands

Dr Balvinder Kaur

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for West Midlands

Dr Jan Poloniecki

Department of Public Health Sciences
St Georges Hospital Medical School
Cranmer Terrace
Tooting
United Kingdom

Roles:

- Phase One collaborator for West Midlands

This centre formed part of a national initiative throughout the United Kingdom, as described on the UK country-level page . Resulting publications are listed on the UK national page.

Ross Anderson, David Strachan, 18 July 2011

Regional
National
Local
Wulumuqi
Wulumuqi(9)
Yaounde

Wulumuqi Centre

Phase One			
Centre:		Wulumuqi, China (Asia-Pacific)	
Principal Investigator:		Professor Man-Lin Xiao	
Age Groups:	13-14	**Timeframe:**	
Sampling Frame:		Fifteen schoools were selected by random from all the junior middle school in Xin-Shi district. In these fifteen schools, all of the students of the first and second grade were our subjects.	

Personnel

Professor Man-Lin Xiao

Department of Paediatrics
The First Affiliated Hospital
Xinjiang Medical College
Li Yu Shan Road No. 1
China

Roles:

- Phase One Principal Investigator for Wulumuqi

Wulumuqi(9) Centre

Phase Three			
Centre:		Wulumuqi(9), China (Asia-Pacific)	
Principal Investigator:		Dr Qiao Li Pan	
Age Groups:	13-14	**Timeframe:**	November 2001 to December 2001
Sampling Frame:		13-14yr: Some schools in the Wulumuqi, Xingiang, China district.	

Personnel

Dr Qiao Li Pan

Xinjiang Children's Hospital
91 Jiankang Road
Wulumuqi
China

Roles:

- Phase Three Principal Investigator for Wulumuqi(9)

Yaounde Centre

Phase Three			
Centre:		Yaounde, Cameroon (Africa)	
Principal Investigator:		Professor Christopher Kuaban	
Age Groups:	13-14	**Timeframe:**	May 2003 to May 2003
Sampling Frame:		13-14yr: All secondary and high schools in the Bafoussam Municipality	

Personnel

Professor Christopher Kuaban

Faculty of Medicine
University of Yaounde
Centre Pasteur DU
B.P. 4021
Cameroon

Roles:

- National Coordinator for Cameroon
- Phase Three Principal Investigator for Yaounde

ISAAC in Yaounde, Cameroon

Cameroon is a small central African country with a population presently estimated at 20 million inhabitants. Asthma is not an uncommon disease in the country but before the ISAAC adventure only a limited number of hospital based studies had been carried out in the country. Consequently, the magnitude of asthma and allergies in Cameroon is not known. When we therefore heard about it, we thought it was an opportunity that would let us have real data about the prevalence of these diseases in our country.

We learnt about ISAAC Phase Three through Professor Nadia Ait-Khaled, the regional coordinator for francophone African countries and without hesitation decided we would participate in the venture. Our regional coordinator then asked us to register with the ISAAC steering committee in New Zealand. This was immediately done. She also asked us to help in the translation of the core questionnaire as well as the environmental questionnaire from English to French given that in Cameroon we speak and write the two languages. We willingly did the translation. But our hopes were dashed as we were told after this that we had to look for funding ourselves for the survey. Thanks to Dr Juergen Noeske, a colleague with whom I have worked for several years, we were able to obtain funding from the German Development Cooperation (GTZ, presently GIZ).

We designed our survey to be carried out in the West Region of Cameroon because in the previous years we had conducted several prevalence and operational studies there particularly in the field of tuberculosis. In this region we chose Bafoussam, the regional capital city and the third largest town of Cameroon in terms of population as our study site. All the 13-14 year old children in the 12 high schools found in the Bafoussam municipality were to be studied. We finally conducted the survey in May 2003, recruiting 2083 children out of a total of 3291 registered in these schools. Our data base was later on sent to the steering committee in New Zealand where after several correspondences checking on some inconsistencies in our data base, our data was finally validated.

Thanks to ISAAC and the publications that followed, we now have real data on the prevalence of asthma and allergies for our country. These findings have permitted us to compare our situation in this domain to that of other countries that participated in the ISAAC study. These results have also been communicated to our Ministry of Public Health and have led to asthma being packaged alongside other non communicable diseases as a major public health problem. Finally, the results of the study have given us baseline information for future interventions in the field of asthma and allergies.

Acknowledgements

We wish to thank immensely the education administrative authorities of the West Region of Cameroon as well as teachers and children who made it possible through their cooperation for us to realize this survey. We gratefully acknowledge financial support given us for this survey by the German Development Cooperation (GIZ). We wish to thank immensely the team of our fieldworkers for all they worked to make the survey a success.

Zanjan Centre

Phase Three			
Centre:		Zanjan, Iran (Eastern Mediterranean)	
Principal Investigator:		Dr Mohammed-Reza Masjedi	
Age Groups:	13-14, 6-7	**Timeframe:**	April 1996 to June 1996
Sampling Frame:		All schools in Zanjan city were included in the sampling frame	

Personnel

Dr Mohammed-Reza Masjedi

Masih Daneshvary Hospital
Dorabad
Shaheed Bahoner Ave
Darabad
Iran

Roles:

- National Coordinator for Iran
- Phase Three Principal Investigator for Zanjan

Appendices

Maps and Graphs

As well as the maps, a variety of other graphs were developed in consultation with the writing groups and Steering Committee to present the data from both Phase One and Phase Three. The most common graphs used were ranked prevalence scatter plots and simple scatter plots. I hope you find these maps and graphs useful and enjoyable to view. As a geographer by training, I particularly enjoyed the process of developing and preparing the maps and feel that they provide a unique and valuable means of viewing and interpreting the ISAAC worldwide data.

Maps

Phase One Worldmaps

Asthma Rhinoconjunctivitis Eczema Synthesis

The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. *Worldwide variation in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema ISAAC.* The Lancet 1998; 351(9111): 1225-32.

Figure 6: World map of 12-month prevalences of symptoms of at least two of three disorders Venn diagram shows overall proportions of children with symptoms of asthma, allergic rhinoconjunctivitis, or atopic eczema, or combinations of symptoms Lancet 1998; 351(9111): 1231

Asthma

The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. *Worldwide variations in the prevalence of asthma symptoms the International Study of Asthma and Allergies in Childhood (ISAAC).* Eur Respir J 1998; 12(2): 315-335.

Figure1 World map for the 13–14 yr old age group, showing the percentage of children who answered "yes" to the written question "Have you had wheezing or whistling in the chest in the last 12 months?" Eur Respir J 1998; 12(2): 321

Figure3 World map for the 6–7 yr old age group, showing the percentage of parents who answered "yes" to the written question "Has your child had wheezing or whistling in the chest in the last 12 months?" Eur Respir J 1998; 12(2): 325

Figure 5 World map for the 13–14 yr old age group, for the video scene showing a person wheezing while at rest The percentage of children who answered "yes" to the question "Has your breathing ever been like this in the last year?" is shown for each centre, with distinct colour symbols used for different prevalence ranges Eur Respir J 1998; 12(2): 328

Rhinoconjunctivitis

Strachan D, Sibbald B, Weiland S, Aït-Khaled N, Anabwani G, Anderson HR, Asher MI, Beasley R, Björkstén B, Burr M, Clayton T, Crane J, Ellwood P, Keil U, Lai C, Mallol J, Martinez F, Mitchell E, Montefort S, Pearce N, Robertson C, Shah J, Stewart A, von Mutius E, Williams H. *Worldwide Variations in prevalence of symptoms of allergic rhinoconjunctivitis in children the International Study of Asthma and Allergies in Childhood (ISAAC).* Pediatr Allergy Immunol 1997; 8(4): 161-76.

Figure 5 Global map of the prevalence of rhinoconjunctivitis in 6-7-year-old children in ISAAC centres Pediatr Allergy Immunol 1997; 8(4): 166

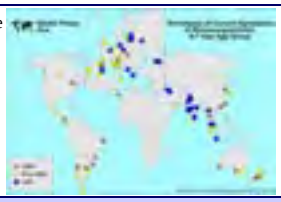
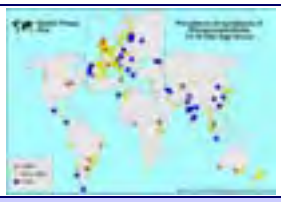


Figure6 Global map of the prevalence of rhinoconjunctivitis in 13-14-year-old children in ISAAC centres Pediatr Allergy Immunol 1997; 8(4): 166



Eczema

Williams H, Robertson C, Stewart A, Aït-Khaled N, Anabwani G, Anderson HR, Asher MI, Beasley R, Björkstén B, Burr M, Clayton T, Crane J, Ellwood P, Keil U, Lai C, Mallol J, Martinez F, Mitchell E, Montefort S, Pearce N, Shah J, Sibbald B, Strachan D, von Mutius E and Weiland S. *Worldwide variations in the prevalence of symptoms of atopic eczema in the international study of asthma and allergies in childhood.* J Allergy Clin Immunol 1999; 103(1 Pt 1): 125-38.

Figure1 Global map of symptoms of atopic eczema in the last 12 months in 458,623 children aged 13 to 14 years in 153 centers in 56 countries J Allergy Clin Immunol 1999;103:127

Figure2 Global map of symptoms of atopic eczema in the last 12 months in 256,410 children in aged 6 to 7 years in 90 centers in 37 countries J Allergy Clin Immunol 1999;103:127

The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

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ISAAC Maps
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The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

Phase Three Time Trends

Asthma Rhinoconjunctivitis Eczema

Asher MI, Montefort S, Björkstén B, Lai CKW, Strachan DP, Weiland SK, Williams H, and the ISAAC Phase Three Study Group. *Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood ISAAC Phases One and Three repeat multicountry cross-sectional surveys.* The Lancet 2006; 368(9537): 733-743.

Figure 2: World map showing direction of change in prevalence of asthma symptoms for 6–7 year age-group and 13–14 year age-group Each symbol represents a centre Blue triangle=prevalence reduced by =1 SE per year Green square=little change (<1 SE) Red triangle=prevalence increased by =1 SE per year Lancet 2006; 368(9537): 738

6-7 years

13-14 years

Figure 3: World map showing direction of change in prevalence of allergic rhinoconjunctivitis symptoms for 6–7 year age-group and 13–14 year age-group Each symbol represents a centre Blue triangle=prevalence reduced by =1 SE per year Green square=little change (<1 SE) Red triangle=prevalence increased by =1 SE per year Lancet 2006; 368(9537): 739

6-7 years

13-14 years

Figure 4: World map showing direction of change in prevalence of eczema symptoms for 6–7 year age-group and 13–14 year age-group Each symbol represents a centre Blue triangle=prevalence reduced by =1 SE per year Green square=little change (<1 SE) Red triangle=prevalence increased by =1 SE per year Lancet 2006; 368(9537): 740

6-7 years

13-14 years

Eczema

Williams H, Stewart A, von Mutius E, Cookson B, Anderson HR and the International Study of Asthma and Allergies in Childhood (ISAAC) Phase One and Three Study groups. *Is eczema really on the increase worldwide?* J Allergy Clin Immunol 2008; 121(4): 947-54.

Figure2 World maps of flexural eczema symptoms in the last year showing changes in the prevalence of eczema symptoms for 13- to 14-year-olds (A) and 6- to 7-year-olds (B) in consecutive prevalence surveys conducted 5 to 10 years apart J Allergy Clin Immunol 2008; 121(4): 951-2

Fig.2A

Fig.2B

Phase Three Worldmaps

Asthma

Lai CKW, Beasley R, Crane J, Foliaki S, Shah J, Weiland S, and the ISAAC Phase Three Study Group. *Global variation in the prevalence and severity of asthma symptoms Phase Three of the International Study of Asthma and Allergies in Childhood (ISAAC).* Thorax 2009; 64: 476–483.

Figure 1 Prevalence of current wheeze according to the written questionnaire in the 13–14 year age group Thorax 2009; 64: 478

Figure 2 Prevalence of symptoms of severe asthma according to the written questionnaire in the 13–14 year age group Thorax 2009; 64: 479

Figure 3 Prevalence of current wheeze in the 6–7 year age group Thorax 2009; 64: 480

Figure 4 Prevalence of symptoms of severe asthma in the 6–7 year age group Thorax 2009; 64: 481

Figure S1 Prevalence of symptoms of severe asthma amongst wheezers in the past 12 months in 13-14 year age group Thorax 2009; 64: 476-483 online material

Figure S2 Prevalence of unreported asthma amongst wheezers with symptoms of severe asthma in the past 12 months in 13-14 year age group Thorax 2009; 64: 476-483 online material

The ISAAC Story

Figure S3 Prevalence of symptoms of severe asthma amongst wheezers in the past 12 months in 6-7 year age group Thorax 2009; 64: 476-483 online material

Rhinoconjunctivitis

Aït-Khaled N. Pearce N. Anderson HR. Ellwood P. Montefort S. Shah J. and the ISAAC Phase Three Study Group. *Global map of the prevalence of symptoms of rhinoconjunctivitis in children The International Study of Asthma and Allergies in Childhood (ISAAC) Phase Three.* Allergy 2009; 64: 123–148

Figure 1 Map of prevalence of current symptoms of rhinoconjunctivitis, 13- to 14-year age group Allergy 2009; 64: 133

Figure 3 Map of prevalence of current symptoms of rhinoconjunctivitis, 6- to 7-year age group Allergy 2009; 64: 141

Eczema

Odhiambo J, Williams H, Clayton T, Robertson C, Asher MI, and the ISAAC Phase Three Study group. *Global variations in prevalence of eczema symptoms in children from ISAAC Phase Three.* J Allergy Clin Immunol. 2009;124(6):1251-8.

Figure1 World maps showing prevalence of current symptoms of eczema for the age group 6 to 7 years (A) and 13 to 14 years (B) Each symbol represents a center Allergy Clin Immunol 2009;124(6):1253

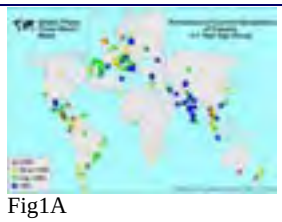


Fig1A

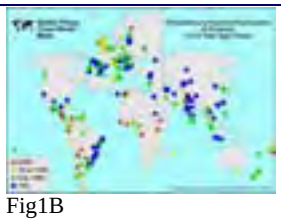


Fig1B

Figure E2 World maps showing prevalence of current symptoms of severe eczema for the age groups 6 to 7 years (A) and 13 to 14 years (B) Each symbol represents a center J Allergy Clin Immunol 2009;124(6):1258 e4

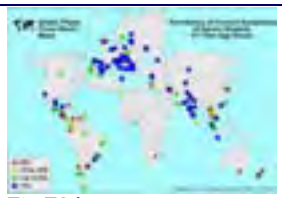


Fig.E2A

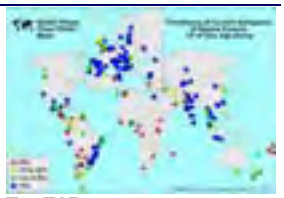


Fig.E2B

Graphs

Phase One Worldmap Papers

Asthma Rhinoconjunctivitis Eczema Synthesis

The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. *Worldwide variation in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and atopic eczema ISAAC.* The Lancet 1998; 351(9111): 1225-32.

Figure 1: 12-month prevalences of self-reported asthma symptoms from written questionnaires

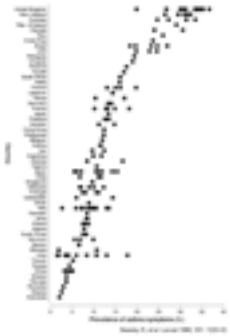
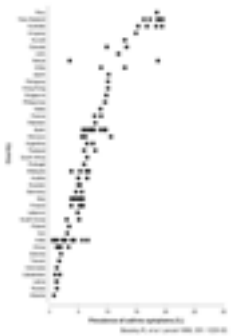


Figure 2: 12-month prevalences of asthma symptoms from video questionnaires



The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

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Figure 3: 12-month prevalences of allergic rhinoconjunctivitis symptoms

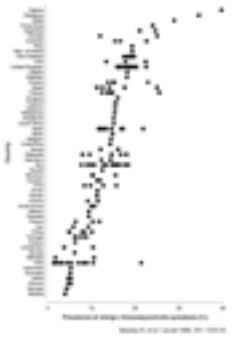


Figure 4: 12-month prevalences of atopic eczema symptoms

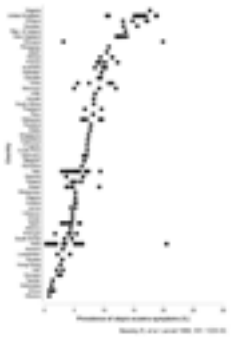
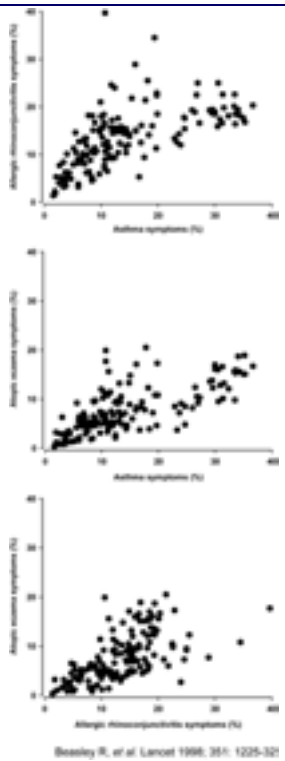


Figure 5: Scatter plots of 12-month prevalences of symptoms from written questionnaires



Asthma

The International Study of Asthma and Allergies in Childhood (ISAAC) Steering Committee. *Worldwide variations in the prevalence of asthma symptoms the International Study of Asthma and Allergies in Childhood (ISAAC).* Eur Respir J 1998; 12(2): 315-335.

Figure 2: Ranking of participating countries for the percentage who answered positively to the question "In the last 12 months, how often, on average, has your (child's) sleep been disturbed due to wheezing?: one or more nights per week" for: a) the 13–14 yr olds; and b) the 6–7 yr olds

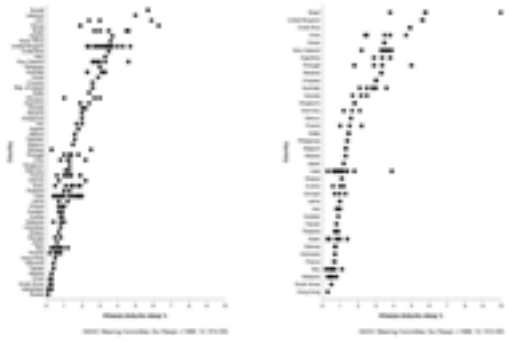


Figure 4: Scatter plots for centres for the percentage of children who have had "wheezing or whistling in the chest in the last 12 months" The x-axis shows self-reported wheezing in 13–14 yr olds and the y-axis wheezing reported by parents in 6–7 yr olds The line of identity is shown

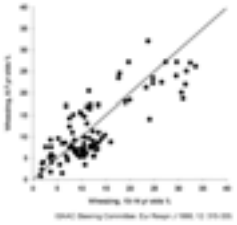
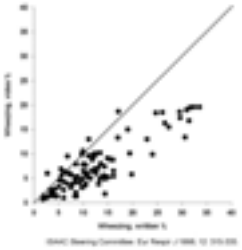


Figure 6: Scatter plots for the percentage of the 13–14 yr old age group responding "yes" for wheezing in the last year (video questionnaire) against "wheezing or whistling in the chest in the last 12 months" The x-axis shows wheezing for the written questionnaire and the y-axis wheezing for the video questionnaire The line of identity is shown



Rhinoconjunctivitis

Strachan D, Sibbald B, Weiland S, Aït-Khaled N, Anabwani G, Anderson HR, Asher MI, Beasley R, Björkstén B, Burr M, Clayton T, Crane J, Ellwood P, Keil U, Lai C, Mallol J, Martinez F, Mitchell E, Montefort S, Pearce N, Robertson C, Shah J, Stewart A, von Mutius E, Williams H. *Worldwide Variations in prevalence of symptoms of allergic rhinoconjunctivitis in children the International Study of Asthma and Allergies in Childhood (ISAAC).* Pediatr Allergy Immunol 1997; 8(4): 161-76.

Figure 1: Scatter plot comparing prevalence of hay fever and prevalence of rhinoconjunctivitis across ISAAC centres in 6-7-year-olds

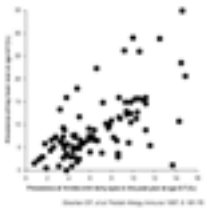


Figure 2: Scatter plot comparing prevalence of hay fever and prevalence of rhinoconjunctivitis across ISAAC centres in 13-14-year-olds

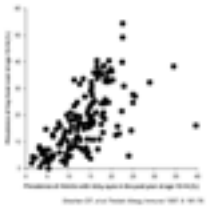


Figure 3: Scatter plot comparing the prevalence of rhinoconjunctivitis in each age group across ISAAC centres

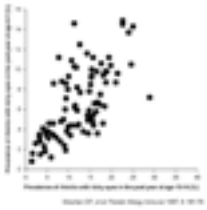
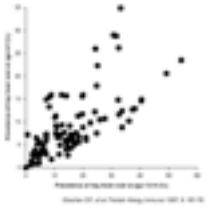


Figure 4: Scatter plot comparing the lifetime prevalence of hay fever in each age group across ISAAC centres

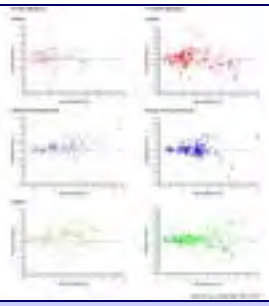


Phase Three Time Trends Papers

Asthma Rhinoconjunctivitis Eczema

Asher MI, Montefort S, Björkstén B, Lai CKW, Strachan DP, Weiland SK, Williams H, and the ISAAC Phase Three Study Group. *Worldwide time trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema in childhood ISAAC Phases One and Three repeat multicountry cross-sectional surveys.* The Lancet 2006; 368(9537): 733-743.

Figure 1: Bland-Altman plots showing mean change in prevalence of symptoms of asthma, allergic rhinoconjunctivitis, and eczema per year for 6–7 year age-group and 13–14 year age-group versus mean prevalence of Phases One and Three for each centre

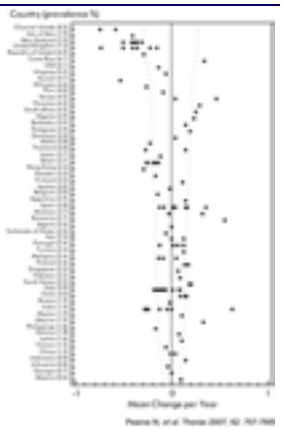


Asthma

Pearce N, Aït-Khaled N, Beasley R, Mallol J, Keil U, Mitchell E, Robertson C, and the ISAAC Phase Three Study Group. *Worldwide trends in the prevalence of asthma symptoms Phase III of the International Study of Asthma and Allergies in Childhood (ISAAC).* Thorax 2007; 62(9): 758-66. view Article | view Editorial

Figure 1 Ranking plot showing the change per year in prevalence of current wheeze (wheeze in the past 12 months) in children aged 13–14 years for each centre by country, with countries ordered by their mean prevalence (for all centres combined) across phase I and phase III The plot also shows the confidence interval about zero change for a given level of prevalence (ie, the mean prevalence across phases I and III) given a sample size of 3000 and no cluster sampling effect

Figure 2 Ranking plot showing the change per year in prevalence of >4 attacks of wheezing in the previous 12 months in children aged 13–14 years for each centre by country, with countries ordered by their average prevalence (for all centres combined) across phase I and phase III The plot also shows the confidence interval about zero change for a given level of prevalence (ie, the mean prevalence across phases I and III) given a sample size of 3000 and no cluster sampling effect



The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

Figure 3 Ranking plot showing the change per year in the lifetime prevalence of asthma ("asthma ever") in children aged 13–14 years for each centre by country, with countries ordered by their mean prevalence (for all centres combined) across phase I and phase III The plot also shows the confidence interval about zero change for a given level of prevalence (ie, the mean prevalence across phases I and III) given a sample size of 3000 and no cluster sampling effect

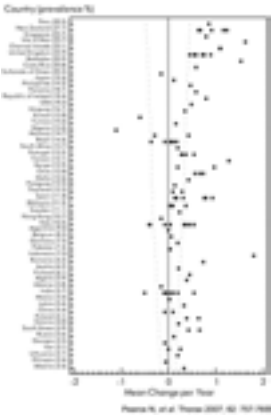


Figure 4 Ranking plot showing the change per year in prevalence of current wheeze (wheeze in the past 12 months) using the video questionnaire in children aged 13–14 years for each centre by country, with countries ordered by their mean prevalence (for all centres combined) across phase I and phase III The plot also shows the confidence interval about zero change for a given level of prevalence (ie, the mean prevalence across phases I and III) given a sample size of 3000 and no cluster sampling effect

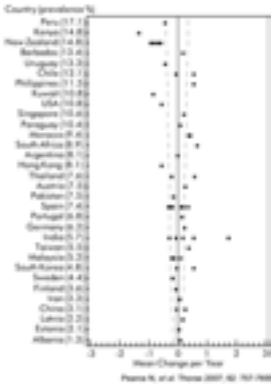


Figure 5 Ranking plot showing the change per year in the prevalence of current wheeze (wheeze in the past 12 months) in children aged 6–7 years for each centre by country, with countries ordered by their mean prevalence (for all centres combined) across phase I and phase III The plot also shows the confidence interval about zero change for a given level of prevalence (ie, the mean prevalence across phases I and III) given a sample size of 3000 and no cluster sampling effect

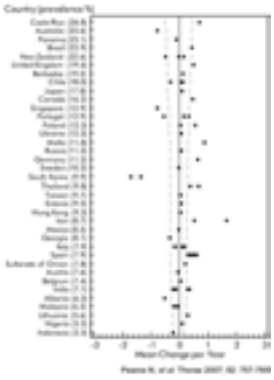


Figure 6 Ranking plot showing the change per year in prevalence of >4 attacks of wheezing in the previous 12 months in children aged 6–7 years for each centre by country, with countries ordered by their mean prevalence (for all centres combined) across phase I and phase III The plot also shows the confidence interval about zero change for a given level of prevalence (ie, the mean prevalence across phases I and III) given a sample size of 3000 and no cluster sampling effect

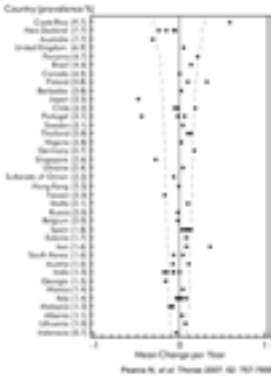
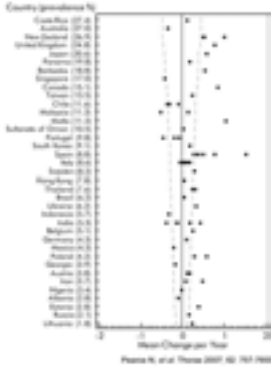


Figure 7 Ranking plot showing the change per year in the lifetime prevalence of asthma ("asthma ever") in children aged 6–7 years for each centre by country, with countries ordered by their mean prevalence (for all centres combined) across phase I and phase III The plot also shows the confidence interval about zero change for a given level of prevalence (ie, the mean prevalence across phases I and III) given a sample size of 3000 and no cluster sampling effect



Rhinoconjunctivitis

Björkstén B, Clayton T, Ellwood P, Stewart A, Strachan D, and the ISAAC Phase Three Study Group. *Worldwide time trends for symptoms of rhinitis and conjunctivitis Phase III of the International Study of Asthma and Allergies in Childhood.* Pediatr Allergy Immunol 2008; 19(2): 110-24. view full article

Figure 1: Ranking plot showing the change per year of symptoms of rhinitis in 13- to 14-yr-old children for each centre by country, with countries ordered by their average prevalence (for all centres combined) across Phase I and Phase III The plot also shows the confidence interval about zero change for a given level of prevalence, given a sample size of at least 3000 and no cluster sampling effect

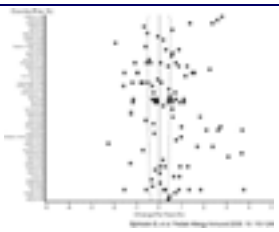


Figure 2: Ranking plot showing the change per year of symptoms of rhinitis in 6- to 7-yr-old children for each centre by country, with countries ordered by their average prevalence (for all centres combined) across Phase I and Phase III (c f Fig 1)

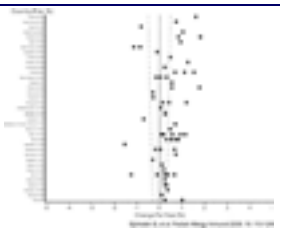


Figure 3: Ranking plot showing the change per year of symptoms of rhinoconjunctivitis (affirmative responses to both the questions 'In the past 12 months, have you had a problem with sneezing or a runny or blocked nose, when you DID NOT have a cold or 'the flu'?' and 'In the past 12 months, has this nose problem been accompanied by itchy-watery eyes?') in 13- to 14-yr-old children for each centre by country, with countries ordered by their average prevalence (for all centres combined) across Phase I and Phase III (c f Fig 1)

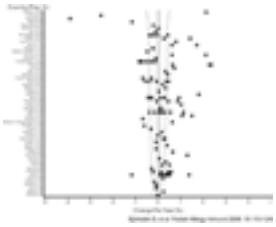


Figure 4: Ranking plot showing the change per year of symptoms of rhinoconjunctivitis (affirmative responses to both the questions 'In the past 12 months, have you had a problem with sneezing or a runny or blocked nose, when you DID NOT have a cold or 'the flu'?' and 'In the past 12 months, has this nose problem been accompanied by itchy-watery eyes?') in 6- to 7- yr-old children for each centre by country, with countries ordered by their average prevalence (for all centres combined) across Phase I and Phase III (c f Fig 1)

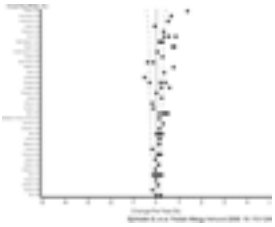
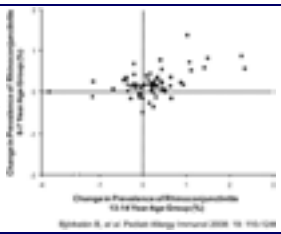


Figure 5: Scatter plot showing the change per year of symptoms of rhinoconjunctivitis for the 13–14 yr age group and the 6–7 yr age group for centres which included both age groups



Eczema

Williams H, Stewart A, von Mutius E, Cookson B, Anderson HR and the International Study of Asthma and Allergies in Childhood (ISAAC) Phase One and Three Study groups. *Is eczema really on the increase worldwide?* J Allergy Clin Immunol 2008; 121(4): 947-54.

Figure 1 Ranking plots depicting annual change in eczema prevalence (defined as symptoms of flexural eczema in the last year) between the 2 ISAAC surveys on the horizontal axis against average prevalence between the 2 surveys on the vertical axis A, Children 13 to 14 years old B, Children 6 to 7 years old Countries are ordered by ascending average prevalence The dashed lines denote 95% CIs about zero change for a given prevalence level, given a sample size of 3000 and no cluster sampling effect Red diamond points denote countries that used English-language questionnaires

Fig.1A

Fig.1B

Figure E1 Ranking plots of changes in symptoms of severe eczema for 13- and 14-year-olds ordered by average prevalence

Figure E2 Ranking plots of changes in symptoms of reporting the disease label of eczema for 13- and 14-yearolds ordered by average prevalence

The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

Figure E3 Ranking plots of changes in symptoms of severe eczema for 6- and 7-year olds ordered by average prevalence

Figure E4 Ranking plots of changes in symptoms of reporting the disease label of eczema for 6- and 7-year olds ordered by average prevalence

Phase Three Worldmap Papers

Rhinoconjunctivitis

Aït-Khaled N. Pearce N. Anderson HR. Ellwood P. Montefort S. Shah J. and the ISAAC Phase Three Study Group. *Global map of the prevalence of symptoms of rhinoconjunctivitis in children The International Study of Asthma and Allergies in Childhood (ISAAC) Phase Three.* Allergy 2009; 64: 123–148

Figure 2 Prevalence of current symptoms of rhinoconjunctivitis, 13- to 14-year age group Countries are ordered by average prevalence

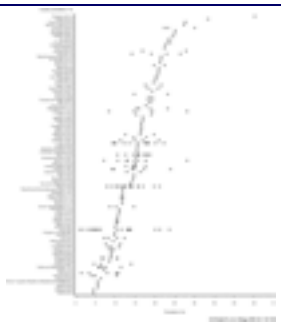


Figure 4 Prevalence of current symptoms of rhinoconjunctivitis, 6- to 7-year age group Countries are ordered by average prevalence

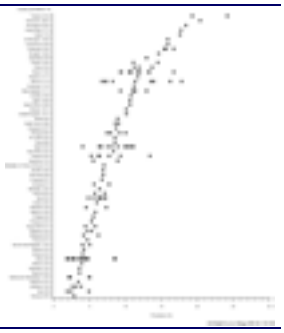
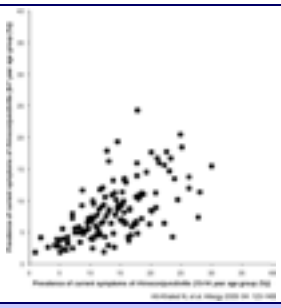


Figure 5 Scatter plot of prevalence of current symptoms of rhinoconjunctivitis, both age groups



Eczema

Odhiambo J, Williams H, Clayton T, Robertson C, Asher MI, and the ISAAC Phase Three Study group. *Global variations in prevalence of eczema symptoms in children from ISAAC Phase Three.* J Allergy Clin Immunol. 2009;124(6):1251-8.

FIG 2 Ranked prevalence plots of current symptoms of eczema for the age group 6 to 7 years (A) and 13 to 14 years (B) Each symbol represents a center Countries are ordered by average prevalence

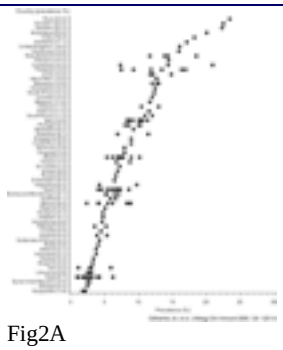


Fig2A

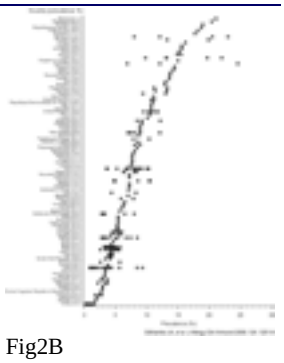


Fig2B

FIG E3 Ranked prevalence plots of current symptoms of eczema for the age groups 6 to 7 years (A) and 13 to 14 years (B) Each symbol represents a center Regions are ordered by average prevalence

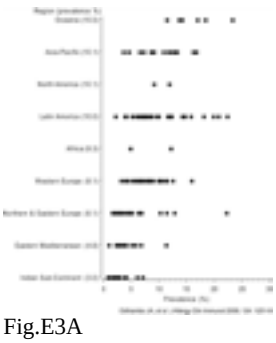


Fig.E3A

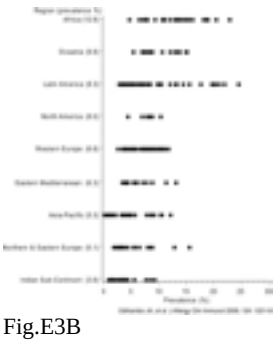


Fig.E3B

FIG E4 Ranked prevalence plots of current symptoms of severe eczema for the age groups 6 to 7 years (A) and 13 to 14 years (B) Each symbol represents a center Countries are ordered by average prevalence

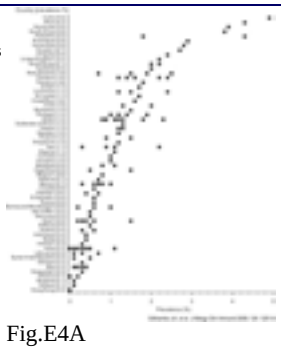


Fig.E4A

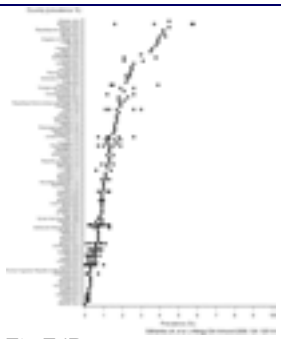


Fig.E4B

FIG E5 Ranked prevalence plots of lifetime reported "eczema" for the age groups 6 to 7 years (A) and 13 to 14 years (B) Each symbol represents a center Countries are ordered by average prevalence

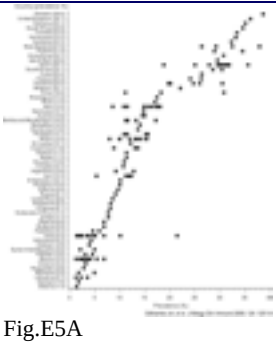


Fig.E5A

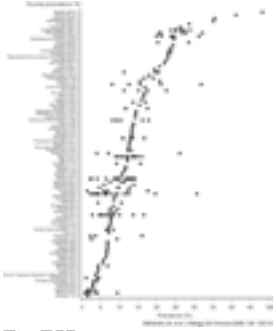


Fig.E5B

FIG E6 Scatter plots illustrating prevalence by sex for current symptoms of eczema (A), current symptoms of severe eczema (B), and lifetime reported "eczema" (C) for the age group 6 to 7 years, and current symptoms of eczema (D), current symptoms of severe eczema (E), and lifetime reported "eczema" (F) for the age group 13 to 14 years Each symbol represents a center The line of equality is shown on each plot

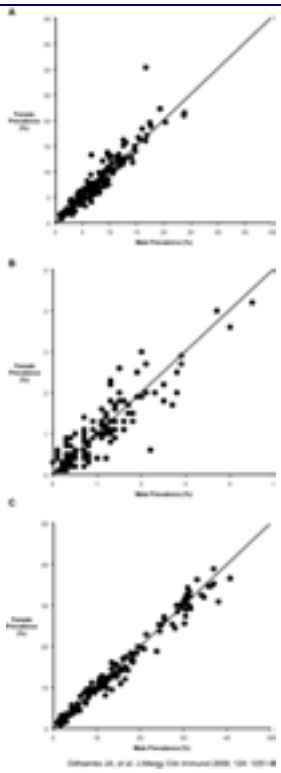


Fig E6A-C

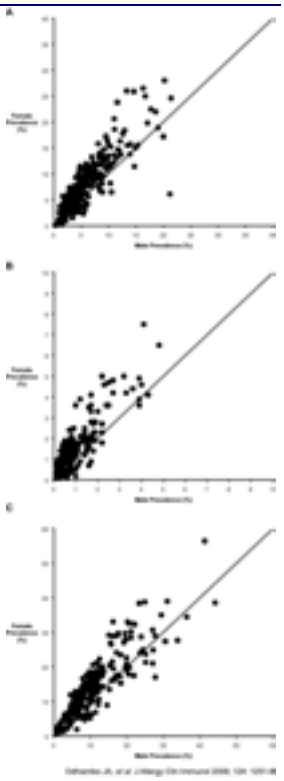


Fig E6D-F

Appendices

ISAAC Maps

List of Centres

Summary of publications

List of Publications

References

Steering Committee

Photos

The full size versions of all these maps and graphs are available at: http://isaac.auckland.ac.nz/story/methods/maps.php

ISAAC Centres

Over three hundred centres in 105 countries participated in the three phases of ISAAC. These centres are listed by region,country then centre and Phase showing Principal Investigator and number of children.

All ISAAC centres by region

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Africa				
Algeria				
	Algiers - Phase One	Dr A Bezzaoucha	1173	
	West Algiers - Phase One	professor Badia Benhabylès	2024	
	Wilaya of Algiers - Phase Three	Professor Badia Benhabylès	4203	
		Country Total	**7400**	
Cameroon				
	Yaounde - Phase Three	Professor Christopher Kuaban	2983	
		Country Total	**2983**	
Congo				
	Brazzaville - Phase Three	Professor Joseph M'Boussa	1012	
		Country Total	**1012**	
Cote d'Ivoire				
	Urban Cote d Ivoire - Phase Three	Dr Bernard Ngoran Koffi	3342	
		Country Total	**3342**	
Ethiopia				
	Addis Ababa - Phase One	Associate Professor Kibrebeal Melaku	2951	
	Addis Ababa - Phase Three	Associate Professor Kibrebeal Melaku	3195	
	Jima - Phase One	Professor Berhane Seyoum	3027	
		Country Total	**9173**	
Gabon				
	Port-Gentil - Phase Three	Dr Isabelle Ekoume Hypolite	3166	
		Country Total	**3166**	
Ghana				
	Kintampo - Phase Two	Dr Emmanuel OD Addo-Yobo	1354	
		Country Total	**1354**	
Kenya				
	Eldoret - Phase One	Dr Fabian O Esamai	3024	
	Eldoret - Phase Three	Dr Fabian O Esamai	3289	
	Nairobi - Phase One	Dr Joseph A Odhiambo	3243	
	Nairobi - Phase Three	Dr Lucy Ng'ang'a	3023	
		Country Total	**12579**	
Morocco				
	Benslimane - Phase Three	Professor Zoubida Bouayad	1008	
	Boulmene - Phase Three	Professor Zoubida Bouayad	1254	
	Casablanca - Phase One	Professor Zoubida Bouayad	3183	
	Casablanca - Phase Three	Professor Zoubida Bouayad	1777	
	Marrakech - Phase One	Professor Zoubida Bouayad	2900	
	Marrakech - Phase Three	Professor Zoubida Bouayad	1689	
	Rabat - Phase One	Professor Abedelkrim Bennis	3276	
		Country Total	**15087**	
Nigeria				
	Ibadan - Phase One	Professor Babatunde O Onadeko	3057	1696
	Ibadan - Phase Three	Professor Babatunde O Onadeko	3142	2396
		Country Total	**6199**	**4092**
République de Guinée				
	Conakry - Phase Three	Professeur Oumou Younoussa Sow	3115	
		Country Total	**3115**	
Republique Democratique du Congo				
	Kinshasa - Phase Three	Prof Dr Jean-Marie Kayembe	2930	
		Country Total	**2930**	
Reunion Island				
	Reunion Island - Phase Three	Dr Isabella Annesi-Maesano	2362	
		Country Total	**2362**	
South Africa				
	Cape Town - Phase One	Dr Hugo Nelson	5173	
	Cape Town - Phase Three	Professor Heather J Zar	5037	
	Polokwane - Phase Three	Professor Kuku Voyi	4660	3480
		Country Total	**14870**	**3480**

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Sudan				
	Khartoum - Phase Three	Professor Omer Abdel Aziz Musa	2896	
		Country Total	**2896**	
Togo				
	Lome - Phase Three	Professor Osseni Tidjani	3090	
		Country Total	**3090**	
Tunisia				
	Grand Tunis - Phase Three	Professeur Faouzia Khaldi	6119	
	Sousse - Phase One	Professeur Mohamed Jerray	3020	
	Sousse - Phase Three	Professeur Mohamed Jerray	3042	
		Country Total	**12181**	
		Regional Total	**103739**	**7572**
Asia-Pacific				
China				
	Beijing - Phase One	Professor Yu-Zhi Chen	4167	
	Beijing - Phase Two	Professor Yu-Zhi Chen	4214	
	Beijing - Phase Three	Professor Yu-Zhi Chen	3530	
	Chongqing - Phase One	Professor Kun-Hua Chen	4296	
	Guangzhou - Phase One	Professor Nan-Shan Zhong	3855	
	Guangzhou - Phase Two	Professor Nan-Shan Zhong	3510	
	Guangzhou - Phase Three	Professor Nan-Shan Zhong	3514	
	Shanghai - Phase One	Dr Mao Bao-Shan	3483	
	Tibet - Phase Three	Assistant Professor Osamu Kunii	2878	
	Tong Zhou - Phase Three	Professor Yu-Zhi Chen	3542	
	Wulumuqi - Phase One	Professor Man-Lin Xiao	3207	
	Wulumuqi(9) - Phase Three	Dr Qiao Li Pan	3884	
		Country Total	**44080**	
Indonesia				
	Bali - Phase Three	Professor Putu Konthen	2569	
	Bandung - Phase One	Prof Dr Karnen Baratawidjaja	2249	1390
	Bandung - Phase Three	Prof Dr Cissy B Kartasasmita	2826	2503
	Semarang - Phase Three	Dr Winarto Suprihati	2435	
		Country Total	**10079**	**3893**
Japan				
	Fukuoka - Phase One	Professor Sankei Nishima	2827	2896
	Fukuoka - Phase Three	Dr Hiroshi Odajima	2520	2958
	Tochigi - Phase Three	Professor Makino Sohei	4466	
		Country Total	**9813**	**5854**
Malaysia				
	Alor Setar - Phase One	Dr Keng Hwang Teh	3298	2978
	Alor Setar - Phase Three	Dr Keng Hwang Teh	2941	3786
	Ipoh - Phase One	Dr Lim Wee Yeong	3313	2506
	Klang Valley - Phase One	Associate Professor Jessie de Bruyne	6079	3109
	Klang Valley - Phase Three	Associate Professor Jessie de Bruyne	3025	3044
	Kota Bharu - Phase One	Associate Professor Ban Seng Quah	3113	3819
	Kota Bharu - Phase Three	Associate Professor Ban Seng Quah	2989	3157
	Muar - Phase One	Dr Kok Wai Chum	2833	2873
		Country Total	**27591**	**25272**
Philippines				
	Metro Manila - Phase Three	Professor Felicidad Cua-Lim	3658	3698
	Metro Manilla - Phase One	Professor Felicidad Cua-Lim	3207	3558
		Country Total	**6865**	**7256**
SAR China				
	Hong Kong - Phase Two	Dr Christopher Lai	3011	
	Hong Kong 13-14 - Phase One	Dr Christopher Lai	4666	
	Hong Kong 13-14 - Phase Three	Professor Gary Wong	3321	
	Hong Kong 6-7 - Phase One	Professor Yu Lung Lau		3618
	Hong Kong 6-7 - Phase Three	Professor Yu Lung Lau		4448
		Country Total	**10998**	**8066**
Singapore				
	Singapore - Phase One	Professor Bee-Wah Lee	4206	2353
	Singapore - Phase Three	Associate Professor Daniel Yam Thiam Goh	4217	5389
		Country Total	**8423**	**7742**

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
South Korea				
	Provincial Korea - Phase One	Dr Sang-Il Lee	6990	5527
	Provincial Korea - Phase Three	Professor Ha-Baik Lee	7375	4258
	Seoul - Phase One	Dr Sang-Il Lee	2993	2582
	Seoul - Phase Three	Professor Ha-Baik Lee	2888	1760
		Country Total	**20246**	**14127**
Taiwan				
	Taipei - Phase One	Professor Kue-Hsiung Hsieh DECEASED	11400	4806
	Taipei - Phase Three	Dr Jing-Long Huang	6378	4832
	Taoyuan - Phase Three	Dr Chun-Chieh Kao	3190	3293
		Country Total	**20968**	**12931**
Thailand				
	Bangkok - Phase One	Dr Pakit Vichyanond	3713	3629
	Bangkok - Phase Three	Dr Pakit Vichyanond	4669	4209
	Chantaburi - Phase Three	Dr Thanong Prasarnphanich	2901	3321
	Chiang Mai - Phase One	Associate Professor Muthita Trakultivakorn	3927	3828
	Chiang Mai - Phase Three	Associate Professor Muthita Trakultivakorn	3538	3106
	Chiangrai - Phase Three	Dr Rawee Nettagul	1809	1677
	Khon Kaen - Phase Three	Associate Professor Jamaree Teeratakulpisarn	3410	2658
	Nakorn Pathom - Phase Three	Dr Aree Kongpanichkul	6975	1821
		Country Total	**30942**	**24249**
Vietnam				
	Ho Chi Minh City - Phase Three	Dr Baïch Vaên Cam	4240	3879
		Country Total	**4240**	**3879**
		Regional Total	**194245**	**113269**
Eastern Mediterranean				
Egypt				
	Cairo - Phase Three	Dr Maggie Louis Naguib	3047	
		Country Total	**3047**	
Iran				
	Birjand - Phase Three	Dr Mohammed-Reza Masjedi	2829	2693
	Rasht - Phase One	Dr Mohammed-Reza Masjedi	3182	3013
	Rasht - Phase Three	Dr Mohammed-Reza Masjedi	3004	3057
	Tehran - Phase One	Dr Mohammed-Reza Masjedi	2691	2456
	Tehran - Phase Three	Dr Mohammed-Reza Masjedi	3119	3008
	Zanjan - Phase Three	Dr Mohammed-Reza Masjedi	2805	2777
		Country Total	**17630**	**17004**
Jordon				
	Amman - Phase Three	Dr Faisal Abu-Ekteish	2447	2598
		Country Total	**2447**	**2598**
Kuwait				
	Kuwait - Phase One	Dr Jawad A al-Momen	1056	
	Kuwait - Phase Three	Dr Jawad A al-Momen	2882	
		Country Total	**3938**	
Lebanon				
	Beirut - Phase One	Dr Fuad M Ramadan	2993	
		Country Total	**2993**	
Malta				
	Malta - Phase One	Professor Stephen Montefort	4184	3493
	Malta - Phase Three	Professor Stephen Montefort	4136	3795
		Country Total	**8320**	**7288**
Pakistan				
	Islamabad - Phase Three	Dr Mohammad Osman Yusuf	4066	3966
	Karachi - Phase One	Dr Zulfiqar A Bhutta	1829	
	Karachi - Phase Three	Dr Naseeruddin Mahmood	2999	2113
		Country Total	**8894**	**6079**
Palestine				
	North Gaza - Phase Three	Mr Shaban Mortaja	3627	3575
	Ramallah - Phase Two	Dr Nuha El Sharif	2304	
	Ramallah - Phase Three	Dr Nuha El Sharif	3929	3754
		Country Total	**9860**	**7329**

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Sultanate Of Oman				
	Al-Khod - Phase One	Associate Professor Bazdawi Al-Riyami	3174	3891
	Al-Khod - Phase Three	Associate Professor Omar Al-Rawas	3747	4130
		Country Total	**6921**	**8021**
Syria				
	Aleppo - Phase Three	Dr Khaldoun Tabbah	3063	
	Lattakia - Phase Three	Professor Yousser Mohammad	3010	2373
	Tartous - Phase Three	Dr Samira Mohammad	2995	2734
		Country Total	**9068**	**5107**
		Regional Total	**73118**	**53426**
Indian Sub-Continent				
India				
	Akola - Phase One	Dr Ramesh M Maheshwari	2138	2030
	Bangalore - Phase Three	Professor Sylvan Rego	3440	2959
	Bikaner - Phase Three	Professor Mohammed Sabir	3059	
	Bombay (16) - Phase One	Dr Mohan Keshav Joshi	4225	3967
	Bombay (17) - Phase One	Dr Uday Anath Pai	2226	1148
	Bombay (18) - Phase One	Dr Kalyani Raghavan	3178	3568
	Borivali - Phase One	Dr Vasant A Khatav	3878	1672
	Borivali - Phase Three	Dr Vasant A Khatav	1004	900
	Chandigarh - Phase One	Professor Lata Kumar	3139	2891
	Chandigarh - Phase Three	Dr Meenu Singh	3122	
	Chennai (3) - Phase Three	Dr Gururaj Setty	2181	1116
	Davangere - Phase Three	Dr P S Suresh Babu	2945	3043
	Jaipur - Phase Three	Professor Virendra Singh	3607	2545
	Jodhpur - Phase One	Dr K C Jain	1094	1104
	Jodhpur - Phase Three	Dr K C Jain	2341	2114
	Kottayam - Phase One	Dr T U Sukumaran	2047	2156
	Kottayam - Phase Three	Dr T U Sukumaran	3685	2619
	Lucknow - Phase Three	Professor Shally Awasthi	3000	3000
	Ludhiana - Phase Three	Professor Jugesh Chhatwal	3108	3225
	Madras (2) - Phase One	Dr Sarela Rajajee	1903	1466
	Madras (3) - Phase One	Dr N Somu	3086	2491
	Mumbai (16) - Phase Two	Dr Jayant Shah	1658	
	Mumbai (16) - Phase Three	Dr Mohan Keshav Joshi	1881	2865
	Mumbai (18) - Phase Three	Dr Asha Vijaykumar Pherwani	2982	4862
	Mumbai (29) - Phase Three	Dr Sumant Narayan Mantri	1829	1833
	Nagpur - Phase Three	Dr Sundeep Salvi	4150	4294
	New Delhi (7) - Phase One	Dr Kamlesh Chopra	3026	2938
	New Delhi (7) - Phase Three	Professor S K Sharma	3469	3706
	Neyveli - Phase One	Dr G Jayaraj	3281	1498
	Orissa - Phase One	Dr Pradeep Kumar Kar	1248	1520
	Pimpri - Phase Three	Dr Sundeep Salvi	3128	3838
	Pune - Phase One	Dr Neeta Milind Hanumante	2702	3248
	Pune - Phase Three	Dr Neeta Milind Hanumante	1983	2711
	Rasta Peth - Phase Three	Associate Professor Sheila Bhave	3065	3147
		Country Total	**92808**	**80474**
Sri Lanka				
	Sri Lanka - Phase Three	Dr Kirthi D Gunasekera	3717	3345
		Country Total	**3717**	**3345**
		Regional Total	**96525**	**83819**
Latin America				
Argentina				
	Buenos Aires - Phase One	Dr Natalio Salmun	2996	3005
	Córdoba - Phase One	Dr Carlos E Baena-Cagnani	3042	
	Córdoba - Phase Three	Dr Carlos E Baena-Cagnani	3445	982
	Neuquén - Phase Three	Professor Gustavo Enrique Zabert	3172	1930
	Rosario - Phase One	Dr Natalio Salmun	3008	3007
	Rosario City - Phase Three	Prof Dr Carlos D Crisci	3099	2952
	Salta - Phase Three	Dr Maximiliano Gómez	3000	
		Country Total	**21762**	**11876**

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Bolivia				
	Santa Cruz - Phase Three	Dr Rosario Pinto-Vargas	3257	
		Country Total	**3257**	
Brasil				
	Aracaju - Phase Three	Dr Jackeline Machado Motta Franco	3043	2443
	Belo Horizonte - Phase Three	Associate Professor Paulo Augusto M Camargos	3088	
	Brasília - Phase Three	Dr Wellington G Borges	3009	
	Caruaru - Phase Three	Assistant Professor Almerinda Silva	3026	
	Curitiba - Phase One	Professor Nelson Rosário	3004	
	Curitiba - Phase Three	Professor Nelson Rosário	3628	
	Feira de Santana - Phase Three	Associate Professor Leda de Freitas Souza	1732	440
	Itajaí - Phase Three	Dr Cláudia dos Santos Dutra Bernhardt	2737	1511
	Maceió - Phase Three	Professor Francisco José Passos	2746	1990
	Manaus Amazonas - Phase Three	Dra Maria do Socorro Cardoso	3009	3011
	Nova Iguaçu - Phase Three	Associate Professor Antônio José Ledo Aves Cunha	3185	3249
	Passo Fundo - Phase Three	Dr Arnaldo C Porto Neto	2949	
	Porto Alegre - Phase One	Professor Renato Stein	3195	2846
	Porto Alegre - Phase Three	Dr Gilberto B Fischer	3007	
	Recife - Phase One	Dr Patricia Gomes M Bezerra	3086	1410
	Recife - Phase Three	Dr Murilo de Britto	2865	
	Rural Santa Maria - Phase Three	Professor Dirceu Solé	3057	
	Salvador - Phase One	Associate Professor Leda de Freitas Souza	3162	
	Salvador - Phase Three	Associate Professor Leda de Freitas Souza	3020	1069
	Santa Maria - Phase Three	Professor Dirceu Solé	3065	
	Santo Andre - Phase Three	Associate Professor Neusa Wandalsen	3232	2167
	São Paulo - Phase One	Professor Dirceu Solé	3007	3005
	São Paulo - Phase Three	Professor Dirceu Solé	3161	3047
	São Paulo West - Phase Three	Dr Antonio Carlos Pastorino	3181	3312
	Uruguaiana - Phase Two	Professor Renato Stein	1971	
	Vitória da Conquista - Phase Three	Associate Professor Leda de Freitas Souza	1679	399
		Country Total	**75844**	**29899**
Chile				
	Calama - Phase Three	Dr Luis Alberto Vera Benavides	1618	
	Central Santiago - Phase One	Dr Ignacío Sanchez	2944	1458
	Chiloe - Phase Three	Dra Amanda Contreras	3000	
	Punta Arenas - Phase One	Dr Lidia Amarales	3482	3060
	Punta Arenas - Phase Three	Dr Lidia Amarales	3044	3052
	South Santiago - Phase One	Dra Eliana Cortez	3051	3182
	South Santiago - Phase Three	Dr Pedro Aguilar	3026	3075
	Valdivia - Phase One	Dr Mario A Calvo	3231	3138
	Valdivia - Phase Three	Dr Mario A Calvo	3105	3183
		Country Total	**26501**	**20148**
Colombia				
	Barranquilla - Phase Three	Dr Alfonso M Cepeda	3204	3209
	Bogotá - Phase Three	Dr Gustavo Aristizábal	3830	3256
	Cali - Phase Three	Dr Gustavo A Ordoñez	3100	3005
		Country Total	**10134**	**9470**
Costa Rica				
	Costa Rica - Phase One	Dr Manuel E Soto-Quirós	3200	2942
	Costa Rica - Phase Three	Dr Manuel E Soto-Quirós	2436	3234
		Country Total	**5636**	**6176**
Cuba				
	La Habana - Phase Three	Dra Patricia Varona Peréz	3026	1803
		Country Total	**3026**	**1803**
Ecuador				
	Guayaquil - Phase Three	Dr César Bustos	3082	
	Pichincha - Phase Two	Dr Phillip Cooper	894	
	Quito - Phase Three	Dr Sergio Barba	3014	3055
		Country Total	**6990**	**3055**
El Salvador				
	San Salvador - Phase Three	Dr Margarita Figueroa Colorado	3260	1365
		Country Total	**3260**	**1365**
Honduras				
	San Pedro Sula - Phase Three	Dr Agustin Bueso-Engelhardt	2675	1907
		Country Total	**2675**	**1907**

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Mexico				
	Ciudad de México (1) - Phase Three	Dra Blanca E Del-Río-Navarro	3891	3205
	Ciudad de México (3) - Phase Three	Dra Mercedes Barragán-Meijueiro	3474	3493
	Ciudad de México (4) - Phase Three	Dra Nelly Ramírez-Chanona	2662	895
	Ciudad Victoria - Phase Three	Dr Roberto García-Almaráz	3122	2603
	Cuernavaca - Phase One	Professor Isabelle Romieu	3102	3097
	Cuernavaca - Phase Three	Professor Isabelle Romieu	1431	2579
	Mérida - Phase Three	Dr Manuel Baeza-Bacab	3019	2896
	Mexicali Valley - Phase Three	Dr J Valente Merida-Palacio	2988	2568
	Monterrey - Phase Three	Dr Sandra Nora González-Díaz	3006	3030
	Toluca - Phase Three	Dr Francisco J Linares-Zapién	3021	3235
	Villahermosa - Phase Three	Dr Sergio Romero-Tapia	3109	2678
		Country Total	**32825**	**30279**
Nicaragua				
	Managua - Phase Three	Dr José Félix Sánchez	3263	3286
		Country Total	**3263**	**3286**
Panamá				
	David-Panamá - Phase One	Dr Gherson Cukier	2885	3043
	David-Panamá - Phase Three	Dr Gherson Cukier	3183	2942
		Country Total	**6068**	**5985**
Paraguay				
	Asunción - Phase One	Dr Jaime A Guggiari-Chase	2966	
	Asunción - Phase Three	Dr Jaime A Guggiari-Chase	3000	
		Country Total	**5966**	
Peru				
	Lima - Phase One	Dr Pascual Chiarella	3158	
	Lima - Phase Three	Dr Pascual Chiarella	3022	2244
		Country Total	**6180**	**2244**
Uruguay				
	Montevideo - Phase One	Dra Dolores Holgado	3072	3071
	Montevideo - Phase Three	Dra Dolores Holgado	3177	
	Paysandú - Phase Three	Dra María Cristina Lapides	1738	1512
		Country Total	**7987**	**4583**
Venezuela				
	Caracas - Phase Three	Dr Oscar Aldrey	3000	2999
		Country Total	**3000**	**2999**
		Regional Total	**224374**	**135075**
North America				
Barbados				
	Barbados - Phase One	Dr Malcolm E Howitt	3533	3289
	Barbados - Phase Three	Dr Malcolm E Howitt	2498	2759
		Country Total	**6031**	**6048**
Canada				
	Hamilton - Phase One	Professor Malcolm R Sears		3337
	Saskatoon - Phase One	Dr Brett Taylor	1901	2418
	Saskatoon - Phase Three	Professor Donna Rennie	1200	1255
	Vancouver - Phase Three	Professor Alex Ferguson	2853	
		Country Total	**5954**	**7010**
Trinidad and Tobago				
	St Augustine - Phase Three	Dr Michelle A Monteil	3512	2611
	Tobago - Phase Three	Dr Michelle A Monteil	1464	550
		Country Total	**4976**	**3161**
USA				
	Chapel Hill - Phase Three	Dr Karin Yeatts	128443	
	Chicago (3) - Phase One	Professor Victoria Persky	1422	
	Chicago (4) - Phase One	Professor Victoria Persky	3756	
	Sarasota - Phase Three	Dr Hugh H Windom	1245	
	Seattle - Phase One	Professor Gregory J Redding	2330	
	Seattle - Phase Three	Professor Gregory J Redding	2422	
		Country Total	**139618**	
		Regional Total	**156579**	**16219**

Northern and Eastern Europe

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Albania				
	Tiranë - Phase One	Professor Alfred Priftanji	2957	2981
	Tiranë - Phase Two	Professor Alfred Priftanji	1052	
	Tiranë - Phase Three	Professor Alfred Priftanji	2983	2896
		Country Total	**6992**	**5877**
Bulgaria				
	Sofia - Phase Three	Dr Todor Popov	1926	1181
		Country Total	**1926**	**1181**
Croatia				
	Rijeka - Phase Three	Dr Kristina Lah Tomulic	2194	1633
		Country Total	**2194**	**1633**
Estonia				
	Narva - Phase One	Dr Mall-Anne Riikjärv	1424	
	Tallinn - Phase One	Dr Mall-Anne Riikjärv	3560	3070
	Tallinn - Phase Two	Dr Mall-Anne Riikjärv	971	
	Tallinn - Phase Three	Dr Mall-Anne Riikjärv	3603	2385
		Country Total	**9558**	**5455**
Finland				
	Helsinki - Phase One	Dr Merja Kajosaari	2855	
	Kuopio County - Phase One	Dr Juha Pekkanen	2878	
	Kuopio County - Phase Three	Dr Juha Pekkanen	3051	
	Lappland Area - Phase One	Dr Leena Soininen	3077	
	Turku and Pori County - Phase One	Dr Turku Antti Koivikko	3085	
		Country Total	**14946**	
Georgia				
	Kutaisi - Phase One	Dr Nino Khetsuriani	3297	3356
	Kutaisi - Phase Three	Dr Maia Gotua	2650	2666
	Tbilisi - Phase One	Professor Amiran Gamkrelidze	3449	3414
	Tbilisi - Phase Two	Dr Maia Gotua	1012	
		Country Total	**10408**	**9436**
Hungary				
	Svábhegy - Phase Three	Dr Györgyi Zsigmond	4219	2451
	Szeged - Phase Three	Dr Zoltán Novák	2899	
		Country Total	**7118**	**2451**
Iceland				
	Reykjavik - Phase Two	Dr Michael Clausen	937	
		Country Total	**937**	
Kyrgyzstan				
	Balykchi - Phase Three	Dr Imanalieva Cholpon	1382	729
	Bishkek - Phase Three	Dr Imanalieva Cholpon	5048	3146
	Jalalabat - Phase Three	Professor Shairbek Sulaimanov	2404	1664
		Country Total	**8834**	**5539**
Latvia				
	Riga - Phase One	Dr Marcis Leja	3004	3003
	Riga - Phase Two	Dr Vija Svabe	908	
	Riga - Phase Three	Dr Vija Svabe	1283	
	Rural Latvia - Phase One	Dr Marcis Leja	3145	
		Country Total	**8340**	**3003**
Lithuania				
	Kaunas - Phase One	Professor Jurgis Bojarskas	1600	1878
	Kaunas - Phase Three	Associate Professor Jolanta Kudzyte	2723	2772
	Panevezys - Phase Three	Professor Jurgis Bojarskas	1187	1176
	Siauliai - Phase Three	Professor Jurgis Bojarskas	3516	1341
		Country Total	**9026**	**7167**
Poland				
	Krakow (1993) - Phase One	Associate Professor Grzegorz Lis	3750	
	Kraków (1995) - Phase One	Associate Professor Grzegorz Lis	2786	2264
	Kraków (1995) - Phase Three	Associate Professor Grzegorz Lis	2545	2497
	Poznan - Phase One	Associate Professor Anna Brêborowicz	3631	2710
	Poznan - Phase Three	Associate Professor Anna Brêborowicz	1875	1999
		Country Total	**14587**	**9470**

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Republic of Macedonia				
	Skopje - Phase Three	Assoc Prof Emilija Vlaski	3026	
		Country Total	**3026**	
Romania				
	Cluj - Phase One	Professor Diana Deleanu	3396	
	Cluj - Phase Three	Professor Diana Deleanu	3019	
		Country Total	**6415**	
Russia				
	Moscow - Phase One	Professor Rakhim M Khaitov, Director of the Institute of Immunology	3411	
	Novosibirsk - Phase One	Prof Dr Elena G Kondiourina	3654	3637
	Novosibirsk - Phase Three	Prof Dr Elena G Kondiourina	3769	2730
		Country Total	**10834**	**6367**
Serbia and Montenegro				
	Belgrade - Phase Three	Dr Zorica Zivkovic MD, Phd	3228	1932
	Nis - Phase Three	Asst Professor Snezana Zivanovic	1207	1002
	Novi Sad - Phase Three	Dr Mila Hadnadjev	1171	1044
	Podgorica - Phase Three	Dr Omer Adzovic	1014	933
	Sombor - Phase Three	Dr Eva Panic	1105	1029
		Country Total	**7725**	**5940**
Sweden				
	Linköping - Phase One	Professor N-I Max Kjellman	2496	1329
	Linköping - Phase Two	Dr Lennart Bråbäck	907	
	Linköping - Phase Three	Dr Hartmut Vogt	2679	2089
	Stockholm/Uppsala - Phase One	Dr Tony Foucard	3075	3029
	Östersund - Phase Two	Dr Lennart Bråbäck	1195	
		Country Total	**10352**	**6447**
Ukraine				
	Kharkiv - Phase One	Associate Professor Viktor Ognev	3311	2971
	Kharkiv - Phase Three	Associate Professor Viktor Ognev	2428	1950
	Rural Kharkiv - Phase Three	Associate Professor Viktor Ognev	3968	3000
		Country Total	**9707**	**7921**
Uzbekistan				
	Samarkand - Phase One	Professor Tamara Aripova	1758	
	Tashkent - Phase One	Professor Tamara Aripova	2904	
		Country Total	**4662**	
		Regional Total	**147587**	**77887**
Oceania				
Australia				
	Adelaide - Phase One	Dr Declan Kennedy	3030	3063
	Melbourne - Phase One	Professor Colin F Robertson	2759	2840
	Melbourne - Phase Three	Professor Colin F Robertson	2192	2968
	Perth - Phase One	Professor Louis Landau	3650	2192
	Sydney 13-14 - Phase One	Professor Adrian Bauman	2839	
	Sydney 6-7 - Phase One	Dr Jennifer Peat		2804
		Country Total	**14470**	**13867**
Cook Islands				
	Rarotonga - Phase Three	Dr Roro Daniel	445	
		Country Total	**445**	
Fiji				
	Suva - Phase Three	Dr Rosalina Sa'aga-Banuve	3093	
		Country Total	**3093**	
French Polynesia				
	Polynesie Francaise - Phase Three	Dr Isabella Annesi-Maesano	4289	
		Country Total	**4289**	

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
New Zealand				
	Auckland - Phase One	Professor M Innes Asher ONZM	3206	3526
	Auckland - Phase Three	Professor M Innes Asher ONZM	2870	3541
	Bay of Plenty - Phase One	Dr Chris Moyes	2813	2681
	Bay of Plenty - Phase Three	Dr Chris Moyes	1976	2150
	Christchurch - Phase One	Associate Professor Philip Pattemore	3191	3318
	Christchurch - Phase Three	Associate Professor Philip Pattemore	3116	3315
	Hawkes Bay - Phase One	Dr David Barry	3550	3338
	Hawkes Bay - Phase Two	Professor Julian Crane	1320	
	Nelson - Phase One	Dr Richard MacKay	1839	1868
	Nelson - Phase Three	Dr Richard MacKay	2305	1867
	Wellington - Phase One	Professor Julian Crane	4424	3838
	Wellington - Phase Three	Professor Neil Pearce	3050	2537
		Country Total	**33660**	**31979**
Niue				
	Niue Island - Phase Three	Ms Moka Magatogia	79	47
		Country Total	**79**	**47**
Nouvelle Caledonie				
	Nouvelle Caledonie - Phase Three	Dr Isabella Annesi-Maesano	7247	
		Country Total	**7247**	
Samoa				
	Apia - Phase Three	Ms Peone Fuimaono	2986	
		Country Total	**2986**	
Tokelau				
	Tokelau - Phase Three	Dr Tekie Iosefa	66	
		Country Total	**66**	
Tonga				
	Nuku alofa - Phase Three	Dr Sunia Foliaki	2671	
		Country Total	**2671**	
		Regional Total	**69006**	**45893**
Western Europe				
Austria				
	Kärnten - Phase One	Associate Professor Gerald Haidinger		5264
	Kärnten - Phase Three	Associate Professor Gerald Haidinger		4847
	Salzburg - Phase One	Dr Josef Riedler	3371	3658
	Urfahr-Umgebung - Phase One	Associate Professor Gerald Haidinger	1515	2129
	Urfahr-Umgebung - Phase Three	Associate Professor Gerald Haidinger	1439	2029
		Country Total	**6325**	**17927**
Belgium				
	Antwerp - Phase One	Professor Paul Vermeire	1515	6533
	Antwerp - Phase Three	Professor Joost Weyler	3250	5645
		Country Total	**4765**	**12178**
Channel Islands				
	Guernsey - Phase One	Dr David Jeffs	1170	
	Guernsey - Phase Three	Dr Peter Standring	1248	
	Jersey - Phase One	Dr Richard Grainger	1135	
	Jersey - Phase Three	Ms Rosie Goulding	773	
		Country Total	**4326**	
France				
	Crétail - Phase Two	Dr Isabella Annesi-Maesano	1400	
	Marseille - Phase One	Professor Denis Charpin	3494	
	Montpellier - Phase One	Professor Philippe Godard	3384	
	Pessac - Phase One	Professor André Taytard	3302	3202
	Strasbourg - Phase One	Dr Christine Kopferschmitt-Kubler	5403	
	West Marne - Phase One	Dr Isabella Annesi-Maesano	2961	
		Country Total	**19944**	**3202**
Germany				
	Dresden - Phase Two	Professor W Leopold	3023	
	Greifswald - Phase One	Professor Axel Kramer	3169	2853
	Munich - Phase Two	Professor Erika von Mutius	3301	
	Münster - Phase One	Prof Dr Ulrich Keil	4003	3739
	Münster - Phase Three	Prof Dr Ulrich Keil	4132	3830
		Country Total	**17628**	**10422**

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Greece				
	Athens - Phase One	Associate Professor Christina Gratziou	2561	1654
	Athens - Phase Two	Associate Professor Christina Gratziou	985	
	Thessaloniki - Phase Two	Associate Professor John Tsanakas	1018	
	Thessaloniki - Phase Three	Associate Professor John Tsanakas	1228	
		Country Total	**5792**	**1654**
Isle Of Man				
	Isle of Man - Phase One	Dr Peter Powell	1467	
	Isle of Man - Phase Three	Dr Andreea Steriu	1716	1096
		Country Total	**3183**	**1096**
Italy				
	Ascoli Piceno - Phase One	Professor Sergio Bonini	1130	
	Bari - Phase Three	Dr Lucio Armenio	1287	1943
	Colleferro-Tivoli - Phase Three	Dr Valerio Dell'Orco	1361	1143
	Cosenza - Phase One	Dr Enea Bonci	1068	
	Cosenza - Phase Three	Dr Enea Bonci	925	
	Cremona - Phase One	Mr Franca Rusconi	1201	1392
	Emilia-Romagna - Phase One	Dr Marco Biocca	3961	4472
	Emilia-Romagna - Phase Three	Dr Claudia Galassi	1347	2265
	Empoli - Phase One	Ms Lucia Chetoni	1046	1434
	Empoli - Phase Three	Dr M G Petronio	1229	1152
	Firenze - Phase One	Dr Elisabetta Chellini	1171	1138
	Firenze - Phase Three	Dr Elisabetta Chellini	1383	1036
	Frosinone - Phase One	Mr Roberto Ronchetti	1147	
	Mantova - Phase Three	Dr Gabriele Giannella	1114	1288
	Milano - Phase One	Dr Luigi Bisanti	3373	3616
	Milano - Phase Three	Dr Luigi Bisanti	1410	2249
	Palermo - Phase Three	Dr Stefania La Grutta	1221	
	Roma - Phase One	Dr Francesco Forastiere	3323	4027
	Roma - Phase Two	Dr Francesco Forastiere	1354	
	Roma - Phase Three	Dr Francesco Forastiere	1325	2224
	Siena - Phase One	Ms Elisabetta Renzoni	1181	
	Siena - Phase Three	Dr Piersante Sestini	1082	
	Torino - Phase One	Dr Giovannino Ciccone	1242	1429
	Torino - Phase Three	Dr Giovannino Ciccone	1180	2361
	Trento - Phase One	Dr Silvano Piffer	4426	
	Trento - Phase Three	Dr Silvano Piffer	1311	2359
	Verona - Phase One	Professor Attilio Boner	2208	2076
	Viterbo - Phase One	Mr Guiseppe Corbo		1231
		Country Total	**44006**	**38835**
	Netherlands - Phase Three	Professor Rutger Engels	6896	
	Netherlands (Utrecht) - Phase Two	Professor Bert Brunekreef, PhD	3541	
		Country Total	**10437**	
Norway				
	Tromsø - Phase Two	Dr Wenche Nystad	3669	
		Country Total	**3669**	
Portugal				
	Coimbra - Phase Three	Dr M Lourdes Chiera	1177	
	Funchal - Phase One	Dr Fernando D Borges	3532	1797
	Funchal - Phase Three	Dra Rita Câmara	3161	1819
	Lisbon - Phase One	Dr José E Rosado Pinto	3030	2143
	Lisbon - Phase Three	Dr José E Rosado Pinto	3024	2477
	Portimao - Phase One	Dr Carlos Nunes	1058	1189
	Portimao - Phase Three	Dr Carlos Nunes	1109	1069
	Porto - Phase One	Dr José M Lopes dos Santos	3131	
	Porto - Phase Three	Dr José M Lopes dos Santos	3336	2464
		Country Total	**22558**	**12958**
Republic of Ireland				
	Republic of Ireland - Phase One	Professor Luke Clancy	3147	
	Republic of Ireland - Phase Three	Professor Luke Clancy	3089	
		Country Total	**6236**	

Country	Centre	Principal Investigator	Number 13-14 years	Number 6-7 years
Netherlands				
Spain				
	A Coruña - Phase Three	Dr Angel López-Silvarrey Varela	2979	3016
	Almeria - Phase Two	Dr José Batlles-Garrido	1126	
	Almeria - Phase Three	Dr José Batlles-Garrido	4051	3349
	Asturias - Phase Three	Dr Ignacio Carvajal-Urueña	4184	3193
	Barcelona - Phase One	Dr Rosa M Busquets	3031	
	Barcelona - Phase Three	Dr Rosa M Busquets	3066	3002
	Bilbao - Phase One	Dr Alfonso Delgado Rubio	3212	3019
	Bilbao - Phase Three	Dr Carlos González Díaz	3401	3157
	Cádiz - Phase One	Dr Andrés Rabadán Asensio	3270	
	Cartagena - Phase One	Professor Luis García-Marcos	3017	3335
	Cartagena - Phase Two	Professor Luis García-Marcos	1429	
	Cartagena - Phase Three	Professor Luis García-Marcos	3998	2948
	Castellón - Phase One	Dr Alberto Arnedo-Pena	3094	3594
	Castellón - Phase Three	Dr Alberto Arnedo-Pena	4024	3915
	Madrid - Phase One	Dr Gloria García-Hernández	3321	2442
	Madrid - Phase Two	Dr Gloria García-Hernández	981	
	Madrid - Phase Three	Dr Gloria García-Hernández	2652	2347
	Pamplona - Phase One	Professor Francisco Guillén-Grima	3040	2996
	Pamplona - Phase Three	Professor Francisco Guillén-Grima	2932	3176
	San Sebastián - Phase Three	Professor Eduardo G Pérez-Yarza	1195	926
	Valencia - Phase One	Professor Maria M Morales-Suárez-Varela	3179	3940
	Valencia - Phase Two	Professor Maria M Morales-Suárez-Varela	1362	
	Valencia - Phase Three	Professor Maria M Morales-Suárez-Varela	3132	3398
	Valladolid - Phase One	Professor Alfredo Blanco-Quirós	3178	
	Valladolid - Phase Three	Professor Alfredo Blanco-Quirós	2944	
		Country Total	**71798**	**51753**
Turkey				
	Ankara - Phase Two	Dr Yildiz Saraçlar	2976	
		Country Total	**2976**	
United Kingdom				
	Anglia and Oxford - Phase One	Professor H Ross Anderson	2324	
	North east and Yorkshire - Phase One	Professor H Ross Anderson	3709	
	North Thames - Phase One	Professor H Ross Anderson	2220	
	North Thames - Phase Three	Professor H Ross Anderson	2356	
	North West - Phase One	Professor H Ross Anderson	3029	
	Scotland - Phase One	Professor H Ross Anderson	4444	
	Scotland - Phase Three	Dr Jane B Austin	4662	
	South and West - Phase One	Professor H Ross Anderson	2707	
	South Thames - Phase One	Professor H Ross Anderson	2297	
	South Thames - Phase Three	Professor H Ross Anderson	2432	
	Sunderland - Phase One	Dr Mohammad H Shamssain	2092	1864
	Sunderland - Phase Three	Dr Mohammad H Shamssain	2193	1843
	Surrey/Sussex - Phase One	Professor David Strachan	2114	
	Surrey/Sussex - Phase Three	Professor David Strachan	5082	
	Trent - Phase One	Professor H Ross Anderson	2207	
	Wales - Phase One	Professor H Ross Anderson	2351	
	Wales - Phase Three	Dr Michael Burr	2501	
	West Midlands - Phase One	Professor H Ross Anderson	2219	
	West Sussex - Phase Two	Professor David Strachan	1056	
		Country Total	**51995**	**3707**
		Region Total	**275638**	**153732**
		Global Total	**1340811**	**686892**

ISAAC Journal Information

The below table shows the journals that have published articles by ISAAC collaborators. It shows the journal, its impact factor (if available) and the number of ISAAC articles the journal has published. This information is also available at http://isaac.auckland.ac.nz/publications/journalSummary.php.

Journal Name	Website	Impact Factor 2010	Number of Original ISAAC Articles Published	Number of Letters About ISAAC	Number of Editorials About ISAAC
Acta clinica Belgica	http://www actaclinicabelgica be/	0 532	1		
Acta Paediatrica	http://www wiley com/bw/journal asp?ref=0803-5253	1 955	4		
Acta Paediatrica Japonica	http://onlinelibrary wiley com/journal/10 1111/%28ISSN%291442-200X		1		
Allergologia et Immunopathologia	http://www elsevier es/revistas/ctl_servlet?_f=7032&revistaid=105	0 779	19		
Allergologie	http://www dustri com/nc/de/deutschsprachige-zeitschriften/mag/allergologie html	0 143	5		
Allergology International	http://ai jsaweb jp/past html		2		
Allergy	http://www3 interscience wiley com/journal/118519659/home	6 297	24	1	
Allergy and Asthma Proceedings	http://www oceansidepubl com/aap/index htm	1 735	5		
Allergy and Clinical Immunology	www hhpub com		1		
Allergy Asthma and Clinical Immunology	http://e-aair org/index php		2		
Allergy Asthma and Immunology Research	2004-2009: http://www swetswise com/eAccess/viewTitleIssues do?titleID=267852 2009:http://www aacijournal com/		1		
Allergy Hypersensitivity Asthma	No Website		1		
American Journal of Public Health	http://www ajph org/	3 85	1		
American Journal of Respiratory and Critical Care Medicine	http://www atsjournals org/	10 191	6		1
Anales de pediatria (Barcelona)	http://www elsevier es/revistas/ctl_servlet?_f=7032&revistaid=37	0 57	5		
Anales del sistema sanitario de Navarra	http://www cfnavarra es/SALUD/ANALES/default html	0 252	1		
Anales Espanoles de Pediatria	Continued by Anales de pediatria (Barcelona)		4		
Annals of Allergy, Asthma and Immunology	http://www annallergy org/issues	2 801	6		
Annals of Epidemiology	http://www annallergy org	3 238	1		
Annals of Tropical Paediatrics: International Child Health	http://www ingentaconnect com/content/maney/atp	0 966	3		
Archives De Pediatrie	http://www elsevier com/wps/find/journaldescription cws_home/505820/description#description	0 305	1		
Archives of Disease in Childhood	http://adc bmjjournals com	2 616	7		
Archives of pediatrics and adolescent medicine	http://archpedi ama-assn org/	4 029	1		
Archivos de bronconeumologia	http://www archbronconeumol org/bronco_eng/ctl_servlet?_f=1		2		
Asian Pacific Journal of Allergy and Immunology	http://www allergythai org/index php?name=AsianPacificJournalofAllergyandImmunology	0 172	3		
Asthma	no Website		1		
Atencion primaria	http://www elsevier es/revistas/ctl_servlet?_f=7232&revistaid=27	0 619	1		
Australasian Epidemiologist	http://www aea asn au/journal_aims htm		1		
Australian and New Zealand journal of public health	http://www3 interscience wiley com/journal/117969397/home	1 529	1		
Australian Family Physician	http://www racgp org au/afp/	0 647	1		
BMC public health	http://www biomedcentral com/bmcpublichealth/	2 364	1		
British Journal of Dermatology	http://www wiley com/bw/journal asp?ref=0007-0963&site=1	4 351	2		
British Medical Journal	http://www bmj com/	13 471	3		
Bulletin de l'Académie nationale de médecine	http://www academie-medecine fr/le_bulletin cfm?langue=fr	0 316	1		
Cadernos de Saúde Pública	http://www scielo br/scielo php?script=sci_serial&pid=0102-311X&lng=en&nrm=iso	0 987	1		
Canadian Medical Association Journal	http://www cmaj ca/	9 015	2		
Chest	http://www chestjournal org/	6 519	1		
Childrens Pulmonology	No Website		6		
Clinical and Experimental Allergy	http://www3 interscience wiley com/journal/117999818/home	4 195	25		
Clinics	http://www scielo br/scielo php?script=sci_serial&pid=1807-5932&lng=en&nrm=iso	1 422	1		
Cough	http://www coughjournal com		1		
Current Allergy and Clinical Immunology	http://www allergysa org/allsa htm	0 196	1		
Current Opinion in Allergy and Clinical Immunology	http://journals lww com/co-allergy/pages/default aspx	3 431	1		
East African Medical Journal	http://www ajol info/journal_index php?jid=53		3		
Eastern Mediterranean Health Journal	http://www emro who int/publications/emhj/index asp		1	1	
Environmental Health	http://www ehjournal net/	2 45	2		
Environmental Health Perspectives	http://www ehponline org	6 087	2		
Epidemiologia e Prevenzione	http://www epidemiologiaeprevenzione it/cms/?q=node/4	0 636	20		
Epidemiology	http://journals lww com/epidem/pages/default aspx	5 866	5		
Ethiopian medical journal	http://www emaethiopia org/journal aspx		1		
European journal of clinical nutrition	http://www nature com/ejcn/index html	2 561	1		

Journal Name	Website	Impact Factor 2010	Number of Original ISAAC Articles Published	Number of Letters About ISAAC	Number of Editorials About ISAAC
European Journal of Epidemiology	http://www springerlink com/content/102883/	4 535	2		
European Respiratory Journal	http://erj ersjournals com/	5 922	36		
Georgian medical news	http://www geomednews org/		2		
Gesundheitswesen	http://www thieme-connect com/ejournals/toc/gesu		1		
Health and place	http://www elsevier com/wps/find/journaldescription cws_home/30519/description#description	2 694	1		
Indian Paediatrics	http://indianpediatrics net/	0 9	1		
International Archives of Allergy and Immunology	http://content karger com/ProdukteDB/produkte asp?Aktion=JournalHome&ProduktNr=224161	2 235	4		
International Journal of Biometeorlogy	http://springerlink metapress com/content/100429/	1 805	3		
International journal of chronic obstructive pulmonary disease	http://www dovepress com/articles php?pa=overview&journal_id=6		1		
International Journal of Epidemiology	http://ije oxfordjournals org/	5 759	6		
International journal of obesity	http://www nature com/ijo/index html	2 654	1		
International Journal of Occupational and Environmental Health	http://www ijoeh com/index php/ijoeh	1	1		
International Journal of Tuberculosis and Lung Disease	http://www ingentaconnect com/content/iuatld/ijtld	2 557	7		3
Iranian Journal of Allergy, Asthma and Immunology	http://www iaari hbi ir/journal/	0 742	2		
Irish Medical Journal	http://www imj ie/		3		
Jornal de Pediatria	http://www scielo br/scielo php?script=sci_serial&pid=0021-7557&lng=en&nrm=iso	1 065	7		
Journal Medical Libanais	http://lebanesemedicaljournal org/index html		1		
Journal of Allergy and Clinical Immunology	http://www jacionline org/	9 273	8	2	
Journal of Asthma	http://informahealthcare com/loi/jas	1 341	14	1	
Journal of Investigational Allergology and Clinical Immunology	http://www jiaci org/index htm	1 489	15		
Journal of Investigative Dermatology	http://www nature com/jid/	6 27	0		1
Journal of Isfahan Medical School	http://journals mui ac ir/jims		1		
Journal of Korean medical science	http://jkms org/	0 832	1		
Journal of Paediatrics and Child Health	http://www wiley com/bw/journal asp?ref=1034-4810&site=1	1 221	3		
Journal of Shahid Sadoughi University of Medical Sciences and Health Services	No Website		1		
Journal of the European Academy of Dermatology and Venereology	http://onlinelibrary wiley com/journal/10 1111/%28ISSN%291468-3083	3 309	0	1	
Journal of the Medical Association of Thailand	http://www mat or th/journal/all php		1		
Journal of the National Medical Association	http://www nmanet org/index php/Publications_Sub/jnma	1 104	1		
Journal of the Royal Society of Health	http://rsh sagepub com/		1		
Journal of tropical pediatrics	http://tropej oxfordjournals org/	1 248	1		
Journal Romanian Society Allergology & Clinical Immunology	no Website		1		
Korean Journal of Preventative Medicine	http://prevent richis org/		1		
La Tunisie médicale	http://www latunisiemedicale com/		1		
Leukotriene Research and Clinical Review	No Website		1		
Macedonian Journal of Medical Science	http://www mjms ukim edu mk/MJMS_Archive htm		2		
Maedica A Journal of Clinical Medicine	http://www maedica org		1		
Maternal and child health journal	http://www springerlink com/content/105600/		1		
Medical Journal of Australia	http://www mja com au/	2 684	2		
Medical Principals and Practice	http://content karger com/ProdukteDB/produkte asp?Aktion=JournalHome&ProduktNr=224259	1 069	2		
Medicina Clinica	http://www elsevier es/revistas/ctl_servlet?_f=7032&revistaid=2	1 413	3		
Medicina-Lithuania	http://medicina kmu lt/main-e htm	0 446	1		
Monaldi archives for chest disease	http://archest fsm it/pne/index html		1		
Monatsschrift Kinderheilkunde	http://www springerlink com/content/0026-9298	0 231	1		
Nature	http://www nature com/nature/index html	36 101	1		
New England Journal of Medicine	http://www nejm org	53 484	1		
NZ Medical Journal	http://www nzma org nz/journal/		4		
Occupational Environmental Medicine	http://oem bmj com/	3 494	4		
Otolaryngologia polska	http://www otolaryngologia org pl/orl2/otol_pol/teksty php		1		
Otolaryngology - Head and Neck Surgery	http://www journals elsevierhealth com/periodicals/ymhn	1 565	1		
Paediatric respiratory reviews	http://www journals elsevierhealth com/periodicals/yprrv/home	2 676	1		

Journal Name	Website	Impact Factor 2010	Number of Original ISAAC Articles Published	Number of Letters About ISAAC	Number of Editorials About ISAAC
Pediatric Allergy and Immunology	http://www wiley com/bw/journal asp?ref=0905-6157	2 874	40		
Pediatric Allergy and Respiratory Disease (Korea)	http://www kapard or kr/		1		
Pediatric Asthma, Allergy and Immunology	http://www liebertonline com/doi/abs/10 1089/pai 2004 17 244		1		
Pediatric Clinics of North America	http://www pediatric theclinics com/	2 204	1		
Pediatric Pulmonology	http://www3 interscience wiley com/journal/39249/home	2 239	12	2	
Pediatrics	http://pediatrics aappublications org/	5 391	1		
Pharmacoepidemiology and drug safety	http://www3 interscience wiley com/journal/5669/home	2 339	1		
Pneumologia (Bucharest, Romania)	http://www pneumologia eu/US/EN-home htm		1		
Pneumologie	http://www thieme-connect de/ejournals/toc/pneumologie		1		
Pneumonologia i Alergologia Polska	http://www pneumonologia viamedica pl/		5		
Preventive medicine	http://www elsevier com/wps/find/journaldescription cws_home/622934/description	3 299	1		
Primary Care Respiratory Journal	http://www thepcrj org		1		
Przeglad Lekarski	http://www wple net/plek/przeglad_lekarski htm		2		
Respiratory Medicine	http://www elsevier com/wps/find/journaldescription cws_home/623069/description#description	2 525	3		
Respiratory Research	http://respiratory-research com/	2 859	4		
Respirology	http://www wiley com/bw/journal asp?ref=1323-7799	1 865	4		
Revista alergia México	http://www imbiomed com mx/1/1/articulos php?method=showIndex&id_revista=12		2		
Revista De Saude Publica	http://www scielo br/scielo php?script=sci_arttext&pid=S0034-89102000000600016&lng=en&nrm=iso	0 862	1		
Revista Medica de Chile	http://www scielo cl/scielo php?script=sci_serial&lng=en&pid=0034-9887&nrm=iso	0 366	2		
Revista panamericana de salud pública	http://www scielosp org/scielo php?pid=1020-4989&script=sci_serial		1		
Revista Portuguesa de Pneumologia	http://www scielo oces mctes pt/scielo php?script=sci_issues&pid=0873-2159&lng=en&nrm=iso	0 355	1		
Revue d'épidémiologie et de santé publique	http://www sciencedirect com/science/journal/03987620	1 247	1		
Revue des Maladies Respiratoires	http://www sciencedirect com/science/journal/07618425	0 426	11		
Revue francaise d'allergologie et d'immunologie clinique	http://www sciencedirect com/science/journal/03357457	0 212	6		
Rhinology	http://www rhinologyjournal com/	0 803	1		
Salud Publica de Mexico	http://bvs insp mx/rsp/inicio/		3		
Scandinavian Journal of Work Environment and Health	http://www sjweh fi/	3 54	1		
Sozial- und Präventivmedizin	http://www springerlink com/content/109374/		2		
TABIB-E-SHARGH	No Website		1		
Tanaffos	http://nritld ac ir/tanaffosjournal/tabid/1362/language/en-US/Default aspx		2		
The Journal of the Association of Physicians of India	http://www japi org/		0	1	
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Thorax	http://thorax bmj com/	6 525	13		2
Toxicology Letters	http://www elsevier com/wps/find/journaldescription cws_home/505519/description#description	3 581	1		
Wiener Klinische Wochenschrift	http://www springerlink com/content/112448/	0 747	3		
World Journal of Pediatrics	http://www springerlink com/content/121086/	0 945	1		
Zhonghua er ke za zhi Chinese journal of pediatrics	http://www wanfangdata com/CMAJ/browse asp		2		
Zhonghua jie he he hu xi za zhi Chinese Journal of Tuberculosis and Respiratory Disease	http://www wanfangdata com/CMAJ/browse asp		1		
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The ISAAC Story

Steering Committee Photos

Nice, France 1994

Barcelona, Spain 1995

Stockholm, Sweden 1996

Berlin, Germany 1997

Geneva, Switzerland 1998

Madrid, Spain 1999

Auckland, New Zealand 2000




















The ISAAC Story















Malta, Malta 2001

Stockholm, Sweden 2002

Kenya, Kenya 2003

Tonga, Tonga 2004












The ISAAC Story
















The ISAAC Story








Hong Kong, SAR China 2005









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The ISAAC Story















Santiago, Chile 2006



The ISAAC Story












Munster, Germany 2007





The ISAAC Story











Casablanca, Morocco 2008






The ISAAC Story


















The ISAAC Story






Merida, Mexico 2009



Auckland, New Zealand 2011


























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The ISAAC Story








ISAAC Receptions

Copenhagen, Germany ERS2005















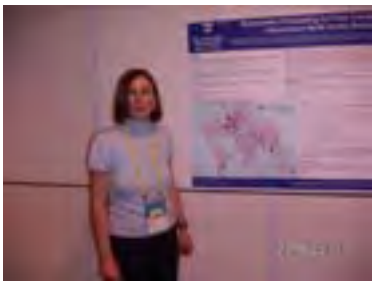
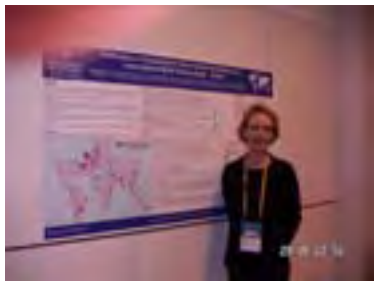








The ISAAC Story

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ISAAC Phase Two











ISAAC
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ISBN: 978-0-473-20211-8
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