INTERNATIONAL STUDY OF ASTHMA AND ALLERGIES IN CHILDHOOD

NEWSLETTER – MARCH 2008

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NEWSLETTER CONTENTS:

Dear ISAAC Colleagues and friends,

A happy new year to you all from the IIDC - The year is off to a very busy start and already it is March!

The Lancet Journal call for papers on asthma has provided a hive of activity for the Steering Committee where we have endeavoured to finish as many worldwide manuscripts as possible for inclusion by the deadline of 18 April. Members of the appropriate ISAAC study groups will receive, for comment, copies before submission in early April - please respond quickly. We hope The Lancet's decision is to include them all.

The nineteenth annual Steering Committee meeting will be held in September this year in Casablanca, hosted by our National Coordinator for Morocco, Zoubida Bouayad and our Regional Coordinator for French Speaking Africa, Professor Nadia Aït-Khaled. We will bring you highlights of this meeting in the ISAAC Newsletter that follows.

The Steering Committee has discussed many ideas about ISAAC Phase Four. The development of this Phase needs your input. We are grateful to those of you who have replied about management ideas and website development. In this newsletter we discuss this further.

We have included again, the ISAAC Phase Five Expression of Interest (EOI) form for those of you that have not yet sent this in to the IIDC (we have already received more than eighty responses). We would appreciate completion of this form so that we can see what interest there is in Phase Five. The Steering Committee has not yet made a decision whether to proceed with Phase Five. If Phase Five does proceed, the National and Regional Coordinators will be processing the registrations, the same way as in Phases One and Three. The Expression of interest is not a formal application at this stage and does not commit either the Principal Investigator or the ISAAC Steering Committee to your centre's participation

Following our usual format we acknowledge special achievements. Please, if you know of other special achievements among our ISAAC collaborators, we would love to hear from you. The ISAAC Newsletter is an excellent way of sharing information among the ISAAC 'family'.

One of the ways in which the ISAAC collaboration thrives is through sharing publications. We would appreciate it if you would check the ISAAC website list of publications and let us know of any we have omitted from any of the sections.

We remember this month, Professor Stephan Weiland who died suddenly on March 19th last year. Our thoughts are with his family.

On behalf of the ISAAC Steering Committee and the ISAAC International Data Centre I wish you well.

Warm wishes

Innes Asher

Professor Innes Asher ONZM

Congratulations to:

Professor Innes Asher

Article and photograph courtesy of the Health Research Council of New Zealand.

Childhood asthma and allergy researcher awarded HRC's prestigious Liley Medal

Studying the change in prevalence of asthma, rhinitis and eczema in children worldwide study has earned Professor Innes Asher from The University of Auckland this year's Liley Medal for health research.

The Liley Medal, awarded annually by the HRC, recognises an individual who has published a research study that has made an outstanding contribution to health and medical sciences. The medal is named after Sir William (Bill) Liley KCMG, BMedSc, MBChB, PhD, FRSNZ, FRCOG to recognise his lifetime contributions to health and medical sciences.

Professor Asher leads the International Study of Asthma and Allergies in Childhood (ISAAC), a major worldwide research programme formed in 1991, with key coordination from New Zealand, studying asthma, allergic rhinoconjunctivitis and atopic eczema.

Her research studied almost half a million school children in 56 countries to determine whether the prevalence of asthma, rhinitis and eczema had changed.

Previously, the prevalence of these conditions had been increasing; however, the research she led found decreases in prevalence in many study centres, including New Zealand. Increases in prevalence were more common in centres with low prevalence and in developing countries.

"The most concerning finding was that the increasing prevalence was most common in the most populous regions of the world (Latin America, Africa, India, Asia-Pacific) meaning high health care impact," Professor Asher says.

The study also found divergent trends for asthma, rhinitis and eczema in children within centres and regions, indicating environmental factors interact with the three conditions in different ways.

In addition to providing new evidence that environmental factors determine prevalence of asthma and allergies, the study has produced an effective research model which can monitor public health internationally and engage researchers worldwide.
"This research is an inspiring example of global leadership and successful international collaboration," HRC Chief Executive Dr Robin Olds says.

Professor Asher's research paper, *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,"* was published the prestigious international journal, *The Lancet,* in 2006, and the research has been highly cited since publication.

The medal was presented to Professor Asher at the New Zealand Science Honours dinner held on 20 November 2007 by Lady Margaret Liley and Dr John Hay, Deputy Chair of the HRC Board.

Congratulations to:

Diana Dumitrascu (Cluj Romania) was promoted to a position of professor in Universitatea de Medicina si Farmacie, "Iuliu Hatieganu" university in January

ISAAC Profile

Professor Luis García-Marcos

Luis is Professor of Paediatrics at the University of Murcia and coordinates the Paediatric Allergy and Paediatric Pulmonology Units at the Arrixaca University Children's Hospital (Murcia).

After attending the School of Medicine of the University of Navarra and of Valencia he graduated in the latter, in 1982. At that time he had no idea that something called "Epidemiology" was of any importance, and preferred to "play" with rats at the Pharmacology laboratory, where he spent most of the time during his last three years at the Valencia school of Medicine. Not seeing a clear future in the rats and influenced by a humanistic interest in Medicine he spent one year engaged in a doctoral thesis project in the field of the History of Medicine. Fortunately, after dedicating long hours reading Jaspers and Dilthey, he decided that this did not seem the correct way to a consistent future, and turned to clinical medicine; probably choosing Paediatrics influenced by his father, a well known paediatrician at that time.

He applied for a position as a resident in Paediatrics in the Arrixaca University Hospital and after obtaining his specialist degree he worked as a registrar in the Paediatric Allergy Unit for several years. During that time he returned to rats in order to do his doctoral thesis, and used the poor animals to know how different infant formulas and their components injured their lungs, using a model of aspiration pneumonia. During that time he spent several periods at the Pulmonology Unit of The London Hospital for Sick Children (Great Ormond St).

Luis arrived in the field of asthma epidemiology after starting a private practice in the nearby city of Cartagena, where he moved to live in 1989, just after becoming Professor of Paediatrics. Cartagena had been heavily polluted for years and –although decreasing by that time- the smog was sometimes remarkable. After convincing the local health authorities to perform studies on respiratory health in children, he worked with them in several small local projects.

When engaged in one of them, he heard about a "videoquestionnaire" that was being developed in New Zealand (the antipodes of Spain!). He then wrote to Neil Pearce and several months afterwards (August 1992) a letter arrived with details of the ISAAC project. From then on, his research interest has been mainly asthma epidemiology. He has been the ISAAC National Coordinator for Spain since the first group of ISAAC collaborators was formed in 1993. In 2005 he was invited to be a member of the ISAAC Steering Committee, and in November 2007 he was asked to join the Executive Committee.

He had recently expanded his research interest to include infant lung function and exhaled breath condensate and the Estudio Internacional de Sibilancias en Lactantes, EISL project **(**http://www.respirar.org/eng/eisl/index.htm**)** He is now Editor-in-Chief of "Allergologia et Immunopathologia" and part of several national committees, including the Paediatric Committee of the Spanish Agency of Human Medicines… and spends too much time in meetings!

ISAAC Profile

Julian Crane is Director of the Wellington Asthma Research Group in New Zealand. He graduated in medicine from London University (UK), came to New Zealand for a year and got stuck, partly through an interest in the problems of asthma. He writes - I first became interested in asthma soon after I arrived in New Zealand from the UK in the mid 1970s. My first job was three months as a casualty officer in a hospital with a catchment of 100,000 people, in that three months I witnessed three asthma deaths in the accident and emergency department and countless asthma admissions. This left a lasting impression.

By the early 1980s there was growing recognition of a new epidemic of asthma mortality in New Zealand. This became the focus of interest amongst clinicians here and then internationally and was of particular interest to me because I became increasingly convinced that the most likely cause was the change in beta agonist therapy that had occurred in New Zealand with the widespread use of a newly introduced beta agonist, fenoterol. I was well aware of the international epidemic of asthma mortality in the 1960s having been made to write a dissertation about it as a medical student and when the same thing happened for a second time in New Zealand it seemed important to investigate the possible role of medication in the epidemic. While doing a diploma in public health I wrote another piece of course work that involved designing a case control study for studying the risks of beta agonist medication on asthma mortality. From memory this received a fairly average score but eventually formed the basis of a series of studies that I undertook with Carl Burgess, Richard Beasley, Neil Pearce and many research staff that together formed the Wellington Asthma Research Group. The restriction of the availability of fenoterol at the end of 1989 led to an immediate and lasting fall in asthma mortality in New Zealand. For me this was a fascinating introduction to epidemiology. By systematically extracting information from stored patient records and using little more than paper, a pencil and a calculator, it was possible to construct plausible evidence that there was an increased risk of death from asthma associated with fenoterol use. It was also a reminder to me at least that serendipity plays a large part in most useful discoveries. From there my interest turned to trying to understand what drives the high prevalence of asthma in New Zealand, a country of green fields, abundant lakes, forests and coastline, almost no outdoor air pollution but with poorly constructed cold, damp and often mouldy dwellings. This of course has proved much more difficult and is the main reason for the development of ISAAC.

At the same time as I became interested in asthma mortality, I was involved in prevalence studies comparing asthma prevalence amongst an isolated Pacific population in Tokelau, where asthma was very uncommon, with a Tokelauan population that had migrated to New Zealand and where asthma had become a major health problem. It was while undertaking this field work and relaxing under tropical palms that I developed the idea of using a video questionnaire as a tool for asking questions about asthma symptoms. Our questionnaires, which were translated into Tokelauan, asked questions about wheezing symptoms that turned out when translated to describe multiple respiratory symptoms. In this situation it occurred to me that it would be much easier to show someone wheezing and ask if the subject has ever had the same experience. This led directly to the video questionnaire that has been used in both Phase 1 and Phase 3 of the ISAAC studies. Interestingly the questionnaire is now beginning to be used as a tool to try and understand the approaches of health professionals to diagnosing and treating asthma.

ISAAC Phase Four

ISAAC Phase Four is a series of activities which have a focus on management, education and advocacy.

We have already consulted ISAAC collaborators and many have expressed an interest in the developments below. Thank you for your feedback.

We have just received limited funding from the Hawke's Bay Medical Research Foundation (New Zealand) to *begin* updating our website so that it is more useful to ISAAC collaborators. We will need more funding to continue this project.

This could be modelled on the United Kingdom National Health Service Library website http://www.library.nhs.uk:

Respiratory http://www.library.nhs.uk/respiratory/
Skin http://www.library.nhs.uk/skin/
ENT http://www.library.nhs.uk/ent/

Our revamped website may include (in addition to existing features):

- Key findings from ISAAC.
- Clinical scenarios to illustrate management recommendations for children with asthma, allergic rhinitis and eczema.
- Specific disease-related issues such as inhaler devices for children with asthma, practical advice for children with eczema.
- Links to evidence based reviews.
- Guidance on special topics.
- Guidance on research.
- Patient information.
- Some of the above translated into the main ISAAC languages.
- Models of study designs to evaluate management interventions.
- ISAAC collaborators "unpublished work" section: contact details to access unpublished research reports and abstracts

If you would like to help Phase Four in any way, please contact Innes Asher:
mi.asher@auckland.ac.nz

ISAAC Phase Five - Expression of Interest ***November 2007***

The ISAAC Steering Committee wish to know whether there is sufficient worldwide interest in undertaking a further Phase of ISAAC (Phase Five). There is no funding available for Phase Five at this stage and we would have to raise new funds for the coordination. Phase Five would not be undertaken until 2010-2012. If it is conducted, then it will involve the same compulsory and optional questionnaires that were used in Phase Three, but there is a possibility that further questions or modules could be added. Apart from the possible additions to the questionnaires, the methodology would follow that of Phases One and Three and centres would be expected to arrange their own funding and ethical approval.

If you have not already completed this form we would appreciate it very much if you could please complete and return this form to the **ISAAC International Data Centre (IIDC):**

Fax: +64 9 373 7602

or Email to: p.ellwood@auckland.ac.nz

My centre is interested in taking part in a further ISAAC Phase Five symptoms prevalence study	***Yes*** ☐	No ☐	Don't know ☐
My centre took part in ISAAC Phase One	***Yes*** ☐	No ☐	Don't know ☐
My centre took part in ISAAC Phase Two	***Yes*** ☐	No ☐	Don't know ☐
My centre took part in ISAAC Phase Three	***Yes*** ☐	No ☐	Don't know ☐

Centre name:	
Country:	
Principal Investigator: (one per centre)	
Phone:	
Fax:	
Email:	
Postal Address:	
COMMENTS	

Date:_____

Name of person completing this form. _____

Poem from the book titled "**Sing Song**"

Author Anne Kennedy, New Zealand.

Plunket visits St Helena

Day three in this world, home
a ruby rash on her face wasn't eczema
according to Plunket, because it wasn't
itchy. Mm, said the mother, mm, we'll see.

Shrunk to nothing because of or in spite of
the preparations they piled on top of it
came back on her back
an itchy patch no bigger than

'two twenty-cent pieces side by side'
they said, using coins as currency for size.
Every night it bothered her but only
for the length of time you could

park your car for two twenty-cent pieces
in the middle of town. That's not very long
with the price of parking these days.

Remember this:
The skin is the first port of call for a reaction to the world.

Comment from Professor Hywel Williams ISAAC Steering Committee Centre for Evidence Based Dermatology Queen's Medical Centre, University Hospital, Nottingham UK.

"I love this particular poem as it reinforces the importance of listening to mothers for the full story of a possible eczematous condition. It is all too easy to see somebody on a good day quickly in clinic, and to be too dismissive of phrases like 'if you had only seen her a couple of weeks ago'. Eczema is a brittle condition which can be horrendously red and scratched one day and quiet and innocent looking 48 hours later."

Published 2003 Auckland University Press
http://www.nzbookcouncil.org.nz/writers/kennedyanne.htm
http://www2.auckland.ac.nz/aup/books/kennedy-singsong.html

ISAAC Publications of world wide analyses - Updated March 2008

Professor Neil Pearce

ISAAC Phase One Publications

1.0 Preliminary Papers

1.1 ISAAC Phase One Manual. 2nd ed. Auckland and Münster: ISAAC Steering Committee, 1993.

1.2 Pearce NE, 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 Resp J 1993; 6: 1455-61. [227 citations to September 2007]

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 Resp J 1995; 8: 483-91. [680 citations to September 2007]

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). Paediatric Allergy Immunology 1997; 8: 161-76. [170 citations to September 2007]

2.2 ISAAC Steering Committee (Writing Committee: Beasley R, Keil U, Von Mutius E, Pearce N). Worldwide variation in prevalence of symptoms of asthma, allergic rhinoconjunctivitis and atopic eczema: ISAAC. Lancet 1998; 351: 1225-32. [1218 citations to September 2007]

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: 125-38. [216 citations to September 2007]

2.4 ISAAC Steering Committee (Writing Committee: Asher MI, Anderson HR, Stewart AW, Crane J). Worldwide variations in the prevalence of asthma symptoms: International Study of Asthma and Allergies in Childhood (ISAAC). Eur Respir J 1998; 12: 315-35. [389 citations to September 2007]

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. Clin Exper Allergy 1998; 28 (suppl 5): 52-66. [70 citations to September 2007]

3.2 Beasley R, Ellwood P, Asher I. International patterns of the prevalence of pediatric asthma the ISAAC program. Pediatric Clinics of North America 2003; 50(3):539-53. [16 citations to September 2007]

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. 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 Ecologic 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, in press.

4.2 Anderson HR. Poloniecki JD. Strachan DP. Beasley R. Bjorksten B. Asher MI. ISAAC Phase 1 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: 1126-9. [48 citations to September 2007]
4.3 Anderson HR and the ISAAC Phase I Study Group. Air pollution and asthma prevalence. In preparation.
4.4 Asher I, et al. Overview of findings of ISAAC Phase I ecologic analyses. In preparation.
4.5 Burr ML, Emberlin JC, Treu R, Cheng S, Pearce N, and the ISAAC Phase I Study Group. Pollen counts in relation to the prevalence of rhinitis and asthma in the International Study of Asthma and Allergies in Childhood (ISAAC). Clin Exper Allergy 2003; 33: 1675-80. [14 citations to September 2007]
4.6 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: 436-43. [48 citations to September 2007]
4.7 Foliaki S, Bjorkstën B, Kildegaard-Nielsen S, von Mutius E, Cheng S, Pearce N. Antibiotic sales and the prevalence of symptoms of asthma, rhinitis and eczema in 13-14 year old children: The International Study of Asthma and Allergies in Childhood (ISAAC). Int J Epidemiol 2004; 33: 558-63. [14 citations to September 2007]
4.8 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: 667-73. [9 citations to September 2007]
4.9 Shirtcliffe P, Weatherall M, Beasley R, on behalf of the ISAAC Phase I Study Group. An inverse correlation between estimated tuberculosis notification rates and asthma symptoms. Respirology 2002; 7: 153-5. [13 citations to September 2007]
4.10 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. [37 citations to September 2007]
4.11 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. [86 citations to September 2007]
4.12 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: 2040-41. [59 citations to September 2007]
4.13 Weiland S, Hüsing A, Strachan DP, Pearce N, on behalf of the ISAAC Study Group and ISAAC Europe. Climate and the prevalence of symptoms of asthma, allergic rhinoconjunctivitis and atopic eczema in children. Occup Environ Med 2004; 61: 609-15. [17 citations to September 2007]

Other Papers

5.1 Anderson R, Robertson C, Montefort S. World-wide variations in asthma in children: association with severity, evidence of other atopic diagnosis and sex ratio. In preparation.
5.2 Crane J, Mallol J, Beasley R, Stewart A, Asher MI, on behalf of the International Study of Asthma and Allergies in Childhood (ISAAC) Phase I study group. Agreement between written and video questions for comparing asthma symptoms in ISAAC. Eur Respir J 2003; 21: 455-61. [21 citations to September 2007]
5.3 Pearce N, Sunyer J, Cheng S, Chinn S, Bjorksten B, Burr M, Keil U, Anderson HR, Burney P, on behalf of the ISAAC Steering Committee and the European Community Respiratory Health Survey. Comparison on asthma prevalence in the ISAAC and the ECRHS. Eur Resp J 2000; 16: 420-6. [43 citations to September 2007]
5.4 Stewart AW, Mitchell EA. Month of birth and childhood atopic diseases: the International Study of Asthma and Allergies in Childhood (ISAAC). In preparation.

ISAAC Phase Two Publications

1.0 Preliminary Papers

1.1 Weiland SK, Björkstén B, Brunekreef B, Cookson WOC, von Mutius E, Strachan DP, and the ISAAC Phase II Study Group. Phase II of the International Study of Asthma and Allergies in Childhood (ISAAC II): rationale and methods. Eur Respir J 2004; 24: 406-412. [36 citations to September 2007]

2.0 Main Findings

2.1 Wienmayr 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 M-A, 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: 565-74.

2.2 Flohr C, Weiland SK, Weinmayr G, Björkstén B, Brabäck 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 (ISAAC) Phase Two. J Allergy Clin Immunol 2008; 121: 141-7.

ISAAC Phase Three Publications

1.0 Preliminary Papers

1.1 Ellwood P, Asher MI, Beasley R, Clayton TO, Stewart AW and the ISAAC Steering Committee. International Study of Asthma and Allergies in Childhood (ISAAC II): Phase III rationale and methods. Int J Tuberculosis Lung Dis 2005; 9: 10-6. [17 citations to September 2007]

2.0 Main Findings

2.1 Asher MI, Montefort S, Bjorksten B, Lai CKW, Strachan D, Weiland SK, Williams H, and the ISAAC Phase Three Study Group. Worldwide trends in the prevalence of symptoms of asthma, allergic rhinoconjunctivitis and eczema in childhood – ISAAC Phase Three. Lancet 2006; 368: 733-43. [38 citations to September 2007]

2.2 Pearce N**,** Aït-Khaled N, Beasley R, Mallol J, Mitchell E, Robertson C, and the ISAAC Phase Three Study group. Worldwide trends in the prevalence of asthma symptoms: Phase Three of the International Study of Asthma and Allergies in Childhood (ISAAC). Thorax 2007; 62: 757-62.

2.3 Björkstén B, Clayton T, Ellwood P, Stewart A, Strachan D, and the ISAAC Phase Three Study Group. Worldwide trends for symptoms of rhinoconjunctivitis: Phase Three of the International Study of Asthma and Allergies in Childhood. Paediatric Allergy Immunol, (In Press).

2.4 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? Journal Allergy and Clinical Immunology 2007 (In Press).

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