Asthma And Migration: Unmasking Asthma Potential. The International Study Of Asthma And Allergy In Childhood (ISAAC) Phase Three

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Rationale: Previous studies of immigrants in USA, Australia, New Zealand and Sweden have suggested that migration to a country with a high prevalence of asthma is a risk factor for developing asthma. ISAAC Phase Three (2001-2005) provided an opportunity to examine the effect of immigration on the prevalence of asthma, eczema and rhinoconjunctivitis worldwide.
Methods: ISAAC Phase Three was a questionnaire based survey of 6-7 year old children and 13-14 year old adolescents worldwide to determine the prevalence of asthma, eczema and rhinoconjunctivitis. A questionnaire was included which contained questions about immigration and duration of residence in the adopted country. Analysis was limited to those centers with at least 5% immigration and those subjects with complete covariate data. Odds ratios and 95% CI were calculated, adjusted for region of the world, gender, GNI and language.
Results: Complete data were available for 43,143 children from 15 centers in 8 countries and 89,482 adolescents from 33 centers in 22 countries. Average immigration rate was 8.9% for children and 15.9% for adolescents. Overall, immigrants had fewer symptoms of asthma and eczema in children and for asthma and rhinoconjunctivitis in adolescents (Table 1).

Odds Ratios (95%CI) for risk of asthma, rhinitis and eczema if not born in country of residence

	6-7 year old n = 43,143	13-14 year old n = 89,482
Current wheeze	0.73 (0.65,0.83)	0.81 (0.73,0.76)
Asthma ever	0.66 (0.58,0.74)	0.69 (0.64,0.75)
Current rhinoconjunctivitis	0.88 (0.76,1.01)	0.85 (0.79,0.93)
Hayfever ever	1.06 (0.93,1.22)	0.93 (0.85,1.00)
Current eczema	0.71 (0.62,0.81)	0.94 (0.85,1.04)
Eczema ever	0.57 (0.51,0.64)	0.79 (0.71,0.87)

The effect of immigration for current wheeze was greater in Oceania [0.51 (0.41,0.63)] and Asia-Pacific [0.51 (0.32, 0.82) for children and Oceania [0.62 (0.0.51,0.75)] and North America [0.61 (0.44,0.83)] for adolescents. Age at immigration had no effect for the 6-7 y.o. children. For adolescents, the protective effect for current wheeze was greater for those who immigrated at age 2 years or less [0.0.69 (0.57,0.83)] than those who migrated after the age of 2 years [0.81 (0.65,1.01)]. When analysis was restricted to those countries with the highest quartile for symptoms, the protective effect was greater for both children [0.59(0.50,0.71)] and adolescents [0.78 (0.69,0.89)].
Conclusion: In this global survey, immigration had a significant protective effect on the prevalence of the symptoms of asthma and eczema in children and asthma and rhinoconjunctivitis in adolescents. The effect diminished with increasing duration of residence in the adopted country.

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