

Project Progress Summary

Section 1: PROJECT IDENTIFICATION Information to be provided for project identification	NOT CONFIDENTIAL
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Title of the project	Prevalence and Determinants of Childhood Asthma and Allergies across Europe	
Acronym of the project	PDCAAE	
Type of contract	Additional costs	Total project cost (in euro) 990,643€
Contract number QLK4-CT-1999-01288	Duration (in months) 48 Months	EU contribution (in euro) 990,643€
Commencement date 1. February 2000	Period covered by the final report 1 February 2000 – 31 January 2004	
PROJECT COORDINATOR		
Name: Stephan Weiland	Title: Prof. Dr. med.	Address: Helmholtzstr. 22, 89081 Ulm, Germany
Telephone: 0731 50 31060	Telefax: 0731 50 31069	E-mail address: stephan.weiland@medizin.uni-ulm.de
Key words (5 maximum - Please include specific keywords that best describe the project.). asthma, allergies, children, epidemiology, environment		
World wide web address (the project's www address): http://www.uni-ulm.de/epidemiologie/		
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List of participants		
The Steering Group of this project consists of		
1. Prof. Dr. Stephan Weiland (Coordinator). Department of Epidemiology, University of Ulm, Germany		
2. Prof. Bengt Björkstén (Contractor). Centre for Allergy Research, Karolinska Institute, Stockholm, Sweden		
3. Prof. Bert Brunekreef (Contractor). Environmental and Occupational Health Group, Institute for Risk Assessment Sciences, Utrecht University, Netherlands		
4. Prof. Bill Cookson (Contractor). Centre for Human Genetics, University of Oxford, United Kingdom		
5. PD Dr. Erika von Mutius (Contractor). Dr. von Haunersche Kinderklinik, University Children's Hospital Munich, Germany		
6. Prof David Strachan (Assistant Contractor to 1), Department of Public Health Sciences, St. George's Hospital Medical School, London, UK		

Section 2: Project Progress Report**NOT CONFIDENTIAL***(2 pages maximum.. Use short sentences. Be factual. Avoid technical terms as much as possible)***Objectives:**

The specific objectives were:

1. to assess the variation in the prevalence and severity of clinical symptoms and objective markers of asthma, allergic rhinitis and atopic eczema in children living in different study centres in Europe;
2. to assess the association between potential determinants and the occurrence and severity of asthma and allergies in children in different centres and to make comparisons between and within study centres in Europe;
3. to assess the associations of genotypes known or suspected to play a role in childhood asthma and allergies with the measured phenotypes and to investigate gene/gene as well as gene/environment interactions in different study centres in Europe.

Results and Milestones:Study methods

Community based prevalence studies were conducted in 9-11 year old children. Participation of at least 1.000 children per study center was required. Children were sampled using schools in a defined geographical area as sampling unit. The study modules include standardised questionnaires with detailed questions on the occurrence and severity of symptoms of asthma, allergic rhinitis and atopic eczema, on their clinical management, and on a broad range of previous and current exposure conditions. In addition, standardised protocols were applied for examination of flexural dermatitis, skin prick testing, bronchial challenge with hypertonic saline, blood sampling for IgE analyses and genotyping, and dust sampling for assessment of indoor exposures to allergens and endotoxin. There was an option to perform the measurements of lung function and sampling of blood only in randomly selected children with (n=100) and without (n=100) wheeze in the last 12 months. Dust samples were only collected for children in these sub-samples.

Study centres were identified on the basis of the International Study of Asthma and Allergies in Childhood (ISAAC) Phase I findings. 16 study centers in 10 European countries completed the study and submitted their data (representing a total of 25.182 children). The participating countries reflect the full range of prevalence rates in Europe, including countries which rank at the top (United Kingdom) and at the bottom (Greece/Albania) of the worldwide distribution of the prevalence of wheeze. Laboratory analyses were conducted centrally for IgE (Stockholm), indoor exposures (Utrecht) and genotypes (Oxford). Statistical analyses were performed at the coordinating centre in Ulm, Germany.

Results

There were marked variations in the prevalence of wheeze during the last 12 months ranging from 4.4% to 16.1%. The prevalence was particularly high in the United Kingdom and Norway and lowest in Albania and Greece. There were also major variations in the prevalence of symptoms of allergic rhinoconjunctivitis (4.8%-24.3%) and atopic eczema (5.0% - 25.4%) in the past year. Rates were relatively low in Greece and Albania and relatively high in the UK and Spain.

There was a marked variation in the prevalence of skin prick test reactivity (14%-43%), increased levels of allergen-specific serum Immunoglobulin E (5.0%-25%), and bronchial hyper-responsiveness (2%-43%) between centres. Atopic sensitization and bronchial hyperresponsiveness were major determinants of the variation in clinical manifestations and severity of these atopic diseases.

The observed patterns support findings of ISAAC Phase I (which studied 6-7 and 13-14 year olds). In addition, the patterns are confirmed by measurements of objective markers of allergy (skin prick tests and serum IgE), asthma (bronchial hyperresponsiveness) and atopic eczema (clinical examination).

The study identified important differences in exposure conditions between study centres. Many of the risk factors under investigation were associated with clinical manifestations of the atopic diseases. The project also revealed important discrepancies between the role of risk factors (e.g. allergen specific sensitization) operating either at the population or individual level.

The measurements of indoor exposure showed for all biological contaminants large differences between countries, often hundred fold or more when comparing median concentrations or loads. Few other potential determinants of allergy and asthma show such wide variations between countries, and this provides perspectives for further epidemiological analyses.

Genetic studies have shown a surprisingly strong variation in the frequency of asthma susceptibility alleles in Europe. Strong genetic interactions have been observed to underlie asthma, whereas wheeze and the total serum IgE levels seem only weakly influenced by the genes tested.

A further strength of the project is the possibility to integrate the data in a broader framework of ISAAC phase II study centres worldwide (14 additional study centres in 12 countries such as Brazil, Ghana, India and New Zealand).

Conclusion

The study has provided an extensive data set on the international variation in the prevalence and determinants of childhood asthma and allergies which is unique in the world. It confirms the large variation in prevalence rates observed previously using also objective markers. It has provided new insights into the role of many determinants, e.g. lifestyle and genetic factors, and offers huge potential for further epidemiological analyses.

Benefits and Beneficiaries:

The primary goal of the project is to identify causes of asthma and allergies which are potentially amenable to intervention and ultimately prevention. Thus, the beneficiaries of this project should be children, with and without atopic diseases, and their parents. The results of this study, however, should also prove to be useful for clinicians, scientists and public health officials.

Future Actions (if applicable):

Presentation of results in international conferences and leading scientific journals are currently in preparation.