

POLICY RESEARCH PROGRAMME FUNDED UNITS FINAL REPORT '2006-2010'

Social Medicine and Health Services Research Unit

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<ol style="list-style-type: none"> 1. Burney P, Newson R, Burrows M, Wheeler D. The effects of allergens in outdoor air on both atopic and nonatopic subjects with airway disease. <i>Allergy</i> 2008;63:542-546. 2. Garcia-Larsen V, Luczynska M, Kowalski M, Voutilainen H, Ahlstrom M, Haahtela T, Toskala E, Bockelbringk A, Lee H-H, Vassilopoulou E, Papadopoulos N, Ramalho R, Moreira A, Delgado L, Castel-Branco M, Calder P, Childs C, Bakolis I, Hooper R, Burney P. Use of a common food frequency questionnaire (FFQ) to assess dietary patterns and their relation to allergy and asthma in Europe: Pilot study of the GA²LEN FFQ . <i>Eur J Clin Nutrition</i> 2011 (in press) 3. Burney PG, Hooper R. Forced vital capacity, airway obstruction and survival in a general population sample from the USA. <i>Thorax</i>. 2011; 66: 49-54. 	

Lay summary

Since the mid-1990s the “Social Medicine and Health Services Research Unit” has had a remit to investigate public health aspects of asthma, and more recently chronic obstructive pulmonary disease (COPD). These are the two most common chronic lung diseases in the UK and worldwide. Over this period it has been asked not to study aspects relating directly to the Health Services.

In covering this remit the Unit has focused on two specific areas, diet and nutrition and the indoor and outdoor environment. In the last programme we had started to give more emphasis to molecular methods and have been involved, specifically, in a very large study addressing the genetic origins of asthma.

We have pursued this remit by participation in large international studies. By studying people living in very different conditions, but using the same methods, we can more easily disentangle the causes of disease. We are also able to undertake much larger studies by spreading the cost and the work between many partners. The large studies that we have led during this period have been the European Commission Respiratory Health Survey (ECRHS), the epidemiological component of the Global Allergy and Asthma European Network of Excellence (GA²LEN), the epidemiological component of the EuroPrevall Integrated Project (on Food Allergy), and the Burden of Obstructive Lung Disease (BOLD) study on COPD. We have also undertaken smaller scale or component studies locally including local studies on air pollution and asthma (ALLOHA) and a local component to the BOLD and GA²LEN surveys.

We have shown that diet is important in maintaining good lung health, in particular maintaining a normal weight and eating a diet with adequate fruit, though there are many details that are still unclear. An essential dietary mineral, selenium, had been thought to be important for control of asthma. In two studies we have shown that this is unlikely to be important. We have developed and tested a new standardised questionnaire for collecting dietary data in very diverse populations with dissimilar diets, and are using this in large international surveys to investigate the role of diet in lung disease.

We have mapped the distribution of allergens from cats and dust mites across Europe and have shown that exposure to cat allergen is associated with increased irritability of the airways, particularly in those who are allergic, but not just in those allergic to cats. We have shown that cleaning agents used in the home or at work increases the chances that asthma will develop in adult life. We have provided several large collaborations with information on both indoor and outdoor air quality. We have been studying further a finding that people with asthma have more symptoms when there is allergen in the air; although this is not surprising we find this in people who are not allergic to the standard allergens. We are trying to find out what allergens might be responsible.

We have contributed large amounts of information to studies that are seeking the genetic basis of asthma and allergy. Early analyses of these studies show that there are previously unknown genes that contribute to the increased prevalence of asthma, but mostly asthma that develops during childhood. We are looking also at other outcomes such as hay fever and looking at whether there are genes that might explain why some environmental risk factors are important.

Work on COPD includes the largest study of COPD prevalence and risk factors yet undertaken. We have contributed data from the United Kingdom to this study and are now managing the development of the programme to look at the extent of the problem in poor countries. It is in these countries that we expect the major epidemic of disease in the coming years. By collecting one of the largest data sets from very diverse populations we hope to understand better the causes of disease and of its severity.

Overview of the Unit's work programme

- **Objectives of the Unit:** the objectives for the unit are to conduct research relevant to understanding the epidemiology of asthma. We were asked specifically to avoid health services research and to focus on other aspects. Subsequently after discussions with the Department of Health we extended the research to chronic obstructive pulmonary disease (COPD).
- **The research programme:** The programme has focused on three areas, environment, nutrition and genetics, and, more recently has included COPD as well as asthma in its remit. This programme was pursued through major collaborations, many of them international in extent. International surveys allow epidemiological programmes to study a much wider spectrum of exposure levels than single centre or even single country studies.
- **The relevance of work programme to DH policy (2006 – 2010):** All the areas that we have covered are highly salient to the development of policy, though public health policy tends to be multi-sectoral in its relevance and not confined to the Department of Health brief. The importance of obstructive lung disease has been recently recognised by the publication of the consultation document on COPD with additional information on Asthma. Although our remit has excluded Health Services Research, which is a major component of this document, the specific areas that we have covered are also relevant to other areas of policy. There is a strong interest in national nutrition and how it influences health and, although this has focused on obesity, other aspects of the quality of nutrition are also of great interest. Food safety is also a key issue for policy development and the problem of food allergy with its occasionally catastrophic effects raises major difficulties for patients, for health care, for schools and for the food industry. The relevance of this is unlikely to reduce in importance as the prevalence of allergy rises in older age groups. Air quality is also an area that is being investigated and for which the costs of any policy, both to individuals and society, are hard to measure and may be either in favour or against remediation in any specific case.

Brief update since last progress report

2010 saw the start of the third survey related to the European Community Respiratory Health Survey (ECRHS III). This study has now been going since the late 1980s and this will be the third time that the people first seen in 1990-1992 will be re-examined. The new survey is supported by a grant from the MRC which will cover the cost of the UK data collection and some of the co-ordination costs. Other centres have obtained funding for their own contributions and work has begun on re-contacting participants. We expect that this survey will tell us a great deal about the prognosis of asthma up to the age of 65 years.

2010 also saw the winding up of data collection in two large programmes: the GA2LEN Network of Excellence postal survey and clinical follow up was the first international multicentre study to include older adults with asthma and to investigate chronic rhino-sinusitis, and the EuroPrevall surveys have been the first international epidemiological effort to specifically focus on food hypersensitivity and allergy. Innovative studies require some additional work before the main analyses can begin and the GA2LEN network has published a validation of the questionnaire that was devised to identify patients with likely chronic rhino-sinusitis. Advanced drafts are ready on the distribution of asthma and rhino-sinusitis and an MSc thesis was written on the association of asthma with post-bronchodilator lung function. Papers have appeared on the methodology of the EuroPrevall surveys and the INCO extension of these to Russia, India and China.

The focus of the programme on **Nutrition** has been represented by a number of publications using dietary patterns to investigate different diseases. These have used the FLAG study in south east London, one of the early surveys undertaken by the programme, data from ECRHS II to investigate asthma and an analysis of data from the Hertfordshire study to look at COPD. Pursuit of the hypotheses relating to fruit and asthma studied earlier in the Café and JO studies led to a proposal for a trial (CHAFFINCH). The pilot study for this has been funded by the BUPA Foundation and will start in 2011. Most important for the future of this line of work, the FFQ designed for the GA2LEN survey has been validated in a survey of five centres in Europe and developed for further use in the BOLD and ECRHS surveys. Data collected using this instrument have already been collected in the GA2LEN follow-up survey and will be analysed in 2011. Finally we are undertaking some methodological research to assess the usefulness of the “dietary pattern” method of analysis, compared with other strategies for assessing disease-diet associations.

The **environmental programme** saw completion of the ALLOHA data collection. This had taken longer than anticipated due to issues at the Chelsea and Westminster Hospital where the study was based. The analysis of samples is being undertaken at Imperial (Dr Meiner Jones) and at King’s College (Prof. Kelly) who are looking at allergenicity and oxidative properties, respectively. The HITEA programme has seen completion of analysis of health effects of endotoxin in indoor air, well ahead of schedule. Further work on the relationship of asthma with mould contaminants is

underway. The ECRHS is part of a major European collaboration (ESCAPE) to assess the association of respiratory health with outdoor air pollution. A study of allergic disease (including asthma) as an influence on job selection has been published, and examination of the relationship of asthma with a range of occupational exposures in the UK is coming to a successful conclusion with several presentations made at international meetings. The HPA-MRC Centre for Environment and Health is developing its programme. Cristina Canova was appointed as the post-doctoral research assistant who will work at the NHLI and she has started work with Prof. Cullinan as well as the respiratory epidemiology group. She will complete the analysis of the ALLOHA data when they are ready. Meanwhile we are re-advertising the studentships, to which we failed to appoint last time.

In **genetics** we published two HuGE reviews, one on GST genes and asthma and the other on the interaction of genes and air pollution. The ALSPAC collaboration published on GST genes and tobacco and on paracetamol use and genetic susceptibility in asthma. Although the initial ECRHS collaboration continues to produce papers the main focus has now switched to the GABRIEL collaboration. The main paper for this study has now been published in the New England Journal of Medicine. This has opened the way for other analyses and we are actively working with colleagues in the SAPALDIA Study in Switzerland and the EGEA Study in France, which both used ECRHS methodology, to develop a joint programme of analysis.

The main focus of the **COPD programme** is the BOLD study. This is running well, though there have been plenty of challenges in running a sophisticated programme in many places with variable internet access. Fieldwork for studies were completed in Portugal, the Netherlands, Estonia and Pune, fieldwork was started in Fez, Sousse and Algiers and training completed for teams from Sri Lanka, Mysore, Delhi, Srinagar, Dakha, Nigeria, Gabon, Kenya, Uganda, Namibia and Rwanda. Papers are being prepared in London on the main data set on risk factors, occupation, tuberculosis, severity and the treatment gap. In the meantime we are preparing a follow up of the London participants as a trial for a larger follow-up study and to answer some specific issues raised by the cross-sectional study. Some of these issues have been separately investigated using the ARIC data from the United States.

During the coming year the programme will come to an end and staff are being transferred onto other work. We will complete the work on ALLOHA and the London BOLD programme and focus on analysing data that have been collected over the last five years. We will also complete the assessment of chronic respiratory disease for the Global Burden of Disease programme in collaboration with colleagues around the world. Staff here will focus mostly on adult asthma and COPD.

Key achievements from 2006 to 2010.

Nutrition

There are several aspects of diet that are relevant to airway disease and the Unit has contributed to several of these. There is a general hypothesis that anti-oxidants are helpful in patients with asthma and that part of the pathophysiology relates to the imbalance between oxidative and anti-oxidative influences. One longstanding but until now poorly tested hypothesis has been that adequate levels of selenium in the diet may be beneficial in asthma as it is required to maintain the function of the anti-oxidant enzyme glutathione peroxidase. Two studies in this period failed to substantiate this hypothesis. The SELINA Trial found no evidence of an effect in a double blind randomised trial [Shaheen, 2007] and the SARI survey, undertaken by the GA2LEN Network failed to show an effect on prevalence [Burney, 2008]. The latter study demonstrated marked heterogeneity in the relation of plasma selenium to asthma in different sites in Europe.

A related hypothesis is that fruit intake may have an effect on asthma. We had earlier shown that this was a more specific effect than previously suggested and was unlikely to be due to Vitamin C, another anti-oxidant. In that earlier study we had shown a strong and specific protective effect of apple intake, the mechanism being unknown, but potentially due to other classes of anti-oxidants. In an update to that earlier study we were able to show a protective effect also of bananas. [Okoko, 2007] The role of fruit in asthma control has not been well studied and there is no high level evidence to guide policy. We have therefore proposed a controlled trial to be carried out in conjunction with the paediatric respiratory teams at The Royal Brompton and St Mary's Hospitals. In order to test methodological aspects of the trial and its feasibility we will conduct a pilot study during 2011 with financial support from a BUPA Foundation grant.

One publication threw new light on the relation between diet and asthma, based on data collected in South Africa. An earlier analysis had shown that the relation between specific IgE and positive allergen skin tests was weak or non-existent in children with a low body weight. After adjusting for this effect we were able to demonstrate the probability that differences in the quality of the diet eaten in rural and urban areas was likely to be responsible for some of the difference in skin test results. We were unable to say which element of the diet this was. [Hooper, 2008]

Where there has been a considerable interest in asthma and nutrition, there has been less interest in nutrition and the aetiology of COPD, where the focus has been more on the cachexia of late stage disease. A paper has recently shown a strong association with diet in the Hertfordshire cohort studied by Prof. Shaheen. The BOLD study has also started to develop a nutritional component. The work has included the adaption of the GA2LEN food frequency questionnaire to local dietary habits in African countries and Mysore in India.

An important contribution to the study of nutrition in airway disease has been the development of a Food Frequency Questionnaire that can be used in Europe (and now further afield). Up until now the large multinational studies such as EPIC have used local questionnaires which vary considerably in their form and content. For the GA2LEN project we have developed a more consistent form based on the European Food Composition System Summary. This has been tested in five countries and partially validated against plasma fatty acids. [Garcia-Larsen, 2011] The method has been used in the GA2LEN follow-up study and has been developed for use in BOLD in sites where this is of interest. Finally the questionnaires have been developed further for use in the ECRHS III.

A further methodological problem with assessing dietary exposure is the method for dealing with large and complex mixtures of foods that are eaten in the diet. It has become very fashionable to reduce the complexity of the data using Principal Components Analysis (PCA) or similar methods. Although we have used these methods in the work of the programme we have reservations about their appropriateness and Mr Bakolis is investigating the comparative advantages of PCA against other more straightforward methods and will produce a PhD based on this research in 2011.

Allergic responses to foods are a major problem to some people and have important implications for health care, for schools and for the food industry. Over the last few years we have analysed samples from the ECRHS to assess the prevalence of sensitisation to food allergens in Europe. We found that the relative prevalence of sensitivity to different food allergens was much more constant between countries than had previously been thought likely, but that surprisingly this was not associated with the prevalence of sensitivity to common aeroallergens, but was better related to the level of total IgE in the country. [Burney, 2010] Subsequently we have led the epidemiological component of another multicentre programme to identify food sensitivity and food allergy in Europe [Kummeling, 2009] and have confirmed the first conclusion, but have found a much better association with the local prevalence of aeroallergen sensitivity. This study has in turn been extended to China, India and Russia. [Wong 2010] Currently we are planning to repeat this work in the new ECRHS study and also examine whether food sensitivity and its relation to disease alters with age.

Environment

Much of the work that the programme has been engaged with has been with the ECRHS and has involved indoor and outdoor pollution in relation to asthma and other allergic conditions. ECRHS has been productive in its own right and has raised important issues relating to the safety of cleaning products used not only in industry but also in the home. [Zock, 2007] More recently the ECRHS data have been shared with others to create enhanced capacity to investigate important issues. This includes a major contribution to the ESCAPE project which is investigating the effects of outdoor air pollution and HITEA which is investigating some aspects of indoor air pollution.

Two more discreet programmes have been an investigation of the health effects of the volcanic eruption in Monserrat, undertaken at the request of the Department of Health, and a study of outdoor allergen and other pollutants as possible precipitants of asthma hospitalisations. An earlier project mostly undertaken in the previous programme had shown an association between particulate pollution that reacted to IgE in patients' serum and new onset symptoms of asthma that was not present in the air on "control" days. [Burney 2007] The new study was designed to see if this finding could be replicated using more severe case definition, with cases being those admitted with airway disease to the Chelsea and Westminster Hospital. This programme is now closed and the clinical data collection completed. Currently samples from the study are being investigated at Imperial (Dr Jones) for evidence of IgE responsive particles and at King's College (Prof. Kelly) for oxidant properties.

We have undertaken some parallel studies of occupation which have included studies associated with the ECRHS and currently data from BOLD are being analysed. A PhD student is undertaking research on the effect of asthma and allergy on job choice and job changes in the 1958 National Birth Cohort. [Butland, in press]

Work in these streams is now transferring to the HPA-MRC funded Centre for Health and the Environment and a new post doctoral research assistant has been appointed to help with this. Part of her remit will be to complete the ALLOHA analyses when the laboratory data are available.

Genetics

Our principal contribution to the genetics of disease has been through the ECRHS cohort. This has been part of the GABRIEL integrated project funded by the EU. The ECRHS was the single largest contributing study to this project. Other European cohorts adopted the ECRHS protocol (SAPALDIA in Switzerland and EGEA in France), and also contributed to GABRIEL. Analyses other than the central GABRIEL analysis were put on hold until the first paper was published last month in the New England Journal of Medicine [Gabriel Consortium 2010].

The main adult GABRIEL population studies have formed an informal consortium ECRHS-Sapaldia-EGEA (ESE) to analyse the rest of the data and Dr Adai Ramasamy has been taken on to strengthen the programme and to facilitate this and other related analyses. A genome wide association study of BHR led by the group is well underway, and other international groups have been asked to take part in the replication phase. We have also led an analysis that also included the North Finnish Birth Cohort, and the 1958 British Birth Cohort and has identified regions important for hayfever and sensitisation to grass. As part of this work a method for detecting gene environment interactions using genome wide data has been developed with Professor Strachan at St Georg's University. The group have contributed effect estimates to the SPIROMETA consortium which is looking for genes associated with lung function, to a German genetic consortium looking at the WNT signalling pathway and asthma, to an ESE effort

to look at lung function decline and to a GABRIEL initiative to identify genes that modify the effect of active and passive smoking on the development of asthma.

Within the ECRHS candidate gene approaches have shown that polymorphisms within TNFalpha are associated with asthma, and that the effect of obesity on asthma is different in individuals carrying different polymorphisms of TNFalpha. [Castro-Giner 2009] Further work is ongoing to examine the interactive effects of domestic endotoxin and CD-14 polymorphisms (paper submitted, revisions requested)

Otherwise much of the work has been on anti-oxidant genes. Dr Newson has been involved with the ALSPAC study examining effect modification of the association of asthma with pre-natal paracetamol exposure by maternal and infant genotype. [Henderson 2010; 2010; 2010]

Dr Minelli organised a HuGE review of the interactive effects of anti-oxidant genes and air pollution which is in press in the American Journal of Epidemiology [Minelli 2010] an another review including unpublished data on the relation of polymorphisms of the glutathione-S-transferase gene to asthma. [Minelli 2010]

DNA samples have also been collected in the GA2LEN study and are to be sent to the Karolinska in Sweden to be analysed.

Chronic Obstructive Pulmonary Disease

The main contribution to work on COPD has been through the BOLD programme. The co-ordination of the international study has now funded through the Wellcome Trust, but first Dr Hooper and then Dr Kato have also been involved with this programme. The UK contribution to BOLD was supported by the programme and is currently being repeated as a follow up with additional tests.

The main fruits from the programme are not expected for some time but there have already been some important findings, some of which have been published or presented at meetings. The first major paper was published in 2007 [Buist, 2007], other communications include information on relative and attributable risks associated with the main risk factors [ERS 2009], the distribution of disease severity [ERS 2009] and the association of COPD with past Tuberculosis [Union, 2010], an association also noted in the UK part of BOLD.

As supplementary studies relating to this programme we have also been analysing the data from the ARIC study. Results from this are highly relevant to the development of policy in relation to COPD. Most important is the finding that mortality in the general population is not associated with FEV1 or with obstruction, but with FVC. [Burney & Hooper 2011] We also have shown that the use of different lung function equations for different ethnic groups is inappropriate, at least when assessing prognosis. [BTS, 2009]

STAFF PUBLICATIONS

RESPIRATORY EPIDEMIOLOGY & PUBLIC HEALTH

2006-2010

NOTE: the papers referred to in the text are highlighted in bold script.

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Other dissemination activities

The majority of the dissemination of information from the Unit comes from the publication in peer review journals, but discussion of the results is greatly enhanced by presentations either of preliminary results at meetings or by invited talks.

Occasionally we provide more formal advice to government or parliament as in the evidence provided to the House of Lords Science and Technology Committee for their report on Allergy (HL Paper 166-I&II) or to the QUARK committee on the costs of air pollution.

We also provide less formal advice on other aspects of work relevant to the department of health including advice to the Biobank and to the Health Survey for England on spirometry.

It is difficult to assess the effectiveness of this strategy, but influential reports have relied heavily on the earlier findings of the group, including reviews by the Royal College of Physicians and the World Asthma Organisation.

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Henderson J, Shaheen S, Newson R, Ring S, Pembrey M, Rose-Zerilli M, Holloway J. Effects of glutathione S-transferase polymorphisms on childhood asthma phenotypes and atopy. Shaheen S, Henderson J, Newson R, Ring S, Pembrey M, Rose-Zerilli M, Holloway J. Effects of aryl hydrocarbon receptor and cytochrome P450 1A1 polymorphisms on childhood lung function and asthma.

Hooper R, Calvert J, Thompson RL, Deetlefs ME, Burney P. Urban-rural differences in diet and atopy in South Africa

Exposure to airway irritants and asthma among professional cleaners from 10 European countries; E. Plana, J. P. Zock, C. Schindler, K. Radon, M. Oliveri, D. Norbäck, S. Kennedy, K. Torén, L. Lillienberg, S. Villani, D Jarvis., A. dErrico, M. van Sprundel, N. Künzli, J. M. Antó, M. Kogevinas, T. Rochat, U. Ackermann-Liebrich M.Kogevinas

The association of asthma with reported 'ovarian cysts in two national birth cohorts; D Jarvis. C. Svanes, F. Gomez-real, B. Leynaert

Lung function and asthma as related to the menopausal transition; F. Gomez-Real, C. Svanes, J. M. Anto, E. Plana, C. Janson, D Jarvis. F. Neukirch, M. Wjst, E. Zemp, E. R. Omenaas, B. Leynaert, J. Sunyer

Maternal age and asthma: are they associated?; C. Svanes, S. Villani, D Jarvis., S. Dharmage

Clustering of risk factors on adult onset asthma; J. Sunyer, J. M. Anto, R. García-Esteban, D Jarvis., P. Burney

Hygiene and allergy: the use of bleach at home and atopic sensitisation in adults; J. P. Zock, E. Plana, D Jarvis., H. Kromhout, M. Olivieri, K. Radon, M. van Sprundel, K. Torén, A. Dahlman-Höglund, J. M. Antó, M. Kogevinas

Asthma and menstrual cycle levels of estradiol and progesterone; B. Leynaert, N. Leone, F. Driss, T. Gíslason, F. Gómez Real, C. Janson, D Jarvis., C. Svanes, J. Sunyer, E. Zemp, F. Neukirch

Replication of positionally cloned asthma genes in an international population-based cohort study (ecrhs-ii); M. Kogevinas, F. Castro-Giner, R. de Cid, D Jarvis., K. van Steen, J. M. Anto, M. Wjst

Asthma control and its determinants. the european community respiratory health survey (ecrhs) ii; L. Cazzoletti, A. Marcon, C. Janson, S. Accordini, M. Bugiani, A. Gulsvik, D Jarvis., R. de Marco

Fixed FEV1/fvc ratio of 0.70 and risk of under-diagnosis of airflow obstruction among young adults; I. Cerveri, A. G. Corsico, S. Accordini, M. C. Zoia, R. Niniano, E. Ansaldo, N. Künzli, G. Sunyer, D Jarvis., S. Chinn, C. Janson, P. Burney, E. Pozzi, R. de Marco

New onset of chronic phlegm and lung function decline in relation to moulds and dampness in the dwelling in the ECRHS-II; D. Norback, J. P. Zock, E. Plana, J. Heinrich, C. Svanes, J. Sunyer, N. Kunzli, S. Villani, M. Oliveri, A. Soon, D Jarvis

5th International Congress on Developmental Origins of Health & Disease, Perth, 2007.

Henderson AJ, Newson RB, Holloway JW, Rose-Zerilli MJ, Pembrey ME, Ring SM, Shaheen SO. Maternal and child glutathione-S-transferase M1 and T1 polymorphisms modify effect of maternal smoking in pregnancy on childhood lung function.

Shaheen SO, Newson RB, Holloway JW, Rose-Zerilli MJ, Pembrey ME, Ring SM, Henderson AJ. Maternal and child glutathione-S-transferase M1 polymorphism modifies risk of childhood asthma associated with prenatal paracetamol exposure.

British Thoracic Society Winter Meeting, London, 2007.

Garcia-Larsen V, Newson RB, Potts JF, Tumilty MK, Shaheen SO. Dietary intake of fruit and childhood asthma.

Annual Ga2len Conference, London 2007

Garcia-Larsen, V.: Dietary patterns in Europe: A standardised dietary questionnaire for Ga2len.

British Thoracic Society Winter Meeting, London 2008.

Bakolis I, Hooper R, Thompson R, Shaheen S. Dietary patterns and adult asthma: population-based case-control study.

European Respiratory Society Annual Congress, Berlin 2008.

Bakolis I, **Hooper R**, Cullinan P, Hansell A, Baxter P, **Jarvis D**. Respiratory health in children exposed to volcanic air pollution.

Castro-Giner F, Kogevinas M, **Jarvis D**, Fosberg B, Jacquemin B, Aguilera I, Vienneau D, Heinrich J, Sunyer J, de Cid R, Gonzalez JR, Wjst M, Estivill X, Antó JM, Kunzli N. Effect of traffic related air-pollution and oxidative stress genes on asthma (ECRHS).

Cerveri I, Corsico A, Accordini S, Niniano R, Ansaldo E, Cervio G, Janson C, Kunzli N, **Jarvis D**, de Marco R. What defines abnormal lung function in asthma? Results from European community respiratory health survey (ECRHS).

de Marco R, Accordini S, Janson C, **Jarvis D**, Wjst M, **Burney P**. Are spirometric criteria good predictors of longitudinal outcomes in COPD patients without taking chronic respiratory symptoms into account? Results from ECRHS.

Hooper R, Heinrich J, Omenaas E, Sausenthaler S, Garcia-Larsen V, **Burney P**. Dietary patterns and asthma: results from three countries in the European community respiratory health survey (ECRHS).

Jarvis D, Kaakinen M, Ruukonen A, Hartikainen A, Pekkanen J, Canoy D, Franks S, Pouta A, Martikainen H, Jarvelin MR. The association of wheeze and FEV1 with free androgen index.

Jithoo A, Bateman E, Beyers N, Lombard C, **Burney P**, Vollmer W, Buist AS. Respiratory questionnaire responses and COPD in a South African population.

Kogevinas M, Castro F, **Jarvis D**, de Cid R, Wjst M, Esivill X, Antò JM, Machler M, Imboden M, Berger W, Rochat T, Probst-Hensch NM. Asthma, obesity and TNFA: two international population-based cohort studies.

Lamprecht B, McBurnie MA, Vollmer W, Gudmundsson G, Nizankowska-Mogilnicka E, Studnicka M, **Burney P**, Buist S, Mannino D. Characteristics of COPD in never smokers: results from the international burden of obstructive lung disease (BOLD) study.

Leynaert B, Sunyer J, Garcia-Esteban R, Svanes C, **Jarvis D**, **Burney P**, J. Antò JM, Neukirch F. Gender differences in asthma: prevalence, diagnosis, and incidence of atopic and non atopic asthma.

Newson RB, **Shaheen SO**, Northstone K, Emmett PM, Sherriff A, Henderson AJ. Dietary patterns in pregnancy and respiratory and atopic outcomes in childhood.

Norback D, Plana E, Zock JP, Heinrich J, Svanes C, Sunyer J, Künzli N, Villani S, Olivieri M, Soon A, **Jarvis D**. Social class, climate, and building age as confounders influencing associations between respiratory symptoms, moulds and dampness in dwellings within the ERCHS-II.

Olivieri M, Mirabelli M, Plana E, Antò JM, Bakke P, D'Errico A, **Jarvis D**, Henneberger P, Norback D, Radon K, Torén K, Van Sprundel M, Villani S, Zock JP, Kogevinas M. Asthma and job selection: an international population-based analysis.

Potts J, **Shaheen S**, **Burney P**. The relation between paracetamol use and asthma: a European case-control study.

Ramasamy A, Castro-Giner F, Heinrich J, Künzli N, **Minelli C**, Kogevinas M, **Jarvis D**. The association of bronchial reactivity with use of gas for cooking is modified by GSTM1 homozygous deletion.

Shaheen S, **Newson R**, Emmett P, Sherriff A, Henderson J. Vitamin D intake in pregnancy and respiratory and atopic outcomes in childhood.

American Thoracic Society Meeting, Toronto 2008

Jithoo A, Bateman ED, Beyers N, Lombard CJ, Irusen I, Chinn S, Burney PGJ, Borgdorff MW, Enarson DA. Tuberculosis and Cannabis as Risk Factors for Respiratory Symptoms

European Respiratory Society Annual Congress, Vienna 2009.

Accordini S, Corsico A, Cappa V, Bugiani M, Cazzoletti L, Cerveri I, Duran-Tauleria E, Gerbase MW, Gislason D, Gulsvik A, Heinrich J, Janson C, **Jarvis D**, Jögi R, Marcon A, Pin I, De Marco R. The socio-economic cost of persistent asthma in the European community respiratory health survey (ECRHS) II.

Bustamante M, Castro-Giner F, Gonzalez JR, Kogevinas M, **Jarvis D**, Heinrich J, Wjst M, Anto JM, Estivill X, De Cid R. A pooling based genome-wide analysis identifies new potential candidate genes for atopy in the echrs study.

Castro-Giner F, Kogevinas M, **Jarvis D**, De Cid R, González JR, Janson C, Antó JM, Wjst M, Estivill X. Age-specific effects of NPSR1 and DPP10 in asthma and atopy: an international population-based cohort study (ECRHS).

Cerveri I, Corsico AG, Cazzoletti L, Verlato G, Niniano R, Accordini S, Ansaldo E, Grosso A, Cappa V, Marcon A, **Jarvis D**, Janson C, Pin I, Siroux V, Jogi R, Foresi A, De Marco R. Is current smoking still common in adults with asthma? Results from ECRHS II.

De Marco R, Accordini S, Marcon A, Cerveri I, Corsico A, Anto J, Gulsvik A, Heinrich J, Janson C, **Jarvis D**, Kuenzli N, Svanes C, Wjst M, **Burney P**. Determinants of the 9-year incidence of COPD in an international cohort of young non-asthmatic adults. Preliminary results from ECRHS II.

Duran-Tauleria E, Anto JM, Forastiere F, Gaga M, Janson C, **Jarvis D**, Roca J, Viegi G, Weinmayr G. IMCA II Project Group Recommended and priority indicators for monitoring COPD and asthma in the European union: results from the IMCA I project.

Ghosh R, Cullinan P, **Jarvis D**. Asthma and occupation in the 1958 birth cohort: potential misclassifications in exposure;

Henneberger P, Mirabelli M, Kogevinas M, Antó J, Plana E, Dahlman-Höglund A, **Jarvis D**, Kromhout H, Lillienberg L, Norbäck D, Olivieri M, Radon K, Torén K, Urrutia I, Villani S, Zock J. The occupational contribution to severe exacerbation of current asthma.

Hooper R, **Burney P**, Vollmer WM, McBurnie MA, Gislason T, Kocabas A, Tan WC, Welte T, **Jithoo A**, Buist AS. Relative and attributable risks associated with COPD in the BOLD study sites.

Jarvis D, **Newson R**, **Potts J**, **Burney P**, Bachert C, Fokkens W, GA2LEN. Chronic rhinosinusitis and asthma: the GA2LEN postal survey

Jithoo A, Vollmer WM, Enright P, Gillespie S, **Burney P**. Improving the efficacy of case-finding for COPD using peak flow.

Kogevinas M, Castro-Giner F, **Jarvis D**, Heinrich J, Anto JM, Toren K, Norback D, Villani S, Olivieri M, De Cid R, Radon K, Estivill X, Zock JP.

Gene-environment interactions in occupational asthma in the European community respiratory health survey (ECRHS).

Leynaert B, Soussan D, Leone N, **Jarvis D**, Anto JM, Dratva J, Gislason T, Janson C, Omenaas E, Real F, Sunyer J, Svanes C, Wjst M, Driss F, Neukirch F, **Burney P**.

Association between serum leptin and asthma in women

MacSali F, Gomez Real F, Sunyer J, Plana E, Anto JM, Janson C, Leynaert B, Wjst M, Dratva J, Zemp E, Omenaas E, **Jarvis D**, Svanes C. Age of menarche, lung function and asthma.

Olivieri M, Zock JP, Heinrich J, **Jarvis D**, Künzli N, Antó J, Norbäck D, Svanes C, Accordini S, Verlato G Risk factors for new-onset cat sensitisation in the European community respiratory health survey (ECRHS) II.

Rebordosa C, Kogevinas M, Guerra S, Castro-Giner F, **Jarvis D**, Cazzoletti L, Pin I, Siroux V, Wjst M, Anto JM, De Marco R, Estivill X, Janson C. 2 adrenoreceptor polymorphisms, asthma control and lung function decline in the ecrhs.

Shaheen S, **Newsom R**, Relton C, Henderson J, Ring S, Davey-Smith G, Holloway J. Relation of cord blood DNA methylation to prenatal paracetamol exposure and childhood asthma.

American Thoracic Society International Conference, San Diego 2009.

Shaheen SO, Jameson KA, Syddall HE, Aihie Sayer A, Robinson SM. The relation of dietary patterns to adult lung function and chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2009; 179: A5522.

Granell R, Minelli C, **Shaheen SO**, Henderson AJ. Glutathione-S-transferase genes and asthma: A Huge systematic review and meta-analysis including previously unpublished results from two UK studies. *Am J Respir Crit Care Med* 2009; 179: A5418.

Greenough A, **Shaheen SO**, Shennan A, Seed P, Poston L. Respiratory outcome in childhood of maternal vitamin C and E supplementation. American Thoracic Society International Conference, San Diego 2009. *Am J Respir Crit Care Med* 2009; 179: A5975.

British Thoracic Society Conference, December 2009

Hooper R. Explaining ethnic group differences in lung function: a cross-sectional study

European Academy of Allergy and Clinical Immunology (EAACI) Congress, Warsaw, Poland, 2009

Le TM, **Kummeling I**, Brunekreef B, van Hoffen E, Lebens A, van Ameijden E, Bruijnzeel-Koomen C, Mills C, **Burney P**, Knulst A. Self-reported food hypersensitivity among populations of adults and children with different cultural background in the Netherlands. (poster presentation)

Stata User Meeting, September 10-11, 2009.

Newson, RB. Homoskedastic adjustment inflation factors in model selection. 15th UK

European Respiratory Society Annual Congress, Barcelona 2010

Exposure to occupational agents and risk of asthma in the 1958 birth cohort; R. Ghosh, P. Cullinan, D. Strachan, D. Fishwick, J. Hoyle, C. Warburton, D.Jarvis

Exposure to high molecular weight occupational agents and asthma in the 1958 birth cohort; R. Ghosh, P. Cullinan, D. Strachan, J. Hoyle, C. Warburton, D. Fishwick, B. Butland, D.Jarvis

A genome-wide scan for gene-environment interactions for childhood contact with cows and household pets identifies more genomic regions for asthma than allergic symptoms; A. Ramasamy, J. Lampi, D. Balding, A. L. Hartikainen, D.Jarvis, M. R. Jarvelin, J. Pekkanen

A common deletion encompassing ADAM genes is associated with lung function in the ECRHS cohort; M. Bustamante, F. Castro-Giner, R. de Cid, J. R. González, G. Escaramís, D.Jarvis, J. Heinrich, J. M. Antó, M. Wjst, M. Kogevinas, X. Estivill

Is there a threshold level of cat allergen exposure on respiratory symptoms in adults?; C. M. Chen, E. Thiering, J. P. Zock, S. Villani, M. Olivieri, L. Modig, D.Jarvis, D. Norbäck, G. Verlato, J. Heinrich

Do childhood factors and asthma modify the impact of smoking on COPD?; M. Voll-Aanerud, A. E. Carsin, R. deMarco, T. Gislason, M. Wjst, D.Jarvis, J. Sunyer, C. Svanes

Ownership and use of the peak expiratory flow (PEF) meter in subjects with asthma participating in the European Community Respiratory Health Survey (ECRHS) II; M. Olivieri, L. Cazzoletti, S. Accordini, A. G. Corsico, E. Duran-Tauleria, D. Gislason, A. Gulsvik, C. Janson, D.Jarvis R. Jogi, A. Marcon, R. Nielsen, R. de Marco

Differences in the socio-economic cost of current asthma according to IgE sensitisation and disease severity: Preliminary results from the ECRHS II; S. Accordini, A. Corsico, M. Braggion, M. Bugiani, L. Cazzoletti, I. Cerveri, M. W. Gerbase, D. Gislason, A. Gulsvik, J. Heinrich, C. Janson, D.Jarvis, R. Jõgi, A. Marcon, I. Pin, R. de Marco

Serum total IgE level is associated with new-onset asthma and lung function decline in atopics but not in non atopics: A longitudinal study; A. E. Carsin, J. P. Zock, S. Guerra, X. Basagana, D. Jarvis, J. M. Anto, J. Sunyer

British Thoracic Society 2010, Winter Session

D. L. Jarvis, L. Gnatiuc, R.B. Newson. Asthma, puberty and BMI in the 1958 British Birth Cohort.

Ghosh R, Cullinan P, Strachan D, Jarvis D. Job categories and risk of adult onset asthma in the 1958 birth cohort from age 16 to age 42 years.

Ghosh R¹, Cullinan P¹, Strachan D², Jarvis D¹. Employment histories of people with asthma in the 1958 Birth Cohort.

American Thoracic Society Congress May 2010,

Lamprecht B; Studnicka M; McBurnie M; Allison M; Vollmer WM; Nastalek P; Nielsen R; Tan WC...L.Gnatiuc... et al. Gender-related Differences In Respiratory Symptoms: Results From The International BOLD Study. *Am J Respir Crit Care Med*, 181;2010:A4066

American Society for Human Genetics.

Gajdos ZKZ, Ramasamy A, Kuokkanen M, Vedantam S, Lyon H, Palmer C, Widen E, Eriksson J, Jousilahti P, Laitinen T, Salomaa V, Hirschhorn JN, Jarvelin MR for the APCAT consortium (2010). Analysis of known asthma-associated variants in population-based cohorts.

Conference of Epidemiological Longitudinal Studies in Europe 2010

Ramasamy A, Lampi J, Balding D, Jarvis D, Pekkanen J, Jarvelin M. Genome-wide scan for gene-environment interactions in NFBC66 for childhood contact with cows and pets identifies more genomic regions for asthma than allergic symptoms (2010). (*CELSE2010*), (accepted for oral presentation)

Diabetes UK 2010

Freathy RM, Sovio U, Mook-Kanamori DO, Prokopenko, Timpson NJ, Berry DJ, Warrington NM et al (EGG Consortium). Identification of two novel loci associated with birth weight.

International Biometrics Conference 2010 Floripa.

Bakolis I., Hooper R. , Burney P. , Shaheen S. Can Dietary Patterns Help to Identify Associations Between Diet and Disease ? (poster presentation)

Annual UK Review Meeting on Outdoor and Indoor Air Pollution Research ,CMDC, Cranfield University 13-14 April 2010

Bakolis I¹, Doekes G², Heinrich J³, Zock JP⁴ , Kogevinas M⁴ , Guerra S⁴ , Ramasamy A¹, Nevalainen A⁵, Jarvis D^{1,6} on behalf of the Indoor group of the ECRHS and the Work Package 10 group of HITEA. The association of respiratory symptoms and lung function with mattress endotoxin levels in adults. Institute of Environment and Health, Cranfield University 2010

INVITED TALKS

4th German Stata Users Group Meeting, 2006 March 31, Mannheim, Germany.

Newsom R. Results sets, results spreadsheets and results plots in Stata.

European Asthma and Allergy and Clinical Immunology 2006 (Munich)

Invited Speaker: Dr Debbie Jarvis

The epidemiology of airway (allergic) disease: from rhinitis to asthma

European Respiratory Society 2006 (Munich)

Invited Speaker: Professor Susan Chinn

Obesity and asthma: evidence for and against a causal relationship

University of Uppsala (26th January 2006)

Invited speaker: Professor Peter Burney

The current epidemic of asthma

EU COST meeting (1st -3rd February, Brussels 2006)

Invited speaker: Professor Peter Burney

New insights into food and allergy

Leicester Institute of Lung Health (3rd May 2006)

Invited speaker: Professor Peter Burney

The asthma epidemic: why did it start? when will it end?

International Union against Tuberculosis and Lung Disease annual congress

(Paris, 1st -4th November 2006)

Invited speaker: Professor Peter Burney

The rising epidemic of asthma in developing countries.

Glenfield Hospital Leicester, 2007

Dr Seif Shaheen: Paracetamol use and asthma: a causal link?

Royal Society of Medicine 2007

Dr D Jarvis: Indoor NO₂

RCP Edinburgh 31st Jan-1st Feb EDINBURGH 2007

Invited Speaker: Prof Peter Burney
Title: Changes in the burden of respiratory disease up to 2050

AAAAI 15/16-19 March PHILADELPHIA 2007

Invited Speaker: Prof Peter Burney
Title: High dose exposure & clinical tolerance

American Thoracic Society San Francisco 18-23 May 2007

P Burney: Survey Design and Methodology: selecting a study design

World Asthma Meeting, Istanbul, 22-25 June 2007

P Burney. Future projections for asthma disease burden in Western countries

Pharmacology and Clinical Aspects of Asthma, NHLI, 17th September 2007

P Burney Epidemiology of Asthma

International Union against Tuberculosis and Lung Disease October 2007

P Burney. The COPD Epidemic: How should the health services respond?

Royal Statistical Society, 17th December 2007

C. Minelli. Quality of meta-analyses of genetic association studies. Survey and recommendations

Leiden University Medical Centre, Leiden, the Netherlands, 2008

Invited speaker: Dr Ischa Kummeling
Title: Food allergy in children and adults in Europe

14th UK Stata User Meeting, London, 8-9 September, 2008.

Invited speaker: Dr Roger Newson
Title: parmest and extensions

Polish Society of Allergy and Immunology. Warsaw September 2008

Invited speaker: Dr Deborah Jarvis
Title: The European Community Respiratory Health Survey.

Baltic Congress of Allergy, Tallin April 2008

Invited speaker: Dr Deborah Jarvis
Title: Methods in Respiratory Epidemiology.

Advances in Respiratory Medicine, NHLI

Invited speaker: Dr Deborah Jarvis
Title: Indoor air pollution

European Respiratory Society Annual Congress, Berlin, 2008.

Invited speaker: Dr Seif Shaheen

Title: Hot Topic symposium: The causes of asthma: genes modifying environment or vice versa?

British Thoracic Society Winter Meeting, London, 2008.

Invited speaker: Dr Seif Shaheen

Title: Diet, paracetamol and respiratory disease.

Royal Society of Medicine (Clinical Immunology and Allergy section) workshop 2008

Invited speaker: Dr Seif Shaheen

Title: Clues on causation from population studies and the role of nutrition.

University of Bergen: International workshop 2008

Invited speaker: Dr Seif Shaheen

Title: Deciduous tooth enamel: A new tool for fetal origins epidemiology?

Advances in Respiratory Medicine course. NHLI 2008

Invited speaker: Dr Seif Shaheen

Title: Paracetamol use and asthma: a causal link?

Dental School, Bristol University 2008

Invited speaker: Dr Seif Shaheen

Title: Deciduous tooth enamel: A new tool to investigate the developmental origins of health and disease?

MRC Asthma UK Centre in Allergic Mechanisms of Asthma Away Day 2008

Invited speaker: Dr Seif Shaheen

Title: Epidemiological insights into the developmental origins of asthma: is epigenetics the key?

ATS Toronto 20-25 May 2008

Invited Speaker: Dr Anamika Jithoo

Recruiting and Retaining Underrepresented Populations for Clinical and Community

Title: Research Trials: Overcoming Challenges...

IUATLD Paris 16-20 October 2008

Invited Speaker: Dr Anamika Jithoo

Title: The COPD epidemic: Diagnosis and screening: what can be achieved?

RSM 4th February London

Invited Speaker: Prof Peter Burney

Title: The changing prevalence of atopic diseases

EUROPREVALL CONGRESS 14-17th May BERLIN

Invited Speaker: Prof Peter Burney

Title: Patterns of food allergy across Europe

EAACI 7-11th June BARCELONA

Invited Speaker: Prof Peter Burney

Title: Symposium 46: Epidemiology of food allergy in adults & children: Europrevall & ECRHS II studies

ERS 4-8TH October BERLIN

Invited Speaker: Prof Peter Burney

Title: Sadoul lecture Just correlations? Unravelling the origins of the asthma epidemic.

BTS London 2009

Invited Speaker: Prof Peter Burney

Title: Should we be using local or racially adjusted standards for lung function?

IUATLD 16-20th PARIS

Invited Speaker: Prof Peter Burney

Title: The COPD epidemic: how should the health services respond?"
& Spirometry: Basic investigation for the evaluation of medical care.**Medical University of Warsaw 23/24th October WARSAW**

Invited Speaker: Prof Peter Burney

Title: Epidemiology of Allergy and Asthma

Food Allergy: Science and clinical practice 5 November London RCP

Invited Speaker: Prof Peter Burney

Title: Changes in the prevalence of allergy

BSACI 8th December LONDON RSM

Invited Speaker: Prof Peter Burney

Title: The epidemic of allergy

XVIII National Congress of Lung Diseases 9-12 December RUSSIA(Yekatarinburg)

Invited Speaker: Prof Peter Burney

Title: The Burden of Chronic Lung Disease: past, present and future

British Society for Allergy and Clinical Immunology Conference, Nottingham, 2009.Invited speaker: **Dr Seif Shaheen**

Title: Prenatal antioxidants and vitamin D and the development of asthma and atopy.

European Academy of Allergy and Clinical Immunology, Warsaw, 2009Invited Speaker: **Prof. P Burney**

Title: The epidemiology of severe asthma in Europe.

European Academy of Allergy and Clinical Immunology, Warsaw, 2009Invited Speaker: **Kummeling I.**

Title: Cross-sectional surveys in EuroPrevall.

European Respiratory Society Annual Congress, Vienna, 2009.

Invited speaker: **Dr Seif Shaheen**

Title: The prenatal environment, epigenetics and asthma (Hot Topic symposium).

Developmental Origins of Health and Disease Conference, Santiago, 2009.

Invited speaker: **Dr Seif Shaheen**

Title: The developmental origins of asthma and respiratory disease.

Title: Methods in Respiratory Epidemiology.

Leiden University Medical Centre, Leiden The Netherlands

Invited Speaker: **Dr Vanessa Garcia Larsen**

Title: The Ga2len FFQ

Invited Speaker: **Prof. P Burney**

Should we be using local or racially adjusted standards for lung function?

European Respiratory Society Barcelona 2010

D Jarvis 'What information should be collected on asthma and COPD in Health Examination Surveys?'

European Academy of Allergy and Clinical Immunology. London 2010

D Jarvis 'Avoiding statistical errors'

P. Burney Global trends in allergy

India Partnering Award Opening Meeting in Mysore, India. October 2010

V Garcia-Larsen. The role of nutrition in the patterns and prevalence of diet-related allergies in the United Kingdom.

V Garcia-Larsen. Use of dietary questionnaires and food composition tables in international epidemiological studies of asthma.

GA2LEN/EAACI Summer School of Allergy and Asthma, Sardinia, Italy. September 2010

V Garcia-Larsen. Diet and asthma: overview and future challenges. GA2LEN/EAACI Allergy Summer School, Sardinia, Italy. September 2010

EAACI Task Force on Exercise and Lifestyle – Porto, Portugal. January 2010

V Garcia-Larsen. Nutrition and asthma – why is it important?

Global Burden of Disease (GBD) workshop Seattle 5-7th May 2010

P. Burney Chronic Respiratory Disease,:

COPD 7 conference, 30Jun -2nd July, BIRMINGHAM,

P. Burney "What have we learnt about the prevalence of COPD – the evolving problem".

"Frontiers in Food Allergen Risk Assessment: a joint symposium by EuroPrevall, ILSI Europe, 20-22nd October , NICE,

P. Burney Patterns of allergy in adults & school age children .

BRUSSELS, ERAM/SERIN, BRUSSELS, 4th-6th November 2010

P. Burney The GA2LEN survey.

P. Burney Rhinitis and Asthma – the view of an epidemiologist.

IUATLD BERLIN , 10-15th November 2010

P. Burney What we know and don't know about COPD in LMICs;

P. Burney COPD and indoor air pollution.

BOOK CHAPTERS

D. Jarvis, S. Shaheen and P. Burney. Epidemiology of Atopy and Atopic Disease. In: Allergy and Allergic Diseases (second edition). Eds. Kay B, Kaplan A, Bousquet J, Holt P. Blackwell, Oxford.

D. Jarvis, S. Shaheen and P. Burney. The epidemiology of asthma and allergic rhinitis. In: "Allergy Frontiers: From Epigenetics to Future Perspectives". Eds. Pawankar, Holgate,S., Rossenwasser. Springer Japan KK.

Jarvis D. 'Emissions related to cooking and heating' in Environmental and Occupational Disease Eds Cullinan P, Tarlo S. John Wiley and Sons. (In press)

Jarvis D, Shaheen S, Burney P. "The epidemiology of asthma and hayfever". In Allergy Frontiers: Epigenetics, Allergens and Risk Factors By Ruby Pawankar, Stephen T. Holgate, Lanny J. Rosenwasser Springer Japan.2009

Jarvis D. 'Health effects of cooking and heating' in "Diseases from Work, Home, Outdoor and other Exposures", Ed Tarlo SM, Cullinan P, Nemery B, published by Wiley Blackwell, Oxford, UK 2010

Newson R. Stata tip 5: Ensuring programs preserve dataset order. In: StataCorp, editor. Thirty-three Stata Tips. College Station, TX: Stata Press; 2006.

Newson R. Stata tip 13: generate and replace use the current sort order. In: StataCorp, editor. Thirty-three Stata Tips. College Station, TX: Stata Press; 2006.

National and international Committees**Professor Peter Burney**

QUARK II (Department of Health)

WHO: Asthma Severity working group

WHO: Chronic Disease Programme working group
Union: Steering Committee, Asthma Drug Facility

Dr Deborah Jarvis:

WHO Advisor on Health effects of Indoor Nitrogen Dioxide for setting of Indoor Air Quality Guidelines

Dr Vanessa Garcia-Larsen:

Member of the Task Force on Lifestyles, asthma and Allergy, EAACI

Dr Adai Ramasamy:

Member of or contributor to the following genetics consortium

ECRHS-SAPALDIA-EGEA collaboration

Analysis of Population-based Cohorts on Asthma Traits (APCAT)

SpiroMeta Consortium

Transnational Asthma Genetics Consortium (TAGC)

Early Growth Genetics (EGG)

Early Genetics and Longitudinal Epidemiology (EAGLE)

Dr Seif Shaheen:

Chaired Working Group (Environment and Lifestyle) for Asthma UK *BARS II* consultation

POST-GRADUATE STUDENTS AND COURSES

Apart from extensive training sessions for specific studies such as GA²LEN, ECRHS and BOLD, the group have been engaged in several other more general courses:

IUATLD 2007, postgraduate course on Spirometry: Basic Investigation for Evaluation of Medical Care

GA²LEN/EAACI funded Allergy School short course on the Epidemiology of Allergy and Respiratory Diseases to be held at NHLI in November 2008.

Pan African Thoracic Society Training programme:

2009: Blantyre, Malawi

2010: Nairobi, KENYA

Conclusion

The start of this programme was disrupted to some extent by the move of the Unit to Imperial College, though the strong support of both the Department of Health and the College made this less problematic than it might have been. Similarly the end of the programme has been destabilised by the ending of the Unit's remit, though again the Department of Health has greatly eased this situation by allowing a cost-neutral extension to the contract.

We have made some substantial progress in all the areas that we sought to address. Much of the results from data collected during this 5 year period will come out in the next couple of years, and the cost-neutral extension will allow at least the next year to produce some major papers from the local studies such as ALLOHA and the major collaborations such as GA²LEN, EuroPrevall and Gabriel.

The success of the programme will largely be judged by whether there is further funding to exploit the findings. Some of this is already secured. ECRHS III is funded to a large extent by the Medical Research Council as well as by funders in other participating countries. This will continue to study both nutrition and environment as well as looking at the likely future of the asthma epidemic in the cohorts born up to 1970. Work on COPD has been supported by the Wellcome Trust and the current grant should allow us to make a good assessment of the world-wide prevalence of this condition as well as assessing the main risk factors and the variations in severity and in the response of the health services. Work on the Environment will be supported by the Centre for Environment and Health, funded by the Health Protection Agency and the Medical Research Council. The BUPA Foundation has supported a pilot study for a trial of fruit consumption in children with asthma.

ANNEX

Three papers

It is difficult to identify clear criteria on which to identify three papers out of the Unit's output of the last 5 years. We could select those that have most citations or been in the most cited journals (e.g. Janson et al. *Eur Respir J* 2006; Buist et al. *Lancet* 2007; Kogevinas et al. *Lancet* 2007, de Marco et al. *Am J Resp Crit Care Med* 2007; Shabaan et al. *Lancet* 2008; Gabriel Consortium, *New Engl Med J* 2010) but this does not say much more than is already obvious.

The papers we have selected are relevant to new directions that are being followed by the Unit and that have provided changes in perspective on important points of the Unit's programme.

Burney P, Newson R, Burrows M, Wheeler D. The effects of allergens in outdoor air on both atopic and nonatopic subjects with airway disease. *Allergy* 2008;63:542-546.

Relates to the environmental programme. This is the first paper that we know of that has attempted to measure allergen generically, rather than measuring the presence of specific allergens or indicators of their presence (such as pollen counts). The paper demonstrates that the effects of allergen in air were large (compared with the effects of small particles) and could easily explain the small effects of particles on symptoms and other effects in patients with asthma. This raises issues about the validity of air pollution studies that do not address this potential form of confounding and also raise more general issues about protection of the public. The observation that sensitisation to common allergens did not seem to explain the effect also raises important issues about the nature of the allergens involved. The paper is being followed up currently in the ALLOHA study.

Garcia-Larsen V, Luczynska M, Kowalski M, Voutilainen H, Ahlstrom M, Haahtela T, Toskala E, Bockelbringk A, Lee H-H, Vassilopoulou E, Papadopoulos N, Ramalho R, Moreira A, Delgado L, Castel-Branco M, Calder P, Childs C, Bakolis I, Hooper R, Burney P. Use of a common food frequency questionnaire (FFQ) to assess dietary patterns and their relation to allergy and asthma in Europe: Pilot study of the GA²LEN FFQ. *Eur J Clin Nutrition* 2011 (in press)

Relates to the Nutrition programme. This is part of a programme to develop a method of designing Food Frequency Questionnaire that are well standardised across countries and diets. It was a response to specific problems encountered in analysing European data where each country selects its own foods according to an entirely free choice. Here the choice and format are largely determined with variations between countries minimised. The paper shows that the method is successful at least in determining one form of fatty acid typically found in dietary fish with reasonably good concordance across very different types of diet (Finnish, German, Polish,

Greek and Portuguese). We are currently following up this work with further validation studies of other dietary constituents and using the questionnaire in a number of international studies.

Burney PG, Hooper R. Forced vital capacity, airway obstruction and survival in a general population sample from the USA. *Thorax*. 2011; 66: 49-54.

Relates to the COPD programme. It has been known since the nineteenth century that spirometry predicts mortality, but the recent literature has increasingly assumed that the association is with measures of obstruction. This paper shows that in the general population the major association is, on the contrary, on the volume of the lungs as measured by the forced vital capacity. This has important implications for the assessment of spirometric values in the community at a time when there are increasing demands to have either screening of lung function or case finding in general practice. It also has implications for the assessment of general risk and for the understanding of cardiovascular risk in particular. We are currently following these up in an extension to the London BOLD Study. Further analyses on ethnic inequalities, not yet published, will provide guidance on the assessment of risk in an increasingly diverse population and on the assessment of the global burden of lung disease.