

Shah Ebrahim: The epidemiology of chronic disease in Britain and India

SUMMARY

Non-communicable diseases such as mental illness, cancer, cardiovascular disease, diabetes and chronic respiratory diseases are the major health burden across the world today, and they are on the rise. Leading epidemiologist Shah Ebrahim, Professor of Public Health at the London School of Hygiene and Tropical Medicine, has recently received a Wellcome Trust Strategic Award to apply his expertise in chronic diseases to capacity building for the management of these diseases in India.



Background

The world's poorest people have the highest rates of both infectious and non-communicable diseases; but traditionally the profound economic impact of non-communicable diseases has been underestimated in developing nations. It is clear from the experience of affluent countries that huge gains are to be made – in prolonged lifetime productivity and wellbeing – with just modest investment. Most studies on chronic disease are of populations in affluent countries, but since the incidence of these diseases is rapidly increasing in developing nations there is an urgent need for data on how best to tailor disease control programmes, policy making and resource allocation in these countries.

Professor Shah Ebrahim, a senior epidemiologist at the London School of Hygiene and Tropical Medicine, trained in medicine in the 1970s and then, funded by a Wellcome Trust fellowship, in clinical epidemiology in the early 1980s. He now specialises in the epidemiology of chronic, non-communicable diseases including cardiovascular disease, diabetes and obesity. He has led studies around the world for key groups such as the World Health Organization and the EU and brings a global perspective to his studies of public health.

Advance

In 1998, Professor Ebrahim established the British Women's Heart and Health Study, which collected data on 4000 women and has continued to monitor the cohort ever since. The research is directly modelled on the British Regional Heart Study of men, which Professor Ebrahim also co-directs. Both studies are looking at causes of and risk factors for cardiovascular diseases. The British Women's Study is the only large-scale study of cardiovascular disease in post-menopausal women in the UK, and has already generated a large amount of data on the life-course determinants of insulin resistance and coronary heart disease. For example, the risk of coronary heart disease in women increases with the number of pregnancies a woman experiences.

Since 2003, Professor Ebrahim has directed a Trust-funded research programme in India. This large population-based study is looking at the influence of migration from country to town on the risk of diabetes and obesity, and has identified large numbers of sibling pairs where one sibling had migrated to an urban life while the other has stayed in the family's rural place of origin. Early findings indicate that the migrants were at higher risk of obesity and diabetes than their siblings in the country; and that migrants now had comparable levels of risk to those of non-migrant urban dwellers. This suggests that they have adopted lifestyles that put them at similar risk to the urban population.

How it's making a difference

Professor Ebrahim's work has been influential in guiding cardiovascular risk factor screening in British women and reducing inequalities in the use of preventative interventions in older women. Since 1998, he has been Coordinating Editor for the Cochrane Heart Group and he has advised public health policy makers in the UK and abroad. He has advised the World Bank, the World Health Organization, governments and independent charities such as Help Age International on chronic diseases.

Professor Ebrahim's research in India has shown that the biological causes of chronic diseases, which have been well established in affluent countries, apply directly to developing nations. However, the underlying reasons for increases in common risk factors in a population may differ. Consequently, prevention and treatment of non-communicable diseases such as cancer, diabetes and heart disease need to be tailored in each case to the risks experienced by the population.

In 2007, Professor Ebrahim and colleagues established the Chronic Diseases Action Group. This partnership of independent experts produced a series of papers in the *Lancet* looking at the evidence on chronic diseases. Subsequently they have focused on capacity building, advocacy, policy and programme development in low- and middle-income countries.

Next steps

In 2008 Professor Ebrahim was granted a Wellcome Trust Strategic Award to build research and training capacity at the New Delhi Public Health Foundation of India, with a focus on chronic diseases. Data in this area are essential for the economic assessment of the feasibility and impact of public health programmes.

The centre in New Delhi will greatly enhance training and research on non-communicable diseases in a region where their incidence is rapidly increasing. The resources will also support current Trust-funded studies in India and the design and implementation of a new large-scale household cohort study.

The large-scale sibling study on diabetes, obesity and migration in India is nearing completion and aims both to strengthen research capacity in the country and to generate

data that can inform programmes to prevent and treat chronic diseases. The ultimate goal is to integrate these programmes into existing health systems.

In the UK, Professor Ebrahim is working with Professor George Davey Smith at the University of Bristol on experimental designs that can identify environmental risk factors for common diseases. This approach – called Mendelian randomisation – looks at genetic variants of markers for environmental risk factors such as alcohol-related diseases. Traditionally, epidemiologists may have compared two groups, such as those reporting high and low levels of drinking. But such studies are often limited by confounding variables – such as smoking or socioeconomic position – that are associated with the behaviours being investigated. Mendelian randomisation compares groups of individuals defined by genotype alone, thus minimising confounding behavioural, socioeconomic or physiological factors. In the case of alcohol-related diseases, Professors Ebrahim and Davey Smith are comparing groups of individuals defined only by genotype: genetic variants in the acetyl dehydrogenase gene (*ALDH2*) can be compared to examine indirectly the effects of alcohol intake on oesophageal cancer.

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Timeline of Shah Ebrahim

