

Unhealthy diet and physical inactivity: Understanding these silent killers

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Swimmers. Credit: Microsoft Corporation

Living a healthy lifestyle might seem like common sense, but the environment we live in can make healthy choices more difficult. Whether it's how much access we have to green spaces, the transport we take to work, or our diet, each can have an impact on leading a long and healthy life.

Diet and activity behaviours, together with alcohol and tobacco, are risk factors for the world's fastest growing health epidemic: a group of 'silent killers' that often develop slowly over many years and are known as the non-communicable diseases (NCDs).

NCDs, so-called because they are not transmitted person to person, include diabetes, cardiovascular disease, chronic respiratory disease, cancer and mental health disorders, and are by far the leading global

cause of death. Of 57 million deaths recorded worldwide in 2008, NCDs were responsible for 36 million, 80% of which were in low- and middle-income countries. By 2030, the total number of NCD-related deaths could rise to 52 million and result in a cumulative loss in global economic output of \$47 trillion.

The statistics are deeply shocking. But, as Professor Nick Wareham, Director of both the Medical Research Council (MRC) Epidemiology Unit and Cambridge's Centre for Diet and Activity Research (CEDAR), explained there are potential solutions: "Behavior is a key risk factor for NCDs, often closely connected with biological, environmental and social factors. With a more supportive environment and the right incentives, individuals might be more able to change their behaviour to look after their own health: taking exercise, eating a healthy diet, not smoking and limiting alcohol consumption."

"As well as ensuring that high-risk individuals get the right support, we need effective strategies for targeting whole populations," he added. "The challenge is to discover what determines the population distribution of health-related behaviours so that we can understand how those distributions can be shifted."

Research in a changing world

CEDAR is intent on building the evidence base on which to move populations in the right direction. Hosted by the Cambridge Institute of Public Health, the Centre is a partnership between the Universities of Cambridge and East Anglia, and the MRC Epidemiology Unit, the MRC Biostatistics Unit and the MRC Human Nutrition Research Unit. Created in 2008, it is one of five UK Public Health Research Centres of Excellence funded with a total of £20 million over five years by the UK Clinical Research Collaboration.

One of the efficiencies of the CEDAR approach is that it enables new studies to be overlaid on the foundations of some remarkably long-running, large-scale epidemiological studies carried out by the University and embedded MRC Units. The European Prospective Investigation of Cancer (EPIC)-Norfolk study, for instance, has been studying 25,000 individuals for almost 20 years to understand not only the connection between diet and cancer but also the factors that are most often present when people stay healthy throughout life. “Many of these factors might be obvious but you actually have to demonstrate their benefit or their risk so that interventions are based on empirical data,” explained Wareham.

Measuring the determinants of behavior and evaluating interventions lie at the heart of the portfolio of projects at CEDAR. One study, SPEEDY, has been focusing on the factors that determine diet and physical activity in childhood and adolescence, a period that shapes behaviours that can last a lifetime. Among the findings of the project, which is funded by the National Prevention Research Initiative (NPRI), is the importance of the ‘physical activity friendliness’ of the school environment. One, perhaps counter-intuitive, finding is that allowing children to play outside in wet weather during school break times is associated with lower activity levels than keeping them indoors and providing opportunities for physical activity. This has implications for school policies on indoor play and the design of school grounds for wet weather.

Through systematic reviews of the evidence and a new randomized trial, CEDAR and the MRC Epidemiology Unit is also learning about how we can prevent childhood obesity by intervening during infancy. UK surveys have shown that more than one in five children are overweight or obese by the time they start school. “Little research has looked at how best to protect the health of bottle-fed babies, who gain weight rapidly and tend to be at higher risk of childhood obesity,” said Wareham. It turns out

that many mothers lack information about how best to bottle-feed their babies and mistakes in feed preparation are common. CEDAR has developed a behavioral intervention aimed at parental feeding which is undergoing evaluation in a randomized controlled trial funded by the NPRI.

Some aspects of behavior are shaped by the environment, including the layout of the buildings we work in or the infrastructure that determines how we travel to work. CEDAR researchers are interested in so-called natural experimental studies, which examine the effects of changes in the environment and policy on physical activity. The Commuting and Health in Cambridge study, funded by the National Institute for Health Research, is assessing whether the provision of new transport infrastructure such as the Cambridgeshire Guided Busway has any effect on travel behavior and physical activity in the commuting population. The Busway only opened in summer 2011 but results gathered during the ‘before’ period are already providing insight into the factors that influence people’s travel behavior.

“It might be that the biggest influences on the population’s diet and activity won’t just come from simply urging people to change,” explained Wareham. “Instead, major whole-scale restructuring of the way society operates might be necessary – from increasing access to green spaces, changing schools’ food policies to rethinking the physical structure of road networks.”

Capacity, research, translation

Building research capacity is a key aim of CEDAR, and currently 35 researchers with expertise in biostatistics, epidemiology, behavioral science, health economics, health geography and public health nutrition contribute to the work of the Centre. Another aim is to make evidence available in a form that is most usable to policy makers, through physical

products such as evidence briefs and evaluation toolkits, and through developing relationships in policy and practice arenas.

Helping to facilitate the translation of research to policy, CEDAR works closely with the Eastern Region Public Health Observatory, which provides information, data and intelligence on people's health and health care for practitioners, policy makers and the wider community.

Some CEDAR investigators also work as part of the newly formed Behavior and Health Research Unit (BHRU), which is funded by the Department of Health Policy Research Programme to contribute evidence on effective ways of changing behavior in populations to improve health and reduce health inequalities. Policy makers are currently showing great interest in 'nudge' approaches – altering environments to prompt healthier behavior, without banning particular choices – and last year the BRHU questioned whether such an approach stands up to scientific scrutiny. We know from past examples that firmer legislative approaches can reap dramatic health rewards: when Scotland first imposed a ban on smoking in public places in 2006, a 17% reduction in admissions for heart attacks was recorded within a year across nine Scottish hospitals. But questions remain about which interventions are the most cost-effective and worthwhile – the so-called 'best buys'.

“The increasing number of people with NCDs is a vast public [health](#) and economic problem. Although it is widely accepted that something needs to be done, there is uncertainty about how this epidemic can be stemmed,” said Wareham. “At the moment, the sound base of research underpinning solutions is largely lacking. There may be some policies that could be put in place now but we believe that interventions should be better evaluated. Going forwards, the scale of the task we face globally is huge. CEDAR has already made a good start.”

Provided by University of Cambridge

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