

Feasting and fasting

Bad nutrition needs the world's attention. Not least that of biologists.

Exterminate the metabolic syndrome! That was the mission of Japan's government when two vice-ministers for health announced in 2006 that they would cut their waistlines. Encouraged no doubt by the media's keen scrutiny of their progress, they duly did so, with Keizo Takemi's girth coming down from 100.5 to 95 cm over six months.

As was clear from a wide-ranging survey of nutrition issues at last month's Pacific Health Summit in Seattle, Washington, behavioural change is a key element in tackling the twin crises of under-nutrition and obesity, which are all too easily forgotten in the competition for the world's attention.

What is also insufficiently recognized is the dual nature of the challenge. The combination of "feasting and fasting", as Margaret Chan, director-general of the World Health Organization (WHO), described it in Seattle, increasingly arises as countries develop. For example, China and Mexico are showing both aspects of the 'nutrition transition' — from extreme under-nutrition to obesity caused by insufficient exercise and an excess of unhealthy diets, and diabetes and cancers that follow.

Researchers have tracked the effects of under-nutrition on mothers from before they become pregnant and on their children in the first two years of life. Not only does it cause immediate health problems for the offspring, but it affects their health, educational and work prospects for the rest of their lives. (For an influential overview, see the series published by *The Lancet* online in January 2008, <http://www.thelancet.com/online/focus/undernutrition>.) Those longer-term consequences, including an increase in type 2 diabetes, exacerbate the health problems that arise with obesity as countries progress in their development.

Priorities for action to encourage behavioural change include education, compulsory labelling of the calorie content of restaurant menus and regulation of the food industry. Change is also required in farming and retailing practices for healthier food, in both developed and developing countries.

But science matters too. And, above all, science that spans the

full range — the study of diets and exercise habits of populations, of physiology, and of molecular mechanisms and genetics — and that includes the social sciences of behaviour as well as the natural sciences of nutrients. For example, cohort studies that examine the dietary intake of women — so often it is women who play a crucial role in public health and who need empowerment — can be related to physiological studies of the effects of dietary components, which in turn can be related to effects of a particular micronutrient on human or model-organism gene expression. Such a holistic approach has the potential for an immediate impact on policies.

"A holistic approach to under-nutrition has the potential for an immediate impact on policies."

Some funding agencies say that they don't receive strong proposals in nutrition. But researchers reasonably assert that funders have only themselves to blame, having weakened organismal biology in favour of cell and molecular studies for many years. A commendable exception to this is France, which for several decades has built and sustained the science of nutrition in a strategic and multifaceted way.

What can best motivate more researchers to tackle these challenges? For a start, an awareness of the sheer impacts of bad nutrition: 35% of under-five child deaths and 11% of the global disease burden are caused by under-nutrition, with poor breastfeeding and deficiencies in zinc and vitamin A being major factors. Meanwhile a poor energy balance in individuals lies at the heart of the epidemic in obesity, which has been estimated by the WHO to give rise to as much as 7% of global health-care costs in developed countries, including a rising tide of diabetes and cancers.

But ultimately, governments need to take the lead. In April, Japan announced a follow-up to its ministers' personal regime of eating less and moving more with a national programme of health check-ups. Next month it hosts the G8 summit, where the cause of improving nutrition will have its opportunity as the participants focus on the food crisis. Science is a critical element requiring the G8's attention in tackling the huge and global burdens of bad nutrition. ■

In rude health

A treasure-trove of data in the UK National Health Service is set to energize biomedical research.

Reaching 60 is often associated with people slowing down and beginning to feel their age. Britons, for instance, are entitled to a free bus pass. But their universal health-care system, the National Health Service (NHS), which celebrates its 60th birthday on 5 July, is broadly considered to be in better shape now than it was at its half-centenary — even though baby boomers are greyer and

new medicines are dearer. Scrapping it and switching to a private system would be unthinkable.

NHS-bashing has become a UK national pastime, and shortcomings are inevitable in what is one of the world's five biggest employers. But Britons who use the service regularly judge it more positively than those who mainly talk about it. British newspapers are often rife with reports of bad management, but a recent survey showed 91% of 17 million hospital inpatients rated their care as good, very good or excellent. And although the NHS sometimes fares badly in surveys that focus on how well specific illnesses are treated, probably the most thorough evaluation of late — a six-country study of equity, efficiency, quality, access, and long and productive patient lives by independent foundation the

Commonwealth Fund — ranked it top, above the health-care systems of Australia, Canada, Germany, New Zealand and the United States.

Scientific research has been a core goal of the NHS since its foundation — but one might be forgiven for not knowing it. For years, the funds for research have been distributed within the regional health-care deliverers in a system that might have been designed to obstruct collaboration with universities and drugs companies. All credit, then, to the NHS's director-general of research and development, Sally Davies. With the creation of the National Institute for Health Research (NIHR), a virtual body within the NHS, Davies has dragged the funds into the daylight. By 2011, these are expected to amount to about £1 billion (US\$2 billion).

In its attention to researchers' careers, networks and collaborations, and to transparent indicators of achievement, Davies' Best Research for Best Health programme is helping to transform the research landscape. Plans include virtual organizations to link universities, hospitals and industry; ten 'academic health centres' resembling US university hospitals, through which researchers will be able to conduct studies on patients more easily; and somewhere between 15 and 50 'health innovation and educational clusters', which the government hopes will speed up procedural innovation, promising better funding for academics who get involved. Meanwhile, NIHR collaboration

with the Medical Research Council, after a fractious start, is beginning to make progress.

Perhaps the most significant move for biomedical science at the NHS lies in opening up the ocean of patients' data that the organization has collected over the decades. Public consultations are now beginning that, favourable soundings suggest, will lead to ways by which researchers can readily find appropriate patients for research and clinical trials, and can gain access to data whose sources are anonymized but traceable subject to the patient's permission. In particular, the national extent and depth of those data will provide researchers in academia and industry with a globally unique resource for highly targeted studies and clinical trials — a key element of translational medicine.

Such an information system will rightfully evoke worries about privacy. In the future, those concerns will become more sensitive as genetic testing becomes more predictively powerful. Yet, at the same time, as that era blossoms, it will bring the risk-pooling benefits of universal health-care to the fore. As long as people do not have to share genetic data with private insurers, as is the case in the United Kingdom until at least 2014, those who anticipate bad health will do well to buy insurance cover. The genetically lucky, meanwhile, might as well save money and rely on the state. This will squeeze private insurers, suggesting that the NHS's golden period may be yet to come. ■

Does the past have a future in Berlin?

Not unless a research institution's managers recognize its value.

Most museums have so little space that they hold the majority of their collections in storage. But the Berlin Medical Historical Museum has problems that border on the absurd. Its overflow is piled up in entirely unsuitable make-shift accommodation, including a former stable that is prone to flash flooding, and a ramshackle lean-to under a railway arch that shakes when trains thunder by, redispersing thick layers of dust and dirt.

The museum used to face directly onto the Berlin Wall, but it now has a fine view across the Spree to the spanking-new central station and the chancellery of united Germany. It belongs to the Charité, the city's historic medical school, which was reconstituted five years ago in a painful merger between the medical faculties of East Berlin's Humboldt University — the original Charité — and West Berlin's post-war Free University.

The ascendancy of the Charité over the western faculty is in part thanks to its long — if interrupted — reputation, having nurtured such scientific giants as Rudolf Virchow, the nineteenth-century pathologist who conceived the cellular basis of disease. Indeed, in the nineteenth and early twentieth centuries, Berlin was a hot-bed of modern science in all disciplines, with the likes of Hermann von Helmholtz, Carl von Siemens and Emil Fischer pushing all possible frontiers. This has bequeathed Berlin many important collections of instruments, specimens and other historic scientific items.

When the Charité was reconstituted it had a mandate to establish scientific excellence — which it has in good part done — with a shrinking budget. But what of its heritage? It has done a marvellous job in restoring the lovely old building housing the Medical Historical Museum, which now has a fine display of the cream of its collection — not to mention an extraordinary meeting room called 'The Ruin', comprising an area bombed out in the Second World War, now simply glassed around. Unfortunately this big investment is not enough. Its archived collections need a safe home. As do the collections of old DDR instruments acquired after the Wall fell, which share the same primitive lodgings. They are invaluable for historians of twentieth-century technology.

To balance its books, the Charité is selling its off-campus buildings, many of historical as well as financial value. One of the most attractive is the 1877 building on the Dorotheenstrasse, with its beautiful glass-roofed anatomical lecture theatre, where pioneering microbiologist Robert Koch announced his discovery of the tuberculosis bacillus. There are additional important collections in some of these buildings, including the physiological instruments that are this week's Hidden Treasure (see page 31). These also need new permanent homes.

To attract the best scientists, the Charité must be able to offer them generous lab space — contemporary science has, of course, to be the top priority. But heritage must not be the default victim.

The Charité will have a new management team in the autumn that would be wise to guarantee a tiny proportion of its budget to protecting the school's illustrious past — which did, after all, give it the upper hand after the reunification of Germany. The year 2010 is the 300th anniversary of the Charité, as well as the 200th anniversary of the Humboldt University and the 100th anniversary of Koch's death. This triple celebration should be a time to remember the debt to the past. Let it not be wiped out. ■