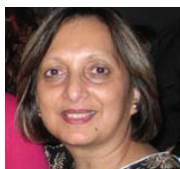


Capacity strengthening for global health research



Article by **Guvanti Goding (pictured), Michael Chew and Jimmy Whitworth**

Disparities around the globe in life expectancy, child survival, maternal mortality and health expenditure all highlight the gross inequity of health and welfare in the world today. Several of the Millennium Development Goals focus on health. The goals of reducing child mortality, improving maternal health, and combating HIV and AIDS, malaria and other diseases all require major improvements in delivery and uptake of health services. We need both new interventions and better application of existing proven interventions. A concerted response is urgently required to ensure the generation of new knowledge for effective disease prevention, development of affordable diagnostics and therapeutics, efficient delivery of cost-effective interventions, and health promotion. Central to this response is the need for research and increased uptake of research outcomes.

The developing world faces many challenges in relation to health research: lack of funds; poor institutional infrastructure; a lack of appropriately trained personnel; huge health burdens of both communicable and non-communicable diseases; and a lack of cohesive political advocacy.

Since its establishment in 1936, the Wellcome Trust has played a significant role in promoting global health. The Wellcome Trust's mission is to foster and promote research with the aim of improving human and animal health. With annual grant support of over £500 million, a significant proportion is devoted to fund global health research. For example, in 2006, we spent £73 million on health research in low- and middle-income countries.

Strengthening research capacity in biomedical science and public health constitutes a major component of the Wellcome Trust's international funding strategy. We aim to build a critical mass of sustainable research capacity in developing countries. In doing so, we support researchers to tackle the

most pressing local health problems and to deliver health benefits for people and their livestock.

Personal support

Building capacity locally includes encouraging excellent researchers to develop their careers in their home countries or regions (see Example 1). Support needs to be long-term to nurture the organic development of teams, centres and networks. A good example of this working successfully is our relationship with research teams in Kenya which has flourished over the past 50 years. The Trust's current programme, led by Dr Norbert Peshu and Professor Kevin Marsh, undertakes laboratory, clinical, field and policy research on issues of public health importance to Kenya and the region. There are strong links with the Kenyan Ministry of Health through the Kenya Medical Research Institute (KEMRI), which ensure that important research findings make their way into policy and make a difference to medical care (see Example 2). This programme has influence across Sub-Saharan Africa and is attracting research workers from many parts of Africa and beyond.

We provide flexible training and career progression opportunities for the best people at all stages in their careers to work on diseases of importance in a developing country setting. We have recently established a range of fellowship awards for applicants from Africa, Asia and South America wishing to carry out public health and tropical medicine research. Awards are available from junior fellowships for Masters students to senior fellowships for outstanding individuals wishing to establish themselves as research leaders.

Institutional support

Crucial to boosting research capacity is the need to ensure that the research that we support helps to consolidate local infrastructures and national institutions, and is geared to national priorities. To this end, the Trust has committed £10 million over 5 years to a partnership with the UK Department for International Development, and the International Development Research Centre, Canada, which aims to strengthen health research capacity in Kenya and Malawi. The partnership aims, through working with local ministries of health and key national institutions, to strengthen the generation and use of health research at a national and

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international level. Key components of this initiative include:

- ✦ supporting and training promising individual scientists;
- ✦ strengthening key academic research and policy-making institutions;
- ✦ facilitating collaborative engagement of national representatives;
- ✦ improving regulation and co-ordination of the national research environment.

There are significant difficulties with building research capacity in developing countries. Funding opportunities for individuals are often fragmented and difficult to access. The pipeline of young school leavers and graduates needed to embark on scientific careers is thin and unreliable. There is a lack of credible career pathways and few role models of successful research leaders. Research infrastructure is often inadequate and there is a lack of connectivity between teaching in universities and the institutes in which research is conducted. Over time we aim to help support the development of a critical mass of skilled and adequately remunerated academic and technical staff working in a vibrant academic environment with strong national and international links with research partners and networks. This

requires strong national political advocacy for science and research and development of national strategies for research priorities. This will involve not only the scientific perspective of what will work but also the social viewpoint of health delivery to those in most need.

Challenges

Looking to the future we need to think about how we can use our funding schemes and other mechanisms as drivers of change. We need to encourage more partnerships and networks between institutions in developing countries and also to encourage more equitable partnerships between northern institutions and those in developing countries (see Example 3). The issues of attrition and brain drain need to be addressed. This requires not only sensitive policies in developed countries to avoid pulling skilled scientists away from their home countries, but also local Government and international support for developing mechanisms for the retention of high quality trained professionals.

We all need to be advocates for science and technology, and to support the skilled individuals who are essential to enhance the health, lives and livelihoods of those in the poorest countries of the world. □

Example 1

In 2002 Dr Mayfong Mayxay received a Wellcome Trust Research Training Fellowship for a clinical and laboratory assessment of antimalarial drug efficacy in the Lao People's Democratic Republic (Lao PDR or Laos). His research involved spending long periods in rural Lao studying how best to treat malaria patients in one of the poorest countries in the world, living and working in villages where initially there were no modern utilities like piped water and grid electricity, let alone telephones, televisions and the Internet.

When Mayfong obtained a scholarship under a SEAMEO-TROPMED programme he contacted Mahidol University Professors Sasithon Pukrittayakamee and Nick White, who took him under their wing. Mayfong completed a PhD, succeeded in obtaining a competitive Trust fellowship, and is now a critical member of the Lao Project funded by the Trust as a part of its Major Overseas Programme in South-East Asia. Since 2001 Mayfong, in collaboration with his mainly Lao and British colleagues, has published nearly 30 papers in international peer-reviewed journals, many having real impact in directing health policies and practice in Laos. His clinical trials on artemisinin-based combination therapies (ACT) provided key evidence for the Lao Government to change its national malaria treatment policy to ACT. He has also been investigating the causes of fever in rural Laos and made key

contributions to the first post-colonial medical journal in Laos which describes the Project's infectious disease research in English and Lao languages.

In July 2007, Mayfong published a paper, in collaboration with his colleagues in the Lao Project, the Lao Government and the USA, in the prestigious *American Journal of Tropical Medicine and Hygiene*, reporting a sophisticated study on population genetic markers in malaria parasites. This paper suggested that the previous national antimalarial treatment policy of chloroquine would not be efficacious in any parts of Laos and that ACT would be superior over the whole country and not just where clinical trials had been conducted. It exemplifies the nature of the research emanating from the Trust's Major Overseas Programme in South-East Asia which includes work in Laos. Under the overall direction of Professor Nick White, University of Oxford, the South-East Asia Programme, which includes developing the research site in Laos, has its major base at Mahidol University, Bangkok, Thailand. Professor White's interest in the pharmacology of antimalarial drugs and the studies on artemisinin derivatives has provided the basis for treatment trials for malaria on a large scale in Thailand and Viet Nam, and subsequent recommendation by WHO as the treatment of choice for malaria in many countries.

Example 2

Dr Michael English is a Wellcome Trust Clinical Senior Fellow based at the Kenya Medical Research Institute/Wellcome Trust programme in Nairobi, Kenya. His previous research funded through the Trust's Research Career Development Fellowship, also based in Kenya, has demonstrated that health workers

are unaware of the evidence defining appropriate hospital treatment of children with severe diseases including malaria, anaemia, pneumonia, diarrhoea/dehydration, severe malnutrition and simple neonatal disorders. Treatment is therefore commonly inappropriate, inadequate or occasionally, even actually dangerous. Such

treatment is provided to hundreds of thousands of children annually in Kenya and, almost certainly, to millions of children throughout Africa. Major gains in child survival can only be made if improved preventive and primary care are combined with the right treatment at the right time for those that present with severe disease. In Kenya, the majority of the first-line resources needed to support care of the severely ill child are available. The challenge then is to determine how the care provided can be optimized to suit the context, in line with the best available evidence. Research addressing this issue has very rarely been attempted in rigorously designed studies in developing country settings and never as part of an

integrated approach to inpatient paediatric care.

The aim of Dr English's current research project is primarily to conduct a public health efficacy study of an intervention to improve care for children in hospitals in Kenya. The intervention, based on the referral care component of the Integrated Management of Childhood Illness (IMCI) strategy, with Kenya's Ministry of Health comprises training, guidelines, job aides, supervision and quality improvement activities delivered over 18 months to a number of hospitals in the country. Results will critically inform the debate on scaling-up and improving new integrated health systems in Kenya.

Example 3

International Partnerships for Capacity Development

✦ International Collaborative Research Grants scheme

This £12 million initiative is a partnership between the Wellcome Trust, the National Health & Medical Research Council of Australia and the Health Research Council of New Zealand and is designed to foster collaborations between the researchers in low- and middle-income countries (LMICs) in South and Southeast Asia and the Pacific Islands with the investigators based in Australia and New Zealand. Eleven research programmes were awarded which focus on major health issues of the LMICs of the region and develop research capacity in the region.

✦ Wellcome Trust – Burroughs Wellcome Infectious Disease Initiative

This £18 million partnership initiative supported 13 trilateral international collaborations between the UK, USA or Canada and LMICs anywhere in the world. The aim of the partnership initiative was to advance understanding of

infectious diseases which affect developing countries and to increase research capacity in the LMICs through training and technology transfer.

✦ The Health Research Capacity Strengthening (HRCS) initiative

The HRCS initiative is a partnership between the Wellcome Trust and the UK's Department for International Development (DFID) who agreed to commit £10 million each towards a joint programme of health research capacity strengthening in Africa as part of the UK Government 2004 Spending Review. The International Development Research Centre (IDRC), Canada has joined the initiative, both as an implementing partner with experience in health research programmes in East Africa, and as a co-funder. The partnership aims to strengthen the capacity for the generation of new health research knowledge within Kenya and Malawi, and improve its use in evidence-based decision-making, policy formulation and implementation.

Gunvanti Goding is a science programme officer at the Wellcome Trust in the Populations and Public Health Section, which manages research grants, fellowships and partnership programmes based in the UK and the low- and middle-income countries of the world. She obtained a doctorate from her research on gene regulation at Cancer Research, UK and has carried out a number of research projects in virology and molecular biology.

Michael Chew is a science programme officer at the Wellcome Trust and works for the Tropical and Clinical Immunology and Infectious Disease Section, which manages many of the research grants based in low- and middle-income countries. Before joining

the Trust, he undertook research for a PhD in parasitology at Imperial College London, and worked as a scientist at the Institute of Child Health, London, and Imperial College for 16 years.

Jimmy Whitworth is head of International Activities at the Wellcome Trust, where he oversees strategy and policy for research in developing and restructuring countries of the world, including fellowships, project and programme grants, networks and partnerships. Previously he was Professor of International Public Health at the London School of Hygiene and Tropical Medicine, and has spent most of the past 25 years working on medical research topics in Africa.