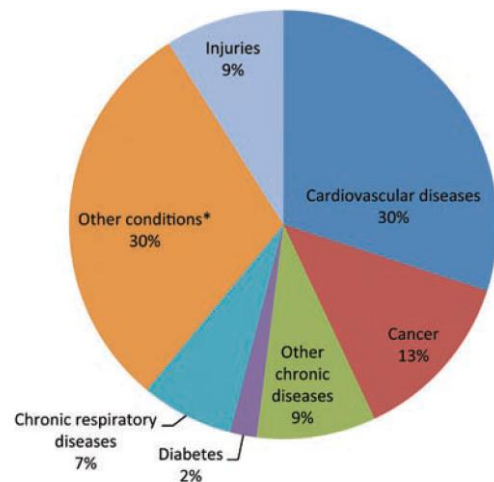


## Global Health Science: Beyond Infections

### A Strategy for investment in Non-communicable Disease Research

MRC has a longstanding commitment to global health research. In partnership with Low and Middle Income Countries (LMICs), and aligned with global initiatives, we have made substantial contributions to the fight against infectious disease<sup>1</sup>. Continuing this tradition, MRC, working with other Research Council and funding partners, is making major contributions to AMR research, vaccine development, emerging infections and pandemic preparedness.

We recognise the need to sustain and strengthen these efforts over the next two decades. However, the health needs of the LMICs are evolving. Improving infrastructures and service delivery for the prevention and treatment of infectious diseases and increasing relative prosperity driving urbanisation are changing health-related behaviours (eg. patterns of physical activity, diet, tobacco and alcohol consumption). As a result, non-communicable diseases represent the new health challenge (See figure below showing data from WHO 2005 – 'Other conditions' comprises communicable diseases, maternal and perinatal conditions and nutritional disorders). These conditions were responsible for 63% of all global deaths in 2008, a figure projected to rise to 75% by 2030; 80% of NCD deaths now occur in LMICs and half of those who die are in their most economically productive years<sup>2</sup>. Even in Africa, where the burden of communicable, maternal, perinatal and nutrition related disease is high, NCDs are predicted to become the major cause of death within the next 15 years. Importantly, these challenges are set against a backcloth of an increasing burden from mental health disorders (75% of which affect LMIC populations<sup>3</sup>) and the impact of increasing life expectancy.



Over the last five years the UK research effort in non-communicable disease and health systems in LMICs has developed rapidly, but is still on a relatively small scale (for MRC it represents less than 25% of the global health portfolio). To catalyse further change to meet the emerging challenge we now need to increase the breadth and scale of UK research, and widen our international partnerships.

Improving health in LMICs will need a broad range of approaches relevant to non-communicable disease, and to the wider social, economic, cultural and environmental contexts that affect health, embracing new discovery science and translational programmes in partnership with LMICs, NGOs and industry:

- The pattern of health and disease – in areas ranging from hypertension to diabetes, stroke and mental health – often differs substantially from that seen in the most developed countries, with differences in risk associations, age of onset, progression, and symptoms. Often, in LMICs, disease epidemiology is not well described. Effective prevention, early detection, and treatment, needs a full

<sup>1</sup> In particular, malaria, TB and HIV

<sup>2</sup> WHO Global Status Report on Noncommunicable Diseases, 2010

<sup>3</sup> APPG Report on Mental Health for Sustainable Development, 2014

understanding of the variations in patterns of disease and their biomedical and environmental<sup>4</sup> causes (including the social and cultural environment).

- Even when direct factors influencing health – such as food intake – are well known, the wider context that shapes these risk factors for individuals and populations will vary widely between LMICs, and in many cases will be changing more rapidly than in the most developed countries. New approaches are needed in population, social, economic, cultural and environmental research – exploring the interplay between health and variation in food and nutrition, occupational risk, culture, education and lifestyle, and changing rural and urban environments.
- Translating scientific understanding of NCDs into health, societal and economic gains will call for new designs and technologies, and evaluative research, for prevention, for clinical care and to understand the contribution of social and cultural factors and context. UK research will need wider partnerships with public and private organisations in LMICs to achieve impact, and for some LMICs contributing to a strengthened national research capability will also be a prerequisite.

A more complete global research approach to non-communicable disease will benefit research in developed countries as well as LMICs. Understanding wider and more extreme variation in diet, in environment, or in early life; and a more complete understanding of human biological social and cultural variability, will undoubtedly give new insights into universal processes in human health and disease.

### **Areas of interest**

i. Research opportunities: We are open to supporting new research in any area of health. There are no areas of global NCD research which are so well developed that they are a lower priority for new funding. However, to illustrate the research opportunities, there are some overlapping areas where there are obvious gaps in knowledge and where UK research, in partnership, should be well placed to contribute:

- Cardiovascular and metabolic research
- Cancers of high prevalence in LMICs
- Mental health and neurocognitive development
- Adolescent, maternal, and childhood health
- Impacts of demographic/behavioural changes across the lifecourse (including food and nutrition, malnutrition, obesity and physical activity) and cultural factors, with a focus on maintaining health
- Environmental change – urbanisation, rural change, climate change, environmental degradation
- Technologies, designs and methods suited to LMICs – including opportunities for informatics, user-led service design in research and health policy support; biomedical technologies; new forms of data; research tools and methods

Across all of these examples, the research challenges range across the spectrum of research MRC and partners already supports, from fundamental work on resilience to disease, disease mechanisms and genetic/environmental interactions, to population and social sciences, arts and humanities, and translational research. Aligned with MRC's wider priorities, opportunities for experimental medicine approaches will be emphasised.

Many will, in addition, need broader interdisciplinary scope, to achieve fuller understanding of the effects / options for change that are determined by wider economic factors; culture, media and society; food supply; variations in public service and systems; urbanisation and urban design etc.

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<sup>4</sup> Throughout the document environment should be taken to mean both the physical and social environment and environmental exposures includes social exposures

Exploration of complex interacting processes (either across coordinated projects, or within larger programmes) will be needed in many areas. For example, in understanding how diet, microbiome, early development and environment, infection and adult environmental factors interact to shape metabolism and health; or in understanding how early development, biology, culture and environment interact in mental health.

ii. Capability needs: research success will, in many cases, depend on sustained development of research capability in Low- or Middle- income partner countries around the research issue of focus. In many new research areas, initial funding support will often need to build capability at the same time as building towards new knowledge. Important areas are likely to include:

- Developing / enhancing longitudinal or cross-sectional population studies and sampling
- Ability to study broader environmental exposures including Social and cultural influences and systems
- Large scale data analysis
- Capacity to join up data, align methods etc across countries or regions to enable comparative studies or larger scale
- Research collaborations, cross-cultural and public engagement and translational collaborations
- Research skills and technical and management skills
- Research instruments, standards and methods tailored to the culture, environment, or operational practicalities such as task shifting.

### **The Funding Challenge**

MRC's support for global health – over £250m over the last five years – has mainly been delivered through conventional funding for Programmes and Projects, Units, Centres, Fellowships and Translational grants. We expect funding to exceed £400m over the next five years, mostly through the same mechanisms – but to fully capitalise on this opportunity to diversify the global health portfolio and form new cross-Council links there will be a need to fund both short-term and medium-term foundation/development grants. These will provide a basis for larger investments in future years, many of which will be collaborative cross-Council initiatives, and opportunities to work with other major funders outside of the GCRF such as DfID, Wellcome Trust and the Gates Foundation.