

## Chronic Disease Research Growing Global



CrossMark

K. Srinath Reddy<sup>\*,†</sup>

*Geneva, Switzerland; and New Delhi, India*

The Sustainable Development Goals (SDGs), adopted by the United Nations in September 2015, set a transformational agenda for global health in many novel ways. First, they embedded health in the framework of integrated and sustainable development, in which the many domains of human welfare and planetary survival were clearly acknowledged to be inseparable and interdependent. The co-benefits of the health sector acting in concert with other sectors, such as agriculture and food systems, education, environment, poverty reduction, urban development, energy security, and women's empowerment, were emphasized as the basis for adopting a unified approach to synergistic and sustainable development.

Second, the SDGs targeted commitments and actions by all countries across the world, unlike their predecessors, the Millennium Development Goals, which were aimed only at the low- and middle-income countries. This universality of the SDGs is also the transformational tenet that moves "international health" to "global health." To put it simply, the former marked an earlier era where health experts, researchers, and funders from high-income countries went to low- and middle-income countries and asked "what can we do for you?". In the new era of global health, all countries recognize the imperatives of providing a combined response to common challenges and ask "what can we do together?". Although the early impetus for global health came from a sense of shared vulnerability (severe acute respiratory syndrome, avian flu and other zoonotic pandemic threats, bioterrorism), the momentum for global health now comes from a spirit of shared values (universal health coverage, commitment to reduce health inequities within and across populations).

It is in this broader context of a global compact for sustainable development and health equity that we must situate the third major change brought about by the SDGs in the worldview of health. Chronic noncommunicable diseases (NCDs) have finally been acknowledged by the SDGs as a major public health challenge that confronts the whole world. Within the health SDG, NCDs now form a prominent target for reduction of premature mortality younger than 70 years of age, alongside reduction of disability and promotion of well-being, which are integral to the NCD agenda [1]. These chronic diseases are now well documented to be the foremost cause of preventable deaths in the world [2,3]. Even more alarmingly, low- and middle-income countries, which presently account for 80% of all NCD-related deaths and 90% of NCD deaths younger than 60 years of age, are experiencing rapidly escalating epidemics with a mounting toll of mid-life mortality. A global thrust is needed to counter this global threat.

How will investment in global partnerships for research in the prevention and control of NCDs advance this global health agenda? Do we not know enough already, to act? Yes, we do indeed have sufficient knowledge, based on prior research conducted mostly in high-income countries, to initiate a scientifically credible policy and program response to contain and control the advancing NCD epidemics in the low- and middle-income countries. However, even this requires fresh implementation research to identify evidence-informed, context-specific, resource-sensitive culturally compatible, and equity-promoting health system interventions and multisectoral actions. Do we need to know more to act better? The answer to this question too is in the affirmative. We need to fill critical gaps in the epidemiologic understanding of the dimensions, determinants, and dynamics of the global NCD epidemics and develop more effective and affordable interventions that greatly enhance the ability to prevent and control these disorders.

Global partnerships, such as the National Heart, Lung, and Blood Institute/UnitedHealth Group Collaborating Centers of Excellence [4], can yield rich dividends in both these domains of knowledge generation and knowledge translation. While investigating the causal agents and pathogenetic pathways of NCDs thus far, etiologic research has been limited by the fact that the abundance of scientific literature contributed by high-income countries only explored these relationships in a small segment of the human population. Global health research now offers a fascinating landscape of vast opportunity for studying greater heterogeneity in individual risk factor distributions and their combinations in relation to chronic diseases, across the full population distribution of the whole human family. It opens the avenue for understanding a wide variety of gene-environment interactions and will help to identify hitherto undetected or poorly understood protective factors by drawing on the diversity that exists across different ethnic groups. Socioeconomic, nutritional, and cultural transitions that are unfolding across the world provide variations within and across populations, whose study will provide new clues on disease causation and new approaches to prevention. Burgeoning interests in epigenetics and the microbiome could not have come at a better time for global research in chronic disease causation. The value of extending study of risk factors for cardiovascular disease to multiple populations has already been demonstrated by such studies as INTERSALT, INTERHEART, and INTERSTROKE, which focused on conventional risk factors [5-7]. There is now a need to study novel risk factors and newly identified pathogenetic pathways across the larger canvas of multicountry studies.

The author reports no relationships that could be construed as a conflict of interest.

From the \*World Heart Federation, Geneva, Switzerland; and the †Public Health Foundation of India, New Delhi, India. Correspondence: K. S. Reddy. ([ksrinath.reddy@phfi.org](mailto:ksrinath.reddy@phfi.org)).

GLOBAL HEART  
© 2016 World Heart Federation (Geneva). Published by Elsevier Ltd. All rights reserved.  
VOL. 11, NO. 1, 2016  
ISSN 2211-8160/\$36.00.  
<http://dx.doi.org/10.1016/j.ghheart.2015.12.009>

The need for easily accessible and affordable health care also provides a fertile ground for innovations in low- and middle-income countries. Low-cost, high-yield health system interventions for effective prevention, early detection and care, and affordable therapies developed in resource-constrained environments are also potentially portable to the health systems of high-income countries, which are increasingly challenged by escalating healthcare costs.

Evaluation of cost-effective health care provision by technology-enabled frontline health workers, new models of integrated primary care for multiple risk factors and comorbidities, and impact of mobile phone and other information technology-mediated interventions on point-of-care diagnostics and quality of chronic continuous care exemplifies areas of high-value research that can have global benefits. The role of nonphysician health care providers in improving the outreach and effectiveness of primary health services for NCD prevention and care is particularly of great relevance [8].

The merits of investing in chronic disease-related research in low- and middle-income countries go beyond the obvious advantages of large sample sizes available for study and the low costs of conducting research. There is no doubt that large studies are easier to mount in the more populous countries. Million-strong cohort studies, with astonishingly high rates of follow-up, now place China in the forefront of epidemiologic research in chronic diseases, with unparalleled power to study interactions between multiple variables. Recruitment of the numbers needed for large clinical trials too is easier than in high-income countries with smaller populations. Large studies can also be mounted with lower costs. More important than these attractive features is the fact that science is better served by studying a wider range of human experience, both in observational and experimental research. How can the Big Data revolution ever aspire to be big, if it draws on data from only a small segment of humanity? Global science also needs to be illuminated by the collective brain power of researchers from across the world, working together to answer the big questions of our time. The intellectual prowess of low- and middle-income country researchers needs to be nurtured and creatively engaged for the collective good of humanity.

Finally, the younger demographic profile of low- and middle-income countries offers a compelling reason why the world must invest more in health research that is conducted on the platform of productive global partnerships. Young minds are universally more innovative and seek new solutions to problems with ebullient enterprise that breaks through status quo. Over the next half century,

most of the world's young persons will be living, working, exploring, discovering, and inventing in the low- and middle-income countries. Their scientific enterprise is a rich resource that must be mined, through adequate investments in research capacity building and funded collaborative research. To such partnerships in global health research, high-income country researchers not only bring their vast expertise in methodologically rigorous and well-organized research but can also help to build sound foundations of research ethics and foster appropriate scientific conduct in collaborative research. The world will be the winner through such purposeful and productive partnerships.

Thus far, truly equitable global partnerships have been far more evident and energetic in other domains of science, whereas going global has been a recent and relatively sporadic feature of health research. The transition from "international health" to "global health" has begun in the last decade. Now is the time for health sciences to grow more global in research collaboration, through substantial and sustained investments. Global investments in NCD research can build a platform that can be a model for all domains of health research, in an increasingly interconnected and interdependent world. As they say in Disney World, "it is a small world after all!"

## REFERENCES

1. Transforming our world: the 2030 agenda for sustainable development. (advance unedited version). UN Sustainable Development. Available at: <https://sustainabledevelopment.un.org/post2015/transformingourworld>; August 2015. Accessed October 24, 2015.
2. Noncommunicable diseases country profiles 2014. Geneva: World Health Organization; 2014.
3. GBD 2013 Mortality and Causes of Death Collaborators. Global, regional, and national age-sex specific all-cause and cause-specific mortality for 240 causes of death, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. *Lancet* 2015; 385:117-71.
4. Engelgau MM, Sampson UK, Rabadan-Diehl C, et al. Tackling NCD in LMIC: achievements and lessons learned from the NHLBI-UnitedHealth Global Health Centers of Excellence Program. *Glob Heart* 2016;11: 5-15.
5. Intersalt-Cooperative-Research-Group, Cooperative I. INTERSALT: an international study of electrolyte excretion and blood pressure. Results for 24 hour urinary sodium and potassium excretion. Intersalt Cooperative Research Group. *BMJ* 1988;297:319-28.
6. Yusuf S, Hawken S, Ōunpuu S, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries (the INTERHEART study): case-control study. *Lancet* 2004;364:937-52.
7. O'Donnell MJ, Xavier D, Liu L, et al. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): a case-control study. *Lancet* 2010;376:112-23.
8. Abegunde DO, Shengelia B, Luyten A, et al. Can non-physician health-care workers assess and manage cardiovascular risk in primary care? *Bull World Health Organ* 2007;85:432-40.