



## How to shape research to advance global health

Soumya Swaminathan explains how the World Health Organization's new science division can promote universal health coverage in all countries.

For seven decades, the World Health Organization (WHO) has been trusted to set the norms and standards for global health. Over the past year, the organization has been critically appraising its processes in light of technological and societal progress, and has restructured itself to focus on building up health-systems capacities. The WHO science division, which I lead, was established in March. It brings together existing research groups focused on reproductive health, infectious diseases and health-care systems. It is also charged with strengthening the WHO's capacity to promote and establish guidelines on public health, preventive care, clinical medicine and ethical research, and ensuring that emerging technologies improve safety and well-being.

In my past roles at the WHO and in India's health ministry, I have often been struck by the high expectations that governments have for WHO advice. Many countries, especially lower-income ones, are reluctant to implement policies without WHO guidance. Billions of people rely on official lists of essential medicines and diagnostics: highly vetted, evidence-based recommendations for tracking disease and prioritizing which health services should be provided.

It's a similar story with data. Although government officials might not like health statistics that show, for example, low vaccination rates or poor prenatal care, such information can motivate them to take action. The WHO is committed to making access to and transparency of health data a public good. That will improve understanding of health needs and disease burden, but countries will be reluctant to share their data unless they see real public-health benefits and feel that groups that provide data are treated fairly. Although we expect difficulties, we plan to transform the ways in which we collect, archive, manage, analyse and share data.

The science division will also help to catalyse innovation that industry and academia frequently neglect. After the 2014 Ebola outbreak, the WHO developed a list of high-priority pathogens, along with target product profiles for interventions (for instance, that a vaccine for Lassa fever should provide protection for five years after a single dose). Having clear guidelines encouraged researchers to take on these challenges, including the creation of CEPI, a coalition for epidemic preparedness, which is making progress on vaccines for Lassa fever, Nipah and Middle East respiratory syndrome (MERS).

A few weeks ago, the WHO convened stakeholders to strategize ways to advance a tuberculosis vaccine candidate, which will probably require innovative development approaches, such as public-private partnerships. The 'ring-vaccination' design used in clinical trials of the rVSV-ZEBOV Ebola vaccine in West Africa came from a collaboration of trial methodologists, virologists, statisticians and public-health experts. It delivered more than anybody thought possible: an efficacious vaccine amid a terrible outbreak.

The WHO also hopes to convene global experts to help research leaders and policymakers fill knowledge gaps on issues in their nations that will have broad practical impact. For example, cost-effective interventions for non-communicable diseases would promote health and address leading causes of death. What policies increase the consumption of fruits and vegetables by people in poverty? Where physicians are scarce, can nurses help people with diabetes to manage their condition, using decision-support systems on mobile phones? The goal is for scientists from the global south to truly take the driver's seat, so that questions and insights will address countries' needs and deliver tangible results.

We anticipate that this research will generalize to help strengthen health systems. For example, how best can digital-health tools assist front-line workers in providing quality services? Can real-time data visualization in a capital city recognize a hepatitis outbreak in one province, or a shortage of malaria bednets in another? How can countries learn to use their data to improve health systems?

Another task is to ensure that advances in technology are matched with the most pressing needs. For example, mobile phones allow information to flow rapidly to remote settings, and so enable the provision of certain health services without face-to-face visits. Artificial intelligence might do the same, but will require a regulatory framework. Medicines and diagnostics are not rolled out until their relative risks and benefits have been assessed. Health-care software should have similar requirements.

The WHO has two unique advantages for helping to decide which frameworks should be applied to emerging technology: its high credibility and

its convening power. New technologies offer endless possibilities, from machine learning for disease prediction to gene drives in mosquitoes to stop malaria. They also demand broad societal discussion of ethics, equity, justice, risks, benefits and appropriate limits, especially when technologies could harm the most vulnerable. Several experts have called for the WHO to set up an observatory or registry to record ongoing clinical studies involving therapeutic gene editing of human cells or embryos, and to collect input from the public and diverse experts to propose a global regulatory framework.

Achieving these goals for the science division will be challenging. The WHO has a surprisingly small budget for its outsized role, and must work hard to secure consensus and cooperation from funders and member countries. However, all agree on the urgency of these tasks, and the need to come together and realize them. Greater coordination of science activities within the WHO will help to make that happen. ■

THE WHO IS  
COMMITTED TO  
MAKING  
ACCESS TO  
AND TRANSPARENCY  
OF HEALTH DATA  
A PUBLIC  
GOOD.

Soumya Swaminathan is chief scientist at the World Health Organization in Geneva, Switzerland.  
e-mail: swaminathans@who.int