

Science and Technology for Global Health

This is a great honor and I thank Mr. Omi and his organization for this opportunity to take part in what has become one of the most seminal meetings in the science and technology field.

By Global Health I mean the aspiration for good health around the world; using all available resources and disciplines to address the full range of important health threats which are by definition in the national interest of all countries. Health is a practical state which means different things across the globe but science is an international language which needs education to be understood. Education changes everything. Sadly not everyone gets educated, especially girls.

So first, whenever we see gender [and the resulting health] disparities we must fight them. I like to think of it as ***If women ruled the world...***

Second we must recognize that no one can do this alone. We must not be afraid to partner. It is not a competitive sport and we must also recognize that we are **all** part of global civil society. Collaborations bring exponential improvement.

And third, the value of human life is universal and ethically beyond measure.

So how **do** science and technology contribute to global health? In a word, innovation.

Innovation is needed in what we discover; in how we do it and how we apply it and make it available to everyone who needs it. There is little point in developing new technologies of any kind if the people with the greatest need can't get their hands on them.

Let's explore the gaps from a pharmaceutical perspective.

When we think of innovation we tend to focus on discovery of molecules, targets, receptors and the development of practical applications to deliver the results of the new finding. This is the basis of pharmaceutical innovation and it has contributed significantly to the increased expectancy and quality of life so many of us enjoy.

But we will always need more medicines. Shakespeare considered it unlikely that we'd cure all disease – "that death should have play for lack of work" and it is still true four hundred years later. There are significant gaps in R&D; we need to explore both the predictable AND also hope that basic research will discover what we can't predict. But we also need new ways of using existing medicines. Combination therapies are now standard treatment for AIDS, TB and malaria. But

first someone had to have the idea that combining medicines would give better survival and that required innovation.

Sadly, neglected diseases have largely missed out on the latest advances in science and technology. But focused collaborations like WHO Tropical Disease Research Initiative bring targets and structures together. We need to reduce the cost of R&D, use innovative evaluation tools to assess safety and efficacy, especially in the developing world, hopefully reducing the need for costly clinical trials. Regulatory agencies and academia must partner to accelerate the development of new medicines. Clinical trials sites and capacities are in short supply and regulatory capability needs to improve so that new medicines for neglected diseases can be evaluated in endemic countries and not in the so-called developed world. We must unblock the R&D bottleneck.

There are approximately 4 billion people living on next-to-nothing a day. We need innovative ways to get treatments to people who do not have access because they could not afford them or because there is no health distribution system to service their needs. I paraphrase the former President of the World Bank James Wolfensohn who famously warned that we cannot just leave the drugs on the beach. First we need precise and timely forecasting of demand so that manufacturing is optimally efficient; we need public health research to help us design delivery systems and establish disease control programs and we must find innovative ways of doing business; pause by selling to institutional buyers like UNICEF/MSF we can ensure much wider distribution of life-saving treatments. And we need mobilization of sufficient resources to purchase needed quantities of authentic medicines. This requires serious, innovative culture change.

There are also innovative ways of enabling people to afford healthcare whether through microfinance in Dacca or cheap insurance in DC.

We have innovative ways to diagnose diseases – home testing kits for TB, Malaria and HIV put detection into the community, saving enormous amounts of money and giving citizens the ownership of their health.

Our chairman asked us to suggest three things that we could practically do.

1. New targets and new compounds.
2. New models and techniques for evaluation.
3. Increase clinical trial capacity
4. Increase capacity for uptake of new medicines.

A healthy world is a prosperous one and prosperity leads to stability. Technology can help us achieve this. As my friends in Lesotho say - 'together, the multitude can defeat a bull' Science and technology are part of the multitude, Disparity is the bull. Thank you.