

Research and the Millennium Development Goals

How research and development for new, innovative health tools can help reach global health targets

Research and development for new, innovative health tools are essential to achieve the Millennium Development Goals (MDGs) and enable more equitable and sustainable improvements across health services and health outcomes. Previous investments in research to develop new vaccines, drugs, diagnostics, and other tools have led to some of the greatest advances in global health to date, saving countless lives and resulting in billions of dollars in cost savings. Global health research has also contributed to significant gains in expanding and accelerating access and delivery of health tools by helping to build capacity and growth at the national level. With sustained investment and support, further gains are achievable: from the eradication of polio, to the elimination of malaria; from controlling and ending the AIDS and tuberculosis (TB) epidemics, to effectively diagnosing and treating neglected tropical diseases. However, these goals will not be achieved without the development of new and more effective technologies. Investments in developing the next generation of new global health technologies have the potential to save millions of lives and alleviate the health, social, and economic burden of diseases.

In many instances, the tools needed to achieve major improvements in health and development do not exist or are outdated. For example, more than six million people, the vast majority in developing countries, die from AIDS, TB, and malaria each year and new infections continue to outpace treatment efforts. Vaccines to prevent HIV or malaria and more effective vaccines to prevent TB are still in development. TB drugs are ineffective and outdated due to drug resistance, overly burdensome administration, and adverse interactions with

Before 2015, several new innovative technologies could accelerate our ability to achieve the MDGs:

The **RTS,S malaria vaccine** candidate is currently being tested and could be available for young children as early as 2013. Such a vaccine would reduce the burden of sickness and death from malaria.

The recently WHO-approved **MenAfriVac™ meningitis vaccine** is an inexpensive solution to ending the plague of yearly meningitis epidemics in Africa, which can attack as many as one out of every hundred people.

New **diagnostic tests for tuberculosis** offer the potential to more quickly and easily identify infection and could speed treatment to improve chances of survival for patients and reduce burdens on health worker time.

The recently-announced results of an advanced clinical trial of an **ARV-based microbicide** offer new hope for women's HIV prevention. Though more testing is needed, a microbicide could give women the power to protect themselves with or without their partners' cooperation.

New devices to apply contraceptives, such as Depo-Provera in Uniject®, could help women in the developing world avoid unplanned pregnancies—which make up an estimated 25 percent of all pregnancies—and protect both mothers and their families.

New insecticides could help control insects that spread diseases such as dengue fever, Chagas, filariasis, and leishmaniasis. These new insecticides could be sprayed indoors and used in bed nets to prevent mosquitoes and other insects from biting people inside their homes.

HIV/AIDS treatment. Neglected tropical diseases—such as dengue fever, leishmaniasis and African sleeping sickness—affect more than one billion people annually. Many of these diseases have no effective treatment, while treatments for others are outdated. The lack of effective tools that are affordable and appropriate in limited-resource settings remains an important obstacle to attaining the health-related MDGs. If a sustained impact on global health outcomes is to be realized and global targets for disease control and elimination are to be met, research to develop new technologies must continue through 2015 and beyond.

Progress toward achieving the MDGs

Dramatic achievements have been made since the MDGs were first established in 2000, but substantial progress is needed to attain the goals by 2015 and maintain the spirit and intent of the MDGs beyond the 2015 timeframe. Capitalizing on the fruits of science, research, and innovation will help realize the goals, contribute to successes over the long term, and can have an impact on:

Improved health through new technologies

Research suggests that advances in health and medical technologies have been the major drivers behind massive improvements in health worldwide over the past century¹, resulting in an average increase in life expectancies of 21 years in low- and middle-income countries between 1960 and 2002.² Despite these advances, major disease burdens in the developing world—and wide health inequities between rich and poor countries—persist. New health technologies to address these disease burdens are urgently required. The table on page one highlights some of the new technologies on the verge of being introduced or with the potential to be introduced before 2015, and many more are being developed to address diseases that continue to plague low- and middle-income countries. Whether for new vaccines, diagnostic tests, contraceptive-

delivery methods, or a microbicide, we must increase investment in the research and development of new tools and rapidly expand access to them as soon as they are available in order to maximize their impact and save lives. By improving governments' ability to introduce, deliver, and scale up these new technologies, key gains in strengthening health systems can be achieved—for example, through improved ability to forecast demand, plan, and budget for the introduction of a new product and strengthened regulatory capacity for testing, licensure, and introduction of new technologies.

Improved economic development through better health, and strengthened capacities for science, technology, and innovation

Investments in research and development can significantly contribute to broader development goals, including economic growth and poverty reduction. Disease is a major barrier to economic growth: ten percent to 15 percent of economic growth in developing countries between 1960 and 1990 is attributable to reductions in mortality, even when accounting for other growth factors such as trade and infrastructure.³ By significantly reducing or removing disease burdens, new health technologies can help unleash potential for economic growth and poverty reduction in low- and middle-income countries.

Even beyond this direct impact on health, and the broader effects on development, investments in health research can help strengthen capacities for science, technology, and innovation in low-resource settings, and contribute to economic growth and poverty reduction. Research shows that countries' capacities to absorb, use, adapt, and eventually generate new technological advances are major drivers of economic growth. The health research and biopharmaceutical sectors can be key contributors to economic growth. Countries at all stages of development are implementing strategies to foster indigenous health research and biopharmaceutical capacities, both to ensure access to essential

¹ Jamison D. Investing in Health. In: Bremen J, Measham A, Alleyne G, Claeson M, Evans D, Prabhat J, Mills A, Musgrove P. eds. *Disease Control Priorities in Developing Countries*. New York, NY: Oxford University Press; 2006.

² World Bank. World Development Indicators. 2004.

³ Jamison, D, Lau L, Wang J. Health's Contribution to Economic Growth in an Environment of Partially Endogenous Technical Progress. In: Lopes-Cassanovas G, Rivera B, Currais L. eds. *Health and Economic Growth: Findings and Policy Implications*. Boston, MA: Massachusetts Institute of Technology; 2005: 67-91.

medicines, and to contribute to economic diversification, growth, and poverty reduction. Health research focusing on diseases of the developing world necessarily involves investments in clinical and laboratory infrastructure and human resources in developing countries, as well as close collaboration with governments to build a supportive policy and regulatory environment for health innovation and access. Strengthening health-related science and research capacities among developing country partners is crucial to economic growth, and can also help develop capacities that are transferable to other sectors, such as climate change technology, food security and hunger, and safe water.

The way forward

Even after 2015, research for new global health tools will be needed to address issues such as drug and insecticide resistance, new infectious disease threats, or technologies which remain outdated and ineffective. As a long-term approach to global health and development is considered, it is imperative that science, research, and innovation remain key components of a comprehensive strategy.

Sustained investments in research for the next generation of global health tools can help ensure that in the ongoing fight against diseases worldwide, innovative technologies place us on the winning side of this battle. For example, new health tools, such as vaccines, could have game-changing impacts in the fight against disease. An HIV/AIDS vaccine with 50 percent efficacy given to just 30 percent of adult population could prevent nearly one-quarter of all new infections between 2015 and 2030.⁴ A modeling study in Southeast Asia showed that mass vaccination with a new and effective TB vaccine



Photo credit: PATH/Aurelio Ayala III
Developing new global health tools can help reach the MDG target of reducing child deaths worldwide.

could prevent most—80 percent—people from getting sick with TB by 2050.⁵ In the run-up to the MDGs and beyond, it is crucial that national governments integrate research into their strategic plans to achieve global health and development goals. By prioritizing and elevating science, research, and innovation, countries around the world can help ensure that new vaccines, drugs, microbicides, diagnostics, insecticides, and other products offer their full potential to solve or slow diseases and save millions of lives each year. Research, science, and innovation for global health have the potential to transform societies and save lives worldwide well into the future. Supporting the crucial efforts to develop new health tools can help ensure that the most effective solutions for global health are available to help meet the MDGs and tackle health challenges beyond 2015.

⁴ Estimating the Impact of an AIDS Vaccine in Developing Countries [policy brief 20]. New York: IAVI; 2009.

⁵ Abu-Raddad L, Sabatelli L, Achterberg J, Sugimoto J, Longini I Jr, Dye C, Halloran M. Epidemiological benefits of more effective tuberculosis vaccines, drugs and diagnostics. In: *Proceedings of the National Academy of Science (USA)*. 106(33):13980-5; 2009.

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About the Global Health Technologies Coalition

The Global Health Technologies Coalition (GHTC) is a group of more than 30 nonprofit organizations working to increase awareness of the urgent need for tools that save lives in the developing world. These tools include new vaccines, drugs, microbicides, diagnostic tests, and other devices. The coalition advocates for increased and effective use of public resources, incentives to encourage private investment, and improved regulatory systems. Learn more at www.ghtcoalition.org.