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Global Health
INITIATIVE

Global Health Medical Technologies: Status Critical

Thanks to medical research over the last 40 years, illnesses such as cancer and heart disease can be diagnosed earlier and treated more effectively. But for other diseases, which affect half the world's population, improvements in treatments have been less impressive. Millions continue to die from a lack of safe, practical vaccines and drugs for HIV, malaria, tuberculosis (TB), and the aptly named neglected tropical diseases.

Over the last 20 years, new initiatives have sprung up designed to speed along research and development of global health medical technologies. Already we are starting to see that investing in global health research pays off as new drugs and diagnostics are being developed and new medical tools are being tested in clinical trials worldwide. Nevertheless, the gap between what's available and what's needed is still large.

Much more needs to be done—research and development efforts need to be intensified and research dollars scaled up.

Status of Global Health Medical Technologies

	HIV/AIDS	Tuberculosis (TB)	
Prevalence	<ul style="list-style-type: none"> • 33 million people were living with HIV as of 2007. • 2.5 million people were newly infected with HIV in 2007. • HIV/AIDS is endemic in the Americas, Asia, Sub-Saharan Africa, and the Caribbean. 	<ul style="list-style-type: none"> • 8.8 million people develop active TB every year, and 2 billion people are currently infected with a latent, inactive form of the disease. • In 2005, there were 424,000 cases of multidrug-resistant TB (MDR-TB) and 27,000 cases of extensively drug-resistant TB (XDR-TB). 	
Prevention	<ul style="list-style-type: none"> • There is currently no vaccine against HIV. Clinical trials are being conducted worldwide. • A vaccine—even a partially effective one—has the potential to curb the HIV pandemic. • Microbicides (topical gels or creams that may prevent infection by HIV) are being developed and tested. 	<ul style="list-style-type: none"> • The only TB vaccine, BCG, was developed in 1921. BCG is still used to immunize infants, but it does not protect adults against the most prevalent form of TB. • An ideal vaccine would protect against all strains of TB in both children and adults, and it would be safe for use by people taking HIV drugs, as people with HIV are at high risk of TB infection. • Several potential vaccines are being tested in clinical trials. 	
Treatments	<ul style="list-style-type: none"> • There is no cure for HIV/AIDS. • More than 20 antiretroviral drugs are available to slow the spread of HIV, but they have significant side effects and have to be taken every day. Resistance to these drugs can also develop. 	<ul style="list-style-type: none"> • Today's TB treatments are more than 40 years old, are only partially effective, and can take 6-9 months to administer. • Simpler, shorter treatment courses are needed, especially for multi and extensively drug-resistant TB. • Preclinical and clinical trials are underway to develop a new treatment. 	
Diagnostics	<ul style="list-style-type: none"> • A range of reliable diagnostics is available worldwide. 	<ul style="list-style-type: none"> • The most commonly used diagnostic, sputum microscopy, is unreliable and more than 100 years old. • Because TB is airborne, rapid diagnostics are vital to TB control efforts. 	
Funding Needed For Research and Development	<ul style="list-style-type: none"> • An estimated \$1.2 billion is needed annually to develop a safe, effective HIV vaccine. • About \$280 million is needed for research toward a safe, effective microbicide. 	<ul style="list-style-type: none"> • \$900 million is needed every year for the next 10 years to develop new TB tools through the Global Plan to Stop TB. 	
NIH Spending	<ul style="list-style-type: none"> • In 2007, NIH spent \$597 million on vaccine research and \$99 million on microbicide research. 	<ul style="list-style-type: none"> • In 2007, NIH spent \$166 million on TB research. 	

	Malaria	Neglected Tropical Diseases	
	<ul style="list-style-type: none"> • 350–500 million malaria cases occur per year. • Malaria is endemic in more than 100 countries worldwide. Sub-Saharan Africa and Southeast Asia carry the greatest burden. 	<ul style="list-style-type: none"> • Together, neglected tropical diseases (NTDs) affect 1 billion–1 in 6–people worldwide. • NTDs are most heavily concentrated in Africa and Latin America. • Because many NTDs cause severe disfigurement, their victims are often isolated, neglected, and stigmatized. 	Prevalence
	<ul style="list-style-type: none"> • There is no malaria vaccine. Promising potential vaccines are being developed and tested worldwide. • Preventive drugs (known as anti-malaria prophylaxis) can be taken to prevent malaria, but only on a short-term basis. • Bed nets and insect sprays have been developed to hinder the spread of malaria. 	<ul style="list-style-type: none"> • Vaccines are the best prospect for sustainable control of NTDs, yet there are no vaccines for most of these diseases. 	Prevention
	<ul style="list-style-type: none"> • New drugs known as artemisinin-based combination therapies (ACTs) have generally proven to effectively treat malaria, but resistance to them is growing. 	<ul style="list-style-type: none"> • Five NTDs (trachoma, soil-transmitted helminths, onchocerciasis, schistosomiasis, and lymphatic filariasis) can be treated simultaneously by administering integrated treatment programs. • Treatments are extremely limited for the other eight diseases considered to be NTDs. They are often toxic or impractical to administer in poor communities without developed health care systems. More research is needed to develop treatments for these NTDs. 	Treatments
	<ul style="list-style-type: none"> • Current diagnostics require advanced lab technology. New, rapid diagnostics are needed for use in developing countries without this technology. 	<ul style="list-style-type: none"> • Many of the current diagnostics are cumbersome and invasive. • Simple, accurate, inexpensive diagnostics are needed. 	Diagnostics
	<ul style="list-style-type: none"> • \$1 billion is needed for research and development for a malaria vaccine and new treatments. 	<ul style="list-style-type: none"> • \$500 million a year is needed in order to spur advances in medical technologies for NTDs. 	Funding Needed For Research and Development
	<ul style="list-style-type: none"> • In 2007, NIH spent \$104 million on malaria research. 	<ul style="list-style-type: none"> • In 2006, NIH spent \$107 million on research for neglected tropical diseases. (Estimate based on NTD spending by NIAID, the main NIH institute for tropical and infectious disease research.) 	NIH Spending

Global Health Initiative ■ Families USA
1201 New York Avenue NW, Suite 1100 ■ Washington, DC 20005
202-628-3030 ■ www.familiesusa.org/issues/global-health/

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