advancing **innovation** to save lives

GHTC
global health technologies coalition

The Honorable Shalanda Young
Acting Director
Office of Management and Budget
725 17th Street NW
Washington, DC 20503

September 17, 2021

Dear Acting Director Young:

As members of the Global Health Technologies Coalition (GHTC)—a group of 38 nonprofit organizations, academic institutions, and aligned businesses advancing policies to accelerate the creation of new drugs, vaccines, diagnostics, and other health tools for enduring and emerging global health threats—we write to highlight the critical role of US programs that support global health research and development (R&D) and encourage your continued support for this important work in the fiscal year 2023 (FY23) budget request.

US investment in the development of new vaccines, drugs, devices, diagnostics, and other health technologies is essential to addressing some of the world's greatest health challenges—achieving an AIDS-free generation; ending malaria, tuberculosis (TB), and neglected tropical diseases (NTDs); ending preventable maternal and child deaths; protecting us from antimicrobial resistance (AMR); and most urgently, ending the COVID-19 pandemic and preventing future outbreaks of emerging infectious diseases. The COVID-19 pandemic has demonstrated that R&D must be the tip of the spear of our response to, and prevention of, global health emergencies. Our lack of tools designed for use in all settings to prevent and treat this disease—and the inequitable global distribution of available tools—has wreaked havoc on the global economy and strained vulnerable health systems to their breaking point.

While the need for continued R&D for COVID-19 remains pressing, and the impact of the COVID-19 tools developed to date becomes clearer, we have decades of evidence that federal funding for global health R&D broadly yields a significant return on investment for the United States: creating jobs, growing the economy, expanding US R&D capacity, leveraging private-sector and nonprofit-sector funding, and saving costs in health treatment and services—significant benefits in addition to protecting American health and security. These are a few illustrative examples:

- Development of a safe and effective COVID-19 vaccine on a dramatically compacted timeline was conceivable only because of past US government investments in global health R&D which have fueled new biotechnologies, manufacturing platforms, and clinical trial methods. In fact, nearly every advanced COVID-19 vaccine candidate supported by the US government was built on previous vaccine research for other global health threats, including Zika, Ebola, SARS, MERS, HIV/AIDS, malaria, TB, and pandemic influenza.
- US government funding for COVID-19 R&D has enabled progress towards at least 91 health innovations including diagnostics, therapeutics, vaccines, and medical devices—a testament to how quickly science can progress with focused investment.
- US investment in global health R&D between 2007 and 2015 supported the development of an impressive array of life-saving health technologies, including at least 11 new products for

malaria, 10 for TB, 2 for HIV/AIDS, and 4 for Ebola.

- 89 cents of every US government dollar directed to global health R&D during that period were invested within the United States.
- Between 2007 and 2018, US government investment in global health R&D injected $14.5 billion into the American economy. This investment is estimated to have created 240,000 new jobs and generated an additional $40 billion in economic output.

As you develop the fiscal year 2023 (FY23) budget, we urge you to sustainably grow global health R&D investments at agencies within the Department of State, including the US Agency for International Development (USAID); the Department of Defense (DoD); and the US Department of Health and Human Services (HHS), including the National Institutes of Health (NIH), the Centers for Disease Control and Prevention (CDC), and the Biomedical Advanced Research and Development Authority (BARDA). At this time of continued global crisis, the Administration must make forward-looking choices to respond to the health emergency before us and draw on the painful lessons emerging from it to ensure that we are primed and ready for the next health threat—while also committing to continue progress against the full range of enduring global health challenges. **Global health R&D, which improves the lives of people around the world while creating jobs, spurring economic growth, and supporting US interests and health security, is a win-win investment from both a strategic and humanitarian perspective.**

As COVID-19 infections continue to rise around the world, the global health community is urging funding increases for core global health programs in FY23—both to protect progress made against historic threats and to treat and prevent COVID-19 and its secondary impacts. **Recognizing that we remain in the middle of an unprecedented global health emergency, GHTC's minimum and recommended funding levels for FY23 are as follows:**

(in millions)	**FY23 Minimum Funding Level** ***(Highest of FY21 enacted or House proposed FY22)***	**FY23 Recommended Funding Level**
USAID		
SIGHT Fund for global health R&D **(*NEW LINE*)**	N/A	$750 *available through FY25*
HIV/AIDS	$330	$350
Malaria	$820	$1,000
Maternal and Child Health	$879.95	$1,012
Neglected Tropical Diseases	$112.5	$150
Nutrition	$160	$300
Tuberculosis	$469	$1,000
Global Health Security	$1,000	$1,000
Family Planning in all accounts	$830	$1,740
State Department		
PEPFAR	$4,520	$5,020
Global Fund	$1,560	$2,000

CDC		
Center for Emerging Zoonotic and Infectious Diseases	$674.3	$900
Center for Global Health	$842.8	$1,142.6
of which Global Public Health Protection	$448.2	$503.2
of which Global Tuberculosis	$9.2	$21
NIH		
National Institute of Allergy and Infectious Diseases	$6,557.8	$7,036.5
Office of AIDS Research	$3,290	$3,845
Fogarty International Center	$96.8	$106.8
BARDA		
Emerging infectious diseases (EIDs) **(*NEW LINE*)**	N/A	$500
Antimicrobial resistance in all accounts		$500
DoD	Robust agency-wide funding for global health R&D	Robust agency-wide funding for global health R&D

As evidenced by the COVID-19 pandemic and the preceding Zika and Ebola epidemics, health crises overseas can quickly become health crises at home. Protecting the well-being of Americans requires a globally focused, whole-of-government approach: purposeful, coordinated investment in global health R&D is not only critical to combating health threats abroad but also to promoting global health security.

Each US agency involved in global health R&D occupies a unique niche in the fight against global disease and provides skills and leadership that are complementary in scope. Together they support the development, scale-up, and introduction of affordable health products, policies, and practices that promote health in low- and middle-income countries and the United States.

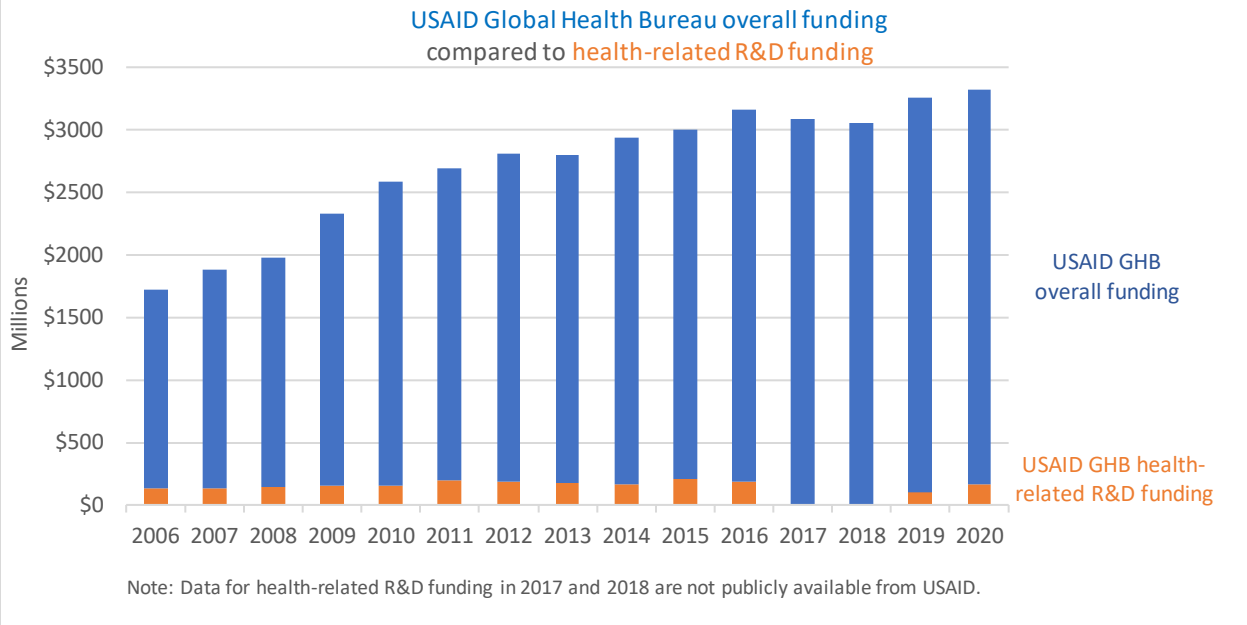
US Agency for International Development

For decades, USAID has supported the development, introduction, and scale-up of affordable health products that save lives and lower health treatment costs in low- and middle-income countries. Through partnerships with nonprofit and private-sector organizations, USAID has fostered impressive innovations for critical health technologies, including:

- Supporting research to develop safe, effective, accessible, and acceptable tools for use in the developing world to prevent **HIV/AIDS**, including investigational HIV vaccines; microbicides and a microbicide vaginal ring to prevent HIV infection in women; and a rapid, disposable HIV/AIDS diagnostic test for infants supported through a Saving Lives at Birth award.

- Playing a key role in the global effort to fight **TB** by supporting research to develop innovative, new drug regimens and diagnostics for drug-susceptible and drug-resistant TB, including the world's first child-friendly TB medicines, developed with critical seed funding from USAID and introduced in 2015; a new, FDA approved, all-oral six month regimen for the treatment of extensively drug-resistant TB; and a new all-oral treatment regimen that reduces the time it takes to treat drug-susceptible TB from six months to four months. USAID expertise on implementation and scale-up of these innovations is a critical piece of the product development cycle and should continue to be prioritized.
- Supporting the development of vaccines, antimalarials, insecticides, and novel vector control tools against **malaria**, including a promising single-dose cure and the child-friendly malaria drug Coartem® Dispersible, which has been distributed in over 50 countries and has saved an estimated 980,000 child lives since its introduction in 2009.
- Developing interventions to help **women and children** during childbirth in low-resource settings that may not have consistent access to electricity, refrigeration, trained health workers, or other resources, such as oxygen therapies.
- Supporting development of drugs and diagnostics for a select group of **NTDs**, including tools to fight dengue and other mosquito-borne diseases that have been deployed from Indonesia to the Florida Keys with promising results.
- Innovating solutions to tackle **malnutrition**—which still contributes to more than 40 percent of preventable childhood deaths and myriad other health effects—through evidence-based food technology solutions such as **micronutrient supplements**, **fortified foods**, and **biofortified, nutrient-rich staple food crops**.
- Sourcing and scaling up breakthrough innovations to combat **infectious disease epidemics** including Ebola and Zika. USAID's Fighting Ebola Grand Challenge—led by the Center for Innovation and Impact (CII), which applies business-minded approaches to accelerate the research, development, and scale-up of health innovations—identified 1,500 innovative technologies to advance the fight against Ebola and advanced 14. One of these technologies is a low-cost, battery-powered tool used during both the Ebola and COVID-19 responses that manages the flow rate of IV treatments with a simple gravity system, replacing the need for expensive, difficult-to-use infusion pumps. The Combating Zika and Future Threats Grand Challenge received over 900 crowdsourced technology proposals and selected 26 projects to fund, which cut across vector control, surveillance, diagnostics, and other interventions. Aiming to build on this legacy of impact, in March 2020, USAID issued a request for information for proposals for **low-cost, scalable innovations that could support the international COVID-19 response**, including new products and service delivery approaches. It received hundreds of proposals for potentially game-changing innovations, but **without dedicated funding to advance and scale these proposals, USAID has made limited investments in COVID-19 R&D despite the enormous scale of global need**.

The lack of readily available, flexible funding for global health R&D at USAID has been demonstrated to dramatic—and devastating—effect during the COVID-19 pandemic but follows a trend that far predates this emergency. Over the past fifteen years, while US funding for global health has nearly doubled, **USAID spending on global health R&D has stagnated, shrinking as a proportion of total global health spending**. Now at under two percent of overall US global health investments through USAID and the State Department, R&D funding has been far outstripped by the growing needs for new tools in the face of growing AMR, shifting disease burdens, and emerging disease threats.



There are several structural limitations that contribute to this concerning trend. The USAID Global Health Bureau's approach to investing in R&D leaves funding decisions to the inclinations of individual disease and health area program offices within the Bureau without significant cross-cutting or coordinated oversight. These offices face difficult decisions between funding immediate program and delivery needs and investing in innovations that might improve outcomes and reduce costs in the future—a perceived trade-off that tends to deprioritize innovation. But with progress plateauing across so many global health goals—even *before* the massive disruptions wrought by the COVID-19 pandemic—it is clear that "more of the same" will not get us across the finish line for global health challenges that the US government has invested in for decades. Scaling up global health tools that work and doubling down to develop innovations that work better are two sides of the same coin, and both must be resourced.

For this reason, in FY23, **GHTC proposes the creation of a new USAID SIGHT (Supporting Innovative Global Health Technologies) Fund with an initial appropriation of $750 million in multi-year funding available through FY25**. The SIGHT Fund would be a new source of flexible funding for global health R&D that would:

- Increase the net proportion of spending on R&D within the Global Health Bureau without siphoning off funds from disease-specific program offices.
- Provide more flexibility and predictability for program managers who make R&D investment decisions—and shift the risk burden of these investments away from programs already stretched thin by the requirements and secondary impacts of COVID-19, allowing them to make bolder, more forward-thinking R&D investment decisions.
- Enable greater investments in cross-disease health tools which currently struggle to find support in the siloed, disease-specific funding structure of the Global Health Bureau—as well as innovations to address other challenges, such as AMR, which lack a dedicated program office.
- Institutionalize innovation as a core USAID global health priority by creating healthy competition for R&D funding, prompting disease-specific program offices to more frequently and critically reflect on gaps and the innovations needed to fill those gaps to achieve US global health goals.

To ensure its success, the SIGHT Fund should be housed within the Global Health Bureau and administered by forward-looking leaders able to assess a variety of innovation needs across disease and

health areas and identify the most promising opportunities to accelerate product development. Key qualities of decisionmakers determining outlays should include direct experience in biomedical product development, multi-sector partnerships, human-centered design, clinical trials, regulatory processes, market-shaping, and global health program implementation.

The process for innovation proposal review and investment decision-making should center the perspectives and priorities of affected communities and local innovators. USAID leadership should consider new avenues for collecting, assessing, and incorporating such feedback to ensure that the SIGHT Fund becomes a mechanism to center diversity, equity, and inclusion at every stage of product development—and that investments both accelerate progress towards health targets in the near term and build innovation capacity in partner communities in the long term. Promising models might include building in a decision-making role for Community Advisory Boards, designating a portion of the Fund to be eligible for direct proposals from innovators in low- and middle-income countries, including access and affordability provisions in funding agreements, and many other exciting approaches drawn from recent efforts to better center the leadership and equity of affected communities in R&D.

To achieve maximum gains from SIGHT Fund investments, awards should prioritize investments in stages and types of R&D that are not prioritized elsewhere in the US government or wider research ecosystem—such as the valleys of death between pre-clinical and clinical research and product approval and scale-up.

Finally, to ensure that the Fund supplements, rather than supplants, existing funding and partnership models for global health innovation across the Global Health Bureau, leadership should consider including a matching requirement or cost-sharing bonus for awards from the SIGHT Fund to program offices—linking core global health funding appropriated by health area to catalytic matching investments from the SIGHT Fund.

In addition to standing up this new R&D funding mechanism, USAID should continue to strengthen partnerships with global innovation partners in FY23, particularly the Coalition for Epidemic Preparedness Innovations (CEPI). A US contribution of $200 million to CEPI in FY23 will support their critical work to advance development of new vaccines for emerging infectious diseases with pandemic potential, which will complement and reinforce US pandemic preparedness and response efforts by ensuring equitable global access for underserved communities in low- and middle-income countries. While US support for CEPI's work on COVID-19 through the allocation of emergency supplemental funding from the American Rescue Plan Act remains pressing, sustained US support is also needed for CEPI's enduring mission to ensure the world is prepared for the next pandemic threat by advancing efforts to compress the vaccine development timeline for emerging infectious diseases to 100 days, including through the development of prototype pathogen research targeting high-risk virus families and beginning early-stage development of vaccines for future viral threats.

USAID bilateral investments in global health R&D and investments through outside partners should be delineated in the agency's next five-year strategy for health-related R&D which should be developed and released in the coming year, ideally through in-depth consultations with the agency's innovation partners. To improve transparency, the congressionally directed annual reports on this strategy should include specific funding amounts dedicated to research and product development by each program; specific information about health product development goals and timelines; details about USAID investments in drugs, vaccines, diagnostics, and devices; details about collaborations with other federal agencies and private-sector partners; and an assessment of any critical gaps in product development for global health and recommendations for filling such gaps. This report is critical to providing insight and transparency into how USAID thinks strategically about R&D investments. In recent years, however, these reports have not consistently been made public—a trend that should be reversed to enable transparency and foster open collaborations among global health R&D stakeholders.

As we grapple with the enormous impact of COVID-19 on every aspect of global health, **GHTC strongly recommends funding the Global Health Programs account at or above the minimum funding levels noted in the table above, urging USAID to invest in R&D for new global health innovations in each of the disease and condition areas within the account, and supporting the creation of a new SIGHT Fund to center innovation as a core global health priority and support progress towards desperately-needed global health tools.**

Department of Health and Human Services

Institutions within HHS—including **CDC, NIH,** and **BARDA**—make major contributions to the development of new global health technologies.

Centers for Disease Control and Prevention

CDC leads global disease surveillance, capacity building, and the development of new tools and technologies critical to global health—such as diagnostics to identify global threats like COVID-19, Ebola, and the bubonic plague. It is a lead implementer in the Global Health Security Agenda, a partnership of more than 60 nations that works to build capacity in low- and middle-income countries to rapidly detect global health risks, prevent them when possible, and respond effectively when they occur. Funding for Global Health Security at CDC has also supported the development of National Public Health Institutes in more than 25 countries over the past decade to help streamline public health activities and enable improved disease detection and outbreak response. In many countries, these CDC-supported entities are now leading their country's COVID-19 response activities. The thread connecting all of CDC's international activities is the agency's scientific and technical leadership, which makes CDC an integral part of the global health R&D ecosystem. For example, CDC has developed an HIV rapid test that can diagnose HIV in minutes and distinguish recent from long-standing HIV infection. This test, now commercialized by two manufacturers, is being integrated into routine HIV testing services in 17 PEPFAR-supported countries to establish a real-time HIV surveillance and response system.

Within CDC, the **Center for Global Health** (CGH) provides expertise on immunizations, disease eradication, and public health capacity-building around the globe through its Divisions of Global HIV & TB, Parasitic Diseases and Malaria, Global Public Health Protection, and Global Immunization. Among the far-reaching and high-impact work of CGH, one main priority is to "research, develop, and evaluate new tools and approaches to combat global health threats." As a global hub for infectious disease research, CGH is uniquely equipped to develop and validate tools for disease surveillance and diagnosis. These tools are critical not only for tracking events of public health importance, such as emerging infectious diseases, but also for monitoring the impact of US global health programs in settings that might otherwise have limited data collection capacity. CGH operates in some countries where USAID does not have a presence, extending the reach of US global health programming, and provides critical scientific and technical support to other agencies and interagency global health initiatives such as PEPFAR, the President's Malaria Initiative, and USAID's NTD Program.

As a division of CGH, the Division of Parasitic Diseases and Malaria (DPDM) works to protect Americans and those living abroad from malaria and other parasitic diseases that can cause blindness, malnutrition, and disfigurement. One of DPDM's priorities is to develop tools for detecting, preventing, and eliminating parasitic diseases, with an emphasis on curtailing drug and insecticide resistance. With the additional funding requested by the Administration in FY21 and continued budget growth, DPDM will be resourced to manage a growing domestic workload while also supporting innovation for improved tools.

In complement to CGH, CDC's **National Center for Emerging Zoonotic and Infectious Diseases** (NCEZID) provides advanced laboratory services and molecular detection techniques that enable researchers to understand and monitor infectious diseases, identify new infectious diseases of unknown origin, and develop new diagnostic tests and other tools to combat global health challenges. For example, NCEZID developed Trioplex, a diagnostic that can differentiate Zika, dengue, and chikungunya viruses, and supports early-stage R&D of vaccines for infectious diseases such as Nipah virus infection and dengue, Lassa, and Rift Valley fevers.

The NCEZID Office of Advanced Molecular Detection (AMD) uses DNA sequencing and advanced computing technologies to study infectious diseases, revealing insights about their basic biology that is critical to developing diagnostics, drugs, and vaccines. For instance, AMD played a vital role in determining the genetics of Ebola and Zika. These advanced capabilities are today being leveraged for the COVID-19 response: AMD is leading the SARS-CoV-2 Sequencing for Public Health Emergency Response, Epidemiology, and Surveillance (SPHERES) initiative, a national genomics consortium coordinating SARS-CoV-2 sequencing across the country that provides crucial information to track the spread of the virus and emerging variants. NCEZID serves as an international reference hub for vector-borne viral and bacterial diseases and plays a leading role in the National Strategy for Combating Antibiotic-Resistant Bacteria to prevent, detect, and control outbreaks of antibiotic-resistant pathogens which pose a growing threat to public health—including drug-resistant TB.

Prior to the spread of COVID-19 in 2020, TB was the world's leading infectious disease killer, impacting individuals and families around the world—including in all 50 states of the United States. The **Tuberculosis Trials Consortium (TBTC)** is a collaboration of researchers from CDC and other domestic and international partners that conduct research on the diagnosis, clinical management, and prevention of TB infection and disease relevant to improving TB programming, such as that led by USAID. TBTC has a strong record of research success: its clinical trials—which have enrolled more than 14,000 patients and volunteers around the world over the last 20 years—have supported the development and implementation of new lifesaving TB technologies and significantly improved global TB treatment and prevention guidelines, including by developing precision medicine approaches that reduce costs to patients and health care systems. **TBTC is operated by the Division of Tuberculosis Elimination (DTBE) within the National Center for HIV/AIDS, Viral Hepatitis, STD, and TB Prevention**. Funding to DTBE has been flat for 20 years, resulting in a 49 percent loss in real funding between fiscal years 1994 and 2016. Further, between fiscal years 2005 and 2016, DTBE reduced its share of spending on TB research from 20 percent to 10 percent. DTBE needs sustainable funding increases to continue and build on its progress in TB research. This is especially critical now because COVID-19 research, which has benefited from past investments in TB R&D, has redirected respiratory disease control resources and expertise from DTBE and its ongoing TB research. Funding for TB R&D at CDC, in addition to other US agencies, including NIH and USAID, should be increased to reach the United States' fair share funding target as identified at the recent United Nations High-Level Meeting on TB, which would amount to just 0.1 percent of US gross domestic expenditure on R&D.

CDC was appropriated significant supplemental appropriations in the COVID-19 relief bills, including robust funding for global activities, but its core annual appropriations must be steadily increased to sustain this vital work and prepare for the next great global health challenge. Investments in CDC's global activities have a direct impact on American global health security. As COVID-19 stretches health systems around the world to their limit, years of hard-won progress against persistent global health threats like HIV/AIDS, malaria, TB, and NTDs are at risk. Robust funding for all of CDC's global health functions is essential to mitigate this damage and ultimately ensure that Americans are protected from a range of enduring and emerging health threats. These investments are all interrelated and complementary: CDC's investments in global health security have laid the foundation for the agency's global response to COVID-19, and these investments were built on decades of sustained efforts to

combat HIV, malaria, and TB; eradicate polio; and prepare for and detect influenza and other pandemic threats. The entire ecosystem of CDC's global health work requires robust funding if our efforts to defeat COVID-19 globally, prepare for the next pandemic, and protect global health security are to succeed.

National Institutes of Health

The National Institutes of Health (NIH) excels at basic and early-stage biomedical research, unlocking scientific discoveries that can later be translated into lifesaving global health technologies by the private sector, nonprofits, and other US agencies. While NIH primarily facilitates basic research on global health challenges through intramural programs and external grants to universities, nonprofits, and other organizations across the United States, its ongoing investment in clinical trials for HIV/AIDS and, increasingly, trials for malaria and tuberculosis products, also makes it one of the biggest global funders of clinical development in each of these disease areas.

Strong, steady investments in NIH over the last decade enabled the agency to lead the development of new technologies to combat COVID-19 at unprecedented speed. There are only two other known coronaviruses that can cause fatal diseases: SARS-CoV, which appeared in 2002, and MERS-CoV, which appeared in 2012. NIH funded and conducted extensive research on both, developing animal models, treatments, and vaccines. These past investments enabled NIH scientists to quickly understand and immediately respond to COVID-19 with focused research and accelerated development of diagnostics, therapeutics, and vaccine candidates. Because of this foundation of research on coronaviruses, made possible through robust funding, NIH scientists, within two weeks of discovering COVID-19, were able to determine how the virus enters cells; within two months, develop the world's first COVID-19 vaccine to enter human trials; and within five months, devise a comprehensive strategic research plan and distribute more than 310 research grants averaging $1.5 million each. Over the past year and a half, NIH has launched and led two public-private partnerships to create new therapeutics and diagnostics for COVID-19, the Accelerating COVID-19 Therapeutic Interventions and Vaccines (ACTIV) public-private partnership and the Rapid Acceleration of Diagnostics (RADx) initiative. Now powered by significant supplemental funding from COVID-19 relief bills, ACTIV was initially driven by the agency's discretionary funding, an example of how growing base funding for NIH allows for rapid reallocation of resources as health needs emerge and shift.

While the agency's contributions to COVID-19 are top of mind today, for decades NIH has been a driver of innovation for a range of enduring global health threats, with several institutes and centers serving as hubs for different elements of R&D. The **Fogarty International Center (FIC)** plays an important role in accelerating science, partnerships, and technical assistance to advance new technologies for some of the world's most pressing health challenges. With less than one-quarter of one percent of the total NIH budget, Fogarty delivers significant scientific returns for global and American health, forging international partnerships to facilitate global research. Many FIC-trained scientists now hold high-ranking academic and government positions around the world and have made critical contributions to long-standing global public health challenges, such as HIV/AIDS, and emerging threats, like Zika and Ebola.

While FIC has contributed to significant progress, COVID-19 has made it clearer than ever that science capacity gaps remain between low- and middle-income countries (LMICs) and high-income countries. For instance, many LMICs have limited mathematical modeling capacity, a critical science for monitoring, predicting, and responding to the spread of infectious diseases. Modeling can be used, for example, to anticipate where new disease hotspots will emerge, design exit strategies for lockdowns, and create national vaccination plans. FIC has experience in mathematical modeling training and, with increased funding, could strengthen LMIC capacity for this work. Many LMICs also have limited capacity for conducting genomic surveillance of infectious diseases, a need recently emphasized by emerging variants of COVID-19 and their associated risks. FIC could leverage its extensive network and training

capacity to improve global genomic surveillance and coordination. Progressively increasing FIC's base budget would allow them to pursue a wider range of research priorities with extramural partners**. GHTC welcomes the significant increase requested by the Administration for FIC in FY22 and joins other advocacy organizations in calling for an additional $10 million to be appropriated to FIC in each of the next four fiscal years to support sustainable growth and long-term planning in pursuit of its mission of building research capacity in partner countries.**

For over six decades, most NIH funding for neglected disease R&D has flowed through the **National Institute of Allergy and Infectious Diseases (NIAID)**, which conducts research across a range of global infectious disease threats, including HIV/AIDS, malaria, TB, NTDs, influenza, Zika, Ebola, and now COVID-19. NIAID scientists, in partnership with Moderna, developed the first COVID-19 vaccine, mRNA-1273, and moved the vaccine to human clinical trials just 65 days after the genome of the virus was shared—a record far shorter than any previous vaccine development timeline.

Beyond COVID-19, NIAID has contributed to several game-changing global health innovations. For example, through a public-private partnership, NIAID supported the development of an innovative, automated diagnostic for TB—the Cepheid Xpert® MTB/RIF test—which is simple to use and provides results in less than 2 hours, compared to traditional methods which can take weeks. NIAID supported clinical research demonstrating that a combination of two newer drugs, bedaquiline and delamanid, could be safely taken together to treat drug-resistant TB in HIV-positive and HIV-negative individuals. NIAID also supported preclinical research that contributed to the development of pretomanid, a new drug recently approved by the US Food and Drug Administration for use as part of a combination therapy for highly drug-resistant forms of TB. NIAID also developed an Ebola treatment, mAB114, which was found to dramatically improve the survival rate of infected patients in a clinical trial carried out amid a recent outbreak in the Democratic Republic of the Congo. The technology underpinning this treatment has also been used in research on therapeutics for COVID-19—illustrating how continued investment in a range of global health challenges helps prime our research infrastructure and scientific knowledge base for emerging threats.

The **Office of AIDS Research (OAR)** has led NIH's groundbreaking work in HIV/AIDS R&D for more than 30 years. NIH researchers first identified the HIV virus as the cause of AIDS, developed the first blood test for HIV/AIDS, and created strategies to prevent mother-to-child transmission of the disease. One study estimates that 14.4 million life-years have been gained since 1995 by the use of HIV/AIDS therapies developed as a result of NIH-funded research. NIH has also supported development of a promising mosaic HIV vaccine candidate, designed to address several HIV strains simultaneously, which is now in large-scale clinical trials in sub-Saharan Africa. Today, as we seek to accelerate progress towards the end of HIV/AIDS in the United States in this decade and stem the tide of the disease globally, continued investment in NIH HIV research will pay dividends by increasing the effectiveness of our prevention and treatment tools—the need for which has increased exponentially as COVID-19 has derailed global goals to end the HIV epidemic.

GHTC supports strong, steady increases to NIH funding to protect against long-term impacts of COVID-19 on the US research ecosystem and enable continued progress towards vital R&D targets. From any increase in overall NIH funding, there should be proportionate increases for FIC, NIAID, and OAR.

Biomedical Advanced Research and Development Authority (BARDA)

The Biomedical Advanced Research and Development Authority (BARDA), within the Office of the Assistant Secretary for Preparedness and Response (ASPR) in the Department of Health and Human Services, supports the advanced development of vaccines, drugs, and other medical countermeasures (MCMs) to protect Americans against threats to public health, including emerging infectious diseases, AMR, and pandemic influenza. BARDA is perhaps the world's leading institution for developing medical

countermeasures against global health security threats through public-private partnerships. BARDA works with industry to bridge the "valley of death" between basic research and product development—so-called because many potential medical innovations stall after public funding for basic research drops off but before other public, private, or nonprofit R&D funders pick up later-stage product development efforts. Through unique contracting and incentive mechanisms, BARDA's partnerships ensure promising research is translated into urgently needed medical products by creating commercial incentives for private-sector partners to invest in R&D.

Over the past decade—and to an unprecedent extent since the emergence of COVID-19—BARDA has played a critical role in advancing the development of MCMs for a range of health threats, including naturally occurring threats, but **funding for the agency through base appropriations has not reflected this growing mandate**. The Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019 specifically authorized BARDA to implement "strategic initiatives" to develop medical countermeasures against emerging infectious diseases, pandemic influenza, and AMR. BARDA, however, was established in response to the anthrax attacks, and this historical legacy has bent the agency toward developing MCMs for man-made threats over naturally occurring and infectious disease threats.

Through emergency supplemental appropriations, BARDA has made a significant impact during global health emergencies. Between 2015 and 2017, BARDA helped advance at least three Ebola vaccine candidates, at least six diagnostics for Zika, and at least five Zika vaccine candidates. BARDA has also worked on a broad-spectrum antiviral called galidesivir, which has the potential to treat a variety of pathogens, including Ebola, Marburg, yellow fever, and Zika, and was tested in clinical trials against COVID-19. In response to COVID-19, BARDA has supported at least 91 products, including vaccines, diagnostics, therapeutics, and devices through $25 billion in emergency supplemental funding appropriated through COVID-19 relief bills—more than 43 times its base FY20 appropriation.

As COVID-19 continues to wreak havoc on health systems and the global economy, we are at a peak of a now predictable boom-and-bust cycle of reactive global health security spending that ramps up only after the emergence of new infectious disease threats, leading to unnecessary delays in the development of MCMs. As we have all now seen firsthand, the delay between the emergence of a health threat and the development of appropriate tools to combat it costs lives and disrupts the most fundamental functioning of our global society. We cannot let this cycle repeat itself once we have conquered the immediate threat of COVID-19. **To fully engage BARDA's capacity to develop tools for naturally occurring health threats—including emerging infectious diseases, pandemic influenza, and antimicrobial-resistant pathogens—the agency needs significant increases to its base funding for these critical challenges.**

Instead of relying on reactive funding that cannot keep pace with emerging threats, **Congress should establish a permanent funding line with an annual appropriation of $500 million to sustain BARDA's work on emerging infectious diseases.** Creating a robust, protected funding line for this work would bolster BARDA's capacity to support development of MCMs for the full range of priority infectious disease threats identified by health experts as most likely to cause the next pandemic.

Another growing threat in dire need of BARDA prioritization and resourcing is AMR. BARDA is a leader across three critical stages of R&D to combat AMR, spread across three programs: preclinical research supported by Combating Antibiotic-Resistant Bacteria Biopharmaceutical Accelerator (CARB-X); clinical research funded through the Broad Spectrum Antimicrobials Program; and post-approval funding from the Project BioShield Special Reserve Fund. **GHTC recommends no less than $500 million in funding for BARDA's work on AMR in FY23, including CARB-X funding of no less than $100 million.** BARDA has made significant contributions to the global effort to curb AMR, including through the founding of CARB-X, as directed by the US National Action Plan on Combating Antibiotic-Resistant Bacteria. CARB-X has

now matured into a global partnership including the US, United Kingdom, Germany, the Wellcome Trust, and the Gates Foundation, and has supported 92 preclinical and Phase 1 products since 2016, rapidly advancing radically more innovative products into the antibacterial pipeline.

To continue this progress across all BARDA programs engaged on AMR, GHTC urges that BARDA's AMR work continue to support highly innovative new classes, new mechanisms of action, and non-traditional alternatives, including support for pediatric indications; multidrug-resistant sexually transmitted infections; and the CDC's full list of antimicrobial-resistant threats, as detailed in its Antibiotic Resistance Threats in the United States, 2019 report. The latter includes drug-resistant TB, the leading cause of death globally from AMR. Progress against TB is at great risk as drug resistance grows. BARDA currently conducts no research on drug-resistant TB despite its repeated identification as a global health security threat by experts and as a "leading health security threat" to the United States in congressional testimony provided by CDC. Resourcing all these elements are critical to preventing a post-antibiotic era that would threaten global health security and reverse antibiotic-dependent medical advances.

As noted in the above funding table, GHTC strongly recommends that NIH, CDC, and BARDA be funded as robustly as possible, and that the Administration encourage their work in global health R&D. At a moment when public health is in the spotlight as never before, CDC's role to prevent, detect, and respond to global health threats—including through robust R&D for new and improved interventions—is of utmost importance and requires increased, sustainable funding. From any increase in overall NIH funding, there should be a proportionate increase for NIAID, the Office of AIDS Research, and FIC. BARDA's authority to pursue Strategic Initiatives against naturally occurring threats—reinforced in the Pandemic and All-Hazards Preparedness and Advancing Innovation Act of 2019—is today significantly contributing to our nation's response to COVID-19, but this authority must be supported with robust base appropriations for all naturally occurring infectious disease threats, rather than a continued reliance on emergency supplemental funding as new threats emerge.

Department of Defense

The DoD responds to infectious diseases many Americans may never see up close—such as malaria, leishmaniasis, and cholera—but which military service personnel stationed in LMICs are exposed to alongside local communities. The Walter Reed Army Institute of Research (WRAIR) and the Naval Medical Research Center (NMRC) contribute significantly to this mission.

For instance, because service members deployed by the US military comprise most of the healthy adults traveling each year to malarial regions on behalf of the US government, the US military has taken a primary role in the development of antimalarial drugs and an important role in malaria vaccine development. Nearly all the most effective and widely used antimalarials were developed in part by US military researchers, a remarkable accomplishment. With the latest generation of malaria medicines increasingly facing drug resistance, however, there is an ongoing need for medicines to evolve and for the development of an adult vaccine to adequately protect deployed servicemembers, for whom taking prophylactic drugs at regular intervals is difficult.

While focused on protecting and treating US armed forces, the global health efforts of DoD and its partners include substantial R&D, infrastructure, and capacity building programs that also benefit countries with few healthcare resources and improve our diplomatic relationships with other nations. For example, a new single-dose treatment approved in 2018 for a strain of malaria that sickens around 8 million people annually—including US service members— stems from research conducted at DoD and military research centers. Development of the world's first malaria vaccine (RTS,S/AS01)—currently in

pilot implementation in parts of Ghana, Kenya, and Malawi— traces back to the work of WRAIR and GSK in the 1980s. The RTS,S vaccine has now reached more than 750,000 children across the three countries. In addition, results of a recently published Phase 3 study in Burkina Faso and Mali show a potentially remarkable impact of combining seasonal vaccination of RTS,S with seasonal malaria chemoprevention. The study found that combining the two interventions reduced severe malaria episodes and deaths in children by about 70 percent compared to either intervention alone.

We strongly encourage funding for DoD's malaria drug and vaccine development programs to continue despite recent internal DoD attempts to eliminate malaria drug and research funding—a remarkably shortsighted move that, in the midst of a global pandemic when the need for research and development capabilities for infectious diseases is at its highest, would risk the loss of world-leading infectious disease researchers, the US government's only bench-to-bedside malaria research capabilities, premier malaria research labs, and an insectary utilized by researchers worldwide. **GHTC urges the Administration to make malaria R&D a continued DoD priority and to ensure WRAIR and NMRC are funded for this work at no less than FY18 levels.**

Another critical infectious disease with implications for both US military readiness and global health is HIV/AIDS. For decades, DoD has sponsored important HIV research. The US Military HIV Research Program led the first HIV vaccine clinical trial that showed a reduction in the risk of HIV infection to humans. This research holds promise for ending the HIV/AIDS epidemic at home and abroad.

DoD also supports research on global health security threats. WRAIR led the first clinical trials for a Marburg vaccine developed by NIH. Marburg—a deadly cousin of Ebola—is on the World Health Organization's list of top emerging diseases likely to cause major epidemics. Throughout the COVID-19 pandemic, DoD's Joint Program Executive Office for Chemical, Biological, Radiological, and Nuclear Defense (JPEO-CBRND) and WRAIR have supported research on vaccine candidates. DoD's unique capabilities in developing health tools designed for use in austere settings make it an invaluable player in the global health R&D ecosystem.

As you consider funding for DoD, we strongly recommend that you consider increases for these accounts within DoD as well as for the Congressionally Directed Medical Research Programs (CDMRP) and protect agency-wide funding for global health R&D. It is critical to support infectious disease research at WRAIR, NMRC, and JPEO-CBRND, including their work on chemoprophylaxis, disease surveillance technologies, novel vaccines, and other countermeasures for diseases of military and global health importance.

Each agency's work in global health research and product development is unique and contributes to a vital whole-of-government response to developing medical technologies urgently needed to save lives around the world and protect Americans at home. These efforts are critical and must be resourced appropriately.

In addition, **investments in global health R&D are a net cost savings** compared to continued spending to treat complicated, costly health conditions and emergency spending to counter global pandemics:

- Investments in COVID-19 innovations for low-resource settings, including diagnostics, therapeutics, and vaccines, will lead to incalculable savings if they effectively stem the pandemic and prevent future, recurring outbreaks in the United States.
- Before COVID-19, large-scale disease pandemics were estimated to potentially cost the global economy more than $60 billion a year, while an investment in R&D to prevent these

pandemics was estimated to cost only $1 billion per year. In 2020, it was projected that COVID-19 cost the global economy more than $375 billion per month. We must continue to invest in innovations to recover from COVID-19 and prevent future pandemics.

- A $26 million investment in polio vaccine R&D in the 1950s has saved $180 billion in polio treatment costs in the United States alone.
- It cost $50 million to develop a 50-cent vaccine to combat Meningitis A. By the end of 2020, the vaccine, developed with critical support from USAID, is predicted to have saved $9 billion in treatment costs.

Global health research that improves the lives of people around the world—while at the same time supporting US interests, creating jobs, and spurring economic growth at home—is a win-win investment. We stand ready to work with you to advance US leadership in global health and global health innovation, and we ask that support for global health R&D not come at the expense of other humanitarian assistance and development accounts. At this time of crisis, the Administration must make forward-thinking choices to respond to the emergency before us and draw on the painful lessons emerging from it to ensure that we are primed and ready for the next health threat—while also committing to continue progress against the full range of global health challenges.

Please do not hesitate to contact Jamie Bay Nishi at jnishi@ghtcoalition.org if you have questions or need any additional information.

Signed,

American Society of Tropical Medicine and Hygiene

AVAC

BD

Boston University Social Innovation on Drug Resistance Program

Drugs for Neglected Diseases *initiative*

Elizabeth Glaser Pediatric AIDS Foundation

Equalize Health

FIND

Global Antibiotic Research and Development Partnership, North America

Global Health Council

HarvestPlus

IAVI

Infectious Diseases Society of America

International Partnership for Microbicides

Innovative Vector Control Consortium

Medicines for Malaria Venture

PATH

RESULTS

Sabin Vaccine Institute

TB Alliance

Temptime

Treatment Action Group

Washington Global Health Alliance