THE UNITED STATES AND MEXICO: ADDRESSING A SHARED LEGACY OF NEGLECTED TROPICAL DISEASES AND POVERTY

IN COLLABORATION WITH THE NATIONAL SCHOOL OF TROPICAL MEDICINE AT BAYLOR COLLEGE OF MEDICINE AND THE END FUND

On September 29–30, 2015, Rice University’s Baker Institute for Public Policy, the National School of Tropical Medicine at Baylor College of Medicine, and the END Fund collaborated on a high-level summit to address the neglected tropical diseases (NTDs) and related diseases of poverty shared between the United States and Mexico. More than 150 local doctors, scientists, students, and community leaders attended the event, which examined the causes and implications of NTDs in the United States and Mexico, advances in research and development to fight NTDs, and effective public policy efforts for NTD elimination. Presenters included Mitchell Wolfe, deputy assistant secretary at the U.S. Department of Health and Human Services Office of Global Health, Mercedes Juan Lopez, Mexico’s secretary of health, and Roberto Tapia-Conyer, director general of the Carlos Slim Foundation.

This report reviews the impact and prevalence of NTDs in the United States and Mexico. This report also will address key policy challenges and make recommendations for reducing NTDs in these two countries. Reducing the multifaceted impact of NTDs will require coordinated policies between these two countries that focus on preventive measures and access to therapies as well as the development of new treatments and vaccines.

NTD AND DISEASES OF POVERTY

To start the event, Peter Hotez, M.D., Ph.D., dean of Baylor College of Medicine’s National School of Tropical Medicine, defined NTDs and described their global impact. In 2000, a set of international development goals was created by the United Nations called the Millennium Development Goals (www.un.org/millenniumgoals):

1. Eradicate extreme poverty and hunger.
2. Achieve universal primary education.
3. Promote gender equality and empower women.
4. Reduce child mortality.
5. Improve maternal health.
7. Ensure environmental sustainability.
8. Develop a global partnership for development.

Each goal had aggressive targets to be accomplished by 2015. Development goal #6 specifically addressed the need to “combat HIV/AIDS, malaria, and other diseases.” Global efforts were started to aggressively fight HIV/AIDS and malaria in underdeveloped countries. Through a combination of preventive measures and increased access to drugs, total HIV/AIDS deaths were reduced from 2 million to 1.3 million annually (Murray, C. J. L., et al. 2014). Malaria was reduced from 232 million cases and 1.2 million deaths in 2004 to 165 million cases and 855,000 deaths globally in 2013 (Murray, C. J. L., et al. 2014).

Unfortunately, the “other diseases” often were missing or neglected from initial global health campaigns. Of these missing infectious
diseases, those that caused a significant impact on human health became the basis of NTDs—neglected tropical diseases. NTDs are described as “a group of poverty-promoting chronic infectious diseases” (PLOS Neglected Tropical Diseases). Although there is no consensus on the specific diseases categorized as NTDs, the World Health Organization (WHO) prioritized 17 such diseases that have a major impact on human development (Table 1). Mitchell Wolfe, M.D., deputy assistant secretary of the U.S. Department of Health and Human Services Office of Global Health, described NTDs at the conference as “infectious diseases that are disfiguring, debilitating, and often deadly.” He also suggested that NTDs “persist only in the poorest, most marginalized communities and conflict areas,” but they are also found in more developed countries, including the United States and Mexico.

Not only do NTDs occur in conditions of poverty, but they are also poverty-promoting diseases, creating a cycle of disease and lost productivity that traps its victims in poverty. One of the main ways NTDs promote poverty is by their chronic and disabling nature. Hookworm infections, which causes iron-deficiency anemia, also lead to cognitive deficiencies and lower educational outcomes for children, which can impact future wage earnings (Hotez 2013a). Chagas disease can lay dormant for decades before a sudden onset of cardiac and digestive disorders take hold in 1 out of 3 adults with the disease, reducing their economic capacity.

The economic loss caused by NTDs extends beyond the individuals who suffer from these conditions and their families, also affecting society. Conference participant Bruce Y. Lee, M.D., director of operations research at the International Vaccine Access Center at Johns

### Table 1. WHO Prioritized NTDs

<table>
<thead>
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<th>Infections</th>
<th>Diseases</th>
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| Protozoan  | - Chagas Disease  
- Human African Trypanosomiasis (sleeping sickness)  
- Leishmaniasis |
| Helminth (Worm) | - Dracunculiasis (Guinea worm disease)*  
- Echinococcosis  
- Food-borne Trematodiases  
- Lymphatic Filariasis**  
- Onchocerciasis**  
- Schistosomiasis**  
- Soil-transmitted Helminthiases (hookworm, whipworm and ascariasis)**  
- Taeniasis/Cysticercosis |
| Viral      | - Dengue and Chikungunya  
- Rabies |
| Bacterial  | - Buruli Ulcer  
- Leprosy (Hansen disease)  
- Trachoma**  
- Endemic Treponematoses (Yaws) |

Source: [www.who.int/neglected_diseases](http://www.who.int/neglected_diseases).

* Guinea worm disease is near global eradication.

** These NTDs are treated through mass drug administration programs funded mostly by the U.S. and U.K. governments.
Hopkins Bloomberg School of Public Health, estimated that Chagas disease, a condition endemic only on the American continent, causes an annual global burden of more than $7 billion, with $627 million attributed to health care costs (Lee et al. 2013). Unlike many of the diseases featured in media headlines, Lee argued that the impacts of NTDs are, “in some ways more substantial because the sequelae of the diseases are deeply tied in with many aspects of society and many aspects of economics.”

One way to measure the physical burden of NTDs is through a metric known as a disability-adjusted life year (DALY). DALYS represent years of life lost due to illness, disability, and premature death. The recent Global Burden of Disease Study for 2013 estimates that NTDs cause more than 25 million DALYS worldwide (Murray et al. 2015). However, expert analysis of the Global Burden of Disease Study suggests that the DALYS attributed to NTDs are underestimated and do not account for the economic losses, social stigmatization, or total number of chronic disabilities caused by NTDs (Hotez et al. 2014). It is difficult to measure stigma in terms of an epidemiological metric, such as a DALY; however, this does not downgrade its significance (Weiss 2008). NTDs can lead to social isolation from friends and family and discrimination in public places such as work and school. For example, the disfiguring lesions caused by cutaneous leishmaniasis can lead to spousal abandonment, and Chagas disease infection is associated with work restrictions (Alvar 2012; World Health Organization 2016a). Some may even try to hide their disease to avoid these social consequences and as a result, a patient’s access to treatment and ability to work or attend school can be impacted.

Another challenge in addressing NTDs is access to treatments and preventive measures. Through cost-effective mass drug administration (MDA) programs implemented for seven NTDs in 2006 (Table 1), significant reductions in infections have been observed in trachoma, onchocerciasis, and ascariasis (Vos et al. 2015). However, according to the WHO, less than 50 percent of the populations requiring MDA to treat an NTD have access to these medicines (WHO 2016b). Hence, while drugs can cure some helminth infections, these medications are not readily accessible to all. This is further confounded by the fact that immunity does not occur after the initial infection and reinfection is possible, especially in endemic areas (Hotez 2013a). Trachoma, the leading cause of infectious blindness, can be treated with antibiotics but may also require surgery (Hotez 2013a). Chagas disease can be treated by two antiparasitic medications, but they are highly toxic, can be difficult to access even in the United States, and are only effective in treating early-stages of the disease (Bermúdez et al. 2016; Morillo et al. 2015). Treatment for leishmaniasis varies depending on the species of *Leishmania* parasite causing the infection, geographic location, and host factors. In many cases, effective treatment often requires multiple doses of toxic injections or oral medication, and it can be difficult for patients living in poverty to access these treatments (McGwire and Satoskar 2014). Several emerging viral infections have no specific treatment available.

Carolina Batista, M.D., regional medical manager for the Drugs for Neglected Diseases Initiative (DNDi) Latin America, described research from Doctors Without Borders, which concluded that less than 1 percent of all drugs developed between 1975 and 1999 were for NTDs (Médecins Sans Frontières 2001). Much of this comes from a lack of economic incentive for traditional pharmaceutical companies, who generously donate older drugs that can be used in mass drug administration campaigns to treat at least seven NTDs, but do not have the capacity to create new products that can cure or prevent NTDs. Because of this, groups like DNDi, the Sabin Vaccine Institute, and other private-public partnerships were created through a nonprofit model to develop innovative products for NTDs and other traditionally neglected diseases such as tuberculosis, malaria, and HIV. While these initiatives have made great progress, there is still a lack of vaccines and treatments that are affordable and accessible for many NTDs.
NTDs in the United States and Mexico

Both the Mexican and U.S. governments have made great strides in reducing or even eliminating their major NTDs and related diseases of poverty within their borders. Over the last decade, Mexico has made enormous progress towards controlling or eliminating canine rabies, trachoma, and leprosy. In addition, the government just achieved an important milestone—the elimination of onchocerciasis (Rodriguez-Perez et al. 2015). Malaria, including vivax malaria, is also near elimination in many regions (Carter et al. 2015). The United States also reduced or eliminated several of its NTDs, including soil-transmitted helminth infections, malaria, and trachoma, by the late 20th century (Friederich 1982; Humphreys 2009; Starr and Montgomery 2011).

Despite these public victories, there is strong evidence that NTDs—especially those linked with extreme poverty—remain widespread in Mexico and the United States (Hotez 2008, 2014b; Hotez et al. 2012). Approximately 10 percent of the Mexican population—12 million people—subsists on less than $2 per day—the definition of extreme poverty (World Bank 2015). In the United States, estimates indicate that more than 1.5 million American households with children live at comparable levels of extreme poverty (Shafer and Edin 2013). Extreme poverty is not evenly distributed geographically. It is concentrated heavily in the southern states of both nations—with high levels in Chiapas, Oaxaca, and Guerrero in Mexico, and in New Mexico and the Gulf Coast states in the United States (Hotez 2008, 2014b; Hotez et al. 2012). As in developing nations, this extreme poverty is linked with many NTDs (Table 2).

Roberto Tapia Conyer, M.D., Ph.D., MPH, director general of the Carlos Slim Foundation in Mexico, presented the prevalence of NTDs in Mexico, highlighting the areas of concentrated poverty that overlap with areas that have a high prevalence of NTDs. In Mexico, dengue fever is considered hyperendemic—meaning the disease is constantly present at a high rate and affects all age groups equally (Undurraga et al. 2015). Transmission of dengue has occurred in 28 of the country’s 32 states. Infection rates are especially high in southern states and along the two coasts. Additional estimates indicate that as many as 2 million people are infected annually (Bhatt et al. 2013). Furthermore, there are substantial economic costs associated with medical care, vector control, and disease surveillance—an estimated US$170 million annually in Mexico alone (Undurraga et al. 2015). However, after years of continuous effort, the number of cases decreased by 49 percent between 2013 and 2014 according to the presentation by Mercedes Juan Lopez, M.D., Mexico’s Secretariat of Health, during the Baker Institute conference. This decrease was linked to educational and preventive measures, including mosquito control procedures.

Dengue also has recently emerged in the southern United States, including in South Texas and the Florida Keys (Hayden et al. 2015; Murray et al. 2013). The poor areas of Houston represent the first major U.S. urban area affected (Murray et al. 2013). Kristy O. Murray, DVM, Ph.D., associate professor of pediatrics at Baylor College of Medicine, described conditions in Houston as ideal for dengue to emerge. Among the critical factors are: 1) high levels of travel to and from dengue endemic areas, including shipping via air and sea; 2) a large, densely populated urban environment; 3) mild winters perfect for year-round survival of mosquitos; and 4) only passive surveillance efforts that are not enough to raise alert levels and prevent an outbreak before it happens.

Human infection and autochthonous transmission with chikungunya, a virus also transmitted by mosquitoes, also has been recently documented in Chiapas in southern Mexico and Florida in the United States (Diaz-Gonzalez et al. 2015; Kendrick et al. 2014). There also have been reports of travelers bringing another NTD transmitted by mosquito, Zika virus, to the United States, while autochthonous transmission of the virus has been reported in Mexico (Pan American Health Organization 2016). There is an expectation that these diseases could...
become as widespread in both countries as they have in the Caribbean and Brazil, respectively. There are no specific treatments available for dengue, chikungunya, or Zika. However, Mexico, Brazil, and the Philippines have approved a dengue vaccine developed by Sanofi Pasteur and are working to effectively distribute the vaccine within each country. The U.S. Centers for Disease Control and Prevention’s (CDC) Dengue Branch and U.S.-Mexico Unit are working with Mexico’s Ministry of Health to learn from Mexico’s experience with the vaccine and ensure the success of the program in both countries once the U.S. Food and Drug Administration (FDA) approves the vaccine.

Among the parasitic infections, vivax malaria is now nearly eliminated in Mexico, as it was in the United States by the mid-20th century (WHO 2015c). However, Chagas disease, which is caused by the parasite *Trypanosoma cruzi* that is transmitted by the triatomine insect (also known as the kissing bug), is estimated to impact more than 800,000 people in Mexico, especially in its southern
Baylor College of Medicine, described a case of intraventricular neurocysticercosis (also known as Bruns syndrome) that he diagnosed at the Tropical Medicine Clinic at the Smith Clinic in Houston, Texas.

Public Policy Implications & Principles

The NTDs highlighted above disproportionately affect the 20 million people who live on less than $2 per day in either Mexico or the United States. Dengue is now widespread in Mexico and can no longer be considered a disease exclusive to impoverished populations. Similarly, chikungunya cases are expected to rise considerably in both Mexico and the United States in the coming years. Based on these emerging and neglected disease concerns, a series of public policy guidelines should be considered in order to reduce the disease burden and ultimately affect NTD elimination in the United States and Mexico. To be most effective, it will be critical to examine the social, economic, and environmental factors that contribute to NTD prevalence.

Poverty and Blue Marble Health

When approaching the elimination of NTDs in the United States and Mexico, one must remember that NTDs are not diseases found only in underdeveloped nations, but that they impact all countries. This concept—which we have termed “blue marble health”—highlights that neglected diseases can significantly impact the poor in both developing and wealthy and developed nations (Hotez 2013b, 2015). While the United States and Mexico have taken actions to address NTDs, to date there are important policy and public health gaps in both countries. Mexico has achieved treatment coverage for more than 90 percent of its 11 million pediatric soil-transmitted helminth infections—ascariasis, trichuriasis, and hookworm (WHO 2015b), while cysticercosis (larval infection with *Taenia solium*) remains an important public health threat (Fleury, Sciutto, and Larralde 2012). Although ascariasis, trichuriasis, and hookworm are no longer common NTDs in the United States, toxocariasis caused by either *Toxocara canis* or *Toxocara cati* remains a widespread NTD among the poor, especially among African American children living in poverty in southern states (Hotez 2008, 2014b; Starr and Montgomery 2011). Cysticercosis also is a hidden but significant cause of epilepsy in Texas and California (Hotez 2008, 2014b). During the Baker Institute conference, Rojelio Mejia, M.D., assistant professor of infectious diseases and pediatrics at states. Mexico currently ranks first globally in the number of congenital cases (WHO 2015a). The CDC estimates that 300,000 people live with Chagas disease in the United States, with most of the cases imported from Latin America (Montgomery et al. 2014). However, it was recently determined that there is also autochthonous transmission of human Chagas disease in Texas (Garcia et al. 2015). Furthermore, it is believed that less than 1 percent of Chagas disease sufferers in Mexico have access to diagnosis and treatment (Manne et al. 2013). The number of Chagas patients in the United States with access to diagnosis and treatment is likely similar, given low rates of physician awareness about the disease (Stimpert and Montgomery 2010).

Another NTD, cutaneous leishmaniasis, has a significant impact on health in Mexico. Cutaneous leishmaniasis is primarily caused by the parasite *Leishmania mexicana*, which is transmitted by sandflies (Alvar et al. 2012). Recently, pockets of *L. mexicana* infections were identified in Texas and Oklahoma (Clarke et al. 2013).

Helminth infections also remain important NTDs in both Mexico and the southern United States. In Mexico, approximately 11 million school-aged and preschool-aged children require regular deworming for their major soil-transmitted helminth infections—ascariasis, trichuriasis, and hookworm (WHO 2015b), while cysticercosis (larval infection with *Taenia solium*) remains an important public health threat (Fleury, Sciutto, and Larralde 2012). Although ascariasis, trichuriasis, and hookworm are no longer common NTDs in the United States, toxocariasis caused by either *Toxocara canis* or *Toxocara cati* remains a widespread NTD among the poor, especially among African American children living in poverty in southern states (Hotez 2008, 2014b; Starr and Montgomery 2011). Cysticercosis also is a hidden but significant cause of epilepsy in Texas and California (Hotez 2008, 2014b). During the Baker Institute conference, Rojelio Mejia, M.D., assistant professor of infectious diseases and pediatrics at
surveillance for its neglected parasitic infections and therefore most cannot access either diagnosis or treatment (Hotez 2008, 2014b). In contrast, dengue affects both low-income and high-income individuals, and both countries are committed to active dengue surveillance. There is an urgent need to recognize NTDs as important health disparities and commit to disease surveillance and control programs. In Mexico, some estimates indicate that adequate investment in NTDs would require less than 0.1 percent of overall domestic health spending. To help address NTDs globally, the governments of the G20 nations, including the United States and Mexico, should mobilize resources in order to provide access to diagnosis and treatment of their indigenous NTDs.

**Geography and Environment: Looking beyond the U.S.–Mexico border**

An all-too-common but false narrative regarding disease and poverty in the southern United States is that it likely arises and is imported from Mexico through its southern border. Instead, Mexican NTDs disproportionately occur among the southern states of Mexico, far away from the U.S. border where poverty is more pervasive. Moreover, there is evidence of autochthonous transmission of NTDs within U.S. borders, including Chagas disease, cutaneous leishmaniasis, and toxocariasis. While we cannot exclude some NTDs arising due to human migrations, especially for dengue or chikungunya infections, policymakers and public health officials in general need to instead closely examine both the socioeconomic (especially poverty) and environmental (including climate change) determinants promoting NTDs. Also of note, most NTDs in Mexico are located in rural areas, but it is not known whether this finding is also true of the United States, which is more heavily urbanized. Finally, there is the potentially important role of climate change in advancing the emergence of NTDs, especially NTDs transmitted via insects that thrive in water and rainfall. This aspect needs to be much more closely examined in both the United States and Mexico. Sahotra Sarkar, Ph.D., professor of philosophy and integrative biology at The University of Texas at Austin, warned that his work has shown that the range of insects capable of transmitting NTDs will expand further north if the climate continues to warm (Garza et al. 2014).

**Host factors**

It has been estimated that up to 70 percent of the NTDs in Mexico affect girls and women living in poverty. The “feminization” of poverty has also been observed in the United States, especially among women single-head of households (Hotez 2008). Yet it is unclear whether these same populations are disproportionately affected by NTDs. There is an urgent need to understand gender as a risk factor in vulnerability to NTDs. However, in the case of certain diseases—such as Zika virus, which is associated with an increased risk of birth defects—the disproportionate burden on women and children is clear. It also has been found in Mexico that malnutrition represents key risk factors in host vulnerability to NTDs. Iron deficiency anemia also has been linked to NTDs such as hookworm infection and trichuriasis and could contribute to altered or diminished mental health capacity. The role of nutrition in susceptibility to NTDs in the United States is not known. Still another factor is the role of underlying noncommunicable diseases such as diabetes and heart disease in increasing susceptibility to NTDs, and vice versa. More research should be directed toward understanding the key host factors that may promote susceptibility to NTDs, such as gender, nutritional status, and underlying diseases.

**Health education, awareness, and communications messaging**

There is a profound absence of knowledge about the major NTDs in both the United States and Mexico, both by the general public as well as by physicians (including medical students) and other health care professionals. The vector-borne NTDs exhibit complex life cycles that
often rely on specific human behaviors, insect habitats, and biologies, and sometimes require additional mammalian hosts (such as dogs and rodents). These complexities further compound the difficulty in understanding how NTDs are transmitted and why they disproportionately affect people living in poverty. Creating messages on these factors for community-wide education campaigns can be daunting and challenging. Despite the challenges, the United States and Mexico should systematically ensure that populations vulnerable to NTDs and their health care providers have the education and resources necessary to identify, treat, and prevent these diseases.

Integrated community strategies that start from the ground up with those most affected and most vulnerable are critical for successful public health campaigns, according to a panel discussion on policy strategies for NTD control and prevention at the Baker Institute conference; the featured speakers included Carina Perotti Fux, M.D., medical coordinator for Doctors without Borders in Mexico; Blanca Lomeli, M.D., Mexico country director for Project Concern International; Eva M. Moya, Ph.D., LMSW, assistant professor in the department of social work in the College of Health Sciences at The University of Texas at El Paso; and Andrew Natsios, M.P.A., director of the Scowcroft Institute of International Affairs and executive professor at the Bush School of Government and Public Services at Texas A&M University. The panelists argued that this was especially true when those affected are from neglected and marginalized populations.

Recommendations and Strategic Actions

The United States and Mexico share more than a border; these countries also share many diseases of poverty. Widespread NTDs among the poor and the socioeconomic, environmental, and host factors that promote these NTDs ultimately highlight the need for public policy action. It is the role of the U.S. and Mexican governments to incentivize scientific research on treatment and preventative measures for NTDs, as well as work to produce reliable data on disease incidence and prevalence, define and address factors that lead to NTD infection and lack of access to treatment and prevention strategies, and ensure that communities have the resources necessary to handle local disease burdens. Working together also can make it possible to share solutions and create a model for NTD control that can be adapted and replicated in other nations.

Measuring the real burden of disease

In many cases, we do not know the true burden of NTDs, either in terms of the number of cases or their role in promoting disability, using metrics such as the disability-adjusted life year (DALY). Knowledge on this front would require intensive programs of active disease surveillance, rather than some of the passive reporting systems currently in place. In Texas, which is considered a “ground zero” state for U.S. NTDs, legislation was recently passed (House Bill 2055) for this purpose. As described by Texas State Rep. Sarah Davis at the Baker Institute conference, the bill creates a “sentinel surveillance” program, which will collect high quality data to improve state surveillance of emerging outbreaks. However, similar efforts need to be undertaken in Mexico and other U.S. states. In addition, we lack details on the modes of transmission of these diseases, especially in terms of specific vector and animal hosts involved in autochthonous transmission. Such studies need to be undertaken to enhance our understanding and improve our ability to diagnose, treat, and prevent NTDs.

Determining health economics and defining social determinants

NTDs arise in poverty settings and also promote poverty through their disabling effects and health care costs. We now have cost-estimates for dengue in Mexico and Chagas disease in the United States (Lee et al. 2012). However, additional estimates are required to fully understand the economic burden NTDs create on individuals and on society. In parallel, we need to
better understand the link between poverty (and other social determinants) and the emergence of NTDs in the United States and Mexico. What is it exactly about extreme poverty that promotes NTDs? What are the major drivers? Studies to identify additional social determinants of NTDs also need to be undertaken.

**Ensuring access to prevention and treatment**

Very few people living in poverty have access to prevention, diagnosis, and treatment for NTDs. Among the treatment and prevention measures that need to be considered are mass drug administration (also known as preventive chemotherapy) for helminth infections, as well as case detection and treatment for Chagas disease and leishmaniasis. In many cases, better or improved clinician decision-making algorithms for the NTDs are needed, along with improved physician education and specialty training. Furthermore, many impoverished NTD-affected areas of the United States and Mexico also require better access to vector control, water, sanitation, hygiene, and veterinary public health.

**Incentivizing research and development (R&D)**

Since NTDs (by their definition) mostly affect people living in poverty, new tools devoted to diagnosis, treatment, and prevention have markedly lagged compared to research and development for noncommunicable diseases, such as cancer, diabetes, chronic lung disease, and heart diseases (Hotez et al. 2015). An important exception has been the heavy investment by major pharmaceutical companies in the development of a dengue vaccine, possibly because of dengue’s ability to affect both wealthy and impoverished populations in the Americas and elsewhere. Policymakers need to identify financial instruments and incentives to stimulate investment in NTD research and development that would embrace the major pharmaceutical companies, but also (as highlighted previously) academia, manufacturers in developing countries, and nonprofit product development partnerships (Hotez et al. 2015).

**Training community health workers and developing communication strategies**

In Africa, community health workers helped produce major gains in providing access to mass drug administration for selected NTDs, such as river blindness and lymphatic filariasis. We now need to assess how community health workers could play similar roles in promoting the prevention and treatment of NTDs in the United States and Mexico. We also need to better understand the communication strategies required both for the general public and these community health workers.

**CONCLUSION: A GAP ANALYSIS**

The United Nations recently adopted a set of Sustainable Development Goals (SDGs) for 2015–2030, replacing the Millennium Development Goals for 2000–2015. Target 3C is to “end the epidemics of AIDS, tuberculosis, malaria, and neglected tropical diseases and combat hepatitis, water-borne diseases, and other communicable diseases” by 2030. While it is great that NTDs are acknowledged in the SDGs as significant health issues that need to be addressed, concerns have been raised about the feasibility of the SDGs (Gostin and Friedman 2015). The concerns mainly stem from the overwhelming number of goals and targets, the degree to which they are measurable, and the cost of achieving them. In March 2016, the UN is expected to finalize indicators for the SDGs, which may clarify how progress for each target should be measured.

For individual nations, taking steps to fight poverty-related diseases represents an opportunity to make a significant local and global health impact (Hotez 2014a). A gap analysis is one way to help countries determine the steps they need to take to effectively fight NTDs. For example, the Carlos Slim Foundation is conducting an extensive gap analysis for dengue fever in Mexico. Its work is focused on the disease and economic burdens, epidemiologic surveillance, clinician decision-
making processes, investments in human capital and systematic training, introduction of new interventions (including a dengue vaccine), promoting think tank activities, and establishing public policies that are inclusive of public private partnerships. This same systematic approach should be taken for each of the major NTDs affecting the United States and Mexico, especially vector-borne (including Chagas, West Nile, chikununya, Zika, and dengue) and helminth infections. Researchers, physicians, and policy scholars should coordinate with local, state, and national governments; the academic sector; pharmaceutical and biotechnology companies; and civil societies to create guidelines for successful elimination campaigns and implementation.

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The full conference video and additional information on the participants can be found at www.bakerinstitute.org/events/US-Mexico-NTDs.

Other publications in this series include:


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