

Implications of U.S.-China Collaborations on Global Health Issues

Jennifer Bouey

CT-516

Testimony presented before the U.S.-China Economic and Security Review Commission on July 31, 2019.



For more information on this publication, visit www.rand.org/pubs/testimonies/CT516.html

Testimonies

RAND testimonies record testimony presented or submitted by RAND associates to federal, state, or local legislative committees; government-appointed commissions and panels; and private review and oversight bodies.

Published by the RAND Corporation, Santa Monica, Calif.

© Copyright 2019 RAND Corporation

RAND® is a registered trademark.

Limited Print and Electronic Distribution Rights

This document and trademark(s) contained herein are protected by law. This representation of RAND intellectual property is provided for noncommercial use only. Unauthorized posting of this publication online is prohibited. Permission is given to duplicate this document for personal use only, as long as it is unaltered and complete. Permission is required from RAND to reproduce, or reuse in another form, any of its research documents for commercial use. For information on reprint and linking permissions, please visit www.rand.org/pubs/permissions.html.

Implications of U.S.-China Collaborations on Global Health Issues

Testimony of Jennifer Bouey¹
The RAND Corporation²

Before the U.S.-China Economic and Security Review Commission

July 31, 2019

Thank you, Senator Talent and Commissioner Wessel and distinguished members of the U.S.-China Economic and Security Review Commission, for inviting me to testify today. My testimony on China and global health will have five sections: The first provides a brief history of China’s engagement with global health assistance in the pre–market reforms era (1950s to 1980s). The second summarizes China’s current global health activities and their impact (1980s to the present). The third describes the Chinese government’s motivations and future plans for global health. The fourth focuses on past U.S.-China collaborations in global health and their different strategies. The fifth and the final section contains suggestions for actions U.S. policymakers could take to address the challenges associated with China’s global health activities.

China and Global Health in the Pre–Market Reform Decades (1950s-1980s)

If we accept the goals for *global health* that Robert Beaglehole and Ruth Bonita suggested in 2010 as “actions for promoting health for all,”³ then China’s most significant contribution to global health indexes is arguably its own success in the domestic public health program that reduced mortality, increased life expectancy, and built a comprehensive health system for 1.3 billion Chinese. China’s growth in life expectancy at birth from 35 years in 1949 to 65.5 years in

¹ The opinions and conclusions expressed in this testimony are the author’s alone and should not be interpreted as representing those of the RAND Corporation or any of the sponsors of its research.

² The RAND Corporation is a research organization that develops solutions to public policy challenges to help make communities throughout the world safer and more secure, healthier and more prosperous. RAND is nonprofit, nonpartisan, and committed to the public interest.

³ Robert Beaglehole and Ruth Bonita, “What Is Global Health?” *Global Health Action*, April 6, 2010.

1980 ranks as among the most rapid sustained increase in documented global history.⁴ During this time, China embedded its public health improvement goals in political campaigns and achieved its goals in the expansion of maternal and child health services, immunization, infectious disease reduction, primary health care services (e.g., Barefoot Doctor Program⁵), and general improvements in water, sanitation, and hygiene. Many believed that the significant improvement in health, in partnership with a strong primary education, prepared the workforce for the massive transformation of economy and society in 1978 and laid the foundation for China's economic miracle in the past three decades.⁶ China's experience during these years also helps to inform its strategies for foreign aid programs.

In the early 1950s, as a new and politically isolated country, China had limited activities on foreign aid. Egypt was the first African country to establish the ambassadorial diplomatic relationship with China in 1956.⁷ China's premier, Zhou Enlai, then visited Africa three times between 1963 to 1965 and announced China's "Five Principles in Foreign Relationship" and "Eight Principles in Foreign Aid."⁸ China's global health assistance programs started in this context as it deployed its first medical team to Algeria following the Algerian War and the flight of the country's trained health professionals in 1963.⁹ In the following years, China sent medical teams to Zanzibar (1964), Laos (1964), Somalia (1965), Yemen (1966), Congo (Brazzaville, 1967), Mali (1968), Mauritania (1968), Vietnam (1968), and Guinea (1968).¹⁰ Many attributed the success of China gaining a seat at the United Nations (UN) in 1971 to the support from the delegates of African countries. In 1972, China joined the World Health Organization (WHO) and continued to expand its Chinese Medical Teams (CMTs) to 28 countries.¹¹ In 1978, as WHO announced the Declaration of Alma-Ata to highlight the importance of primary care in the new global paradigm for health care, the Chinese health care system's rural Barefoot Doctor Program was featured.¹²

⁴ Kimberly Singer Babiarz, Karen Eggleston, Grant Miller, and Qiong Zhang, "An Exploration of China's Mortality Decline Under Mao: A Provincial Analysis, 1950–80," *Population Studies: A Journal of Demography*, Vol. 69, No. 1, 2015.

⁵ Officially instituted in 1968, the program sought to shift domestic health policy away from urban centers to severely understaffed rural areas by educating and empowering locals with sufficient medical education to act as basic primary care practitioners. At the program's height, it had created roughly 1 million new paramedical workers, dramatically increasing access to health care across the country.

⁶ Judith Banister and Xiaobo Zhang, "China, Economic Development and Mortality Decline," *World Development*, Vol. 33, No. 1, 2005, pp. 21–41.

⁷ Chu Shulong and Jin Wei, "时事出版社 [China's Foreign Strategy and Policy]," in *China's African Policy [中国对非洲政策]*, Shishi Publisher, 2008, p. 268.

⁸ W. A. C. Adie, "Chou En-lai on Safari," *The China Quarterly*, No. 18, 1964, pp. 174–194.

⁹ Huang Yangzhong, "Pursuing Health as Foreign Policy: The Case of China," *Indianan Journal of Global Legal Studies*, Vol. 17, No. 1, 2010.

¹⁰ Li Anshan, "李安山: 中国援外医疗队的历史、规模及其影响 [History and Impact of the Chinese Foreign Aid Programs]," *Jingluecn*, January 1, 2013 (<http://www.jingluecn.com/zt/zhongguozaiifeizhou/2013-01-07/324.html>).

¹¹ Georgetown University Initiative for U.S.-China Dialogue on Global Issues, *U.S.-China Dialogue on Global Health Background Report*, Washington, D.C., 2017.

¹² T. Hesketh and W. X. Zhu, "Health in China: From Mao to Market Reform," *BMJ*, May 24, 1997.

Less visible but no less significant in China's early global health aid was the role of hospital construction. China's first hospital construction project was building a 100-bed tuberculosis sanatorium in Mongolia in 1959.¹³ This less-known assistance program signaled the start of infrastructure building as a critical part of China's global health aid. In 1969, China built a hospital in Tanzania as part of its growing involvement in the region. In much of Africa and other parts of the world, however, these efforts were overshadowed by the greater health assistance provided by the United States, the Soviet Union, and their allies.

Another Chinese contribution to global health during this period was the discovery of the antimalarial drug artemisinin through a military research program. This top-secret effort was initiated to help North Vietnamese troops suffering from malaria in their jungle warfare during the Vietnam War. Artemisinin later gained WHO's recognition as an antimalarial in 1993¹⁴ and eventually earned a Nobel Prize for Medicine in 2015 for the Chinese scientist, Dr. Tu Youyou, who discovered the medicine. Nowadays, artemisinin is one of the few medical innovations from China that has been approved by WHO. In East Africa, artemisinin combination therapy (ACT), became the preferred treatment for malaria ten years ago.¹⁵

China's Current Global Health Activities (1980s to Present)

Two government white papers on China's overseas development aid, published in 2011 and 2014, did not contain detailed data on development health aid (DHA). A few research papers on China's DHA made inconsistent estimates using data mostly from online or unpublished records. Perhaps the understanding of the scale and scope for each DHA activity is more meaningful. Currently, China's DHA activities can be grouped into the following categories: CMTs, hospital construction, pharmaceutical and equipment donations, public health and health security programs, and health professional training programs.¹⁶ According to a forthcoming book, since 1963, China has sponsored and built more than 150 hospitals in foreign countries, its CMT program cumulatively dispatched more than 25,000 medical professionals to 51 African countries and provided health care for more than 280 million patients, its artemisinin donations reached 40 million people outside China, the international emergency humanitarian response teams reached out more than 60 times, and more than 20,000 foreign health professionals were trained.¹⁷

Chinese Medical Team Program

The primary goals of the CMT program are to provide expert medical services to the host population and to train local health care professionals on-site.⁹ A bilateral agreement between

¹³ Wang Chen, *Chinese Strategy in Health Aid*, Beijing: International Economic and Trade Collaborative Research Center, Chinese Ministry of Health, in press.

¹⁴ Li Anshan, *Chinese Medical Cooperation in Africa: With Special Emphasis on the Medical Teams and Anti-Malaria Campaign*, Uppsala, Sweden: Nordic Africa Institute, 2011.

¹⁵ Chen, in press.

¹⁶ S. Chen, M. Pender, N. Jin, M. Merson, S. Tang, and S. Gloyd, "Chinese Medical Teams in Africa: A Flagship Program Facing Formidable Challenges," *Journal of Global Health*, Vol. 9, No. 1, 2019.

¹⁷ Chen, in press.

China and an aid recipient country on sending a CMT is usually first processed by China's National Health Commission. The agency will then ask a designated provincial government to make decisions on the number of health professionals and their different disciplines for the mission. Once in the host country, the teams are overseen by the Chinese embassy's Economic and Commercial Counselor's office. Most teams consist of the health professionals with necessary medical specialties, a team leader, a translator, and a chef. The size of the teams ranges between a half dozen to more than 100 people, with an average of 20–30 members per team. In 2017 alone, 1,059 Chinese health care workers served in long-term CMTs (rotations of six months to two years) in 51 countries, helping address the gap in the global health workforce.¹⁰ Although most of the CMTs were dispatched for routine clinical operations, China also sent teams to perform specific advanced procedures, such as cataract surgeries, cleft lip repair, and congenital heart disease surgeries.¹⁸

The criticisms of the CMT program pointed out that the program has remained mostly unchanged in terms of its organization and management for 60 years, with little internal or external evaluation since its inception.¹⁹ CMTs also focus exclusively on clinical treatment instead of combining clinical work with public health prevention programs or health care system building. Suggestions have been made to centralize the demand and providers for CMTs instead of letting individual provinces be the primary respondents, diversify and open the selection of health professional at the national level, and align CMT program activities with the local public health system, China's other health aid programs, and the other international donor programs.²⁰

Hospital Construction

China has carried out more than 150 foreign aid projects by building or upgrading clinics, hospitals, antimalaria centers, medicine storage, medical centers and labs, and centers for disease control. Between 2013 and 2017, China completed the initial planning of 50 health care facility infrastructure implementation projects, 70 percent of which were in Africa. In recent years, hospital construction was often accompanied by local infrastructure development (roads and power generators) and donations of Chinese medical equipment and medicines.²¹

One example is the 100-bed Sino-Congo Friendship Hospital completed in 2013 in Brazzaville that provides general clinical services. The hospital, with over 300 staff and a 23-member CMT, provides health care for a population of more than 200,000 people, half of whom are farmers. The Chinese government contributed more than USD 6 million for the construction. The hospital currently ranks among the top three public hospital in the capital area.²² Similar Chinese government donation projects also included the Levy Teaching Hospital in Lusaka,

¹⁸ “Chinese Doctors Perform Surgery upon Cleft Lip, Palate Patients,” *The News*, July 14, 2019 (<https://www.thenews.com.pk/print/486214-chinese-doctors-perform-surgery-upon-cleft-lip-palate-patients>).

¹⁹ S. Chen, M. Pender, N. Jin, M. Merson, S. Tang, and S. Gloyd, “Chinese Medical Teams in Africa: A Flagship Program Facing Formidable Challenges,” *Journal of Global Health*, Vol. 9, No. 1, 2019.

²⁰ Chen et al., 2019.

²¹ Chen, in press.

²² AIDATA, “China Contributes \$6 Million for Construction of China-Congo Friendship Hospital,” undated (<https://china.aiddata.org/projects/30201>).

Zambia and the Mazka Hospital near Kigali in Rwanda. Last year, construction of the first private-funded Chinese hospital was launched as a part of the Belt and Road Initiative (BRI): the Seychelles Afei Holding is backing a \$30 million, 600-bed hospital contract in Ethiopia.²³

Critics have noted that, although this facility construction often filled gaps in critical infrastructure, it is not always well integrated into the local health system. Whereas in China the state might be able to use its authority to integrate the new infrastructure, more-decentralized African health systems cannot typically do so. There were also concerns that China's piecemeal approach to supplying personnel and infrastructure cannot substantially contribute to the health improvement of Africans. Ray Yip, the former director of the China Program at the Bill and Melinda Gates Foundation, stated, "Those all represent a substitution approach. [The Chinese] go to a hospital, they run the service for a year, and during that time people in the catchment area benefit. But when they leave, there is not much left behind. So, it's not a bad thing but in terms of impact, it's relatively small."²⁴

Health Professional Training Programs

In addition to infrastructure and CMT support, China also provides professional training, especially in such medical specialties as obstetrics and gynecology (ob-gyn), surgery, pathology, cancer treatment, neurology, Chinese medicine, trauma, and cardiac surgery. One example is the China-Canada West Africa Cardiology Collaboration Program implemented in Ghana in 2014. The program has trained dozens of cardiology doctors and nurses and raised clinical capacity for countries in West Africa. One graduate conducted the first cardiac surgery in Ghana. In addition to the clinical training, the program also helped organize the first epidemiologic survey on cardiovascular disease risks in the region, which provided critical evidence used by the health policymakers at Ghana's Ministry of Health.

Public Health and Health Security Program Support

Eager to change the country's damaged public health image associated with the initial mishandling of the 2002–2003 severe acute respiratory syndrome (SARS) outbreak, the Chinese government launched an unprecedented response to the Ebola epidemic in West Africa in 2014–2016.²⁵ On March 24, 2014, right after Guinea health authorities confirmed the presence of an Ebola outbreak, the Chinese embassy sent warnings to Chinese nationals there. In early April, the Chinese government provided Guinea emergency humanitarian aid and followed with emergency assistance to Liberia and Sierra Leone. In August, China's State Council mobilized action across 23 ministries and departments, dispatching a CMT to West Africa days after WHO declared Ebola a Public Health Emergency of International Concern. The Ebola team deployed to West Africa was one of the largest CMTs, with about 1,200 clinicians, public health experts,

²³ "‘Silk Road’ Hospital Breaks Ground in Ethiopian Capital," *Xinhua*, September 14, 2017 (http://www.xinhuanet.com/english/2017-09/14/c_136609571.htm).

²⁴ Quoted in Ted Alcorn, "New Orientation for China's Health Assistance to Africa," *Lancet*, December 15, 2015.

²⁵ Huang Yanzhong, "China's Response to the 2014 Ebola Outbreak in West Africa," *Global Challenge*, Vol. 1, 2017, e1600001.

and military medical officers. They opened a 100-bed treatment unit in Liberia and established three field demonstration sites while providing free treatment.²⁶ Within six months, China also built a biosafety level-3 laboratory in Sierra Leone, transporting all construction materials in 87 days.²⁷

Domestically, China accelerated the development of Ebola diagnostic kits and medical countermeasures. In November 2014, the Chinese Food and Drug Administration (FDA) approved the test reagent developed by three Chinese firms, making China one of the few countries that could produce diagnostic kits. One diagnostic test was approved by WHO in May 2015.²⁸

Although China's overall humanitarian contributions to the 2014–2016 Ebola pandemic was dwarfed by those from the United States and the United Kingdom,²⁹ the Chinese government's efforts impressed the international community and may set precedent for China's future engagement in public health emergencies.

Another global health aid milestone is China's contribution to the establishment of the African Center for Disease Control (ACDC). ACDC was proposed by the African Union to help Africa build capacity in pandemic surveillance and responses, including disease surveillance, rapid responses, laboratory systems, information systems, and public health research. The headquarters is in Addis Ababa, the capital of Ethiopia and the headquarters for the African Union. The Chinese government signed the agreement to construct the ACDC headquarters building on June 24, 2019.³⁰ The new office of Global Health under the Chinese Center for Disease Control and Prevention also sent public health experts to serve as technical advisors and provide training at the ACDC headquarters.

Pharmaceutical Donations, Production, and Investment

According to the Chinese Ministry of Commerce, China has donated 38 million doses of antimalarial medicine and USD 10 million worth of equipment to antimalaria centers in more than 40 countries since 2006.³¹ From 2010 to 2012, China donated 60 batches of antimalarial medicine, hepatitis A vaccine, and cholera vaccine. China's donations peaked in 2012 and were halted because of the concerns of the quality of the medicine, tied to a lack of brand recognition and clinical trial evidence.

²⁶ Christina Larson, "China Ramps Up Efforts to Combat Ebola," *Science*, November 3, 2014.

²⁷ Kun Tang, Zhihui Li, Wenkai Li, and Lincoln Chen, "China's Silk Road and Global Health," *Lancet*, Vol. 390, No. 10112, 2017, pp. 2595–2601.

²⁸ Tang et al., 2017.

²⁹ Yanzhong, 2017.

³⁰ Africa Centres for Disease Control and Prevention, "AUC and Government of China Sign Exchange of Letters of Agreement for the Construction of Africa CDC Headquarters Building," June 27, 2019 (<http://www.africacdc.org/press-centre/news/93-auc-and-government-of-china-sign-exchange-of-letters-of-agreement-for-the-construction-of-africa-cdc-headquarters-building-2>).

³¹ Wang Chen et al., "中非卫生合作-国际发展援理论探索与创新 [Relationship Between Aid and Development of African Healthcare and Public Health System]," in 中非卫生合作-国际发展援理论探索与创新 [*Sino-Africa Health Collaborations: Innovations in Global Development Assistant Theory*], Beijing: Ren Min Wei Sheng Publisher, 2015.

Even though artemisinin has been approved by WHO and ACT became the preferred treatment for malaria in East Africa ten years ago, the appreciation of China's donation of antimalarial medicine was hampered by counterfeit medicines resulting from regulatory failure in East African countries and unscrupulous business practices that flooded the markets with fake drugs. As the journalist Kathleen McLaughlin reported in 2013, "The deadliest problem remains counterfeiting and fakes, risking lives and threatening to kill China's potential for real medical aid in Africa."³²

China is also the world's largest provider of active pharmaceutical ingredients (APIs) for the production of antiretroviral treatment (ART) HIV medicine. In 2010, 873 tons of APIs were produced in China, but only 1.9 percent were used in China for ART medicine production. The majority of the APIs were exported to pharmaceutical manufacturers outside China.³³ Currently, only a few medicines and testing kits from China for HIV and malaria were approved by the U.S. FDA or WHO. Even though China produces a sufficient supply of 48 vaccines for 28 diseases for its 1.3 billion population, only one vaccine (Japanese encephalitis) has been prequalified by WHO.

The lack of international qualification for Chinese medical products is partly attributable to the fragmented Chinese pharmaceutical sector. Researchers estimate there are 5,300 to 7,000 local manufacturers, each with a small share of the Chinese domestic market.³⁴ The market, however, is the second largest in the world, grew at a compound annual rate of 16 percent between 2010 and 2014, and is forecasted to grow 9.1 percent between 2015 and 2019.³⁵ The market is currently dominated by generic medicines without patent protection, and many companies have a varying degree of API business mixed in with formulation business, conduct both a distribution and a manufacturing business, and sell both traditional Chinese medicines and Western medicines. The reliable data are often associated with supply chains for hospital sales of prescription drugs in the top-tier cities and large hospitals. Those that provide supply only for smaller cities tend to have little or unreliable data.³⁶ The government has been seeking to consolidate the pharmaceutical sector and increase the average size of firms to support quality inspection and improvement. The latest national recommendation for the 13th Five-Year Plan specifically aimed to have all medicine on the National Essential Drug List go through bioequivalence testing by 2020.³⁷

China is the largest manufacturer of vaccines in the world, producing 1 billion doses each year—about 20 percent of the global supply. Currently, the majority of the vaccines produced in

³² Kathleen McLaughlin, "Fake Fake Drugs from China: What's Stopping a Cure for Malaria in Africa?" *Atlantic*, June 11, 2013 (<https://www.theatlantic.com/china/archive/2013/06/fake-fake-drugs-from-china-whats-stopping-a-cure-for-malaria-in-africa/276750/>).

³³ McLaughlin, 2013.

³⁴ Rachel Lee and Lawton Robert Burns, "China's pharmaceutical sector," in Lawton Robert Burns and Gordon G. Liu, eds., *China's Healthcare System and Reform*, New York: Cambridge University Press, 2017.

³⁵ International Trade Administration, "2016 Top Markets Report Pharmaceuticals: Country Case Study," 2016 (https://www.trade.gov/topmarkets/pdf/Pharmaceuticals_China.pdf).

³⁶ Lee and Burns, 2017.

³⁷ "重磅：医药工业十三五规划完整版 [Chinese National Recommendation for the 13th Five-Year Plan (2015–2020)]," *Sina*, November 8, 2016 (https://med.sina.com/article_detail_103_1_14074.html).

China supply the domestic market, contributing to China's record-low immunization expenditure per capita (\$20 per person in 2009). In 2011, China passed the WHO vaccine regulatory assessment, which allowed Chinese suppliers to qualify for UN procurement. In 2013, the WHO prequalification of the Japanese encephalitis vaccine licensed by China's FDA was another big step forward for China being competitive in the global supplier market. Dr. Lance Rodewald, the head of WHO's Expanded Programme on Immunization (EPI) in China, commented that the news was "really terrific, as they have made it possible for the United Nations and other agencies to procure life-saving vaccines for countries without the capacity to make high quality vaccines or the resources to purchase them."³⁸

However, the hope for a fast and widespread vaccine prequalification may prove to be unrealistic because of the lack of incentives for Chinese manufacturers. Many would rather focus on the domestic market than invest in a lengthy and expensive prequalification process. The Japanese encephalitis vaccine prequalified by WHO succeeded only after years of wide-ranging technical support from PATH,³⁹ with funding from the Bill and Melinda Gates Foundation.

In recent years, the Chinese government has encouraged Chinese pharmaceutical enterprises to invest in Africa. In 2017, Liaoning-based Neusoft Medical Systems signed a deal with the Tanzanian government to build a medical equipment manufacturing facility, the largest in Africa.⁴⁰ In doing so, China is hoping to invest in the long-term market in Africa and capitalize on vertical integration with the Chinese suppliers of APIs—that is, the factories will obtain Chinese APIs without additional payment before the production. The commitment of Chinese API supply will help small African manufacturers reduce preproduction cost and become more competitive.

Motivations and Vision

Even though China's global development assistance was historically overshadowed by the United States, United Kingdom, Japan, and other Organisation for Economic Co-operation and Development (OECD) countries, no one can deny the significance of China's transformation from a recipient of foreign aid to a critical provider of development resources in the Global South. A 2017 analysis showed that China had emerged as an important participant in global health, serving as a source of overseas development assistance and DHA, sharing concerns about cross-border infectious disease threats, joining in global health governance, and participating in global sharing of knowledge and technology.⁴¹ To understand China's plan for global health, we can first review China's motivations in the historical context.

China's early external assistance programs in the 1950s to 1980s were clearly motivated by finding global political partners when facing the pressure of perceived U.S. containment and

³⁸ Quoted in World Health Organization, "China Enters the Global Vaccine Market," *Bulletin of the World Health Organization*, Vol. 91, 2014, pp. 626–627.

³⁹ PATH is a global nonprofit health organization aims to provide health equity.

⁴⁰ "Tanzania: Govt Enter Pact With Chinese Firm to Build Hospital Equipment Factory," September 18, 2017 (<https://allafrica.com/stories/201709190237.html>).

⁴¹ Tang et al., 2017.

competing with Taiwan for diplomatic recognition. China's total foreign aid amounted to 6.9 percent of its GDP in the last years of Mao's era.⁴² After a relatively quiet period during the 1980s and 1990s, when China received global donors' assistance in its own economic reform and development, China reinitiated its foreign aid program in the mid-1990s. China's foreign aid in this later era was designed to pursue common economic development and was overseen by the Ministry of Commerce. In 2000, China hosted the first Forum on China-Africa Cooperation, a new multilateral venue that became the main platform for cooperation between Beijing and African partners. In recent years, China has been aware of the skeptics and criticisms from international societies on the lack of transparency and coordination among its foreign aid projects.

In this context, several specific reasons for China's current increasing contributions to global health emerge.

Pandemic and National Security

Like other countries in the era of globalization, China realized the outbreaks of infectious disease and increased global mobility have posed increasing challenges to global health security. The 2002–2003 SARS pandemic and the provincial governments' mishandling of the early cases is still a fresh memory of many Chinese officials and public health workers. SARS—a deadly and highly contagious virus-borne disease—originated in southern China. For three months, the local government denied the epidemic, causing the deadly virus eventually to spread to 37 countries. This resulted in more than 8,000 infections and 775 deaths, cost China \$25.3 billion from the interrupted international trade and productivity, and slowed its GDP growth by 1–2 percent in 2003.⁴³ In 2016, China announced its first imported yellow fever case associated with a 32-year-old Chinese citizen who had worked in the Luanda Province, Angola, since 2009. The patient developed a fever and chills on March 8, 2016 (day 1), Beijing time and returned to Beijing on March 10, 2016 (day 3), after 22 hours of traveling. He was admitted to the intensive care unit at an infectious disease hospital in Beijing and died on day 9, despite an aggressive treatment.⁴⁴ This first yellow fever case in Asia, which originated from an outbreak of yellow fever in Angola, confirmed China's pandemic concerns, particularly at a time when the scale of China-Africa trade and travel volume had been rapidly increasing. With 1.1 million members of Chinese diasporas in Africa and 100,000 African migrants among many other immigrants in China,⁴⁵ China has legitimate concerns about pandemics' impacts on its own national security.

⁴² Tang et al., 2017; Lin Shi, 当代中国的对外经济合作 [*Contemporary China's External Economic Cooperation*], Beijing: Chinese Social Science Press, 1989, p. 68.

⁴³ Wen Hai, Zhong Zhao, Jian Wang, and Zhen-Gang Hou, "The Short-Term Impact of SARS on the Chinese Economy," *Asian Economic Papers*, Vol. 3, No. 1, 2004, pp. 57–61.

⁴⁴ Zhihai Chen, Lin Liu, Yanning Lv, et al., "A Fatal Yellow Fever Virus Infection in China: Description and Lessons," *Emerging Microbes & Infections*, Vol. 5, No. 1, 2016.

⁴⁵ United Nations, *International Migrant Report 2017: Highlights*, New York, 2017.

Protecting China's Economic Activities and Investments

Another global health concern is pandemics' impact on China's economy, given its increasing dependence on active global trade and developments. BRI is committed to the financing and implementation of large infrastructure projects in many countries in Africa, Latin America, and Asia. Many BRI projects attract international and domestic migrants and concentrate a large quantity of labor and capital in small areas that traditionally have high disease burdens and an underdeveloped health care system. Protection against disease risks and pandemics will be essential to achieve BRI's economic goals.⁴⁶ Therefore, although BRI is primarily economic, there are important health dimensions. In a 2017 BRI meeting to promote health cooperation, a Beijing communiqué was adopted by more than 30 health ministers. Seventeen bilateral memoranda of understanding were signed between China and BRI countries and agencies, such as UNAIDS (Joint United Nations Programme on HIV/AIDS), Global Fund, and Gavi, the Vaccine Alliance. The agreement covered health security, maternal and child health, health policy, health systems, hospital management, human resources, medical research, and traditional medicine. The Chinese government plans to launch four networks—public health, policy research, hospital alliance, and health industry—to promote global health collaborations along its BRI projects.⁴⁷

Improving China's Global Image

As the antiglobalization sentiment rose in many Western countries and the traditional global DHA funding from the United States and its allies plateaued, China's overseas aid budget grew between 2013 and 2015, and China is poised to become a vital global donor.⁴⁸ In a way, the recent establishment of a department of global health at China CDC and China International Development Cooperation Agency (CIDCA) was China's response to some of the international criticism of its global development programs.⁴⁹ The agencies were tasked to lead reforms to improve the efficiency and effectiveness of China's foreign aid by reinforcing central government control and providing coordination of its historically decentralized foreign aid activities (such as province-based CMT and friendship programs). This transition will also include the growing differentiation of foreign aid programs (coordinated by CIDCA) from the commercial financing packages (under Ministry of Commerce). China also seems to want to counter some of the foreign concerns about the financial and environmental risks of BRI infrastructure programs (rogue donor and debt trap diplomacy) by starting to carefully integrate a greater range of socially conscious projects in environmental protection, public health, and education.⁵⁰

⁴⁶ R. Horton, *China's Rejuvenation in Health*, *Lancet*, Vol. 389, 2017.

⁴⁷ Tang et al., 2017.

⁴⁸ Elanah Uretsky, Jennifer Bouey, and Rebecca Katz, "China's Emerging Role in Global Health," *Health Affairs*, January 17, 2018.

⁴⁹ Cheng Cheng, "The Logic Behind China's Foreign Aid Agency," Carnegie Endowment for International Peace, May 21, 2019.

⁵⁰ Matthew P. Goodman and Jonathan E. Hillman, "China's Second Belt and Road Forum," Center for Strategic and International Studies, April 24, 2019 (<https://www.csis.org/analysis/chinas-second-belt-and-road-forum>).

In addition, CIDCA hopes to promote and facilitate policy research and recommendations pertaining to Chinese foreign aid. Compared with many Western countries, China is still new to building its professional and organizational capacity for global governing (e.g., global linguistic, cultural, and political research). Global health is a brand-new academic field in China.⁵¹ There is also a gap in the scholarly work and research on international development and an urgent need to provide adequate training to global health professionals. The agencies working on aid can barely keep pace in recruitment and training with the growth of China's aid-related ambition and its ever-expanding on-the-ground operations and expenditures. Both the department of global health at China CDC and CIDCA are currently encountering difficulties with recruiting sufficient numbers of suitable staff. Many criticisms regarding the transparency of China's aid programs⁵² are often due to the decentralization of the aid programs and the fact that China's current system fails to coordinate data collection and evaluations. As a consequence, China has a difficult time showcasing its global health contributions and impact, compared with the leading countries in the field. The new agencies are expected to change that.

Vision—Future Plan

In the next decades, China will focus on a number of global health areas.⁵³ First, the Chinese government hopes to consolidate and centralize the governing body on global development aid projects and conduct comprehensive evaluations of the projects, especially on sustainability measures and clarifications on the long-term (aid-recipient) country responsibilities to ensure the sustainability of the aid impact. Second, the government hopes to design and implement capacity-building programs in global health, focusing on training in policy, technology, and management. Focus areas include health finance, public health policy design, pandemic preparedness and response, quality control on health products, and traditional Chinese medicine development. The capacity building will rely on on-the-job training, new academic department and management degrees in medical and public health programs, and academic exchange programs. Third, China hopes to emphasize more public health intervention and health system building rather than clinical aids in its DHA programs. Examples including antimalaria surveillance and intervention in the Mekong basin, schistosomiasis control in Africa, and implementing 100 maternal and child health promotion projects in developing countries. Fourth, the government hopes to strengthen collaborations between its DHA programs with multilateral organizations, such as WHO, UNICEF, Global Fund, and Gavi, the Vaccine Alliance. Lastly, the government proposes to combine China's DHA and financial investment with infrastructure-building programs to facilitate biomedical industry development in Africa.

⁵¹ Tang et al., 2017.

⁵² Deborah Brautigam, "U.S. and Chinese efforts in Africa in Global Health and Foreign Aid," in Xiaoqing Lu Boynton, ed., *China's Emerging Global Health and Foreign Aid Engagement in Africa*, Center for Strategic and International Studies, 2011.

⁵³ Chen, in press.

U.S.-China Collaborations in Health

The United States and China have collaborated for more than two decades on infectious disease control (HIV/AIDS, influenza, and emerging infections), cancer, and other noncommunicable diseases.⁵⁴

- As HIV emerged as a crisis in China and the United States, both countries increased their bilateral cooperation to combat the pandemic. The Chinese government partnered with the U.S. CDC to establish China CDC's Global AIDS Program (GAP) in China in early 2003. GAP quickly developed and implemented a comprehensive HIV prevention and mitigation plan across 15 Chinese provinces to promote increased surveillance of high-risk populations. The U.S. CDC, in partnership with China's National Center for AIDS/STD Control and Prevention, has assisted with capacity building, including improving the quality and geographical reach of laboratory testing capabilities, developing an epidemiological surveillance system, and expanding treatment options.
- U.S.-China collaboration was an important part of the anti-SARS campaign in 2003. In October 2003, U.S. Secretary of Health and Human Services Tommy Thompson visited China and forged a multiyear partnership with the Chinese Ministry of Health to develop a more robust public health infrastructure. Thompson also established a U.S. Department of Health and Human Services health attaché at the U.S. embassy in Beijing.
- In 2004, the Chinese National Influenza Center (CNIC) and the U.S. CDC initiated cooperative agreements to build capacity in influenza surveillance in China. The two agencies collaborated on (1) developing human technical expertise in virology and epidemiology in China; (2) developing a comprehensive influenza surveillance system by enhancing influenza-like illness reporting; (3) strengthening analysis, utilization, and dissemination of surveillance data; and (4) improving early response to influenza viruses with pandemic potential. In 2014, China expanded its surveillance and response system to include 408 laboratories and 554 sentinel hospitals and trained 2,500 public health staff. CNIC established viral drug resistance surveillance and platforms for gene sequencing, reverse genetics, serological detection, and vaccine-strain development. CNIC also built a bioinformatic platform to strengthen data analysis, publishing weekly online influenza surveillance reports in English and Chinese. The surveillance system collects 200,000–400,000 specimens and tests more than 20,000 influenza viruses annually, which provides valuable information for WHO influenza vaccine strain recommendations. CNIC now provides training for other countries to improve global capacity for influenza control.
- Beyond infectious diseases, the National Institutes of Health and the Natural Science Foundation of China also signed an implementing arrangement in 2010 to develop the U.S.-China Program for Biomedical Research Cooperation “to stimulate collaborative basic, translational, and clinical research between United States (U.S.)-based researchers and Chinese researchers in the areas of cancer, environmental health, heart disease, blood

⁵⁴ Georgetown University Initiative for U.S.-China Dialogue on Global Issues, 2017.

disorders, diseases of the eye and visual system, mental health, and neurological disorders. Partnering U.S. and Chinese investigators must work jointly to submit identical applications to NIH and National Natural Science Foundation of China (NSFC), respectively.”⁵⁵

These collaborations share common goals for improving the practice of public health and strengthening public health institutions in detecting and responding to public health problems in the United States and China.

Despite common goals and challenges faced by both countries, there are ideological and strategic differences in the United States’ and China’s approaches to foreign assistance. Whereas most U.S. foreign aid is provided by grants, China’s programs are financed by loans.⁵⁶ The West’s approach to aid includes conditionality and selectiveness, which assumes that aid works best in well-governed countries where corruption is not a significant problem; therefore, poorly governed countries are often denied aid.⁵⁷ One could argue that a problem with such an approach is that the countries that fail to fulfill these conditions are the ones most in need of assistance. In contrast, China’s aid to Africa is claimed to be unconditional with “no ties,” which means that China does not impose any political or economic conditions for the recipient countries.

On a tactical level, China and the United States take different approaches to global health crisis situations. The United States and other Western nations tend to favor a “vertical” approach that focuses on capacity building to eradicate a disease’s burden through boosted personnel, medical resources, and research. For example, the United States’ largest global health program—the President’s Emergency Plan for AIDS Relief (PEPFAR)—accounted for 61 percent of U.S. global health funding in FY 2018, or USD 6.6 billion. The funding targets the prevention and the treatment and care of HIV/AIDS.⁵⁸ In FY 2019, three-quarters of the USD 11 billion in U.S. global health assistance funding focused on three diseases: HIV, tuberculosis, and malaria. After adding 5 percent for health security, 80 percent of the U.S. DHA focuses on infectious diseases.⁵⁹

China’s global health aid tends to take a “horizontal” approach centered on building infrastructure to create a system-wide expansion of access to medicine and health care. As mentioned, the 2017 Beijing BRI health forum featured collaborative agreements with 30

⁵⁵ U.S. Department of Health and Human Services, U.S.-China Program for Biomedical Collaborative Research (R01 Clinical Trial Optional), RFA-CA-19-009, January 2019 (<https://grants.nih.gov/grants/guide/rfa-files/rfa-ca-19-009.html>).

⁵⁶ Charles Wolf Jr., Xiao Wang, and Eric Warner, *China’s Foreign Aid and Government-Sponsored Investment Activities: Scale, Content, Destinations, and Implications*, Santa Monica, Calif.: RAND Corporation, RR-118, 2013 (https://www.rand.org/pubs/research_reports/RR118.html).

⁵⁷ Junyi Zhang, “How Does Chinese Foreign Assistance Compare to That of Developed Countries?” Brookings, August 25, 2016 (<https://www.brookings.edu/opinions/how-does-chinese-foreign-assistance-compare-to-that-of-developed-countries/>).

⁵⁸ Henry K. Kaiser Family Foundation, “The U.S. President’s Emergency Plan for AIDS Relief (PEPFAR),” January 31, 2019 (<https://www.kff.org/global-health-policy/fact-sheet/the-u-s-presidents-emergency-plan-for/>).

⁵⁹ Henry K. Kaiser Family Foundation, “Breaking Down the U.S. Global Health Budget by Program Area,” May 31, 2019 (<https://www.kff.org/global-health-policy/fact-sheet/breaking-down-the-u-s-global-health-budget-by-program-area/>).

ministries of health and multilateral organizations in such areas as health security, maternal and child health, health policy, health systems, hospital management, human resources, medical research, and traditional medicine, without naming any specific disease. Instead, the Chinese government highlighted the goals to build four networks—public health, policy research, hospital alliance, and health industry—to promote global health.⁶⁰

It is not a conclusion that disease-specific approaches will neglect system building, nor that infrastructure- and network-building approaches would ignore the local epidemics. This type of labeling of the programs and funding reflects the different measures for outcomes. It raises concerns because many developing countries are experiencing epidemiologic transition—where chronic diseases cause the majority of deaths and limit economic productivities.⁶¹ The infectious-disease-driven global health approach may miss the target.

Nevertheless, these different approaches, while making collaboration difficult, can also be complementary in nature to benefit the recipient countries. African nations have also benefited from the competition introduced into the field of international assistance by China's more-robust foreign aid activities since 2006. This competition has given African governments (including the less stable countries) options and leverage with respect to foreign donors.

Recommendations for Future U.S.-China Collaborations in Global Health

As the world's two largest economies, the United States and China face increasingly similar challenges in health: Domestically, both face a rapid increase in health expenditures because of aging societies, an increase in chronic medical conditions, and an increase in substance use disorders. Globally, both face pandemics, climate-change-induced health problems, mass migration, and bioterrorism. Past U.S.-China collaboration in data and technology sharing on pandemic surveillance, public health system building, and biomedical research have benefited both countries and the world. Unfortunately, given the increased tension between the two countries on trade, technology sharing, and security concerns, bilateral collaborations on health—such as data sharing on surveillance and innovative biomedical research—may suffer. In this context, I would recommend for your consideration the following initiatives.

Collaboration on Global Health Capacity Building

How much China can contribute to global health depends on its personnel and management capability. Until the Chinese government builds a professional workforce to configure its long-term national global health strategy, collect reliable programmatic data, conduct timely evaluations on program effectiveness, and build confidence to embrace the recipient country's culture and language, we will continue to see China's global health aid programs fragmented and in a "hit-or-miss" style without much transparency (e.g., lack of systematic data records),

⁶⁰ Tang et al., 2017.

⁶¹ Thomas Bollyky, "Health Without Wealth: The Worrying Paradox of Modern Medical Miracles," *Foreign Affairs*, November/December 2018 (<https://www.foreignaffairs.com/articles/2018-09-26/health-without-wealth>).

compared with those from more established countries. It may take China five to fifteen years to train its public health professional cohort to work abroad with a more comprehensive vision. Meanwhile, the U.S.-China collaborations should continue on global health training, including scholar and student exchange programs, short-term training on program management, and global health research conferences to help China accelerate its progress toward building an efficient global health workforce. Unfortunately, the concern surrounding the security, technology, and political calculations from both countries will inevitably hurt the established networks on pandemic preparedness and hinder further integration of a global health alliance. I hope the U.S.-China Strategic Economic Dialogue can reopen and be used to incorporate global health collaborations.

Encourage Beijing's Greater Collaborations with Multilateral Organizations

In the past 60 years, China has responded positively to and made progress as a participant in global governance. China's recent prominence in global health has contributed to the UN agencies' missions and opened China to being more receptive to feedback and guidance from WHO, the World Bank, and the International Monetary Fund. The Chinese government holds its reputation working with international institutions in high regard. In a way, one might say that the United States has been quite successful in its Cold War-era goal of reaching out to then-isolated China and including it in the global order. It seems to be counterintuitive to discredit China's contributions when it is starting to take more responsibilities and contributing more as an active member of the global governing system.

Work Toward Regulatory Harmonization

Because China became the largest manufacturer of health products, provider of pharmaceutical ingredients, and producer of vaccines in the world, it is critical that the Chinese government strengthen regulatory structures to ensure the quality control of these products. The government is consolidating the fragmented pharmaceutical sector and fostering larger and stronger companies in its recent five-year national plan. Such action will pave the way for the rigorous regulation implementation. Continuing collaborations between the U.S. FDA and Chinese FDA can help strengthen the process of adopting consistent best practice to regulate medical product manufacturing and development. Capacity building in biomedical regulatory science, similar to that for the global health professionals, is an urgent need in China.

Collaboration on China's Drug Policy

Recent RAND research has brought up concerns about China as an exporter of the vast majority of illicitly sourced synthetic opioids. Lack of regulatory oversight, local corruption, and an abundance of chemical manufacturers in China contribute to this potential global health risk. The Chinese government has taken some steps to stop the trend, but producers are quick to

adapt.⁶² Since most of these synthetic drugs are exported to other countries, China itself has not yet faced the prospect of user-associated morbidity and mortality consequences experienced in other countries. The current concern is whether the Chinese government has the political will and capability to control the situation. I recommend that the United States consider employing lessons from the two recent successful public health programs in China—tobacco control and influenza surveillance—and apply these models to the synthetic drug epidemic.

- **Leverage multilateral organizations’ action on synthetic drugs and provide a cost model—the tobacco control case study:** China is the world’s largest producer and consumer of tobacco. The Chinese government has resisted the WHO Framework Convention on Tobacco Control (FCTC) for years out of fear of losing large government revenue from the tobacco industry. Eventually, however, the government’s pursuit of international recognition in public health and the demonstration that the cost on health care for tobacco users exceeded the profit gained led to the government’s decision to implement the WHO FCTC.⁶³ As we learned from the tobacco control process, working with the multilateral international organizations, such as WHO, may be the best channel to obtain the Chinese government’s collaboration on this action, since the government values its reputation at the UN. In addition, cost-effectiveness analysis, particularly when projecting the increased use of synthetic drugs in China, can provide strong evidence for the public health agencies to convince the government to take action on the illegal practice.
- **Build a surveillance and response system on synthetic drug use—the influenza surveillance system case study:** CNIC and U.S. CDC collaborated on capacity building in seasonal and novel influenza prevention and control strategies in China and beyond. The collaboration also strengthened real-time data analysis and dissemination and provided critical technical support when the Chinese government committed USD 46 million to expand the pandemic response system to influenza and other emerging diseases.⁶⁴ CNIC, in return, provided valuable clinical, lab, and epidemiological research and data to WHO and the U.S. CDC. CNIC became the sixth WHO Collaborating Centre for Influenza in 2010 and now provides training for countries to improve global capacity for influenza control. Expecting a growing epidemic of synthetic drug use in China and other countries, I recommend applying a similar surveillance model to that of influenza to document synthetic drug use and inform the coordinated response.

⁶² Bryce Pardo, Beau Kilmer, and Wenjing Huang, *Contemporary Asian Drug Policy: Insights and Opportunities for Change*, Santa Monica, Calif.: RAND Corporation, RR-2733-RC, 2019 (https://www.rand.org/pubs/research_reports/RR2733.html).

⁶³ Yang Gonghuan, *Tobacco Control in China*, Singapore: Springer, 2018.

⁶⁴ Michael A Stoto1, Min Kang, Tie Song, Jennifer Bouey, Matthew R. Boyce, and Rebecca Katz, “At the Frontier of the Global Battle Against Emerging Infections: Surveillance and Management of Avian Influenza A(H7N9) in Guangdong Province, China,” *Journal of Global Health Reports*, Vol. 3, 2019, e2019017.