

U.S.-China Collaboration in Combating the 2014 Ebola Outbreak in West Africa

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Introduction

From mid-2014 to mid-2015, the U.S. and China worked together to tackle the Ebola outbreak in West Africa. This was the largest on-the-ground global health intervention in both countries' history. The World Health Organization (WHO) first reported on the Ebola outbreak in Guinea and Liberia in March 2014, and the height of the crisis occurred from June to December of 2014. Guinea, Liberia, and Sierra Leone were the countries most affected by Ebola. On April 1, 2015, the WHO reported that there were over 25,000 confirmed, reported, or probable cases of Ebola and over 10,000 deaths.

Timeline

In July 2014, in response to early cases of Ebola, the U.S. Centers for Disease Control and Prevention (CDC) commenced its Ebola response by creating an Emergency Operation Center on the ground and deploying many staff to the region. Activities included training health care workers, establishing laboratories, and conducting testing.

U.S.-China collaboration began in August 2014 when, on behalf of President Obama, National Security Advisor Susan Rice traveled to Beijing to propose to Chinese officials that China join the U.S. in fighting Ebola with funds, personnel, and expertise before it spread globally. According to Rice, China considered the proposal and arrived at the U.N. General Assembly the next month ready to make a "meaningful commitment."

At the September 18, 2014, meeting of the U.N. Security Council, representatives from the U.S., China, and many African countries spoke in support of U.N. Resolution 2177, which was adopted, declared Ebola a "threat to international peace and security," and urged an accelerated U.N. response. Representatives from both the U.S. and China urged other governments to address the crisis. By September, China was working with the WHO, had sent medical staff, and made a commitment to send a mobile laboratory team. In these ways, China turned a bilateral proposal into a multilateral initiative.

At a joint press conference in Beijing on November 12, 2014, President Obama and President Xi addressed the Ebola crisis. Obama was in China for the APEC meeting and turned his trip into a state visit to China. At the press conference, President Xi remarked that the two leaders had decided to "leverage our respective strength and work with the rest of the international community to help affected countries to strengthen capacity-building on health and epidemic prevention so as to place the epidemic under control as soon as possible."

On November 13, 2014, Chinese Ambassador to the U.N. Wang Min reported on Chinese contributions to the Ebola crisis. At this point, the first three rounds of assistance, which included cash, supplies, medical staff, and a People's Liberation Army (PLA) squad, had been completed. The fourth round of assistance was set to begin shortly. It included plans for a treatment center in Monrovia to be built and staffed by a 160-person medical team. This would bring the total number of Chinese experts and medical staff who traveled to the region to 700.

Both the U.S. and China continued to provide support on the ground even after the peak of the crisis passed. U.S. troops remained on the ground until February 2015. Chinese military medical teams continued to operate in Freetown, Sierra Leone, at least through March 2015. The U.S. CDC continued to

be involved on the ground at least through May 2015, when the CDC deployed its 1,000th staff member to the region.

U.S.-China Collaboration

On the ground in Sierra Leone, U.S. and Chinese staff worked side by side at a Chinese laboratory. In Liberia, U.S. and Chinese personnel worked together on the tarmac to offload Chinese emergency supplies from a Chinese transport plane, a moment of collaboration of which both countries' governments are proud. Twenty-four of the Chinese public health experts who were deployed to the region were graduates of a field epidemiology training program to which the U.S. CDC had been providing expertise and training for 15 years.

In response to the Ebola crisis, U.S.-based company Mapp Biopharmaceutical developed ZMapp, an Ebola treatment drug. However, because the drug was produced only in tobacco cells, which caused slow production, and facilities were limited, the company had only a small batch of the drug. It was exhausted quickly in fall 2014 during clinical trials and safety testing required by the U.S. Food and Drug Administration (FDA). In the summer of 2014, ZMapp helped two American aid workers recover from Ebola. ZMapp was tested in the U.S. and U.K., and in January 2015 testing began in Sierra Leone, Guinea, and Liberia.

The PLA's Academy of Military Medical Science and Chinese company Beijing Mabworks used information in ZMapp's patent to create MIL-77, another Ebola treatment drug. Chief executive of Beijing Mabworks Feng Li said that his company had a licensing agreement with ZMapp's intellectual property holder and had a strong desire to fight the Ebola emergency.

Mabworks modified the drug so that it could be produced in mammalian cells instead of tobacco cells. This led to faster production, so Mabworks was able to quickly produce about 100 doses of MIL-77. In March 2015, it was reported that MIL-77 was used to successfully treat a British military nurse who contracted Ebola in Sierra Leone. In June, MIL-77 also helped to treat a nurse in Rome. Doctors Without Borders prescribed MIL-77 to Ebola patients under compassionate use. The NGO chose to use MIL-77 over ZMapp because under ZMapp's trial conditions, only half of the patients would receive the drug, a standard procedure used to determine a drug's efficacy and safety.

Some American government officials expressed patent infringement concerns regarding the creation of MIL-77. ZMapp is comprised of three chimeric monoclonal antibodies, and the American and Canadian governments hold the patents to two of those as they were developed by their military research agencies. In 2015, Mabworks and Mapp Biopharmaceutical signed an agreement giving Mapp Biopharmaceutical the rights to market MIL-77 everywhere in the world except China. China has continued efforts to develop anti-Ebola drugs even after the 2014 Ebola crisis ended. Both countries have continued to develop a vaccine against Ebola.

Individual Contributions

In addition to working together, both countries gave assistance individually. China sent supplies and hundreds of medical workers to the region. In Liberia, a PLA medical squad built a treatment center

with 100 beds and deployed 280 medical staff. China was the first foreign country to build, staff, and maintain a medical facility in the affected region. The Chinese CDC ran a mobile testing lab in Freetown, Sierra Leone, which performed 40-60 blood tests a day and tested corpses to determine if traditional burial practices could be safely performed on the body. The Chinese CDC also sent a 59-person team of epidemiologists, clinicians, and nurses to support Ebola response efforts at the China-Sierra Leone Friendship Hospital, which was built in 2012 with help from the Chinese government. Chinese scientists developed several Ebola detection kits that were used in laboratories. China pledged about US \$125 million to the WHO, the U.N. Ebola Response Multi-Partner Trust Fund, and other organizations.

The United States provided hundreds of millions of dollars in aid to the Ebola crisis, enacted an extensive CDC response, and deployed thousands of troops. In October 2014, President Obama deployed just under 3,000 troops to the region to help build 10 treatment centers with 50 beds each and an additional 25-bed center for health workers. In addition, the U.S. sent supplies and civilian medical staff. The U.S. CDC trained over 24,000 health care workers in West Africa on infection prevention and control. By the end of 2015, the U.S. CDC had a laboratory capacity of 24 in Guinea, Liberia, and Sierra Leone.

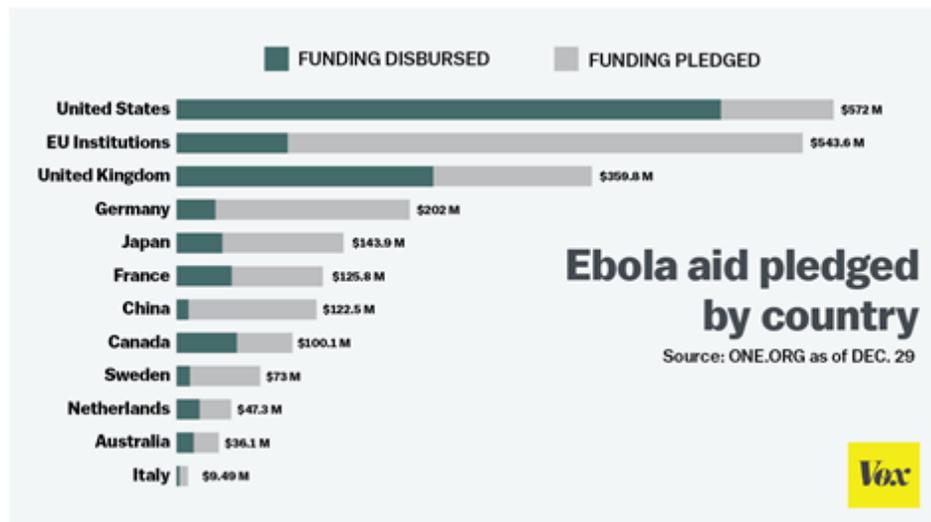
International Community Response

In January 2015, Margaret Chan addressed the WHO Executive Board Special Session on Ebola and highlighted the “extraordinary outpouring of assistance” from many countries, including the U.S. and China. At the same meeting, a nurse who had contracted Ebola while administering care in Sierra Leone thanked the U.S., China, and other foreign countries for their help during the crisis.

China donated US \$11 million to the U.N. Ebola Response Multi-Partner Trust Fund, making it the fourth-largest donor to the fund, after the United Kingdom (US \$31.9 million), Sweden (US \$13.2 million), and Germany (US \$11.6 million). This fund sent some of its donations to the WHO. The U.S. did not donate to this fund.

The U.S. donated over US \$110 million to the WHO, making it the largest donor to the organization by far. These funds came from the U.S. Agency for International Development (USAID), U.S. CDC, U.S. Defense Threat Reduction Agency, and U.S. Department of State. China, through the Ministry of Commerce, donated US \$2 million to the WHO.

As of December 29, 2014, when the Ebola crisis began winding down, the U.S. had made the largest funding pledge and donated the most money to the outbreak out of all donor countries. Among the countries listed below, the U.S. fulfilled the largest percentage of its pledge. China made the seventh-largest pledge, but as of December 29, 2014, had disbursed a very low percentage of it. Many countries also fulfilled little of their pledges. Overall, by February 2015, it was discovered that only 40% of the money pledged by individuals, organizations, and nations had actually reached Guinea, Liberia, or Sierra Leone.



China was criticized for giving less than it had the capacity to, as only 0.5% (US \$193 million) of its Foreign Assistance Funds from 2010 to 2012 was allocated to humanitarian aid. Some considered it a “discrepancy” that China is the world’s second-largest economy but has given much less than other countries to humanitarian causes. Instead China directed its funds to economic, social, and public infrastructure. In comparison, from 2010 to 2012 governments throughout the world gave a total of US \$40.5 billion to humanitarian causes, meaning that China contributed less than 0.5% of the global total. In response to this criticism, the Chinese government said that from 2010 to 2012 it gave half of its US \$14 billion aid budget to Africa.

Implications

Cooperation during the Ebola outbreak has had impacts even after the crisis passed. After the crisis, at the June 2015 U.S.-China Symposium on Ebola, Research, and Global Health Security, both countries reaffirmed their commitment to together creating mechanisms to detect, prevent, and respond to global public health crises. At this summit the U.S. and China signed the Memorandum of Understanding on the Cooperation between China and the United States on New and Re-infected Diseases.

At the event, Chinese Vice Premier Liu Yandong stated that in the realm of public health, the U.S. and China’s mutual interests are increasing. Therefore, strengthening the U.S.-China public health collaboration is “significant to the whole world.” Liu Yandong said he hoped that the U.S. and China will focus on talent cultivation as a top priority of this cooperation. He proposed two programs that will cultivate talented medical and health professionals from both countries: The China-U.S. 100 Hospital Presidents Exchange Program and the Sino-U.S. 1000 Lead Health Practitioners Exchange Program.

On September 25, 2015, USAID and the Chinese Ministry of Commerce signed a memorandum of understanding (MoU) agreeing to coordinate their assistance to African countries. The two countries agreed to establish a yearly meeting to share progress on joint projects, summarize best practices and lessons, and explore new areas of cooperation. The MoU also identified which offices are responsible for

maintaining regular communication. The U.S. and China agreed that their shared objectives include ending poverty and hunger, promoting sustainable development, and implementing the U.N. 2030 Agenda for Sustainable Development.

In April 2015, the U.S. and the African Union (AU) signed an MoU agreeing to work together to establish a continent-wide Africa CDC. China and the AU signed a similar agreement in June 2016. U.S. CDC Director Tom Frieden said that the Ebola epidemic “reaffirmed the need for a public health institute to support African ministries of health and other health agencies in their efforts to prevent, detect, and respond to any disease outbreak.”

China CDC, U.S. CDC, and U.S. NGOs have collaborated to provide expertise to the Africa CDC on ways to strengthen health surveillance. U.S. CDC and China CDC are also collaborating on the Africa CDC’s public health training and disease control programs (see Africa-U.S.-China Trilateral Cooperation Research Series, No. 4).

The U.S. and China also both individually responded to the Ebola outbreak in the Democratic Republic of Congo (DRC) that began in 2018, though there has been no evidence of collaboration to date. On August 31, 2018, China and the WHO signed an agreement stating that China would help fund the WHO’s response to the Ebola outbreak in the DRC. China also planned to send staff to support the WHO effort. In October 2018 China donated US \$1.5 million to South Sudan to prevent the spread of Ebola to the country from neighboring DRC. South Sudan planned to use the money to purchase ambulances and other emergency response supplies.

In May 2018, the U.S. announced that USAID would be contributing up to US \$8 billion to tackle the crisis. On June 1, 2018, the White House announced that the U.S. National Security Council was coordinating a response to the outbreak. The U.S. CDC and USAID sent staff members, including Dr. Ben Kohl, who led the U.S. CDC response to the 2014 Ebola outbreak, to the DRC to support measures focused on controlling the outbreak. The U.S. CDC has also worked with airports and countries in the region to prevent the outbreak from spreading beyond the DRC. USAID and the Department of Health and Human Services was also set to provide personal protective equipment for workers from the DRC. The U.S. National Institutes of Health (NIH) were assisting neighboring Republic of Congo in setting up diagnostic capabilities to help contain any possible spread of the outbreak beyond the DRC.

ZMapp, among other experimental medicines, has been in use at Ebola treatment centers in the area since late 2018, when a randomized control trial commenced with funding from the DRC’s National Institute of Biomedical Research and the U.S. NIH. Over 200 patients received one of the experimental drugs by January 1, 2019. From August 1, 2018, to March 25, 2019, the WHO administered over 90,000 doses of the rVSV-ZEBOV vaccine, licensed to U.S. company Merck, in the DRC. In a report on this program, the WHO wrote that there is increasing evidence of the vaccine’s efficacy. China offered its own vaccine, Adenovirus type 5 vector, developed by the PLA’s Academy of Military Medical Science and Chinese company Cansinobio, to the program. However, it was not chosen for use by the WHO because Merck’s drug had undergone more extensive testing.

Conclusion: Why was this collaboration possible? What were the crucial factors?

Since President Xi Jinping came to power in 2013, Americans have been increasingly doubtful of the U.S.' engagement policy toward China and whether it has brought meaningful benefits to the U.S. To avoid a sudden change in Washington's policy toward China, Beijing was anxiously searching for a means to create a new framework of cooperation with the U.S. called "a new kind of great power relations." Working together to combat the Ebola outbreak had the potential to make this new chapter in the relationship strong. Therefore, China was motivated to partner with the U.S. Additionally, proposing this collaboration was a way to make President Obama's state visit to China a success for both sides.

Another potential factor that led to this U.S.-China collaboration is that both countries were already members of the Global Health Security Agenda, whose mission is to increase global and nations' capacity to prevent, detect, and respond to infectious diseases. This organization was launched in February 2014, and currently over 60 nations are members. Both the U.S. and China were and remain members, demonstrating a shared commitment to this cause. Ambassador Susan Rice has said that China is a very important country for engaging in capacity-building and helping to prevent, detect, and contain outbreaks. In particular, she said that "China's role as a leader in global health is one we need to encourage and support because it serves our shared interests." The understanding of China's value as a public health partner and the relationship that formed through both being members of this organization may have led the U.S. to reach out to China to create a successful collaboration on Ebola.

An additional key factor which likely led to collaboration is that each country individually had an incentive to respond to the crisis. It has been suggested that China responded to the Ebola crisis partly to protect the lives of Chinese citizens living and working in affected countries, and to protect the economies of countries in which China has infrastructure investments. For example, at the time the state-owned China International Water and Electric Corporation was approaching the completion of a hydroelectric facility in Kaleta, Guinea, that would triple Guinea's electricity production. Huawei, the Chinese telecommunications company, also had significant operations in Guinea at the time.

Likewise, President Obama may have been pressured into a large-scale response as he was criticized early on for not giving the Ebola outbreak due attention. He was called on by many, including Doctors Without Borders, the WHO, and the Liberian president, to provide military assistance. Even though the White House said that the likelihood of an Ebola outbreak in the U.S. was very low, it still characterized the Ebola crisis as a national security threat because it could spread to the U.S. and other countries. Obama said the U.S. had an ethical obligation as a world leader to address the crisis in West Africa.

The development of ZMapp and MIL-77 demonstrates that there may be a potential for future U.S.-China collaboration on pharmaceuticals. The U.S. military and U.S. company Mapp Biopharmaceutical were able to create an innovative drug, and the Chinese military and Chinese company Mabworks improved on its previously slow production process. However, American concerns about intellectual property remain a hurdle to U.S.-China pharmaceutical collaboration.

The question of drug testing also caused issues for both the U.S. and China. ZMapp's initial supply was used up by FDA-mandated trials and was rejected by Doctors Without Borders because of trial conditions. Because MIL-77 did not have these conditions, it was widely administered to patients on the ground. On the other hand, ZMapp was given to fewer patients in a controlled study during the latter part of the crisis. More recently, during the 2018 Ebola crisis in the DRC, the vaccine developed by U.S. company Merck was chosen over the vaccine developed by the PLA's Academy of Military Medical Science and Chinese company Cansinobio because Merck's drug had undergone more significant testing. These two situations reflect the tensions between testing and quick delivery of pharmaceuticals.

Another issue we have observed through this research is that there was clearly a lack of coordination between the two countries in their efforts to combat Ebola. For example, each country built its own treatment centers on its own timeline. In other words, each was executing its own plans without much joint planning. This lack of true coordination likely led to the duplication of efforts. While the September 2015 MoU agreeing to more frequent communication between the U.S. and China was signed to enhance U.S.-China collaboration on future projects, to date it does not seem to have facilitated any collaboration on the response to the Ebola outbreak in the DRC. Given that on July 17, 2019, the WHO declared the DRC Ebola outbreak a Public Health Emergency of International Concern, the U.S. and China should try to find areas to collaborate so they can better address the outbreak.

A key lesson from this case study is that after Beijing was approached by the U.S. about becoming involved in the response to the outbreak, China went to the U.N. to seek a broader, multilateral framework of collaboration. This may be because China did not feel comfortable starting a project directly with the U.S., either due to trust issues or fears of accusations of entering into a G-2. Seeking multilateral initiatives over bilateral ones may continue to be China's preference in the arena of international cooperation.

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