BACKGROUND For nearly 40 years after its 1976 emergence in two remote Central Africa villages, the potential for the Ebola virus to spread across large populations, taking thousands of lives and wreaking havoc on fragile health systems was recognized but not realized. The West Africa outbreak that began just before Christmas 2013 in a rural Guinean community changed that. Spreading rapidly across Sierra Leone, Guinea and Liberia, and reaching the capital city of each, the Ebola crisis that was recognized in 2014 highlighted not only unpreparedness across the three countries to deal with an infectious disease outbreak, but also across the world. When the World Health Organization recognized Ebola as a Public Health Emergency of International Concern in early August of 2014, 1,779 Ebola cases had been confirmed, with 961 deaths, and the outbreak had spread to Lagos, Nigeria, the most populous city in Africa.

After an infected traveler from Liberia became ill in the United States, transmitting the virus to two health workers before he died during the fall of 2014, Congress answered President Obama’s request for Ebola funding of both immediate and longer-term resources and responses to fight the disease domestically and abroad with $5.8 billion.

By mid-January of this year when the World Health Organization declared all known chains of Ebola transmission in West Africa ended, 28,500 people had fallen sick from it, including more than 800 health workers, and at least 11,300 people, more than 500 health workers among them, had died. It had taken lives in six countries, with the impacts of the greatest tolls in Liberia, Guinea and Sierra Leone leaving fractured families and communities, and continuing to debilitate health, education, economic and public service sectors.

The outbreak also had left an estimated 10,000 survivors, dealing with lasting physical, social and psychological hardships from the virus. By then the persistence of infectious Ebola in body fluids that include semen had been confirmed by sexual transmission of the virus, and flare-ups of transmission and illness had occurred in each country more than 42 days after the release of the last patient from treatment, a previous benchmark indicating a country was “Ebola-free.” The day after the World Health Organization declared an end to the West Africa outbreak, a new case of Ebola was confirmed in Sierra Leone.

While by late 2014 recognition of the threat posed by the West Africa outbreak had spurred accelerated research and development of treatment and vaccine candidates, opportunities to test the candidates have lagged in the wake of a steep drop in transmissions that followed the U.S. response and other international responses.

NOW Flare-ups of transmission continue, most recently with the deaths of three family members, and the illness of two more in Guinea, the day after the WHO declared an end to the most recent Ebola flare-up in Sierra Leone.

Re-emerging illnesses among survivors and new infections in all three of the hardest hit West African countries during recent months have shown that transmissible virus can be found in the ocular and spinal fluid, breast milk and semen of survivors as much as a year after recovery. Long term health impacts among survivors include joint pain, headaches, depression and other psychiatric symptoms, and debilitating fatigue as well as vision and hearing loss.

Follow up care for survivors, monitoring of viral persistence, semen testing for male survivors, and efforts to prevent transmission from survivors to their sexual partners, family members and health workers continue to be limited by lack of diagnostic and care capacities in countries where the deaths of hundreds of health workers have left fragile health systems further unprepared to respond to future disease outbreaks.
The Ebola crisis impeded access to routine health services including childhood vaccinations, prenatal care, and HIV testing and treatment for HIV, tuberculosis and malaria, contributing to rising death rates from all three diseases in Liberia, Sierra Leone and Guinea. Researchers from the Yale School of Public Health have estimated that diminished health care capacities during the outbreak in Liberia led to 600 additional tuberculosis deaths and about 1,000 additional deaths from HIV and Malaria.\(^1\)

The crisis also has yielded information, lessons and opportunities to strengthen health responses and global health security. New treatment and diagnostic facilities, as well as research efforts have offered the opportunity to improve responses to other diseases (the trial of one vaccine candidate revealed an unexpectedly high prevalence of HIV infection in Liberia, when more than five percent of enrollees were discovered to have the virus\(^1\)). Responses established networks of communication between governments, health facilities and laboratories that were previously lacking in the three most affected countries. Research and development of promising treatment candidates have laid groundwork for future responses, offering reason for future patients to seek prompt medical care. Early trials of two vaccine candidates have shown promising results.\(^ii\)

**The Continuing U.S. Response** Funding for Ebola responses and preparedness helped turn the tide of the outbreak, limit its impact on Americans, and lay a foundation for work to avert future crises. Still, in the wake of its worst months, the Ebola crisis of the last two years left already fragile and inadequate healthcare infrastructures devastated in the three most affected countries. While the crisis highlighted deficits in health capacities in Liberia, Sierra Leone and Guinea, it also found the U.S. insufficiently prepared to deal with even a limited outbreak.

The need for resources provided by the initial funding response continues as developments yield new information on how, and how long, the disease can be transmitted, on the needs of survivors, and other impacts of the outbreak. At the same time, while work to build and inform a global health network that can detect, respond to, and contain future outbreaks, continues to be crucial to domestic health security, the recent reallocation of Ebola dollars to Zika responses provides a vivid example of the danger of regarding emerging infectious diseases as isolated problems and redirecting attention from one to the next without adequately addressing previous health threats and crises. The continuation of Ebola transmission in West Africa, even as a new outbreak with devastating impacts emerges in the Americas demonstrates the need for an expansion, not a reallocation of dedicated global health funding.

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\(^1\) Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 22, No. 3, March 2016
\(^ii\) National Institute of Allergy and Infectious Diseases, PREVAIL I study, presented February 2016 at the Conference on Retroviruses and Opportunistic Infections.
\(^iii\) National Institute of Allergy and Infectious Diseases, PREVAIL I study, presented February 2016 at the Conference on Retroviruses and Opportunistic Infections.