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## Global Polio Eradication Efforts

Poliomyelitis (polio), formerly a widespread global health challenge, is now endemic in only a handful of countries. Efforts to fully eradicate polio by a target date of 2018 are challenged by a variety of factors, including regional instability. Congress supports polio eradication efforts through USAID and CDC global health appropriations and through the World Health Organization (WHO).

### Background

Polio is an infectious disease that affects the nervous system and can cause irreversible paralysis within hours. There are three natural or “wild” types of polio virus (WPV, numbered 1 through 3). There is no cure for polio, but it can be prevented through immunization. About one in 200 cases results in paralysis. Among those who are paralyzed, between 5% and 10% may die after their breathing muscles become immobilized if mechanical ventilation is not available. Polio is spread primarily through ingestion of contaminated water or food, or after placing one’s hands in one’s own mouth after touching items contaminated with the virus. The disease primarily affects children aged younger than five years.

In 1998, the World Health Assembly adopted a resolution to eradicate polio worldwide and launched the Global Polio Eradication Initiative (GPEI) to advance that effort. GPEI is led by national governments, the U.S. Centers for Disease Control and Prevention (CDC), Rotary International, WHO, and the United Nations Children’s Fund. When GPEI was launched, there were an estimated 350,000 cases in 125 countries. In 2014, the disease was endemic (meaning that it is habitually present and domestically transmitted) in only two countries (Afghanistan and Pakistan) and a total of 359 cases were reported. By 2015, only 51 wild poliovirus cases were detected and the Global Commission for the Certification of Poliomyelitis Eradication determined that wild poliovirus type 2 had been eradicated worldwide. In August 2016, two polio cases were identified in Nigeria, two years after the last wild polio case was detected. As of October 28, 2016, only 11 wild poliovirus cases have been identified worldwide.

Global health experts are optimistic that polio eradication is imminent. The CDC indicated that no type 3 wild poliovirus infections have been detected globally since November 2012, suggesting that transmission of the strain has likely been interrupted in the remaining two endemic countries. Type 1 wild poliovirus is believed to be the only strain currently in circulation.

### International Financing

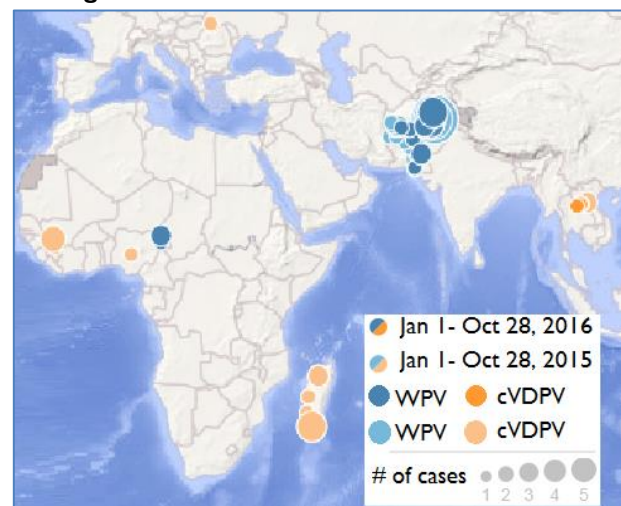
Between 1985 and April 1, 2016, governments, nongovernmental organizations (NGOs), and public and private donors have donated more than \$13 billion in support of GPEI. The United States has provided roughly

20% of these funds, with U.S. funding exceeding \$200 million annually since FY2014. GPEI estimates that it would cost roughly \$3.2 billion from 2016 through 2019 to eliminate polio and, based on global funding trends, has projected a funding gap of roughly \$580 million. WHO contends that if funding goals are met and efforts are maintained, polio could be eradicated by 2018. On the other hand, WHO warns that failure to eradicate polio in countries where the disease persists could lead to a resurgence of nearly 200,000 new cases per year within 10 years. WHO estimates that eradicating polio could save \$40-\$50 billion over the next 20 years, primarily in low-income countries.

### Ongoing Transmission of Wild Polio: Pakistan, Afghanistan, and Nigeria

While the international community has made significant gains in reducing the global spread of polio, efforts to eradicate the disease have been stymied by a variety of factors, including religious objections, misinformation, and intermittent conflict. These obstacles have been largely overcome in recent years but remain problematic in Pakistan and Afghanistan. Instability has also contributed to the resurgence of polio in Nigeria (**Figure 1**).

**Figure 1. Global Polio Cases: 2015 and 2016**



**Source:** Adapted by CRS from Global Polio Eradication Initiative webpage on polio cases at <http://polioeradication.org>, accessed on October 28, 2016.

**Acronyms:** wild poliovirus (WPV); circulating vaccine-derived poliovirus (cVDPV)

### Polio in Pakistan

In 2014, 91% (304) of the world’s 332 wild polio cases occurred in Pakistan. Significant gaps in vaccination coverage persist across the country, particularly in Peshawar, Karachi, and in the Federally Administered Tribal Areas (FATA). These areas have ongoing polio

transmission, and infected people from these regions have spread the disease to other parts of the country and the world. Insecurity in the regions and the targeting of health teams and facilities by Islamic militants, who believe health workers may be spies or carry other misconceptions, have hindered polio eradication efforts in the regions.

### Polio in Afghanistan

The unstable security situation in Afghanistan and attacks on vaccination teams in the country have complicated vaccination efforts in Afghanistan, especially in the provinces of Kunar, Nangarhar, Kandahar, Helmand, Uruzgan, and Farah. Most of the 28 wild polio Afghan cases were imported from Pakistan. The WHO has recommended that the two countries improve coordination of vaccination efforts. In early January 2016, health officials from Afghanistan and Pakistan met to discuss ways to synchronize vaccination campaigns and improve control of cross-border traffic.

### Polio in Nigeria

After being free of polio for more than two years, the Government of Nigeria reported on August 11, 2016, that two children had been paralyzed by the disease in the northeastern state of Borno. Shortly after receiving confirmation of the two cases, the Government of Nigeria declared the outbreak a national public health emergency. According to GPEI, the new cases are closely linked to a strain of wild poliovirus last identified in Borno state in 2011. Borno is one of Nigeria's most unstable areas and is home to Boko Haram, designated by the State Department as a foreign terrorist organization in November 2013 and well-known for having kidnapped 276 schoolgirls from the town of Chibok in April 2014.

Nigeria is collaborating with WHO and other partners to stem the virus's transmission. Throughout the Lake Chad region (western Chad, northern Cameroon, southern Niger, parts of the Central African Republic, and northeastern Nigeria), large-scale, cross-border immunization campaigns are underway and plans to strengthen surveillance systems in the region are being carried out. According to GPEI, some 600,000 children aged less than five years in the Lake Chad region have neither been immunized nor receive regular health care. This region is considered the last polio reservoir in Africa.

### Countries with Vaccine-Derived Polio

There are two types of polio vaccines, one oral (OPV) and the other injectable (IPV). OPV uses a weakened version of the live virus, while the injectable version uses killed virus. Until recently, health workers preferred to use OPV in developing countries. It is cheaper, easier to administer, and provides broader population immunity. The live oral vaccine virus, however, can mutate and has caused paralytic illness just like the natural or "wild" strains. Ongoing efforts to eradicate polio are being stymied by outbreaks of vaccine-derived polio cases, known as persistent circulating vaccine-derived poliovirus (cVDPV). CDC and other GPEI partners hope that recent efforts to manufacture polio vaccines without the type 2 strain may help to reduce cVDPV outbreaks and eliminate them. According to GPEI, small cVDPV outbreaks occurred in six countries in 2015,

including Guinea (4 cases), Laos (6 cases), Madagascar (10 cases), Burma (2 cases), Nigeria (1 case), and Ukraine (2 cases).

### Other Vulnerable Countries

WHO has classified seven countries as vulnerable to polio outbreaks due to inadequate vaccine coverage, gaps in disease surveillance systems, and proximity to countries where the virus persists.

- **Cameroon:** Historical patterns of transmission through Central Africa and gaps in subnational disease surveillance increase the risk of polio outbreak.
- **Equatorial Guinea:** Historical patterns of transmission through Central Africa and gaps in subnational disease surveillance increase the risk of polio outbreak.
- **Ethiopia:** Location in the "wild polio virus importation belt"—a group of countries from west Africa to central Africa and the Horn of Africa that periodically experience polio importation.
- **Iraq:** Three cases of WPV in the Middle East, including two in Iraq, were reported in 2014.
- **Somalia:** Vulnerable due to its location in the "wild polio virus importation belt."
- **South Sudan:** Vulnerable due to its location in the "wild polio virus importation belt."
- **Syria:** Ongoing conflict has made parts of the country inaccessible to vaccination teams. WHO has sought access to besieged areas to vaccinate approximately 2.3 million children.

### Remaining Issues

Congressional support for fighting the global spread of polio appears to be strong, as annual appropriations have grown since the start of the Obama Administration and have exceeded \$200 million since FY2014. Despite funding increases, health experts are troubled by the reemergence of polio in Nigeria and its implications for sub-Saharan Africa. Prolonged instability in the country and in some neighboring states risks further spread of the disease, threatens to derail polio control efforts on the continent, and may raise the cost of eradicating the disease.

As polio elimination proceeds, GPEI is adding IPV to its vaccination plans to reduce the risk of transmitting vaccine-derived polio and plans to phase out the use of OPV entirely. Research efforts are underway to develop a new oral vaccine containing engineered strains of the polio virus less likely to mutate and cause further outbreaks. However, significant cost is involved in bringing a new vaccine to market, and it is unclear if a new type of vaccine will be introduced.

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**Tiaji Salaam-Blyther**, Specialist in Global Health  
**Edward Y. Gracia**, Analyst in Latin American Studies

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