Polio eradication campaign copes with unusual outbreak

Health officials have intensified efforts to eradicate polio in Nigeria after a mutated form of the virus used in the vaccine caused a rare outbreak of the disease.

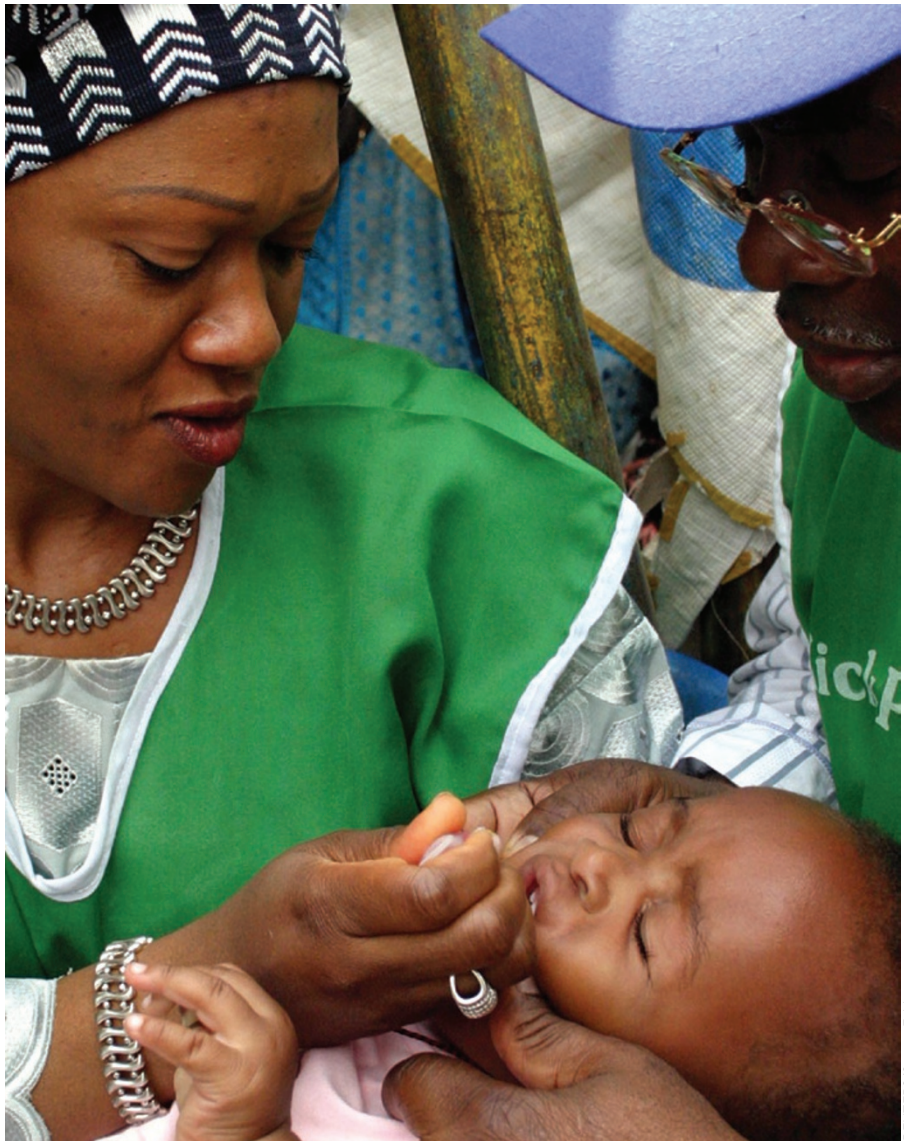
Since January 2006, more than 70 children in the northern part of the country have become paralyzed by the mutated virus, making this the largest outbreak of vaccine-derived polio to date. Experts fear that the outbreak will make parents wary of having their children vaccinated, thereby putting more youngsters at risk for acquiring endemic polio and hindering the eradication effort—which has already suffered several setbacks in Nigeria.

"The problem is explaining to the community that it's not vaccination that's the real risk, but under-vaccination," says Olen Kew, a virologist at the US Centers for Disease Control and Prevention (CDC) in Atlanta. Nigeria is one of the last countries, along with Afghanistan, India and Pakistan, to harbor endemic polio. In 2006, the disease paralyzed about 1,000 people in Nigeria, according to the World Health Organization (WHO).

The live attenuated virus used in the oral polio vaccine stimulates an immune response by replicating in the gut. Therefore, people who receive the vaccine excrete live virus particles into the environment, which help spread immunity in unvaccinated individuals. However, in extremely rare instances, the vaccine virus mutates during replication and regains its ability to cripple people. Outbreaks sparked by such mutations in poorly sanitized communities have occurred at least nine times since 2000 in countries such as Haiti and Indonesia. Although health workers have administered billions of doses of oral polio vaccine worldwide, only about 150 cases of the disease have been directly linked to the vaccine.

Officials first suspected that Nigeria might be harboring a vaccine-derived poliovirus in September 2006, when a lab worker at the CDC noticed an unusually large cluster of paralyzed children in northern Nigeria carrying an atypical type of poliovirus. Genetic sequencing of the virus in the patients' blood samples confirmed that it was a harmful strain that had originated from the vaccine.

Some media outlets have accused the WHO of withholding information about the vaccine-derived poliovirus outbreak to avoid a backlash against the vaccine in Nigeria. But Bruce Aylward, director of the organization's polio eradication campaign, denies the accusation.



REUTERS/George Esiri

70 children in Nigeria have acquired polio since January 2006.

"We didn't know [about the outbreak] until very late in 2006, and we didn't know we had a substantial problem until almost mid-2007," he says. "It took a long time to untangle what was really going on." Scientists highlighted the recent Nigerian outbreak in a report published in September of this year (*MMWR Morb. Mortal. Wkly. Rep.* **56**, 996–1001).

In 2003, rumors that researchers had laced the polio vaccine with HIV and sterility drugs led to a boycott of the vaccine in northern Nigeria and a subsequent outbreak of endemic poliovirus that spread to numerous countries. Health officials relaunched the immunization campaign a year later, but public suspicions lingered.

So far the recent outbreak has not caused widespread rejection of the vaccine, according to Festus Adu, director of the WHO's polio laboratory in Ibadan, Nigeria. In fact, according to the WHO, coverage in the north during the September immunization rounds appeared to be higher than ever before.

Still, international experts caution that the situation in Nigeria is fragile. "There's always a risk that information about the vaccine could be misinterpreted," Aylward says. He adds that the outbreak highlights the need to make polio infection so rare that it becomes more feasible to use a form of the polio vaccine delivered by injection, which costs ten times more than the oral version but does not carry the risk of paralysis.

Cassandra Willyard, New York