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## How Did Nigeria Quash Its Ebola Outbreak So Quickly?

What we can learn from the boot leather, organization and quick response times that stopped Ebola from spreading in this African nation

October 18, 2014 | By [Katherine Harmon Courage](#) | [Véalo en español](#) |

On July 20 a man who was ill flew on commercial planes from the heart of the Ebola epidemic in Liberia to Lagos, Nigeria's largest city. That man became Nigeria's first Ebola case—the index patient. In a matter of weeks some 19 people across two states were diagnosed with the disease (with one additional person presumed to have contracted it before dying).

But rather than descending into epidemic, there has not been a new case of the virus since September 5. And since September 24 the country's Ebola isolation and treatment wards have sat empty. If by Monday, October 20 there are still no new cases, Nigeria, unlike the U.S., will be declared Ebola free by the World Health Organization (WHO).

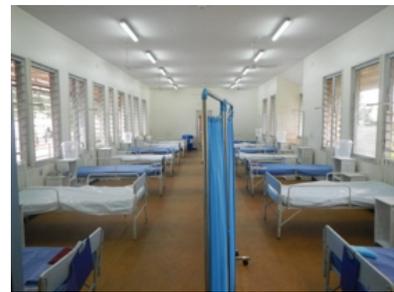
What can we learn from this African country's success quashing an Ebola outbreak?

Authors of a [paper published October 9 in \*Eurosurveillance\*](#) attribute Nigeria's success in "avoiding a far worse scenario" to its "quick and forceful" response. The authors point to three key elements in the country's attack:

- Fast and thorough tracing of all potential contacts
- Ongoing monitoring of all of these contacts
- Rapid isolation of potentially infectious contacts

The swift battle was won not only with vigilant disinfecting, port-of-entry screening and rapid isolation but also with boot leather and lots and lots of in-person follow-up visits, completing 18,500 of them to find any new cases of Ebola among a total of 989 identified contacts.

Such ground-level work may sound extreme, and the usually measured WHO [declared](#) the feat "a piece of world-class epidemiological detective work." But as [William Schaffner](#), chair of the Department of Preventive Medicine and an infectious disease expert at Vanderbilt University, says, "Actually what Nigeria did is routine, regular—but vigorous and rigorous—public health practice. They identified cases early—fortunately they had a limited number—and they got a list of all of the contacts, and they put *those* people under



Empty ebola ward in Nigeria.  
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rigorous surveillance so that if they were to become sick, they wouldn't transmit the infection to others," he says.

[Art Reingold](#), head of epidemiology at the University of California, Berkeley, School of Public Health agrees. The steps are basic: "isolation, quarantine of contacts, etcetera," but governments must "get in quickly and do it really well." It was Nigeria's vigorous and rapid public health response that really stopped the spread. Because when Ebola lands one August afternoon in a city of 21 million, things could go very, very differently.

### **Race to prevent spread**

Nigeria's index patient had been caring for a family member in Liberia who died from Ebola on July 8. Despite having been hospitalized in the Liberian capital Monrovia with fever and Ebola symptoms on July 17, he left medical care (against advice) and three days later took a commercial flight to Nigeria via Togo. After landing he collapsed at the Lagos airport and was taken to the hospital.

There it took three days before an Ebola diagnosis was made. The patient said he had no known exposure to Ebola, so he was first thought to have malaria, which is common and can have similar symptoms including fever, vomiting and headache. After malaria treatment failed to improve the patient's symptoms, however, medical staff began to consider Ebola, especially given his recent travel history. He was moved to isolation while test results confirmed the virus.

From this single individual, who died from the disease July 25, infectious disease experts generated a list of 898 contacts. Why so many? In addition to having become ill in a public place, the patient also infected an individual who then flew to and back from another Nigerian city, Port Harcourt, in late July while sick. That individual passed the infection to three other people, including a health care worker who died on August 22—but not before generating 526 more contacts. The index patient's primary and secondary contacts had only added up to 351.

The fact that two individuals were able to generate so many contacts shows just how vigilant authorities must be in tracking every last potential exposure. But the vigilance paid off. No new cases have been diagnosed in more than a month, and October 1 marked the date at which all of Nigeria's 898 contacts passed the 21-day incubation period during which Ebola symptoms can present themselves.

### **The epidemic that wasn't**

The arrival location of the index patient was a prime place to cause a widespread outbreak. Lagos is Africa's largest city, with a population of 21 million. It is a major hub for travel and business. "A dense population and overburdened infrastructure create an environment where diseases can be easily transmitted and transmission sustained," wrote the authors of [a paper for the U.S. Centers for Disease Control and Prevention's \(CDC\) \*Morbidity and Mortality Weekly Report \(MMWR\)\*](#). As such, "A rapid response using all available public health assets was the highest priority."

But, says [Folorunso Oludayo Fasina](#), a senior lecturer at the University of Pretoria in South Africa, co-author of the *Eurosurveillance* paper and a native Nigerian, it was actually lucky that the index patient in Nigeria fell ill at the airport. "Had the index case gotten the opportunity to contact persons in Lagos or Calabar—[another Nigerian city] where he was to deliver a lecture—it may have been a complete disaster."

Although it took three days to diagnose Ebola (a period during which nine health care workers were infected with the disease), once the diagnosis was confirmed health authorities swung into action. The Federal Ministry of Health worked with the CDC's Nigerian office to declare an Ebola emergency. On July 23—the very same day the patient was diagnosed—they created an Incident Management Center (which morphed into the Emergency Operations Center) and kicked into action an Incident Management System to coordinate responses. Such a centralized and coordinated system "is largely credited with helping contain the Nigerian outbreak early," the *MMWR* authors wrote.

It wasn't the Emergency Operations Center's first time tackling a highly infectious disease. Two years ago, after a global call from WHO, Nigeria redoubled its efforts to eradicate polio, another infectious virus, within its borders. The center has played a large role in working toward that goal, improving response times and preparedness along the way, the authors of the *MMWR* paper wrote. Many of those leading the Ebola response were chosen for their success working on polio eradication.

The government's first priority was to locate all potential contacts. A team of more than 150 designated "contact tracers" tracked down

each of the individuals. Such tracing is the most challenging part of this sort of work, Fasina says, especially in Nigeria, where "houses cannot always be traced by street numbers." With all of those potentially exposed to the virus pinpointed, workers conducted an astounding 18,500 face-to-face visits to check for fever and other Ebola-related symptoms in each of these contacts, according to data in the *MMWR* paper. The check-ups took a little cajoling, Fasina notes. To get folks to meet with tracers also requires a good deal of effort to remove social stigma around the disease.

Any individual showing symptoms was quickly moved to an isolation ward for further testing, which could be completed locally at the Lagos University Teaching Hospital for rapid diagnosis. Once an Ebola case was confirmed, patients were transferred to a special Ebola virus treatment center. Even those contacts that tested negative but showed Ebola-like symptoms were held—separately from Ebola patients—until all symptoms resolved. As cases were confirmed the Emergency Operations Center tracked down additional contacts and decontaminated potentially infectious areas.

In addition to contact tracing and rapid isolation, teams of "social mobilizers" canvassed areas around the homes of Ebola contacts, reaching around an additional 26,000 households with health information. Communicating that information effectively to the broader public is another challenge. Ensuring that people have confidence in the government—and understanding of what it is trying to do—is absolutely key, Vanderbilt's Schaffner notes. Part of that is controlling what he calls "the outbreak of anxiety."

### Lessons for the U.S.

The U.S. outbreak so far has many similarities to the one in Nigeria but "countries such as the U.S. have some lessons to learn," Fasina says. "Infectious disease is the same everywhere but the management may differ," leading to vastly different outcomes.

Schaffner agrees that the U.S. response has not been perfect. "There isn't any doubt that we've stumbled both on the clinical side, with misdiagnoses and insufficient training and supervision in the hospital, and on the public health side," allowing an infected nurse to fly commercially while she was under surveillance, he says. "Now that we've stumbled we shouldn't do it again."

U.S. government agencies seem to be learning. The CDC has beefed up its safety protocols for health care workers dealing with infectious patients and contact monitoring is exercised more strenuously. WHO, for example, [recommends](#) that even health care workers and cleaning staff who have used personal protective equipment and followed all the safety rules when dealing with an Ebola patient be considered "close contacts" and monitored for 21 days. This stands in contrast to the untrained health care workers in Dallas who treated the U.S. index patient (in what likely turned out to be less-than-optimal protective equipment) and were initially asked simply to self-monitor.

The key takeaways are: coordinate, track and monitor. "The Nigerian experience offers a critically important lesson to countries in the region not yet affected by the [Ebola] epidemic as well as to countries in other regions of the world," the *Eurosurveillance* authors noted. "No country is immune to the risk...[but] rapid case identification and forceful interventions can stop transmission."

### Global battle

Public health experts agree that the best way to reduce risk of an outbreak in other countries is to stop the epidemic in west Africa. According to [the latest statistics from WHO](#), as of October 17 some 9,216 people have contracted the illness and at least 4,555 have died. The bulk of the cases have occurred in Guinea, where the epidemic originated, Liberia and Sierra Leone. What was so different in Nigeria compared with neighboring countries farther west?

As the authors of the *Eurosurveillance* note, the rapid action after Nigeria's index patient was diagnosed helped keep the outbreak from spreading more widely. "In contrast the initial outbreak in Guinea remained undetected for several weeks," they wrote. "This detection delay facilitated the transnational spread of the virus to Sierra Leone and Liberia while difficulties and at times inability to track and contain infectious individuals compounded the situation and resulted in an as yet uncontrolled epidemic in these countries."

Now there are just too many people who are ill—or have had contact with the virus—to track in those nations, Schaffner says. And Sierra Leone's announcement on October 10 that it would provide rudimentary kits for people to care for sick family members at home makes the situation that much more dire. To be sure, it will keep sick people from traveling to health centers that are at overcapacity only to get turned away, possibly infecting others along the way. But, Schaffner notes, the "core public health reason for taking that individual out of that family is that you interrupt transmission." Until additional care facilities are prepared to take in the surge of patients the

outbreak will continue to spread untracked and untraced.

The difference between a stemmed outbreak and a full epidemic often also comes down to a question of resources and how quickly they can be made available. "In the three badly affected countries," Reingold says, "dreadful preexisting infrastructure and inadequate resources and capabilities" due in part to poverty, civil war and corruption have made executing standard public health practices for outbreak control nearly impossible. And time is of the essence: "To deal with the out-of-control outbreak there will take immense infrastructure building, staffing, resources and money," Reingold says. "The longer it takes for them to arrive—or to be put in place—the more difficult the job."

In Nigeria the response team was able to corral enough funding, staff and tools from state partners, international groups and nongovernmental organizations to successfully launch its attack on the outbreak right away. "National preparedness efforts should consider how resources can be quickly accessible to fund the early stage of the response," the authors of the *MMWR* paper wrote.

"Every country needs to evaluate its preparedness and must be ready to respond to [an] emergency immediately," Fasina says. "Nigeria was not completely ready," but they identified the index case early and then hit the streets.

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