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Researchers in Nigeria are racing to identify cases of Lassa fever — and to understand why the ongoing outbreak is the worst on record.

PUBLIC HEALTH

Deadly outbreak tests Nigerian health agency

Reforms made after the Ebola epidemic have boosted Nigeria's capacity to track diseases.

BY AMY MAXMEN

An unprecedented outbreak of a deadly viral disease in Nigeria is showcasing the newfound might of the country's public-health agency. Reforms put in place since a devastating Ebola epidemic struck West Africa in 2014 have transformed how Nigeria responds to infectious diseases — including the current Lassa-virus outbreak.

Since 1 January, Lassa fever has sickened

365 people and killed 81, making it the country's largest recorded outbreak of the virus. But public-health experts say that the toll would be much greater had Nigeria not strengthened its Centre for Disease Control (NCDC) over the past few years. The agency, Nigeria's first line of defence against disease outbreaks, has grown from roughly 30 physicians in 2011 to more than 130 epidemiologists, microbiologists and other specialists today. And it is deploying sophisticated data-management tools and

building diagnostic labs to monitor the current outbreak and prepare for the future.

Later this year, the Nigerian government is expected to approve legislation that would make the NCDC an independent agency with its own budget and decision-making powers.

"The Nigeria CDC has become stronger and faster," says Kingsley Ukwaja, a physician at the Federal Teaching Hospital, Abakaliki in Ebonyi state — a hotspot for the current Lassa outbreak. "They came quickly with protective gear, ▶

► and have sent epidemiologists to detect the source of the outbreak, and to locate the contacts of patients who may have the disease.”

Outbreaks of Lassa fever occur regularly in West Africa, where the virus is carried by rats. A person infected with the virus can spread it to others through their blood, urine and other bodily fluids. Symptoms of the disease include fever — and, sometimes, internal bleeding that can lead to death.

The 2014–16 epidemic of Ebola, a virus that can cause similar deadly symptoms, accelerated the transformation of the NCDC. The agency launched in 2011 with medical staff that lacked epidemiological training or the authority to act fast to curb outbreaks, says NCDC chief executive Chikwe Ihekweazu, who works in Abuja.

Nigeria became part of the Ebola epidemic in July 2014, when a man infected with the virus entered the country in Lagos, Nigeria's largest city. Although only 19 people in the country ultimately became infected, many Nigerians felt their country had narrowly skirted disaster. The man in Lagos visited a renowned private clinic where he was diagnosed immediately. That might not have happened had he entered one of the general hospitals that serve much of Nigeria's population, and often lack equipment, doctors and nurses.

In addition, international health organizations were poised to assist Nigerian authorities because they had already been alerted to the

escalating Ebola crisis in Liberia, Sierra Leone and Guinea.

“We were very lucky,” says Ihekweazu, who took the NCDC's helm in 2016 and has changed how it operates. He convinced politicians to grant the agency more autonomy to provide top government officials with information on outbreaks, without concern for the political ramifications. Ihekweazu has also improved how the NCDC interacts with the public. The agency uses television, radio and social media to educate people about public health; that includes combatting false information about how diseases such as Lassa spread.

“We are not where we want to be, but we are miles ahead of where we were,” Ihekweazu says.

DISEASE DETECTIVES

Now, the agency's public-health researchers are trying to understand why the current Lassa outbreak is so extensive. The scientists are collecting samples of the virus to see whether it has become easier to transmit; they are also exploring other hypotheses, such as whether people are living in closer contact to the common African rats (*Mastomys natalensis*) that can carry the virus.

NCDC workers are also building long-term infrastructure and systems to battle this

outbreak and those to come. The agency is coordinating its response at an emergency-operations centre that is modelled on “war rooms” deployed during polio outbreaks and the Ebola epidemic. Staff members are monitoring suspected and potential cases using software called SORMAS, which runs on tablet computers and smartphones. It was developed in response to the plodding pen-and-paper method used to track Ebola.

Yet the NCDC still faces some significant challenges. Many Nigerian states lack facilities to quickly diagnose diseases such as Lassa and Ebola, Ukwaja says, making it harder for the public-health agency to fight outbreaks from the start. In January, three of his colleagues at the hospital in Abakaliki died of Lassa fever. They were exposed to the virus during a four-day wait for test results from samples that had to be shipped out of the state for processing.

Now, that wait has been cut to 24 hours, because the NCDC has built a laboratory in Ebonyi state that has the equipment needed to identify Lassa fever. The facility, which began operating last week, is the fourth such lab in Nigeria.

“Sometimes things need to get worse before they get better,” says Richard Garfield, an epidemiologist who advises the US Centers for Disease Control and Prevention. “Pretty much everything big we have done in epidemiology was in response to a problem we didn't know how to handle.” ■

PUBLISHING

Sites warn against ‘predatory’ journals

Blacklists emerge after closure of popular Beall's list.

BY DALMEET SINGH CHAWLA

When librarian Jeffrey Beall shut down his controversial blog listing potentially ‘predatory’ scholarly publishers and journals last year, copies swiftly appeared elsewhere online. More than a year later, at least one of these copycat blacklists is still growing — maintained by an anonymous website manager who says that they spend hours each weekend working on the list.

Growing interest in the site suggests that there is still an academic appetite for a public blacklist of predatory journals, says the site manager, who identified themselves as a senior research assistant in the hard sciences at a European institution. The site's keeper corresponded with *Nature* by e-mail and declined

to provide any further details of their identity, citing fear of harassment.

Beginning in 2010, Beall, an academic librarian at the University of Colorado Denver, maintained a site listing thousands of open-access journals and publishers that he said deceived authors by charging fees to publish papers without providing expected services, such as peer review and editing. He closed the site in January 2017, and later said that this was because of “intense pressure” from his employer — although his supervisor and institution have denied this, calling it Beall's personal decision.

Sites preserving Beall's list quickly surfaced. The anonymous site manager says that their own page, titled ‘Beall's list of predatory journals and publishers’, was initially intended only for personal use. But soon after the site went live,

they began receiving e-mails from academics asking about the quality of certain journals. The manager now spends four to six hours each weekend replying to these messages, and says that most questions come from academics concerned about publishing in a particular journal.

If the journal titles aren't already listed, the manager says, they carry out an “in-depth analysis” of the publishers' policies, checking them against a set of criteria originally laid out by Beall, and researching whether they are indexed on journal ‘whitelists’, such as the Directory of Open Access Journals or Journal Citation Reports. Journals or publishers deemed untrustworthy by the manager are included in an ‘update’ addendum on the blog. By March 2018, the new site had added 85 stand-alone journals and 27 publishers to Beall's original lists of more than 1,000 titles.

LISTS OF LISTS

Another site, Stop Predatory Journals, also came online in January last year. It is run by a group that, according to the website, consists of scholars and information professionals who decided to “rebuild and resurrect” Beall's list, hoping to create a community-based approach to curation. But the site is not updated regularly.

“I understand their desire to be anonymous,” says Beall, who says that publishers listed