JOHN MOORE/GETTY

Virologists testing samples for Ebola in Liberia in 2014.

PUBLIC HEALTH

Fast Ebola test limits outbreak

Health workers in the Democratic Republic of the Congo can diagnose the virus in hours, instead of days.

BY DECLAN BUTLER

Health workers fighting the Ebola epidemic that swept West Africa several years ago waited days, even a week, for the results of laboratory tests to detect the deadly virus. But in an Ebola outbreak that began in early April in the Democratic Republic of the Congo (DRC), this waiting time has shrunk to hours — thanks to a genetic test that was developed in response to the 2014–16 West African epidemic.

Researchers and health officials credit the faster tests with helping to contain the spread of Ebola in the DRC, by allowing infected people to be isolated and their contacts traced promptly. And should sparks from this outbreak light new fires in neighbouring countries, the nimbler test could help to avert a repeat of the devastating West African epidemic.

The test involves a small machine called the GeneXpert, which is widely used across Africa to diagnose tuberculosis. The DRC's government has made the GeneXpert its primary method of testing for Ebola in the current outbreak. "Labs have been set up with two to three days' notice in new transmission zones, whereas in West Africa it took months and months to get facilities up and running," says Mark Perkins, head of laboratory networks for the World Health Organization (WHO) Health Emergencies Programme. "It's a remarkable change."

One of the biggest lessons of the West African epidemic — in which around 29,000 people were infected and 11,000 died in Sierra Leone, Guinea and Liberia — was the need to diagnose cases of Ebola more quickly. Better lab tests could have averted 30–70% of cases and saved thousands of lives and billions of dollars, according to a May 2018 report by the Foundation for Innovative New Diagnostics in Geneva, Switzerland.

Most Ebola lab diagnostics detect genetic sequences that are specific to the virus in blood, serum and other bodily fluids. During the West African epidemic, these manual tests required highly trained scientists working in sophisticated tight-security labs that were often far from outbreak zones.

In the DRC, by contrast, the same tests are automated and are being performed more rapidly and nearer to transmission zones by GeneXpert. The machine uses custom cartridges for different diseases and was developed for resource-poor settings. In response to the 2014–16 epidemic, the machine's manufacturer developed a cartridge called Xpert Ebola to test for the Zaire strain of Ebola, which is behind the current DRC outbreak. The turnaround time from taking a sample to receiving a diagnosis in this outbreak is usually a matter of hours or at most a day, Perkins says.

The DRC outbreak, which is mainly centred in remote regions of Équateur Province in the northwest of the country, is still relatively small, with 38 lab-confirmed cases, 14 probable cases and 14 suspected (see 'Rapid response'). As of 9 June, 28 of the people thought to have the virus had died.

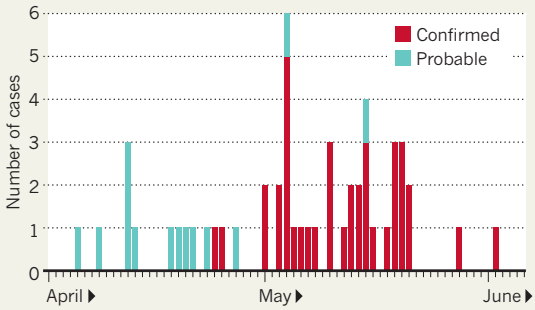
Health officials are cautiously optimistic that the outbreak can be stopped quickly. But the WHO is still worried that the virus could spread across the DRC and the rest of Central Africa. Some cases may have gone undetected, which could lead to resurgences of the disease. And for the first time in the DRC, cases have occurred in an urban area.

Should further regional outbreaks occur, GeneXpert machines will continue to be a big help, officials say. There are already around 150 of the machines in the DRC and several hundred in nearby countries for testing for tuberculosis and other diseases. By swapping in Xpert Ebola cartridges, a large Ebola-testing network could be quickly created, says Perkins.

Thanks to lessons learnt from the West African outbreak, says Mara Jana Broadhurst, an Ebola-diagnostics specialist at Stanford University in California, "a new paradigm for Ebola virus detection and diagnosis is taking shape". ■

RAPID RESPONSE

With the GeneXpert test, health workers fighting the current outbreak of Ebola in the Democratic Republic of the Congo have rapidly set up testing labs in transmission zones to deliver fast results.



SOURCE: WHO