

# Ebola vaccine approved for use in ongoing outbreak

Officials have signed off on an experimental vaccine in the Democratic Republic of the Congo, but the decision on whether to deploy it remains up in the air.

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Ebola vaccines have been used before, but only in trials such as this one in 2015 in Liberia.

Regulatory and ethics-review boards in the Democratic Republic of the Congo (DRC) have approved the use of an experimental Ebola vaccine to combat an ongoing outbreak of the virus, officials announced on 29 May. If they decide to deploy the vaccine, called rVSV-ZEBOV, health-care workers will offer it to those at highest risk of contracting the disease.

Uncertainties over the outbreak's magnitude mean that Congolese authorities and the World Health Organization (WHO) must determine whether the small number of confirmed cases justifies the cost and logistical complexity that comes with deploying the vaccine, says Marie-Paule Kieny, assistant director-general of health systems and innovation at the WHO's headquarters in Geneva, Switzerland.

Officials have confirmed only two cases of Ebola since they started getting reports of people with Ebola-like symptoms in late April. There are 17 suspected cases in the DRC awaiting a diagnosis, as of an update from the WHO dated 28 May. Sixty-seven percent of the computer simulations run by officials predict that there will be no further cases in the next month.

### Handle with care

Nonetheless, officials have spent the past two weeks preparing to transport the vaccine to the outbreak's epicentre in Likati, a remote part of the Bas-Uélé province, a part of the country that borders the Central African Republic. Workers will need to use a combination of helicopters and motorcycles, because the heavily forested province — nearly twice the size of Ireland — doesn't have paved roads. Another option is to use small boats to traverse the region on narrow rivers. Furthermore, a lack of electricity in the area will require portable freezers capable of storing the vaccine doses at  $-80^{\circ}\text{C}$ .

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The WHO and the Congolese authorities will also need to train nurses on how best to roll out the immunizations, says Eugene Kabambi, a WHO communications officer based in Kinshasa, DRC. And communities must be educated about the vaccine so that there are no misunderstandings about its safety or its benefits, given the danger of Ebola.

In the meantime, the Congolese Ministry of Health and the WHO have arranged for the deployment of two mobile laboratories in Bas-Uélé, where researchers with the Congolese National Biomedical Research Institute can run diagnostic tests for Ebola. And a group from the aid organization Médecins Sans Frontières (MSF, also known as Doctors Without Borders) has set up and staffed a 10-bed Ebola treatment unit near the outbreak's epicentre.

## **In case of emergency**

In April, a WHO working group recommended the use of rVSV-ZEBOV should an outbreak occur, on the basis of promising results from a clinical trial conducted in 2015 during the Ebola crisis in Guinea<sup>1</sup>. There are 300,000 doses of the vaccine available, owing to an agreement made in 2016 between the international organization Gavi, the Vaccine Alliance, and Merck, the pharmaceutical company that manufactures rVSV-ZEBOV.

The key to Merck's vaccine is a protein expressed on the surface of the Zaire strain of Ebola, collected during a 1995 outbreak in Kikwit, DRC. This is nearly identical to the strain circulating in the country now. The protein triggers a person's immune system to produce antibodies that fight the virus.

Should the vaccine be deployed, staff at MSF will vaccinate health-care workers in the hot zone and the initial group of people who had contact with those infected with Ebola, as well as a secondary group who had contact with the initial crowd. This 'ring-vaccination' strategy was used in Guinea in 2015 to protect those at highest risk of exposure.

The infrastructure, including laboratories and equipment, and the personnel required to address the Ebola epidemic in the DRC won't come cheap. The Congolese government has estimated that its response will require US\$14 million. But a humanitarian crisis in the Kasai region in central DRC is also draining resources from the government and international donors. The United Nations stated in April that it will cost at least \$11 million to meet the immediate nutritional, health and educational needs of more than a million people who have been displaced by escalating conflicts in the region.

"Ebola outbreaks are tragic but expected," says Mark Feinberg, president of the International AIDS Vaccine Initiative based in New York City. "And this is an important opportunity to test how prepared countries are to decide whether or not they want to deploy new vaccines, and how, before they are licensed."

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## **References**

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1. Henao-Restrepo, A. M. *et al. Lancet* **389**, 505–518 (2017).