

## **EBOLA OUTBREAK IN DRC (North Kivu):**

### **I. Epidemiological situation (August 29, 2018):**

- A total of 115 cases of haemorrhagic fever reported in the region, 85 confirmed and 30 probable.
- Of the 85 confirmed cases, 19 are cured, 19 are hospitalized, and 47 have died.
- More than 2500 contacts are being followed

This is the second EVD outbreak in DRC this year and the 10<sup>th</sup> outbreak in the past four decades. It is occurring in a conflict zone, which explains why outbreak detection took three months. The response has been fast, but vaccinating people in the “red zone” is very challenging. There is concern of the outbreak spilling into Uganda.

### **II. Response**

#### **Vaccination**

Since vaccination began on 8 Aug, 4645 people have been vaccinated, including 2372 in Mabalako (North Kivu), 1135 in Beni (North Kivu), 1017 in Mandima (Ituri province), and 121 in Oicha (North Kivu).

In contrast to the recent Ebola outbreak in DRC, where the vaccine was implemented when the outbreak was already waning, experts think that vaccination in this outbreak could be a real game-changer.

The decision to exclude pregnant and lactating women from vaccination if exposed to Ebola in the current outbreak has been severely criticized. 3 public health experts write in an opinion piece for STAT.

<https://www.statnews.com/2018/08/27/ebola-vaccine-pregnant-lactating-women/>

In fact, at least 20 pregnant women were unintentionally vaccinated in a previous trial, with no evidence of harm. Therefore, the decision not to vaccinate them should be reconsidered (Greg Folkers, NIH, in ProMED).

Some 20 cases of polio (vaccine-derived poliovirus) have been reported in the region, prompting the government to launch a vaccination campaign in the region. However, they have decided to exclude certain areas in the North Kivu province due to the Ebola outbreak. “Piggybacking” the polio vaccine on the Ebola vaccine could be an alternative solution, as commented in ProMED.

#### **Treatment**

Two patients who received the experimental treatment mAb114 have recovered, according to Congo’s Health Ministry. mAb114 was isolated from a survivor of an Ebola

outbreak in 1995. Other treatments approved for testing in this outbreak are ZMapp (a cocktail of three mAbs), and the antiviral drugs Remdesivir, Favipiravir and Regn3450-3471-3479 <https://www.apnews.com/41548f7a05e84ce3b9776d827fa657f9>

The Ministry announced some days ago the healing of 14 other people who contracted Ebola in the Beni region. But it is not clear whether these individuals were cured through the use of mAb114.

### **Care**

In Mangina, the epicenter of the epidemic, the Ebola treatment center (ETC), set up by Doctors Without Borders (MSF) and operational for 12 days, currently hosts around 30 patients, with a capacity of 70 beds.

To fight against resistance and misunderstanding, MSF is working to involve families. A visitor trail now exists and, above all, the morgue has been built to allow families to see the deceased, safely.

<http://www.rfi.fr/afrique/20180825-rdc-ebola-centre-traitement-ebola-mangina-epicentre-epidemie-msf-deces>

The United Nations Population Fund (UNFPA) has donated a batch of 10 tons of medical and surgical equipment to the Beni General Referral Hospital to avoid cases of Ebola infection in maternity wards. This donation will cover the care of at least 30 000 people for 6 months and includes childbirth care, access to family planning and care for survivors of gender-based violence.

### **Socio-cultural factors**

The Government has announced that school will start on Sept 3, as planned, and that awareness will be raised among children about hygiene and good measures to avoid infection. School staff will receive training on prevention and response to suspected signs of disease.

A report summarises key socio-cultural considerations related to death, burial, funerals (rites or ceremonies), and mourning in the context of the Ebola outbreak in North Kivu and Ituri provinces.

<http://www.socialscienceinaction.org/resources/key-considerations-context-north-kivu-province-drc/>

Controlling Ebola in a conflict zone is pushing NGOs and WHO to come up with creative strategies to reach those in need, as described in this article.

<https://www.npr.org/sections/goatsandsoda/2018/08/27/641536981/a-dangerous-twist-to-the-latest-ebola-outbreak>

### III. Scientific literature update

#### Virus

A new ebolavirus, Bombali virus (BOMV), was found in free-tailed bats in Sierra Leone, which have the habit of roosting in houses. Future studies on potential of human transmission and pathogenicity are needed.

<https://www.ncbi.nlm.nih.gov/pubmed/30150734>

#### Antibodies

By generating more than 600 lymphoblastoid B cell lines from human survivors of Ebola virus infection, two mAbs with potent neutralizing activity towards each of the three clinically relevant ebolavirus species, were identified. The two antibodies, termed EBOV-515 and -520, conferred complete protection against weight loss and disease in the mouse model of lethal EBOV infection when administered as a monotherapy at 1 day after infection. Partial protection was observed against BDBV in ferrets and SUDV in guinea pigs.

<https://www.ncbi.nlm.nih.gov/pubmed/30029854>

Another paper in Cell performs an analysis of EBOV GP antibodies and defines features that confer protection.

<https://www.ncbi.nlm.nih.gov/pubmed/30096313>

A paper in Nat Microbiol describes three naturally occurring human cross-neutralizing mAbs, from BDBV survivors, that target a conserved site in a canonical GP region (HR2-MPER). Immunization with this antigenic site elicited neutralizing antibodies in rabbits. <https://www.ncbi.nlm.nih.gov/pubmed/29736037>

Worryingly, antibody-dependent enhancement of by human antibodies isolated from survivors was observed in vitro at sub-neutralizing concentrations, regardless of epitope specificity or subclass.

<https://www.ncbi.nlm.nih.gov/pubmed/30110637>

#### Vaccines

A review in The Lancet by members of PREVAC Alliance discusses the current state of EVD vaccine candidates, the gaps and challenges, and ongoing trials conducted by PREVAC with the different vaccine candidates.

<https://www.ncbi.nlm.nih.gov/pubmed/30104048>