

Ebola (EVD) in the Democratic Republic of the Congo (DRC) with Good News in the Fight Against Ebola:

An Update of the Current Situation:

A snapshot of the DRC Dashboard, provided by the DRC with the WHO Regional Office for Africa, includes the following data on the most current number of cases, deaths, survivors, and the contacts followed. **As of 12/21/19, there have been a total of 3,358 cases including both confirmed and probable cases.** This includes one (1) new confirmed case as part of the 3,240 confirmed cases (proven by laboratory testing), and 118 probable ones (almost certainly Ebola, without the ability to confirm with testing due to violence, death & burial of remains, or another cause preventing access to tissue for testing purposes). There are also **another 446 suspect cases that are not included in the total cases and are still undergoing testing for definitive classification.** There have been well over 200,000 contact investigations with most now finishing their monitoring period completely before returning to normal life. The latest group of new cases has been attributed to one single chain of transmission, related to a person who relapsed with Ebola, with subsequent transmissions to others. All are being followed. **There have been 1,096 survivors and 2,224 deaths with a total reported case fatality rate of 66%. Of the more recent cases, 56% are female, 28% are less than 18 years of age, and a consistent 5% are health care workers. There have been over 250,000 vaccinated with the Merck vaccine;** another 2000 plus have been vaccinated with the newer to-the-field (since November) Johnson & Johnson vaccine. Monitoring of those traveling between borders of the DRC and first tier at-risk-for-spread countries have been up and running for two of the three countries. The third is currently developing a more robust system for detection. There have been no recent alerts at border crossings although this has occurred in the past with positive cases slipping through. Second tier countries are educating staff and developing policy as funds permit. Outbreaks of violence, sometimes deadly, occur in a few areas of the DRC and have resulted in temporary stoppage of investigative, testing, monitoring, and proper burial activities until control can be regained. This has been responsible for some of the ongoing outbreaks and remains a problem. Links to the data can be found below.

The Good News in Preventing, Identifying and Treating Ebola:

There are three (3) pieces of good news regarding Ebola and its ability to transmit disease and cause such a high case fatality rate, although none of these guarantee that EVD will not continue to spread in the DRC or, as happens, emerge somewhere else.

- 1. The FDA has approved the Merck Vaccine ERVEBO for Ebola – Zaire,** the one used on a trial basis in previous outbreaks with excellent results and, until November, was the only vaccine being used in the DRC. It has been given to over 250,000 people in a ring vaccination program and for all (as much as possible) health care workers. Currently licensed for 18 years or older, although it has been used in pediatric applications in the DRC. There are other Ebola viruses but Zaire has been the most common.

This has an impact on the US directly and provides for an immediate plan of action should the US again have cases of EVD appear here, either when expected, so that Americans who contract the virus outside the US can be cared for here at a specialized center (there are currently three in the US) with pre-vaccinated HCWs OR, if an unknown case should appear, as it did in Dallas during the 2014-2016 three African Nations' outbreak, with some imported cases to the US and Europe, mitigation by vaccination would begin immediately for those at risk of exposure/infection.

2. In October, the FDA approved the marketing and use of a rapid diagnostic test that detects EVD antigens in certain fluids of living persons suspected of having EVD, as well as oral fluid from a recently deceased person suspected to have died of it. The OraQuick Ebola Rapid Antigen Test is the first test that the FDA has approved for use in the US. However, the test only provides a rapid presumptive (likely) result and has to be confirmed with a more definitive test such as a PCR. A negative Rapid Antigen test does not rule out Ebola. This test is not designed to be used as a screening tool for those that are not symptomatic. Rather, it works only if there is enough virus in the fluid tested to be detected. It is designed to be used on those that have traveled to an area where EVD is present, or been in contact with someone who has, and has/had symptoms of Ebola; the one to be tested must have developed Ebola symptoms as well.

3. Throughout the many outbreaks, attempts to find the best treatment(s) has been on-going. During the current 2018-19 DRC outbreak, the PALM Trial was begun to determine which of four treatments for EVD were most effective. In August, an independent board who was monitoring the trial stopped it because two of the treatments were clearly better in lowering mortality than the other two. The trial also proved that effective trials could be run in the midst of an outbreak/epidemic, even with the ongoing threat of violence. All treatments were randomized to be given as a single treatment along with standard supportive care given to all. The four treatments were a single monoclonal antibody Mab114, a triple monoclonal antibody REGN-EB3, an antiviral drug remdesivir, or a triple monoclonal antibody ZMapp as a control (it had shown possible effectiveness in a trial in West Africa). The end point was death at 28 days. Four treatment centers enrolled 681 patients and, at that point, the board stopped the trial because Mab114 and REGN-EB3 showed a much better ability to prevent death. These treatments have not been licensed for use outside of trials and have not been produced in large quantities capable of being stockpiled, but more work is definitely indicated. I am not including the biochemistry of the different products but am including links to the published study and added commentary (both in the NEJM) as well as a link to the US Library of Medicine (NIH) Study Outline.

Links to the Update of the Current Situation:

DRC Dashboard for 12/21/19 with WHO Regional Office for Africa French with English Transl.:

<https://who.maps.arcgis.com/apps/opsdashboard/index.html#/e70c3804f6044652bc37cce7d8fcef6c>

WHO Regional Office for Africa Situation Report 12/17/19:

<https://www.who.int/publications-detail/ebola-virus-disease-democratic-republic-of-congo-external-situation-report-72-2019>

WHO DRC EVD Disease Outbreak Update for 12/12/19:

<https://www.who.int/csr/don/12-december-2019-ebola-drc/en/>

Links to the Ebola Vaccine Approval:

FDA Announcement of the Approval of Ebola Zaire Vaccine:

<https://www.fda.gov/news-events/press-announcements/first-fda-approved-vaccine-prevention-ebola-virus-disease-marking-critical-milestone-public-health>

University of Minnesota Center for Infectious Disease Research and Policy (CIDRAP) Professional Commentary & Information on the EVD Vaccine:

<http://www.cidrap.umn.edu/news-perspective/2019/12/fda-approves-merck-ebola-vaccine-amid-more-drc-cases>

Links to the Rapid Ebola Diagnostic Test in the US:

FDA Announcement of the First Rapid Ebola Diagnostic Test Approved for Use in the US:

<https://www.fda.gov/news-events/press-announcements/fda-allows-marketing-first-rapid-diagnostic-test-detecting-ebola-virus-antigens>

CDC Guidance for Using Rapid Ebola Diagnostic Testing in the US:

<https://emergency.cdc.gov/han/han00423.asp>

Links to the PALM Trial for Determining the Best Ebola Treatment:

NEJM Main Article Presenting Data from Ebola Treatments Trial (PALM):

https://www.nejm.org/doi/full/10.1056/NEJMoa1910993?query=recirc_curatedRelated_article



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NEJM Commentary on Data from Ebola Treatments Trial (PALM):

https://www.nejm.org/doi/full/10.1056/NEJMe1915350?query=recirc_curatedRelated_article

US National Library of Medicine with the Ebola Treatment Trial (PALM):

<https://clinicaltrials.gov/ct2/show/record/NCT03719586>