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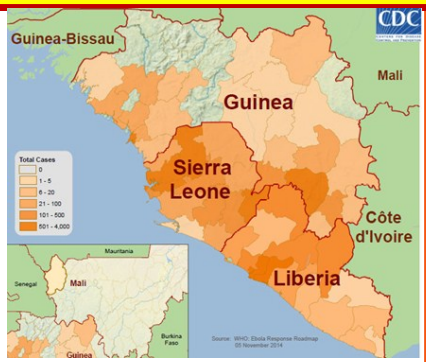
UPDATES ON EBOLA VIRAL DISEASE IN WEST AFRICA 2014 by PRP Ying Hui

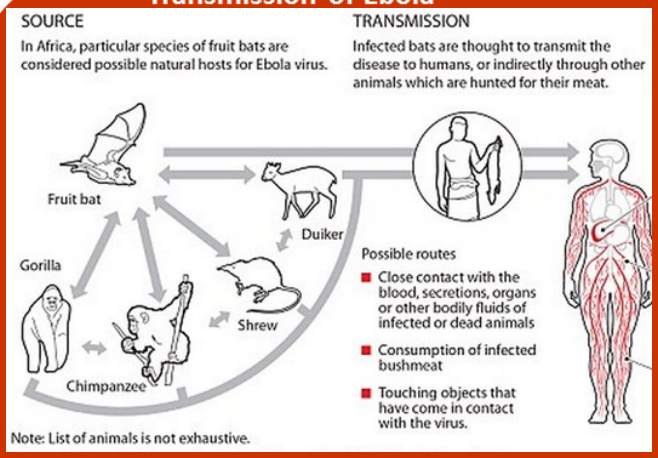


Ebola viral disease (EVD) or formerly known as Ebola haemorrhagic fever first appeared in 1976 in 2 simultaneous outbreaks in Nzara, Sudan and in Yambuku, Democratic Republic of Congo. The latter was a village situated near the Ebola river; from which the disease takes its name. It has a death rate of 90%.

In 2014, the first case associated with the outbreak was notified in March; and it is believed to have started in Guinea before spreading to Sierra Leone and Liberia. As of November 24th, there were a total of 15,319 cases (laboratory-confirmed cases of 9,566) with 5444 deaths in Guinea, Liberia and Sierra Leone. Other countries with cases of Ebola include Mali (one case that was imported from Guinea), Spain (one case occurred in a healthcare worker caring for an Ebola patient who had been transported to Spain from Liberia for care), United States (one travel-associated case was imported to Dallas from Liberia, and resulted in transmission to two healthcare workers; one travel-associated case from Sierra Leone was imported to New York City), Nigeria (one international importation from Liberia resulted in localized transmission, which has ceased) and Senegal (one case that was imported from Guinea).

Ebola is caused by infection with a virus of the family *Filoviridae,* genus *Ebolavirus.* There are 5 identified Ebola virus species, four of which are known to cause disease in human: *Zaire ebolavirus*, *Sudan ebolavirus*, *Taï Forest ebolavirus*, and *Bundibugyo ebolavirus*. The fifth, *Reston ebolavirus*, has caused disease in nonhuman primates, but not in human. The virus causing the 2014 west African outbreak belongs to the *Zaire* species.

Transmission of Ebola



Ebola spreads through human-to-human transmission via **DIRECT CONTACT** (through broken skin, open cut, wound or abrasion, mucous membranes, for example, eyes, nose, mouth) with

- Blood and body fluids (like urine, faeces, saliva, vomit, breast milk, sweat, and mucus semen) of infected person.
- Infected fruit bats or primates (apes & monkeys)
- Objects (like needles, syringes, bedding, clothing, and medical equipment) that have been contaminated with the blood or body fluids of infected person.
- Bushmeat (wild animals hunted for food & contact with infected bats).

Ebola does NOT spread through the air, water, and food. A person infected with Ebola can't spread the disease until symptoms appear. There is no evidence that mosquitos or insects can transmit ebola virus.

Symptoms of Ebola include :

- Fever
- Sore throat
- Abdominal pain
- Hemorrhage (internal & external)
- Severe headache
- Muscle pain
- Fatigue/weakness
- Vomiting
- Diarrhea

The incubation period (the time interval from infection with the virus to onset of symptoms) is 2 to 21 days (average 8-10 days)

Controlling infection in health-care settings

- **Standard precautions** when caring for patients regardless of their presumed diagnosis include basic hand hygiene, respiratory hygiene, use of personal protective equipment, and safe injection practices.
- Extra infection control measures when caring for patients with suspected or confirmed Ebola include use of **face protection** (face shield, or medical mask and goggles), a clean, non-sterile long-sleeves **gown, and gloves.**
- **Isolate** patients with Ebola from other patients.
- Avoid direct, unprotected contact with the bodies of people who have died from Ebola, including **direct contact** with a dead body without protective gear during **funeral rites**.
- Ebola is killed with hospital-grade disinfectants (eg household bleach). Ebola on dry surfaces eg door knobs & countertops can **survive for several hours**, virus in body eg blood can survive up to **several days at room temperature**.
- People are infectious as long as their blood and secretions contains the virus. Ebola virus was isolated from **semen 61 days** after onset of illness in a man who was infected in a lab, hence men should **abstain from sex/oral sex for at least 3 months**.

MANAGEMENT & TREATMENT OF EBOLA VIRAL DISEASE

Treatment and vaccine

- No FDA-approved vaccine or medicine is available for Ebola.
- Supportive care-rehydration with oral or intravenous fluids and treatment of specific symptoms improve survival.
- Treat other infections if they occur
- Maintaining oxygen status & blood pressure.
- Experimental vaccines and treatments for Ebola are under development, but they have not yet been fully tested for safety and effectiveness.
- Recovery from Ebola depends on good supportive care and the patient's immune response
- People who recover from Ebola infection develop antibodies that

Two promising candidate vaccines

- **cAd3-ZEBOV (GSK with the US National Institute for Allergy and Infectious Diseases (NIAID)) – based on a chimpanzee adenovirus to which an Ebola virus gene has been added in a bid to stimulate an immune response.**
- **rVSV-ZEBOV (Public Health Agency of Canada and licensed to NewLink Genetics Corp) – Uses a weakened virus for vesicular stomatitis, a livestock disease, of which one of the genes has been replaced by an Ebola virus gene.**

Experimental treatment – TKM-Ebola

- **Developed by Vancouver-based Tekmira Pharmaceuticals**
- **Collection of three small interfering RNA molecules (siRNAs), targeting three Ebola virus proteins, packaged into their proprietary lipid nanoparticle (LNP) technology.**
- **Tested on a small group of monkey and provided 100% protection against an otherwise lethal dose of Ebola virus.**
- **Being tested in a Phase 1 trial on human.**

Experimental treatment – ZMapp

- **Developed by Mapp Biopharmaceutical in California**
- **A cocktail of three antibodies that cling to the virus and inhibit its reproduction**
- **ZMapp has been given to a small number of infected frontline workers since WHO gave the green light in August. Among those who survived, it was unclear whether ZMapp was the cause.**
- **Derived from tobacco leaves and it is difficult to produce in a large scale. Stocks are reportly exhausted.**

Plasmapheresis

- **Blood serum is taken from survivors and their antibodies are given to the patients.**
- **It has been used as an ad-hoc treatment in Ebola-hit countries but its effectiveness has never been out through clinical trial.**

ANNOUNCEMENT : DISCONTINUATION OF DRUGS

Discontinuation of production sales by manufacturer:

1) **Betamethasone** 0.1% Eye drop
2) **Duofilm** (Salicylic Acid 16.7%, Lactic Acid 16.7%) - We still have a few remaining stocks available. Once stocks depleted, alternative product will be **'Ellgy Corns and Warts, 10mL'** (Salicylic Acid 17%)

Drug Shortage due to shipment problem by overseas manufacturer

1) **Cyclomydril** Eye drop (Cyclopentolate 0.2% + Phenylephrine 1%, 5mL) .
   No generic alternative available.
   Temporary alternative: **Cylogyl** Eye drop (Cyclopentolate 1%, 15mL)
2) Clomipramine 25mg Tab (Anafranil-G)

A publication of :

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