

Working in non-traditional environments: The Ebola Virus Disease Outbreak

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Presentation Overview

Background on Ebola Virus Disease

Ebola Virus Disease Response in West Africa

Safety and Health Challenges in West Africa

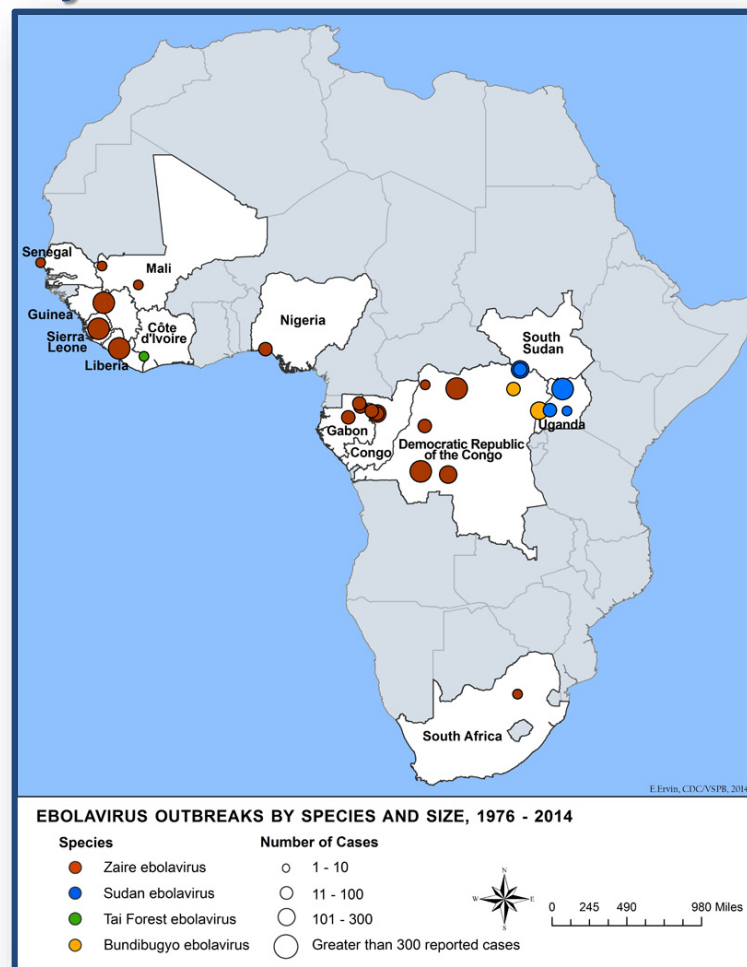
BACKGROUND ON EBOLA VIRUS DISEASE

Ebola Virus Disease (EVD) Background

EVD is a rare and deadly disease

1976: First discovered near the Ebola River in the Democratic Republic of the Congo

Outbreaks occur sporadically in Africa



Ebola Virus Disease

Family of zoonotic RNA viruses

Filoviridae

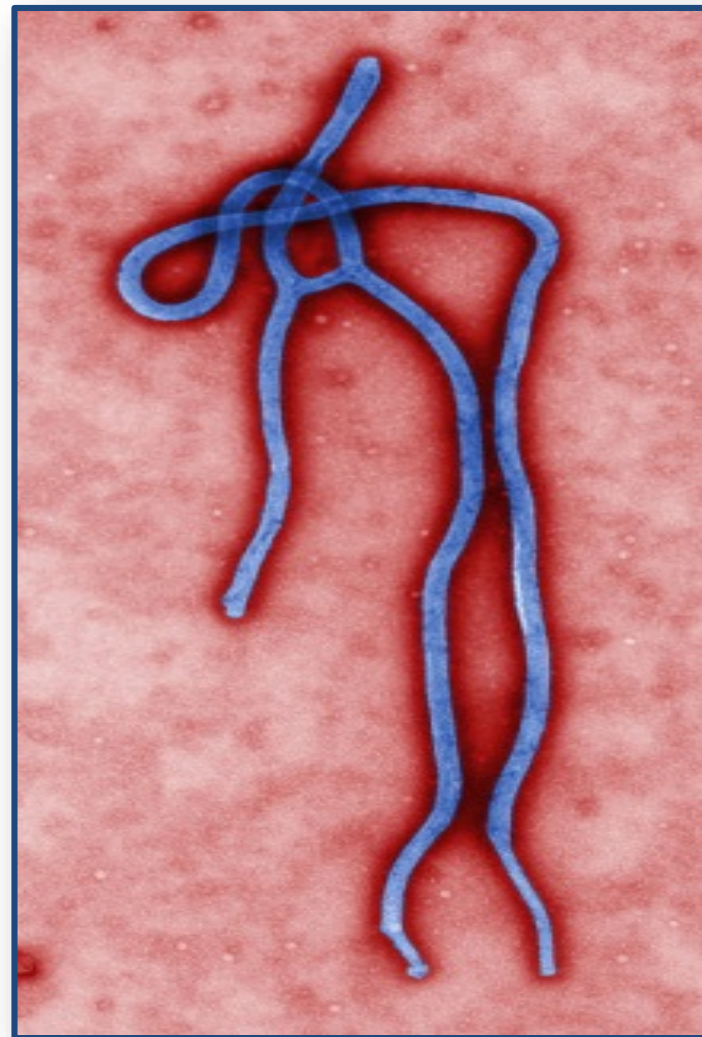
Previously called Ebola
hemorrhagic fever, caused by Ebola
virus infection

5 species of *Ebolavirus*

*Zaire, Bundibugyo, Reston, Sudan, &
Tai Forest*

All but *Reston ebolavirus* known to
cause disease in humans

Historically, death rates for Ebola range
from 50%-90%



Ebola Virus Ecology and Transmission

Ebola virus disease is a zoonotic disease. Zoonotic diseases involve animals and humans.

Animal-to-Animal Transmission

Evidence suggests that bats are the reservoir hosts for the Ebola virus. Bats carrying the virus can transmit it to other animals, like apes, monkeys, and duikers (antelopes), as well as to humans.

Spillover Event

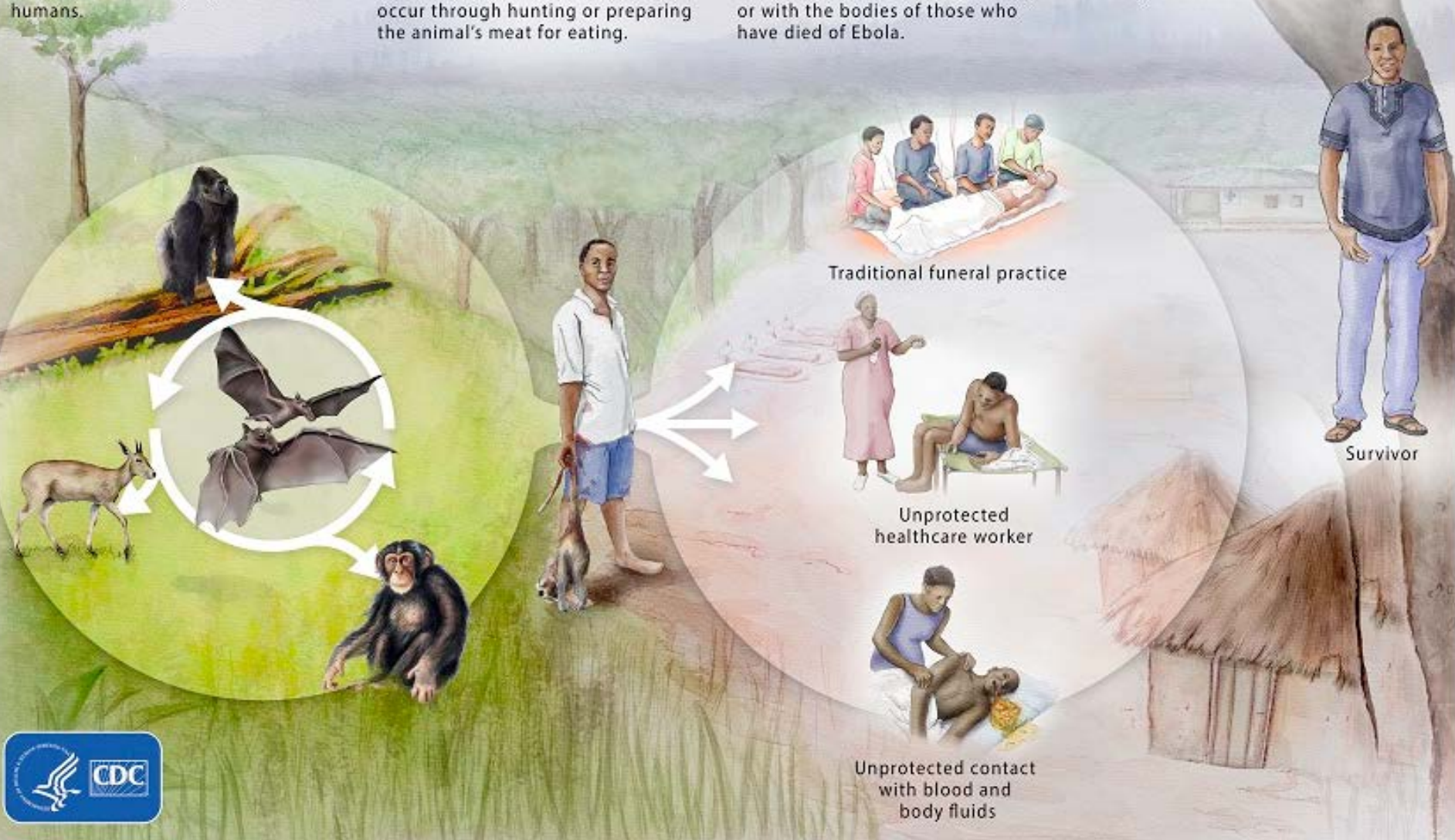
A "spillover event" occurs when an animal (bat, ape, monkey, duiker) or human becomes infected with Ebola virus through contact with the reservoir host. This contact could occur through hunting or preparing the animal's meat for eating.

Human-to-Human Transmission

Once the Ebola virus has infected the first human, transmission of the virus from one human to another can occur through contact with the blood and body fluids of sick people or with the bodies of those who have died of Ebola.

Survivor

Ebola survivors face new challenges after recovery. Some survivors report effects such as tiredness and muscle aches, and can face stigma as they re-enter their communities.



Transmission

Ebola virus spreads through direct contact with infected blood or body fluids

People at highest risk

Health workers caring for patients

Family and friends in close contact

Contact with

Bodies of people that died of EVD

Contaminated objects

Infected fruit bats or primates

Bush meat (wild animals hunted for food)

Possible that virus can be spread through sex or contact with semen of male survivors

Mosquitoes, insects, dogs, and cats are not believed to transmit Ebola virus



You **CAN'T** get Ebola through **AIR**



You **CAN'T** get Ebola through **WATER**



You **CAN'T** get Ebola through **FOOD** grown or legally purchased in the U.S.



Signs and Symptoms

Incubation period, from exposure and infection occurred to when signs or symptoms appear, is 2-21 days (average 8-10 days)

A person infected with Ebola virus is not contagious until symptoms appear

Signs and symptoms of EVD

- Fever
- Severe headache
- Fatigue
- Muscle pain
- Vomiting
- Diarrhea
- Abdominal pain
- Anorexia
- Unexplained hemorrhage



Prevention

No FDA-approved vaccine for EVD

Several investigational vaccines being evaluated in trials

So, what can I do to protect myself?

Wash hands with soap and water or alcohol-based hand sanitizer

Avoid contact with blood and body fluids

Do not handle items that may have come in contact with an infected person's blood or body fluids

Avoid contact with

Dead bodies, semen from an Ebola survivor, bats and nonhuman primates

Do not go to Ebola treatment units

Promptly report any potential unprotected Ebola exposure or illness

Seek medical care immediately if you develop symptoms

Limit contact with other people and do not travel



Treatment

Basic interventions, when used early, can significantly improve the chances of survival

Providing intravenous fluids and balancing electrolytes (body salts)

Maintaining oxygen status and blood pressure

Treating other infections if they occur

Symptoms of EVD and complications treated as they appear

Recovery depends on good supportive care and the patient's immune response

No FDA-approved medicine (e.g., antiviral drug) for Ebola

Experimental treatments for Ebola under development, but not yet fully tested for safety or effectiveness

Several investigational drugs have been used to treat patients with Ebola, but no controlled clinical trials have been conducted

Survivors

Current unknowns:

Some people who have recovered from Ebola have developed long-term complications

Ongoing joint and muscle pain and vision problems

Antibodies and immunity

Not known if survivors are immune for life or can be infected with another species

Not known if surviving Ebola can affect a woman's ability to get pregnant or have children

Current knowns, but more information is needed:

Even after recovery, Ebola virus might be found in some body fluids

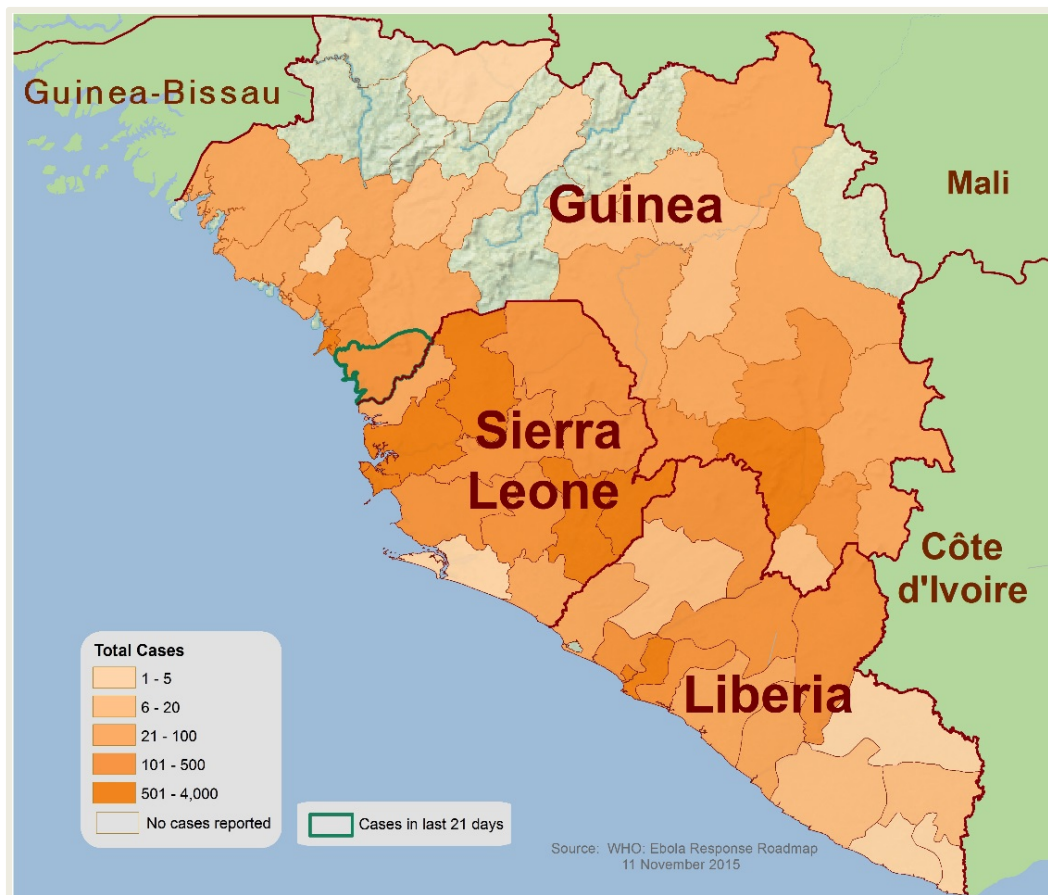
Semen – decreases over time, but should use protection

Breast milk – survivors should not breast feed

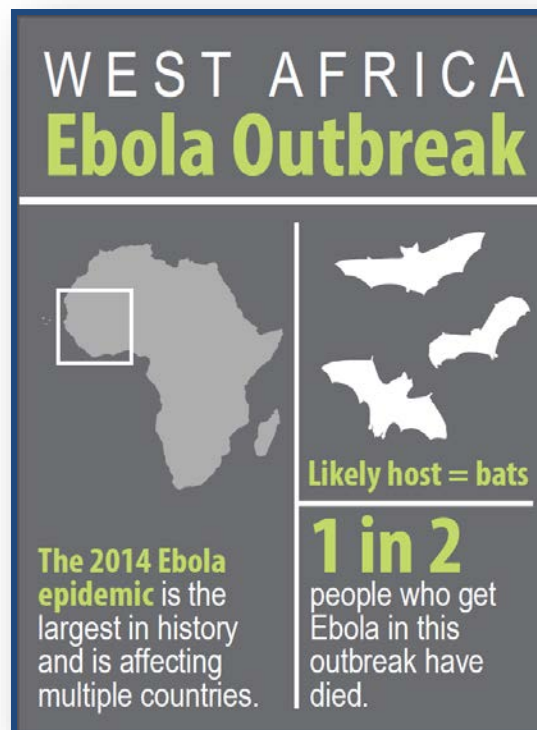
Eye – limited immune activity in the eye



2014 Ebola Outbreak, West Africa



- Largest Ebola outbreak in history
- Largest outbreak response in CDC's history



<http://www.cdc.gov/vhf/ebola/outbreaks/2014-west-africa/distribution-map.html>

Ebola Cases and Deaths

WHO has declared the following countries free of Ebola virus transmission:

Sept. 3, 2015: Liberia

Nov. 7, 2015: Sierra Leone

Dec. 29, 2015: Guinea

A country can be declared Ebola-free 42 days after the last patient tests negative for the virus (42 = double the 21-day incubation period of Ebola virus)

Sporadic cases of EVD are expected

A new case was identified on January 14, 2016 in Sierra Leone



EBOLA VIRUS DISEASE RESPONSE IN WEST AFRICA

Outbreak Challenges in West Africa

Overburdened Public Health and Healthcare Systems

Unpaid healthcare workers
Insufficient treatment centers, beds, medical supplies, and personal protective equipment (PPE)



Outbreak Challenges in West Africa

Porous borders

High population
mobility

Geographic breadth



Outbreak Challenges in West Africa

Lack of Knowledge and Acceptance of Ebola

Distrust of outsiders &
government

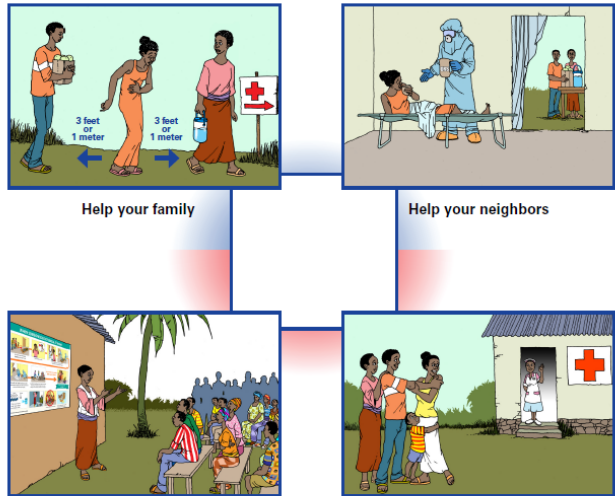
Fear and superstition

Traditional beliefs

Limited knowledge of germ
theory

Stigma

THERE IS STRENGTH IN UNITY!
LET US HELP ONE ANOTHER FIGHT AGAINST EBOLA!



Help your family

Help your neighbors

Help your community

When we help each other we can save lives! Let's help one another fight Ebola!

There is Strength in Unity!

U.S. Centers for Disease Control and Prevention (CDC)

CS201137-C

Overall Goals in EVD Outbreak Response

Patient Care

Experienced and/or trained staff

Strict use of PPE

Stop human-to-human transmission

Case identification, prompt isolation & infection control

Contact tracing

Community education is key!!!



Local Signage for Community Education



SAFETY AND HEALTH CHALLENGES IN WEST AFRICA

Challenges in Ebola Treatment Units

Patient care

Handwashing

Medical equipment

PPE – donning and doffing

Hazardous Waste

Heat Stress

Training



Basic Healthcare Challenges

Overall lack of healthcare access

Pests and Vectors

Water-borne illnesses

Giardia, Schistosomiasis

Insect-borne illnesses

Malaria, bedbugs

Food-borne illness

Animal attacks/bites

Dogs, snakes, bats

Lassa fever

Hot and Humid Weather



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Food Safety Issues



Limited Local Safety Regulations



Waste Disposal at Ocean Edge



Transportation Challenges



Summary of Challenges in responding in West Africa

Limited

Healthcare, transportation, electricity

**Working with a variety of
International responders AND locals**

Local customs

Access to materials

**Your safety and health always remain
your first priority – even with all the
work to be done!**

Questions?

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