

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

# The Epidemiology of Ebola virus disease

**Ehsan Mostafavi; Epidemiologist**

**Head of the Department of Epidemiology,**

**Director of the Research Centre for Emerging and Reemerging  
infectious diseases,**

**Pasteur Institute of Iran, Tehran, Iran**



# Transmission: Bats and animals

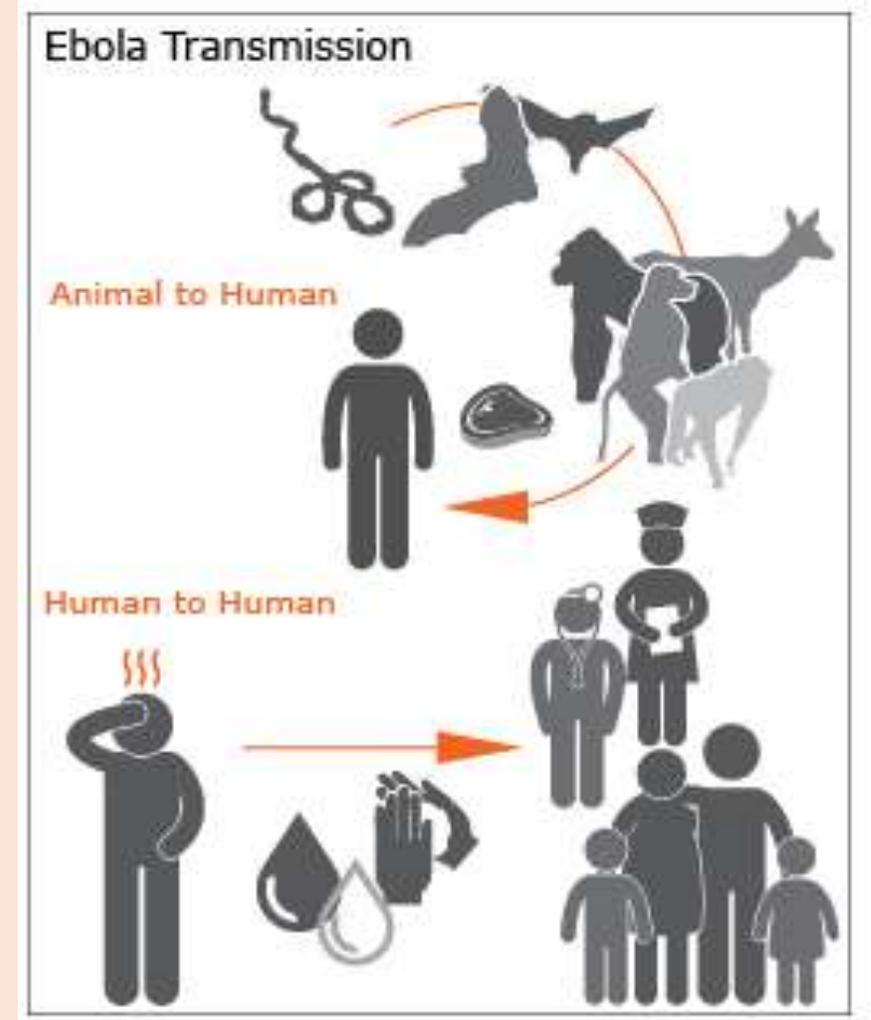
Just how Ebola actually gets from animals or the environment and into humans is **unclear**.

The virus probably "**resides**" in bats.

From there it may occasionally infect humans that directly **handle** or **eat bats**.

Or Ebola may infect an **intermediate species**, such as monkeys or gorillas (non-human primates), that eat contaminated partially-eaten **fruit** that bats drop.

Humans may find the dead "**intermediate**" animal and then eat its **meat**.



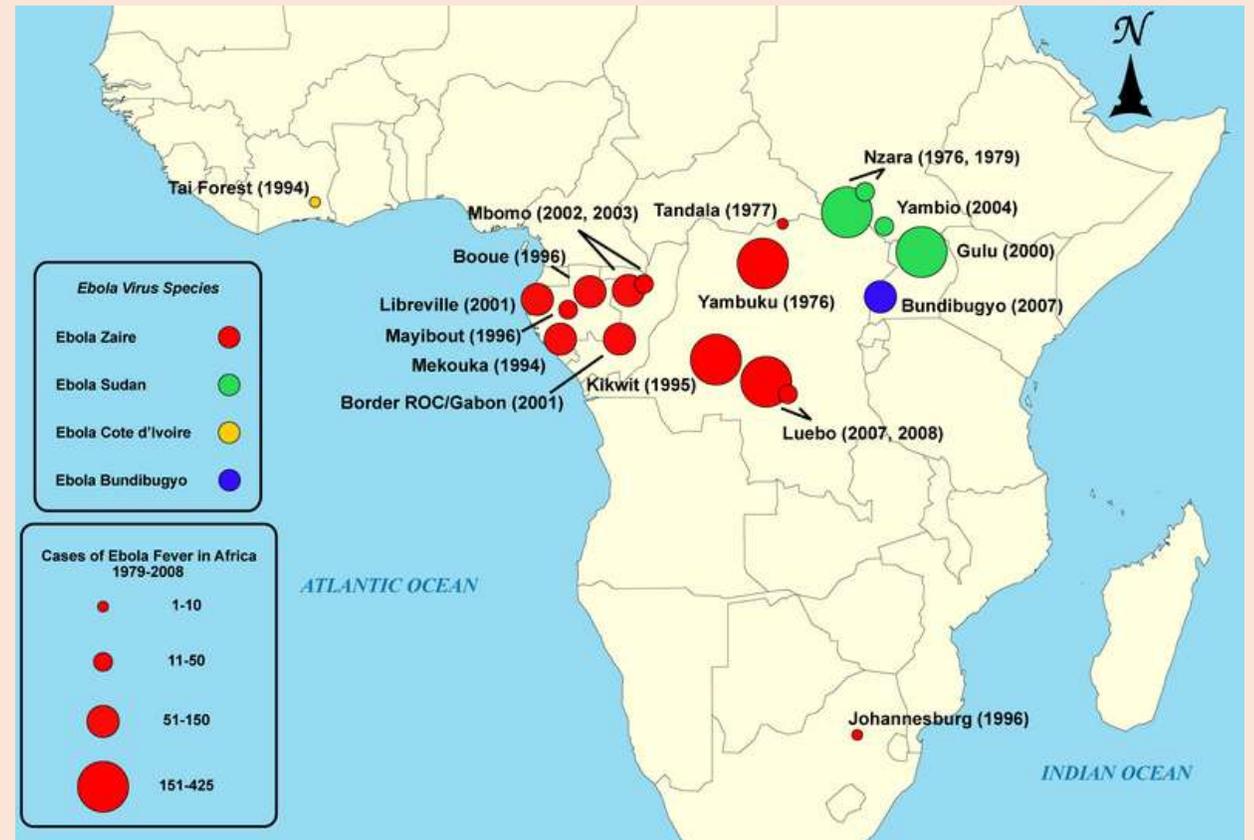


# Transmission: Outbreaks in humans

- Ebola virus is contained in the **blood** and body fluids of infected people (vomit, diarrhea, urine, nasal secretions, sweat, ejaculate).
- The more **symptomatic** a person is, the **greater the risk** of catching the virus from their body fluids.
- In addition, it is possible to become infected by **touching contaminated objects**.
- The germs get onto the toucher's hands, and then may accidentally be transferred into the **nose, mouth** or **eyes**, or enter the blood stream via cuts on the **hands**.
- The virus does not spread through the **air**.
- Clearly, **family, carers, and medical staff** are at high risk.
- The current outbreak in West Africa is being spread **person to person**.
- There are no known cases in which someone got Ebola from **sexual** relations.

# Ebola fever in Africa (1979 to 2008)

- The disease typically occurs in outbreaks in tropical regions of **Sub-Saharan Africa**.
- From 1976 through 2013, WHO reported **1,716** confirmed cases in **Sudan, Zaire, Uganda, Gabon, Congo**



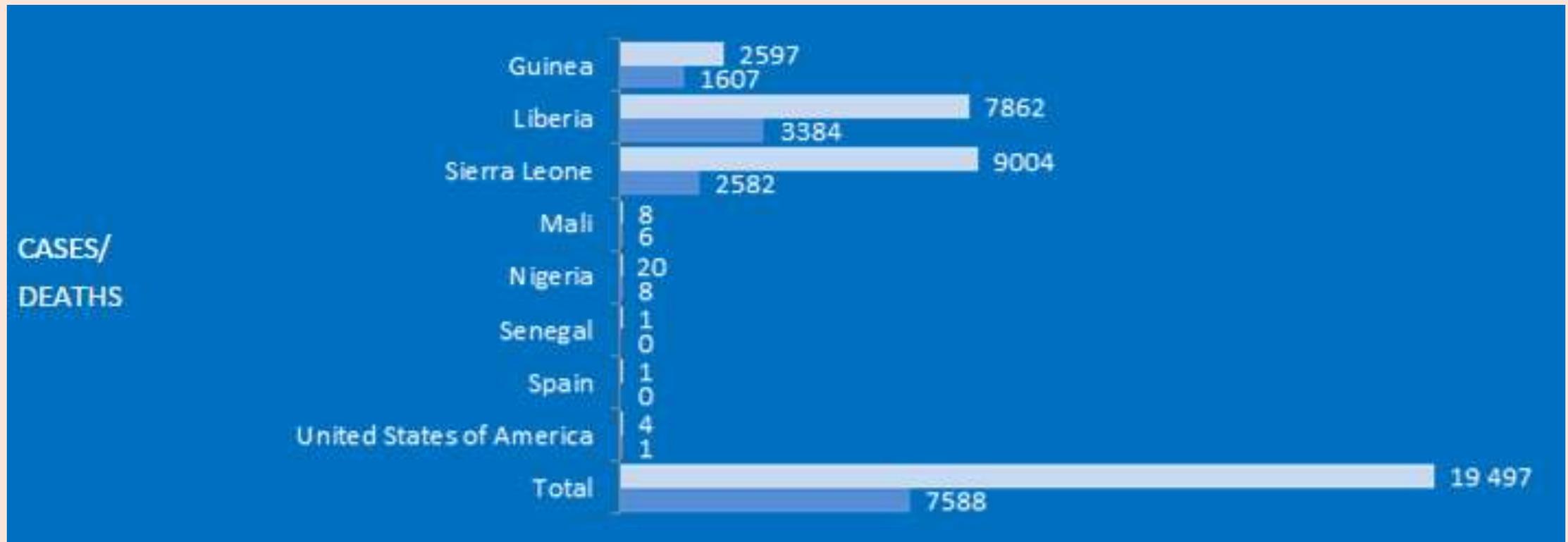


# Ebola fever in Africa (2013-2014)

- This outbreak began in **Guinea**. The first case there occurred in **December 2013**, though it was not reported to WHO/identified as Ebola until **March 2014**.
- Soon after the disease was brought to international attention, cases were also reported in neighboring **Liberia**.
- Control measures were enacted in both countries, and seemed effective. By the **beginning of April**, disease activity slowed. It looked like the outbreak was heading to its end.
- Unexpectedly, cases spiked again in late **May**.
- The disease began actively spreading for the first time in **Sierra Leone** in late May.
- Reports of the diseases in **Nigeria, Senegal, Mali, Spain and United States**.
- Authorities reminded the global community that such **imported cases** would continue to be seen in **nations around the world** until Africa's outbreak is brought under control.

# Situation report

- Up to **24 December 2014**, there have been **19497** reported cases of Ebola virus disease, with **7588** (38.92%) reported **deaths**.



A vertical strip on the left side of the slide shows a microscopic view of biological tissue, likely showing various cells and structures in shades of red and pink.

# The importance of the outbreak

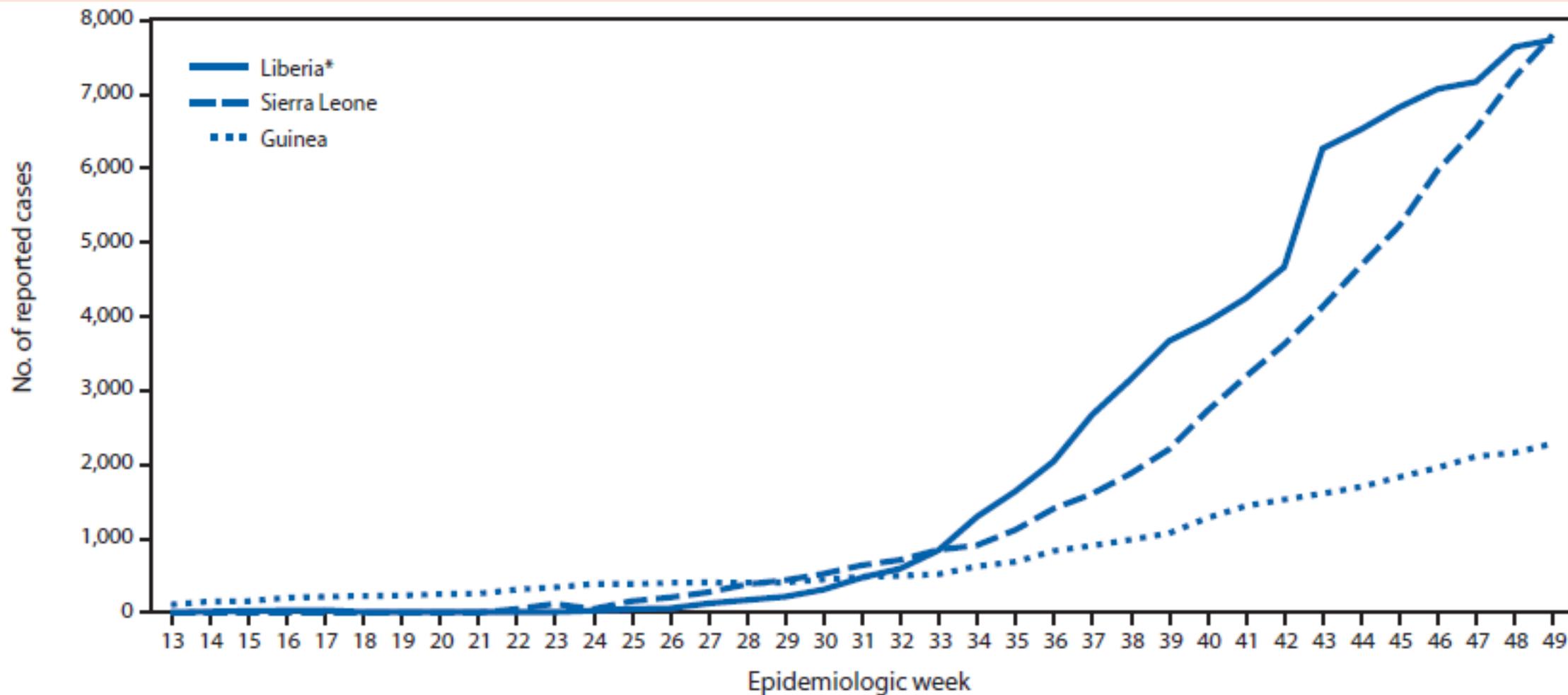
- **Size, scope and export into other countries** are unusual elements.
- In late July 2014, the WHO declared the outbreak a **Grade 3 emergency**.
- In early August 2014, WHO declared it a **Public Health Emergency of International Concern**.
- Indeed, by the end of September 2014 the UN stated the outbreak is "**a threat to international peace and security**"
- The New England Journal of Medicine called the outlook "**bleak**".
- The US CDC said **there could be over a million cases by January 2015** if significant containment measures were not enacted successfully.

# Contact tracing



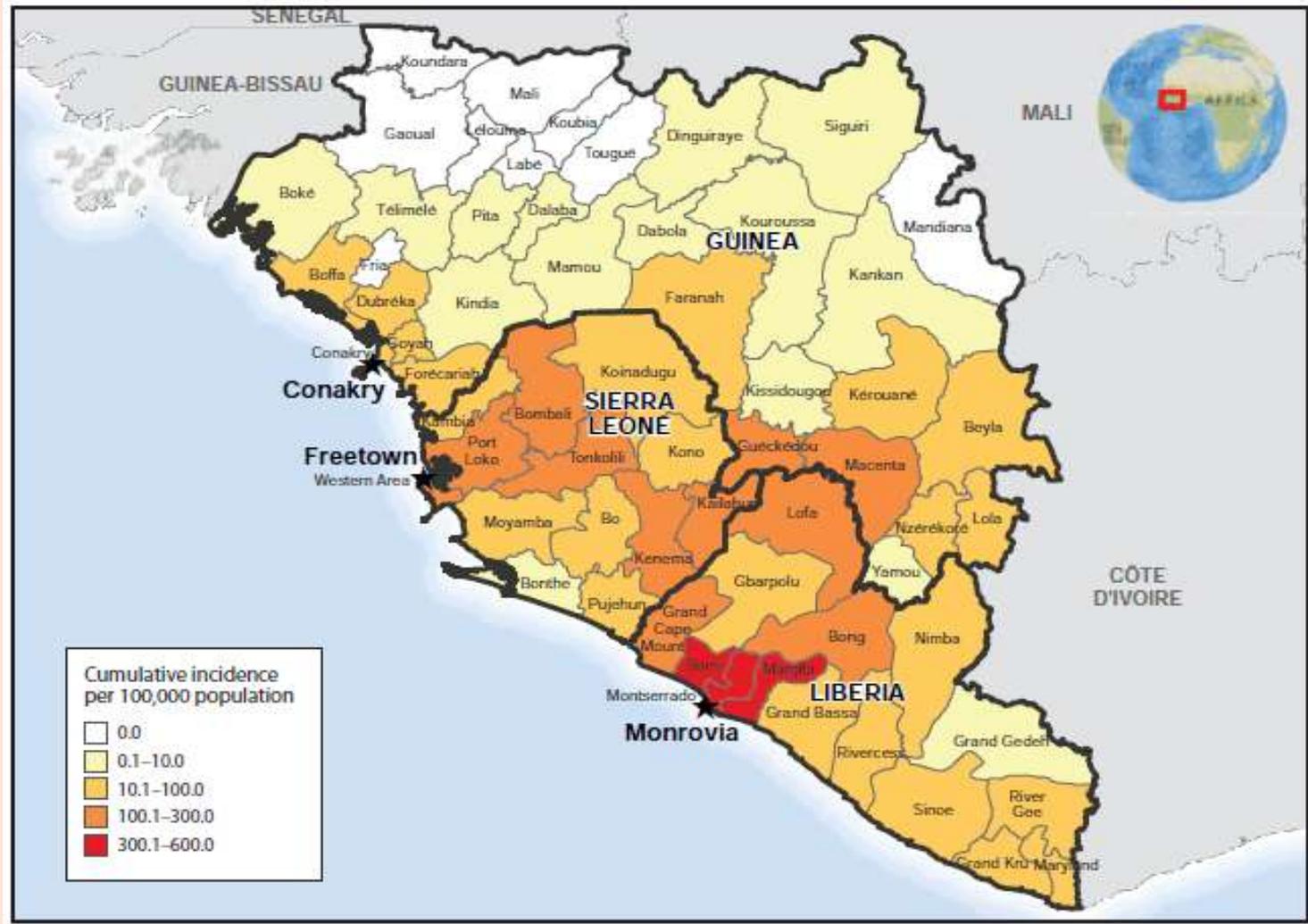
# Cumulative number of Ebola disease cases reported

Guinea, Liberia, and Sierra Leone, March 29–November 30, 2014



# Cumulative incidence of disease

## Guinea, Liberia, and Sierra Leone, November 30, 2014







**Thank you**

**You can be in contact with me: [mostafavi@pasteur.ac.ir](mailto:mostafavi@pasteur.ac.ir)**