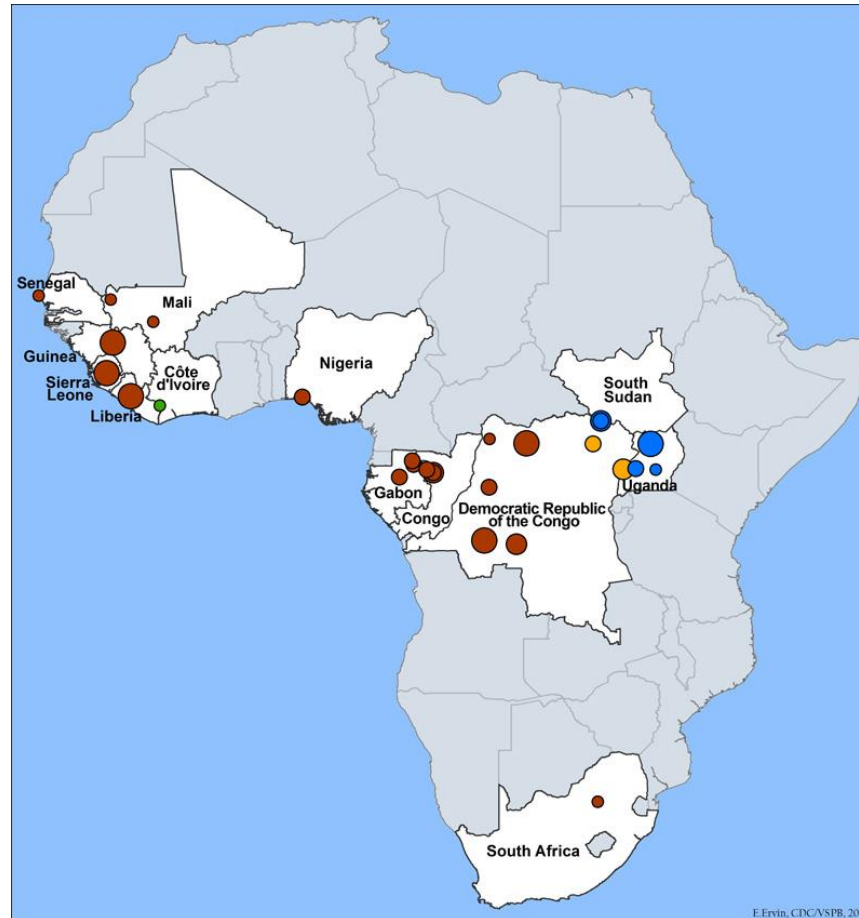
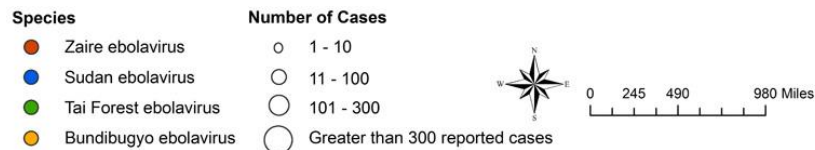




# Previous Ebola Outbreaks 1976 - 2014



**EBOLAVIRUS OUTBREAKS BY SPECIES AND SIZE, 1976 - 2014**



# Ebola 101

- Reservoir
  - Fruit Bats are believed to be the reservoir
- Transmission
  - Contact with infected animals
  - Direct contact with bodily fluids of an infected person
- Incubation Period
  - Typically 8-10 days
  - Range 2 – 21 days
- Prevention
  - Hand-washing
  - Avoid Body Contact
  - Personal Protective Equipment for healthcare workers, burial teams, etc.

# Signs and symptoms of Ebola

- Fever
- Severe headache
- Muscle pain
- Weakness
- Fatigue
- Diarrhea
- Vomiting
- Abdominal (stomach) pain
- Unexplained hemorrhage (bleeding or bruising)

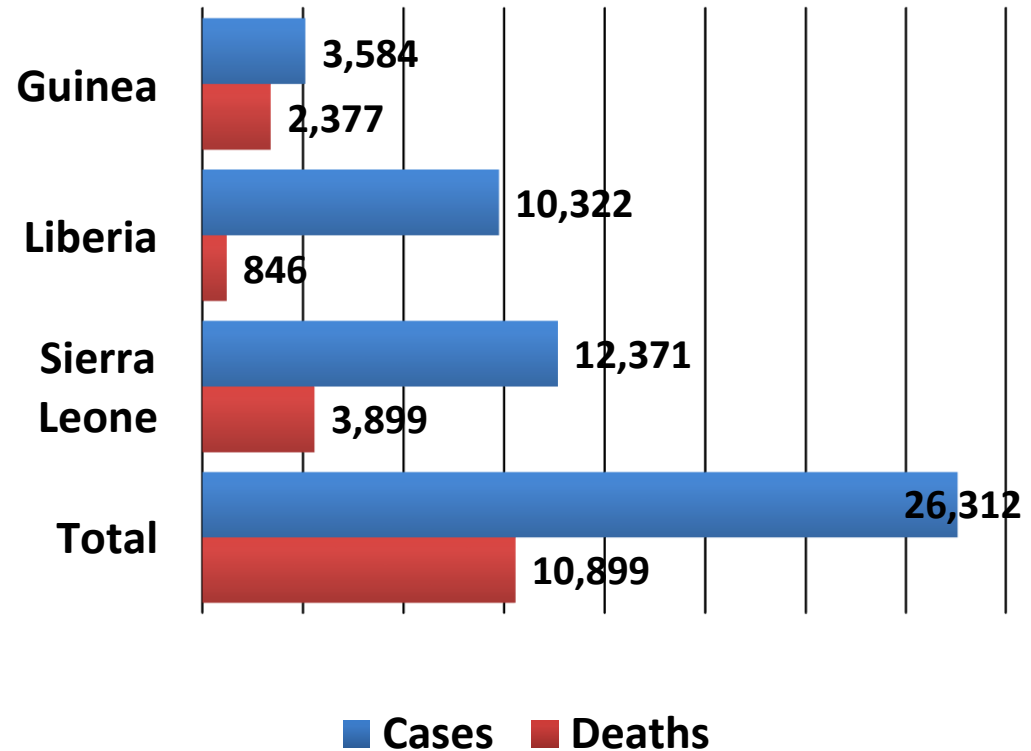
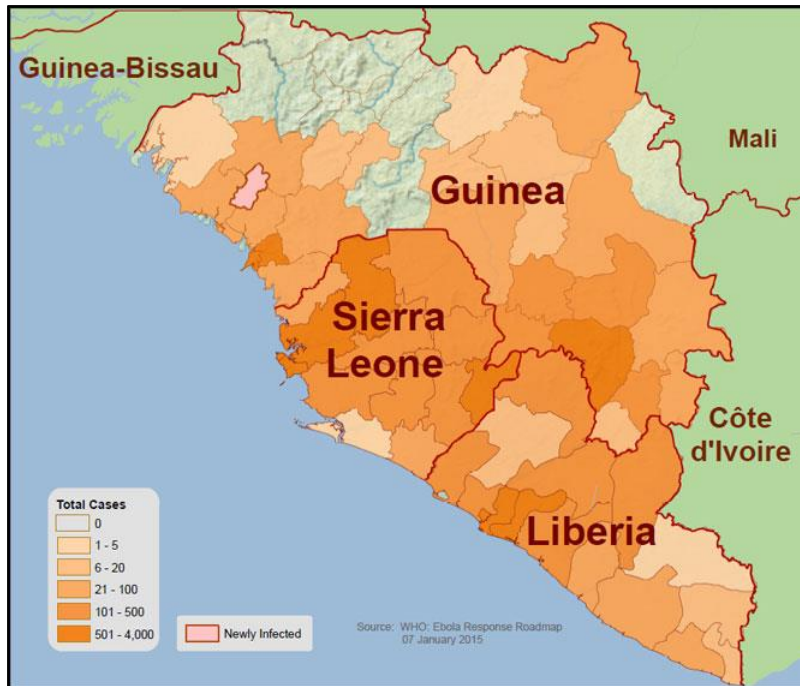


# EBOLA OUTBREAK IN WEST AFRICA



# WHO Ebola Situation Report

## Number of cases and deaths by country as of April 26, 2015



Sources: WHO Ebola Outbreak in West Africa  
- Case Counts; WHO SITREP, 26 April 2015





**SIERRA LEONE**

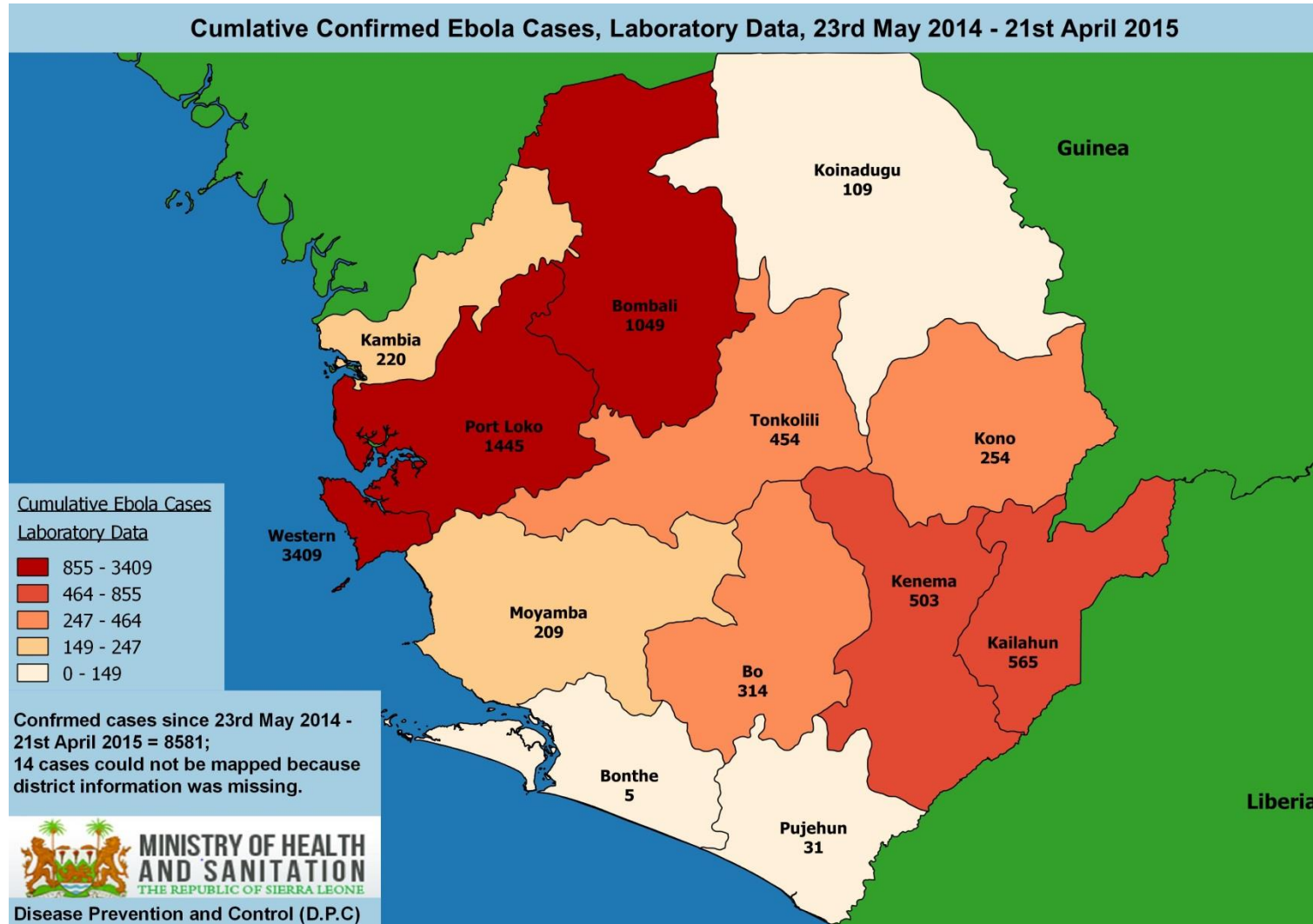




TYPES OF VACCINES

VACCINE	LOT/BATCH	EXP. DATE
OPV	A0PVB740AA	8-15
M/FEVER	J5106-1	2-15
MEASLES	2502213	10-15

# Cumulative Cases by District



# Ebola Response - Port Loko

- **Command Center (British Military)**
  - Sierra Leone military head up different sections, partner with NGOs
    - Alerts, Surveillance, Ambulance, Burial Team, Decon, Quarantine, Food distribution, Contact Tracers, etc.
- **Alert system**
  - 117 call system for community and health care providers to report possible cases and dead bodies
  - Surveillance team dispatched to investigate alerts
  - If meet case definition – Command Center dispatches ambulance for transport to a holding center
    - Case definition – Fever + contact with suspect EVD OR
    - Fever and 2 other symptoms OR
    - 3 Ebola symptoms



# Port Loko Command Center





# Ebola Holding Centers

- Suspect patients divided by dry and wet symptoms; bed spacing
- Blood drawn
  - Ebola
  - Malaria
- Results usually in 24 hours
  - If negative – symptom onset at least 72 hours?
    - No – hold and re-test 72 hrs post symptom onset
    - Yes – release
    - Report result to command center
  - If positive
    - Transport to treatment center

# Ebola Holding and Treatment Centers



# Positive Ebola Cases

- Lab results communicated to Command Center
- Contact tracers dispatched to gather line list
- 21 day quarantine for all contacts
  - Daily follow up
- Food distribution for quarantined households
- Social mobilization teams to educate community
- Decon team dispatched to decontaminate home





# Orphanage





# Ebola Prevention



Burial team



Checkpoint Hand-washing station



# Treatment

- There is no cure for Ebola
- In Sierra Leone, ~40% mortality rate
- Treatment is mostly about preventing dehydration



# Ebola Vaccine ?

- No licensed vaccines currently
- Several vaccines being developed
- Clinical trials in humans with 2 vaccines underway
  - Liberia –January 2015
  - Sierra Leone – April 2015



# Vaccine Phase 2/3 Trials Underway

- ChAd3-ZEBOV – Chimp adenovirus vaccine, GSK/NIAD. Safety/Efficacy trial in Liberia
- rVSV-ZEBOV – recombinant vesicular stomatitis vaccine, NewLink Genetics and Merck Vaccines USA, in collaboration with the Public Health Agency of Canada, trials in Liberia and Sierra Leone



# STRIVE

Sierra Leone Trial to Introduce a Vaccine Against Ebola



# Sierra Leone Study Partners

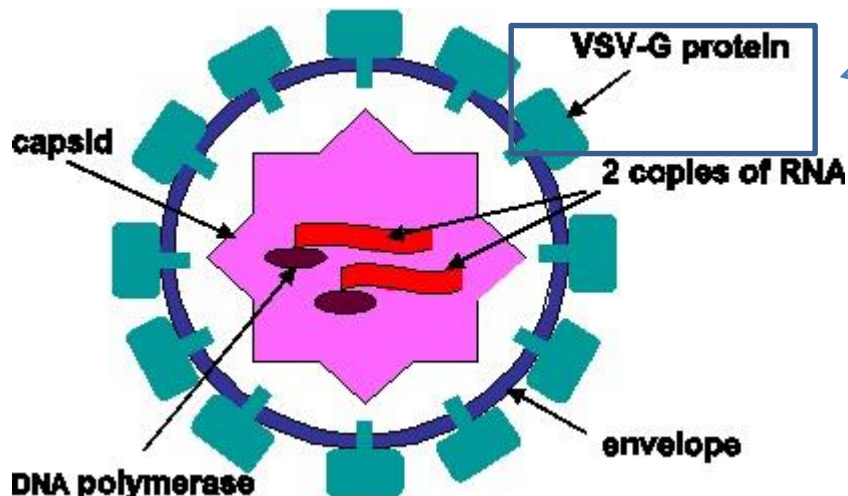
- ❑ Sierra Leone College of Medicine and Allied Health Sciences
- ❑ Sierra Leone Ministry of Health and Sanitation
- ❑ U.S. Centers for Disease Control and Prevention
- ❑ Biomedical Advanced Research and Development Authority

# rVSV - ZEBOV Vaccine – how does it work?

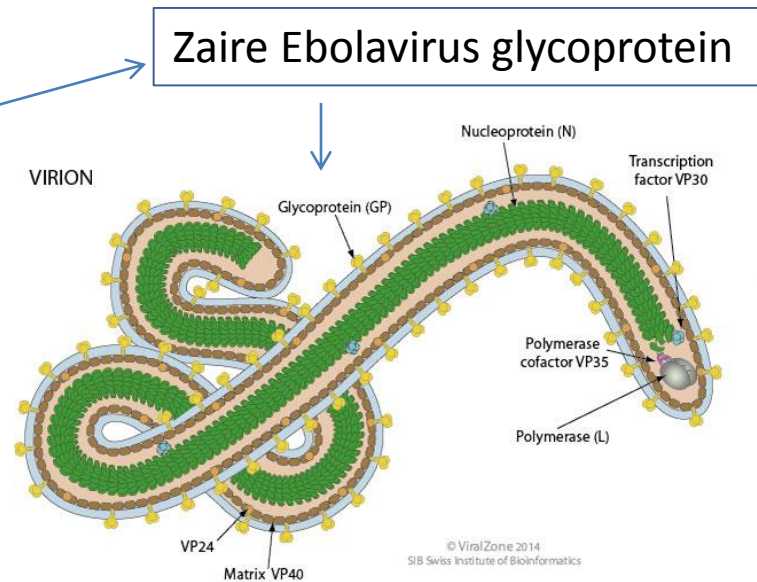
- The Vesicular Stomatitis Virus is the vector
  - VSV infects animals
  - Does not cause illness in humans
- Vaccine contains a piece of Ebola virus
  - Does NOT contain live Ebola Virus
  - You cannot get Ebola from the vaccine
- Has only been tested in small numbers of people
  - Generally safe
  - Antibody response
  - Prevent Ebola??????

# Ebola VSV Vaccine

- The Ebola VSV vaccine takes out the piece of the VSV virus that tells the body it is VSV
- This piece is replaced with a small piece of the Ebola virus.
  - This tricks the body into thinking it is seeing Ebola, and the body makes antibodies to fight Ebola



Vesicular Stomatitis Virus (VSV)



Ebola Virus



# Objectives

- Introduce an **Ebola vaccine** among people at high-risk for getting Ebola
- Measure how *effective* the vaccine is in preventing Ebola among adult front line Ebola response workers in Sierra Leone
- Measure how *safe* the vaccine is by monitoring participants for possible adverse events after vaccination

# Study Design

- ❑ **Unblinded, randomized trial with phased introduction of vaccine (no placebo)**
  - Enrolled responders will be randomly assigned to receive the vaccine shortly after enrollment or approximately 6 months later
  - Participants will be followed for development of Ebola and SAEs
    - Subset of participants will participate in a reactogenicity study
    - Immunogenicity trial also being planned
- ❑ **Vaccine effectiveness will be measured by comparing disease incidence in persons vaccinated earlier versus later**

# Study Target Population

## □ Study groups (~6,000 persons):

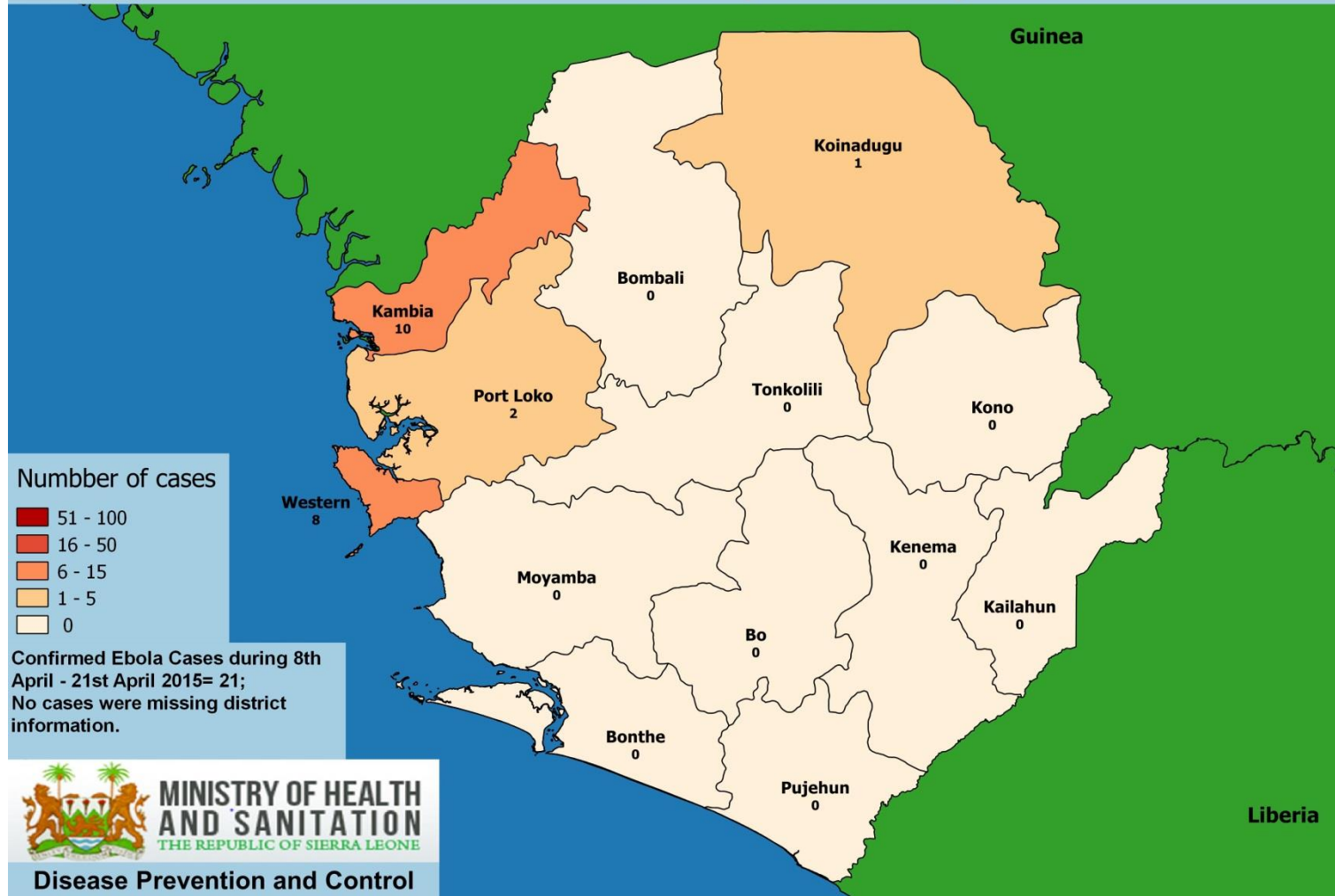
- All adults working in facilities that provide health care (Ebola or non-Ebola related)
- Surveillance officers, ambulance teams, workers responsible for swabbing deceased persons, burial team members

## □ Study districts:

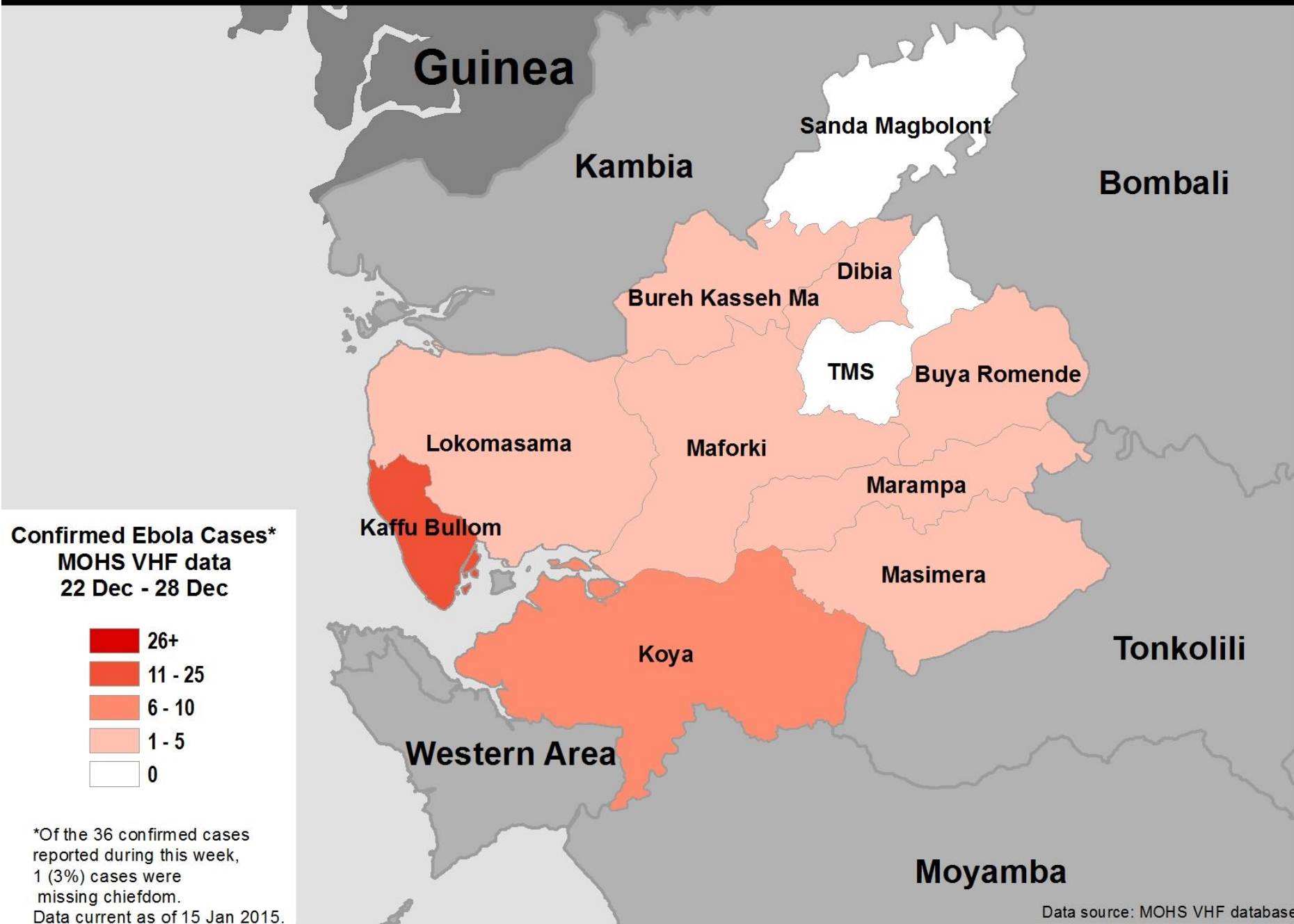
- 4 districts
  - Western: All areas (Urban and Rural)
  - Selected chiefdoms in Port Loko, Bombali, Tonkolili

# Sierra Leone Districts

## Confirmed Ebola Cases, 8th April to 21st April 2015



# Confirmed Ebola Cases By Chieftom, Port Loko, MOHS VHF Data, 22 Dec - 28 Dec 2014





# Exclusion Criteria

- Pregnant and breastfeeding women**
- History of HIV or other immune disorder**
- History of serious allergic reaction to any vaccine**
- Ebola virus disease survivors**
- Prior vaccination with an Ebola or Marburg virus vaccine**

# PLK Vaccine Team 3&4



# Informational Sessions





# Vaccination Site



# Challenges

- Cold Chain
  - Vaccine must be stored at - 80 celsius
  - Dosing
  - Transport to vaccination sites
- Vaccine side effects
  - Mild flu like symptoms = Ebola case definition
- Poor health infrastructure
- No experience with any clinical trials in Sierra Leone
- Declining cases
- Language and literacy – consent issues
- Messaging re: continued use of PPE
- Other trials
  - Treatment trials
  - Lab test trials
  - Other vaccine trials (Johnson and Johnson vaccine)



# Ebola Heroes

- <https://www.youtube.com/watch?v=n9rHaoQbFrs>

