

# **College Guest Lecture: Recent personal experiences on Ebola in Sierra Leone West Africa**

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**In an  
emergency  
WHO is there**



# Outline of presentation

1. Ebola disease outbreak and index case in West Africa
2. Geographical spread
3. Some experience from Sierra Leone
4. Emergency Operations Centre
5. Anthropological study on community resistance
6. Readiness of preparedness plan
7. Wayforward and concluding remarks

# What is Ebola?

1. Ebola is a rare and deadly disease caused by infection with one of the Ebola virus strains:
  - a. Zaire,
  - b. Sudan,
  - c. Bundibugyo,
  - d. Tai Forest virus
2. Ebola viruses are found in several African countries
3. Ebola was discovered in 1976 near the Ebola River in what is now the Democratic Republic of the Congo
4. This outbreak is caused by Zaire Ebola virus as previously reported.
5. The case fatality for this outbreak is  $\pm 70\%$  which is within the up to 90% range of previous outbreaks

# **Index case undetected for 3 months in Guinea**

- On 26 December 2013, a two-year-old boy in the remote Guinean village of Meliandou fell ill with a mysterious illness characterized by fever, black stools, and vomiting. He died two days later.
- Retrospective case-finding by WHO would later identify that child as West Africa's first case of Ebola virus disease. The circumstances surrounding his illness were ominous.
- First officially reported case on 23 March 2014



Ebola is still limited to parts of Africa

A hemorrhagic rash appears over entire body















# Case definitions used in Ebola classification

- 1. Suspect case:** Any person in an Ebola area with fever, muscle aches, vomiting, diarrhea and bleeding
- 2. Probable case:** A suspect with history of contact with an Ebola confirmed case within the past 21 days
- 3. Confirmed case:** Any case who has tested positive by PCR
- 4. Non-case:** A suspected case who is negative for Ebola
- 5. Contact:** Any person has been exposed to contact with a confirmed case of Ebola

# Ebola drains weak health systems

- **Liberia with a 4.2m population:** 51 doctors; 978 nurses and midwives; 269 pharmacists
- **Sierra Leone with a 6m population:** 136 doctors; 1,017 nurses and midwives; 114 pharmacists
- *Source: Afri-Dev.Info*

**Figure 1: Index cases from eating meat from wild animals**



# Ebola disease transmission chain

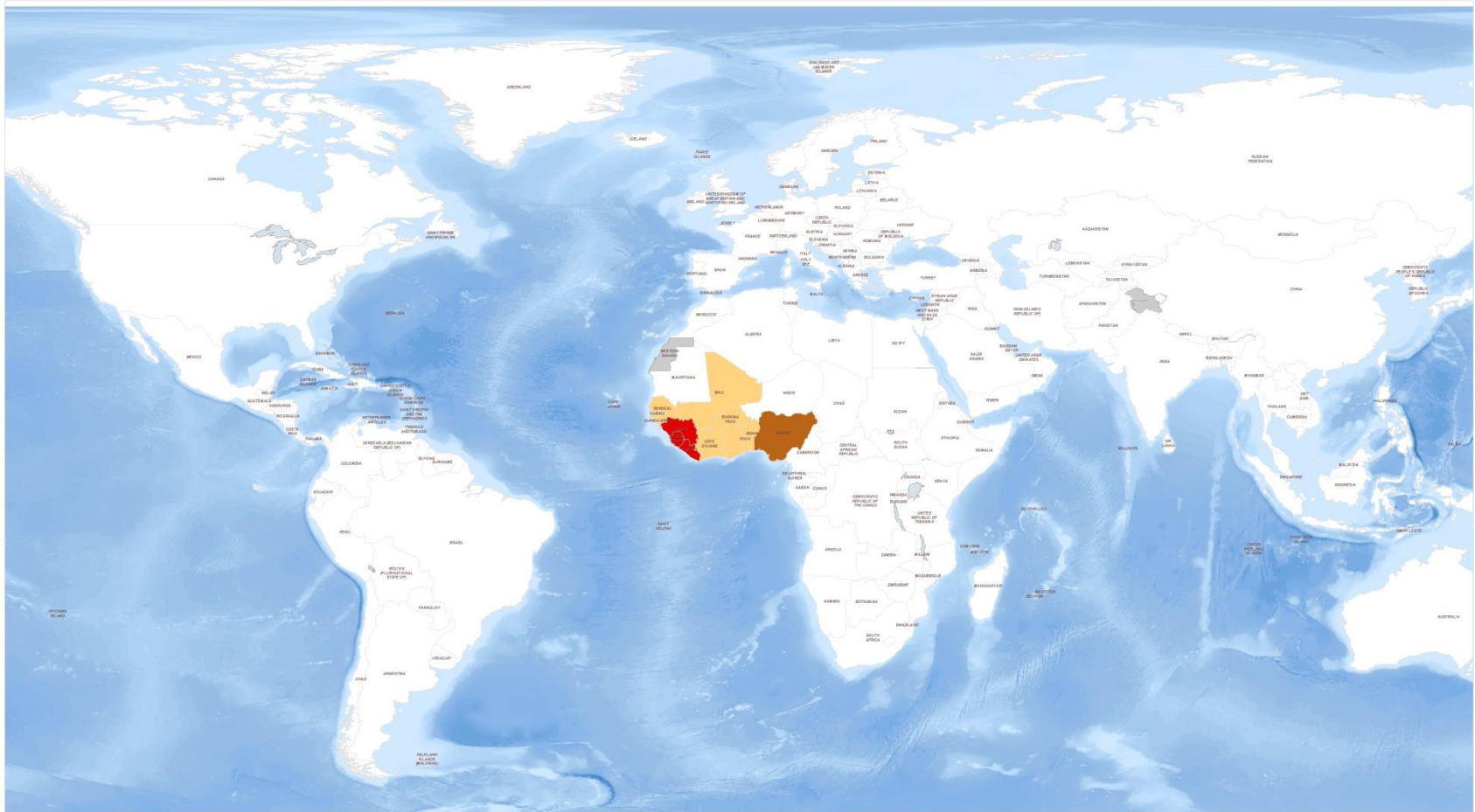
- Reservoir of the Ebola virus are asymptomatic wild animals especially bats, monkeys and chimpanzees
- Index cases usually linked to eating meat from one of the reservoir wild animals
- Infected symptomatic people spread the disease through physical contact, contact with secretions such as vomitus, diarrhea, blood, sweat, saliva, breast milk and semen
- Ebola spread even more easily through the body secretions from the confirmed cases after death
- Unsafe burial of Ebola patients who have died is a very high risk

# Breaking Ebola transmission chain through contact tracing

- The key to containment is effective contact tracing, investigation of rumors and follow up
- Each case can have as many as 100 contacts
- Contact tracing is cumbersome and resource intense intensive
- All contacts are followed up for 21 days in their homes
  - Daily questionnaire is completed on signs and symptoms of Ebola
  - Daily recording of body temperatures
  - Contact tracers report any contact with symptoms



# Status of Ebola Outbreak 2014



Map Scale (A3): 1:75,000,000

1 cm = 750 km

Coordinate System: GCS WGS 1984

Datum: WGS 1984

Units: Degree



**Data Source:**

Admin. Boundaries: World Health Organization

Base Map: GEBCO

Map Production: Global Polio Eradication

Initiative, World Health Organization

Widespread and intense transmission

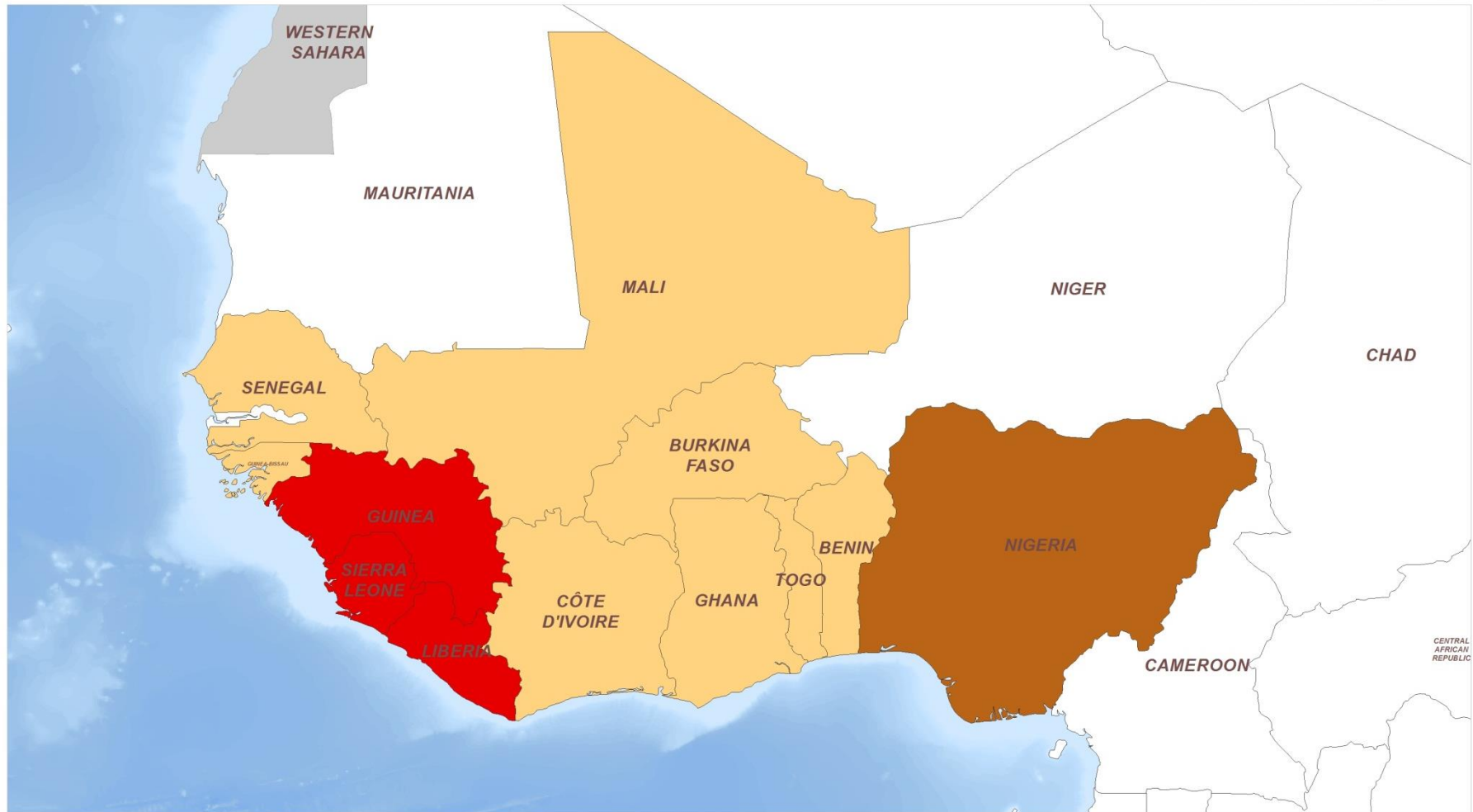
Initial cases or localized transmission

Land bordering countries

No Ebola cases/rumours

*The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.*

# Geographical extent of Ebola Outbreak: Sept 2014



Map Scale (A3): 1:11,888,112

1 cm = 119 km

Coordinate System: GCS WGS 1984  
Datum: WGS 1984  
Units: Degree



**Data Source:**

Admin. Boundaries: World Health Organization  
Base Map: GEBCO  
Map Production: Global Polio Eradication  
Initiative, World Health Organization

Widespread and intense transmission

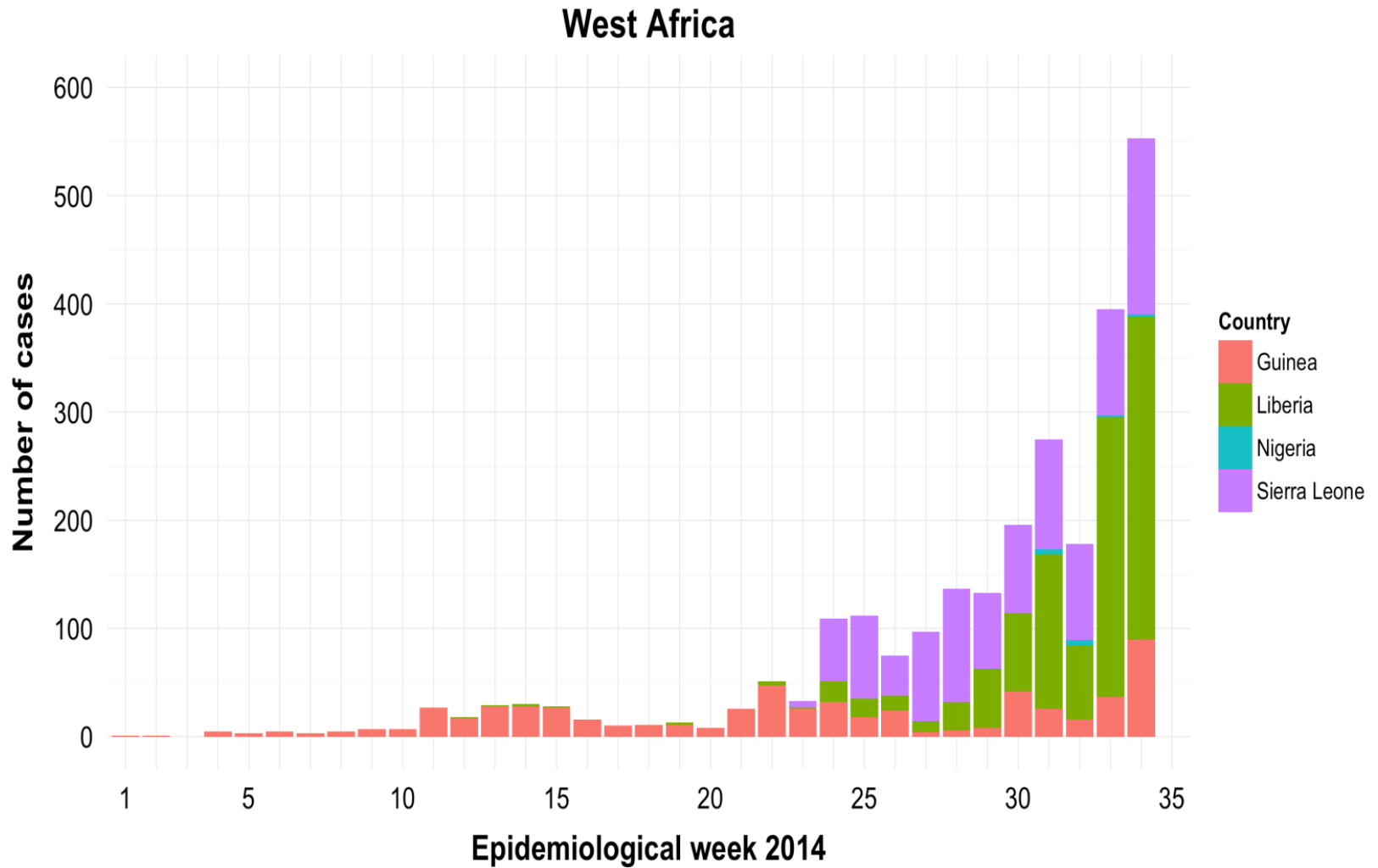
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# Ebola Cases West Africa



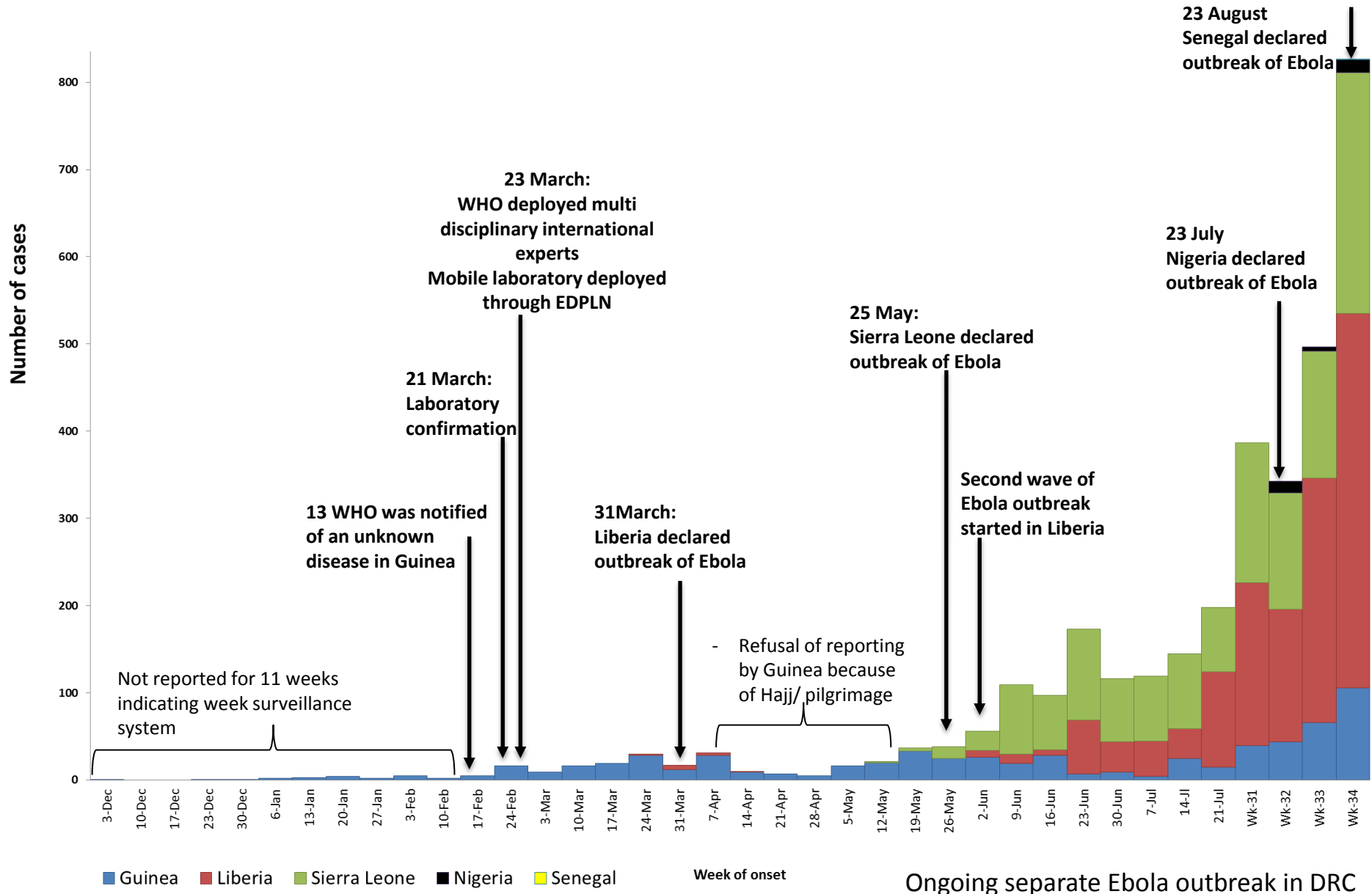
## **Ebola Latest numbers as of 21 September 2014**

- ~~The total number of cases in the current outbreak of Ebola virus disease in west Africa was 6263, with 2917 deaths.~~
- Guinea: more than 1000 cases, and 635 deaths
- Liberia: the worst-affected country in this epidemic, with more than 3200 cases and more than 1600 deaths. More than half of the cases have been reported in the past 21 days.
- Sierra Leone: more than 2000 cases and 1000 deaths more than a third of cases have occurred in the past 21 days.
- Nigeria: 20 cases and 8 deaths due to one introduced case from a traveller from Liberia on 20 July.
- Senegal: One person, who travelled by road from Guinea to Dakar on 20 August, tested positive for Ebola on 27 August.

# Chronology of the outbreak in West Africa

- 17 Feb 2014: WHO was notified of an unknown disease in Guinea
- 21 March: Laboratory confirmation
- 23 March: WHO deployed multi disciplinary international experts
  - Mobile laboratory deployed through EDPLN
- 31 March: Liberia declared outbreak of Ebola
- 25 May: Sierra Leone declared outbreak of Ebola
- 23 July: Nigeria declared outbreak of Ebola
- 23 August: Senegal declared outbreak of Ebola

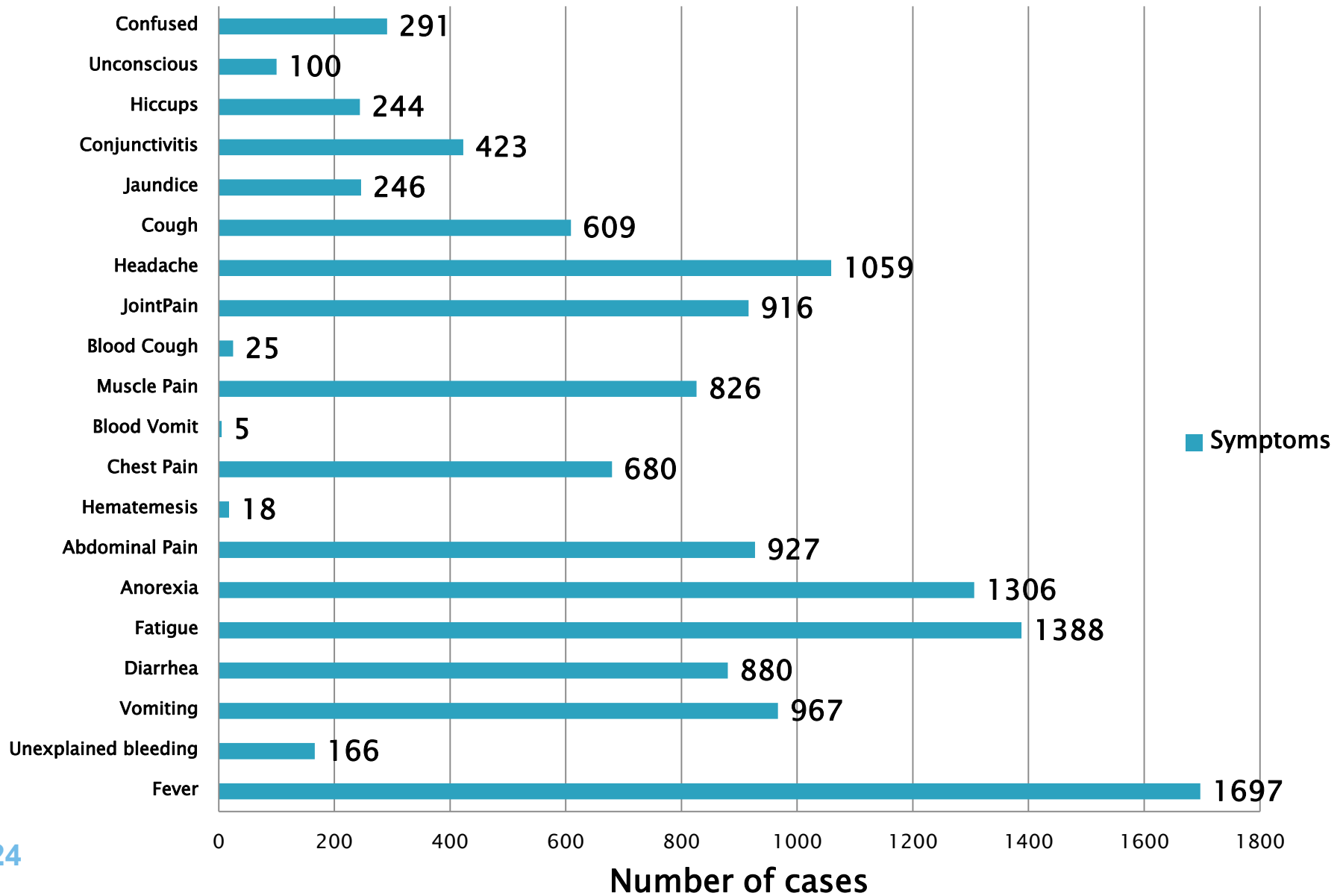
# Epidemic curve and timeline of actions



# Administrative division of Sierra Leone



# Common presenting EVD symptoms Sept 2014





# What happens to a contact who develops symptoms

1. Communities can report any suspected case through the 24 hr call centre
2. The contact tracer can report to the field supervisor a contact
3. A trained surveillance officer is alerted to investigate rumors/suspects
4. If the contact fits suspect or probable case ambulance is sent to collect case to isolation centre
5. Trained health worker takes a blood sample while wearing appropriate personal protective equipment
6. Triple packed sample is sent to nearest accredited laboratory for analysis
7. Suspect or probable case waits for results in isolation centre
8. Result can take days if laboratory is far away
9. Patients and family become very impatient and resist because some cases die waiting for results
10. Food provision and sundry and loneliness of isolated cases may be a challenge

**Figure 2: Sensitization of officers on Ebola Outbreak surveillance at Kambia border post with Guinea: 28 March 2014**



**WHO Representative advocates for non-closure of borders during Ebola outbreak with Ministry in attendance**

**Figure 3: Early community participation is paramount: Kailahun was supported to contain Ebola Virus Disease: 30 June 2014**



**Women volunteered to construct Ebola treatment centre in Kailahun**

**Figure 4: WHO advocacy for political engagement: WHO ADG visit: July 2014**



**Figure 5: WHO advocacy for political engagement: Dr Luis Sambo RD pays courtesy call to President: Aug 2014**



**Figure 6: Using discharged patients as advocates for early care of cases Kalilahun: June 2014**



## Figure 7: Launch of UN \$18 million UN Central Emergency Relief Fund appeal: Aug 2014



**At the head of the table: centre Resident Coordinator flanked by WR and Minister of Health**

**Figure 8: Media coverage of launch of UN CERF**





**Figure 8: Briefing session for Chinese ambassador as part of resource mobilization for Ebola outbreak: July 2014**

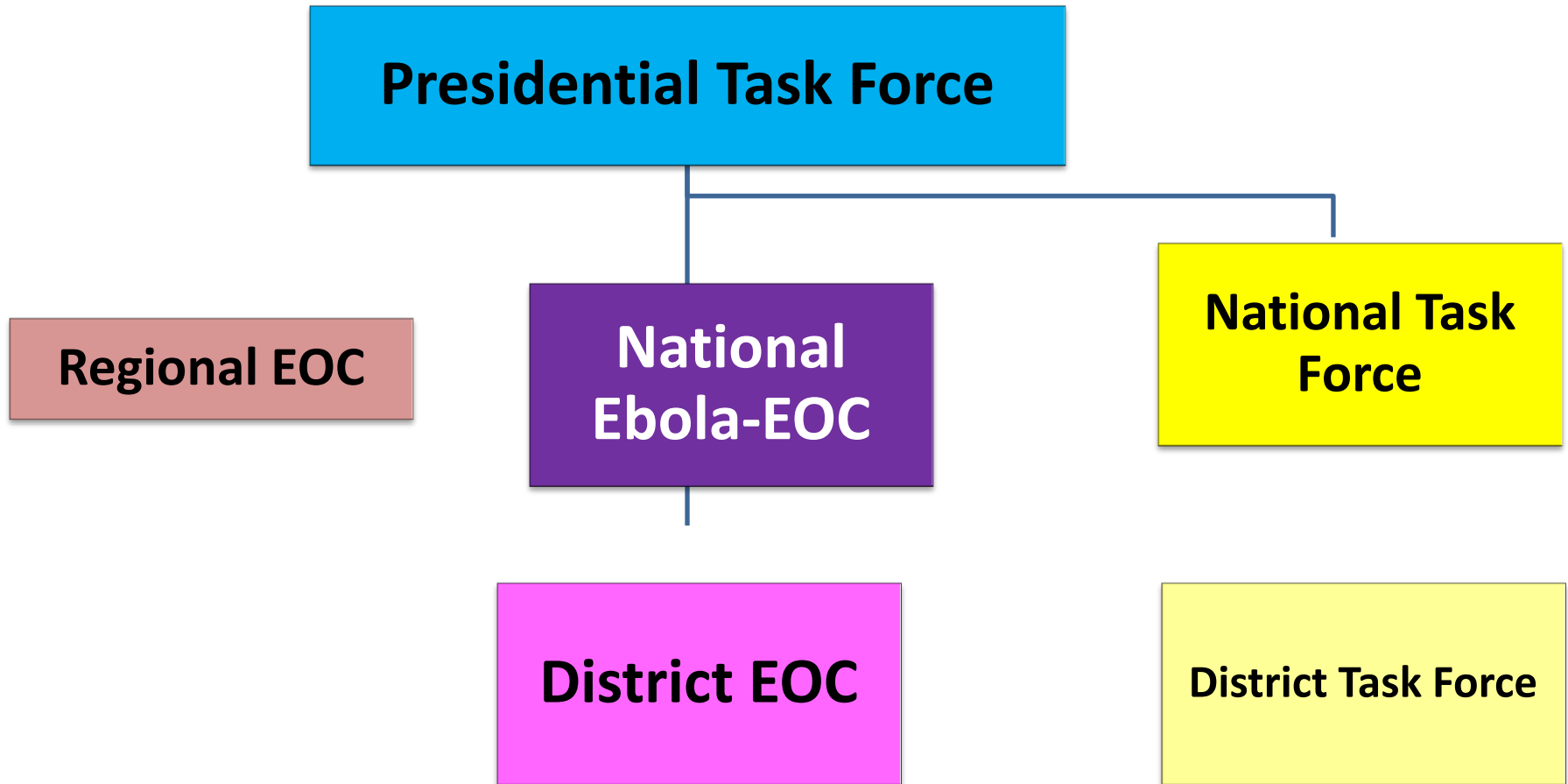


# Figure 9: Establishment of the Ebola Emergency Operations Centre (EOC) within WHO premises

- The EOC is located in the WHO premises and has 5 functional rooms –
  - conference room,
  - 24 hr alerts call center,
  - working area for technical staff, teleconference and
  - special discussion room; and
  - Admin support team room.



**Figure 10: Functional linkages of Ebola response structures**





## National Ebola -Emergency Operation Center



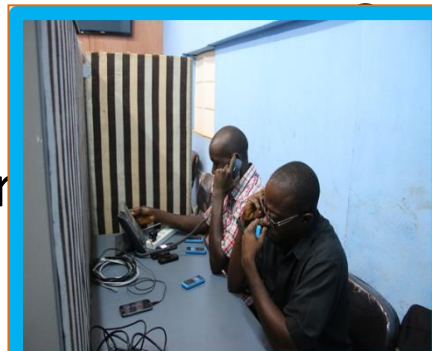
# Figure 11: Composition of the EOC

## Leadership

- ✓ Chair: Minister of MoHS
- ✓ Co-Chair: Representative of the WHO Sierra Leone
- ✓ 12 members (CMO, DPC, WHO(2), UNICEF, UNFPA, WFP, MSF, RED Cross, CDC, Public Health England, MSW)

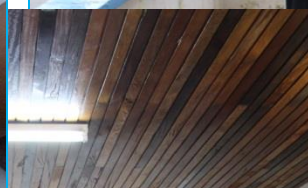
## Operational Staff

1. 24 hr Alert call center staff
2. Technical staff from each pillar and partners
3. Admin staff



## Key Pillars

1. Coordination: **Chief Medical Officer, WHO**
2. Surveillance and lab: **DPC, WHO, UNFPA**
3. Case management: **Director of Hospitals, WHO**
4. Communication and social mobilization: **Health Educ, UNICEF**
5. Logistics: **Central Medical Stores, WFP**



# EOC in Action



**Figure 12: President meeting WCO after visit to EOC: July 2014**



# Figure 13: High level government engagement: President visit to EOC





**Figure 14: Weekend visit by President to EOC**



**Figure 15: President concerned about partners delay**



**Figure 16: President attending EOC meeting**



# Figure 17: Political commitment Minister addresses Kailahun audience on President visit



**Figure 18: WHO Representative advocates for scaling up Kailahun practice in Kenema epicentre with President and Minister present: July 2014**



**Figure 19: EOC in operation with President in attendance: July 2014**



**From left: Minister of Social Welfare; Minister of Health; President; WR and Chief Medical Officer**

## Figure 20: Partnership at work: WHO, DFID, MSF and EOC task Manager during Lakka visit: Aug 2014



**Ebola Treatment Centre in Lakka, Freetown: ready for use with mobile lab from South Africa**

# Partnership with NGOs and traditional organizations)

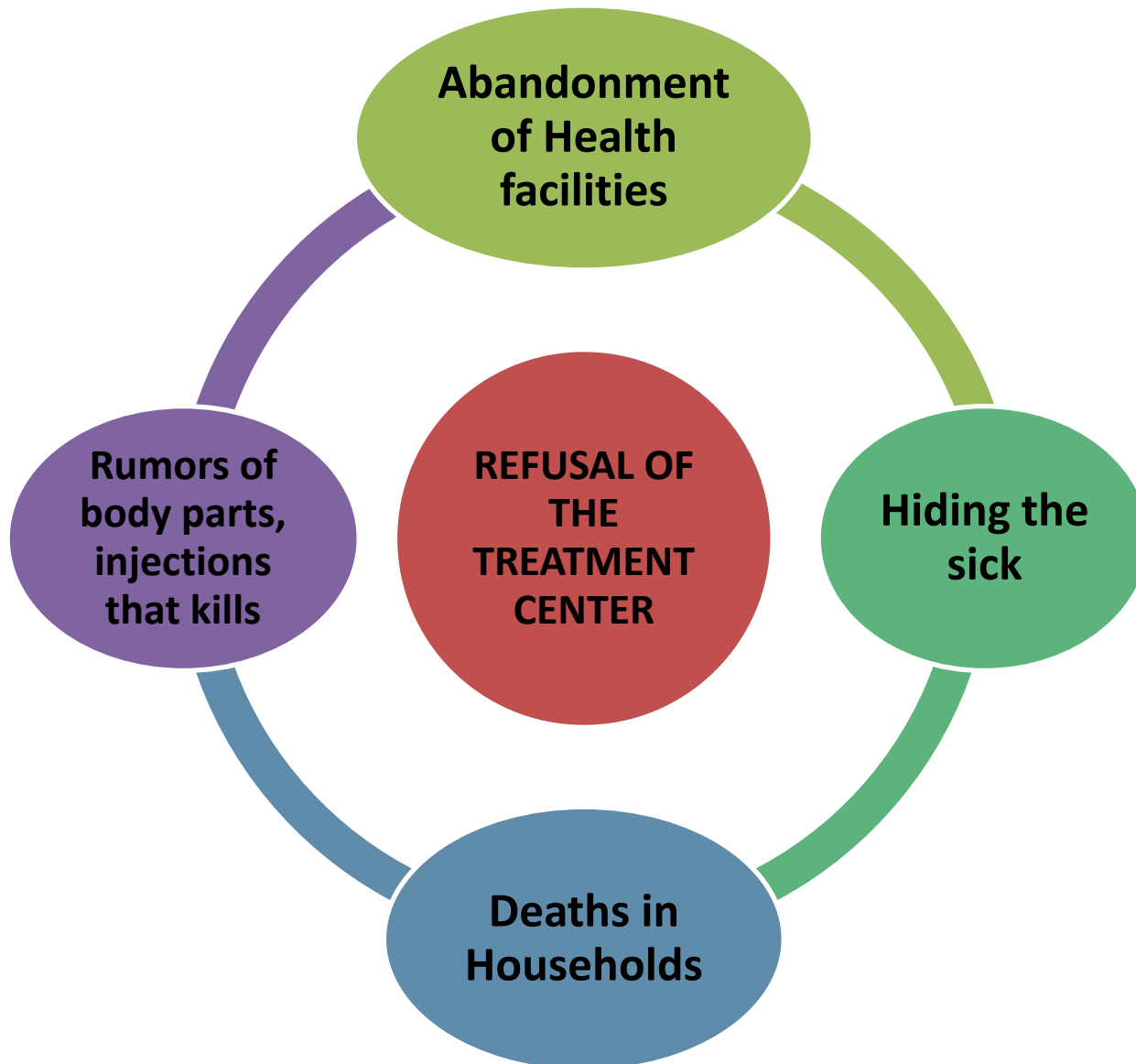




# **Acts of community resistance in Sierra Leone**

1. Vandalizing health sector properties
2. Attacking ambulances and ransacking vehicles
3. Burning and wanton damage of health facilities
4. Forced evacuating confirmed Ebola cases from health facilities
5. Ambushing health officials doing contact tracing and follow up
6. Recent invasion and looting of isolation centres and forced evacuation of infected cases in Liberia
7. Recent kidnapping and killing of health workers in Guinea

# Central Issue of Community resistance



# Some findings on practices on death and burials:

- **Continuation of attitudes towards the sick person**
  - The corpse is washed.
  - The dead body would be dressed nicely and laid on a bed.
  - **Women come and fall on the body crying to show how they have felt her departure.**
  - Some would rub skin with the body to show how they loved the person when he/she was alive.
  - They would do that for hours. Suspicion on people staying away.
  - Mende proverb: “You know who a person really is by the language they cry in.”
- **Philosophy of death:**
  - Death is crossing the river for life after death;
  - Happiness: Becoming an ancestor, intermediary to God
- **Reinterpreting the ritual:**
  - “don’t leave me here” **BUT** : “Send my greetings to the ancestors

## **Market place riots: common occurrences during this outbreak**

- Woman at the market : I saw woman shouting” Ebola is False! ...The Government need a lot of blood to sell to the European countries. All those who are dying with Ebola are being killed. I’ll tell you all the secret!.
- Now, I have revealed the secret, Ebola is gone. A large crowd gathered around her and started jubilating shouting “Ebola is gone! Ebola is gone!!” the main street of Kenema was crowded.
- The police came and took the woman to the police station.
- A little later, the crowd that was around the police station started throwing stones at the police. Another group ran to the Hospital it wanted to set it on fire”
- Funds for Ebola sent through the District Council will just be lost or “chopped”.

# Conspiracy theories fueling community resistance

1. Ebola is not real it is a government ploy
2. Government wants to decimate population of the opposition ahead of national census in December 2014
3. The ministry of health is killing suspected cases with injections so they can harvest their organs for sale
4. A botched scientific experiment that went terribly wrong

**Figure 21: Some findings from the anthropological study: Aug 2014**



**New family structure and stigma**

**Figure 22: Some findings from anthropological study contd.**



**Children talk: lost fathers and/or lost mothers (Aug 2014, Njala)**

## Aftermath of death of both parents: abandoned homes





# Personal Protective Equipment and disinfection



# Key structures of Ebola outbreak preparedness plan

**1. Costed Ebola Outbreak preparedness plan: So far only 2 countries in 47 AFRO have**

**2. Inter-ministerial tasks force on Ebola Outbreak**

- Chaired by Health Ministry and co-chaired by WHO
- Foreign affairs, Information, Trade and Commerce, Home Affairs and Immigration, Finance and Local government

**3. National task force on Ebola Outbreak**

- Chaired by the Ministry of Health and co-chaired by WHO
- Inclusive structure of
  - Key partners in the health sector
  - Civil society
  - Health based UN Agencies
- To meet regularly

**4. Thematic committees of the national task force all chaired by Ministry of Health**

- Coordination (WHO)
- Surveillance/laboratory (WHO)
- Social mobilization/communications (UNICEF/WHO)
- Case management (WHO/MSF)
- Logistics (WFP/WHO)

# Functionality of a preparedness plan: what does it entail

- Coordination role
  - High level political engagement and visibility
  - Sending a team to one of the affected countries to learn
  - Advocacy for resources and supplies including catalytic funds
  - Oversight on plan and mobilization/allocation of resources
- Surveillance/laboratory diagnostic capacity
  - Active surveillance at all ports of entry
  - Prepositioning of sample analysis and lab services
- Social mobilization/communications
  - Dissemination of messages on Ebola prevention and control

# Status of Ebola Preparedness: What is readiness

- Case management
  - Isolation centres for suspected cases
  - Treatment centres for confirmed cases
  - Prepositioning of resources
  - Training of health workers in Infection Prevention Control country wide with a focus on Ebola
- Logistics
  - Human resource surge capacity of international experts
  - Flow of resources
  - Supplies
    - Training of burial teams
    - Personal protection equipment
    - Adequate amounts of chlorine for disinfection
  - Availability of catalytic funds to operationalize the plan

# Lessons learned

1

Weaknesses of surveillance systems: first outbreak detected three month after the putative index case

2

Weaknesses of health systems unable to cope with the EVD outbreak

3

Poor adherence to IPC measures leading to a high number of health care workers affected

4

Limited resources at the Regional Office to manage multiple grade 3 public health emergencies

# Lessons learned contd

1

Limited human resources at country and regional level impacting on other priority health programs

2

Misunderstanding on the role of WHO among some partners

3

Leadership and coordination role of WHO at national, regional and global level recognized by partners

4

Government ownership of the response and leadership key

## People can survive Ebola

- ***Treatment:*** If people showing symptoms can get to hospital early,
  - they can improve their chances of survival and
  - reduce the chance of infecting their family.
- **While there is no proven treatment, early supportive care can help survival chances by**
  - maintaining blood pressure
  - balancing body fluids and their composition and temperature
  - allowing the immune system to fight the virus)
- ***Experimental treatment.*** WHO advises that it is ethical to offer unproven treatments but only if
  - full informed consent is given by the patient.
  - where this is not possible informed consent should be given by family members/ and or the community

## Three types of products being considered

- **blood-derived products**, such as convalescent serum, hyperimmune globulin and antibodies (as in the experimental treatment used recently to treat a few aid workers)
- **anti-viral drugs**-there are several of these that have shown efficacy in animal testing but we have no safety or efficacy data in humans
- **two vaccine candidates**, both of which are now being tested in humans
- No drug or other therapy is formally recommended by WHO until it has gone through rigorous testing, evidence reviews and consideration of the quality of evidence of safety and effectiveness by committees composed of leading experts



# Two vaccine candidates against Ebola

## 1. Chimpanzee adenovirus serotype 3 (Chad3)

- based on a chimpanzee adenovirus
- and is being developed by Glaxo Smith Kline +others.
- This one is undergoing safety testing in humans in the US right now.
- Two other safety trials are planned in Europe and Mali - due to start later this month.

## 2. Recombinant vesicular stomatitis virus (rVSV) vaccine –

- based on the vesicular stomatitis virus
- being developed by a consortium involving Canadian Public Health
- Human safety testing is currently underway.
- 800 doses are currently available but there is very little data on human safety and levels of protection.

# Some concluding messages on Ebola

- WHO does not recommend travel bans to or from countries affected
- Health worker risk can be prevented through training and retraining on Infection Prevention and Control
- International Health Regulations 2005 stress that quarantine measures should respect human rights
- Asymptomatic contacts do not transmit Ebola virus to those around them
- All countries should be prepared to prevent Ebola spillover
- Case fatality of 55-60% is lower than reported up to 90%
- Options including vaccines being fast tracked by Dec 2014

**Thank you**