

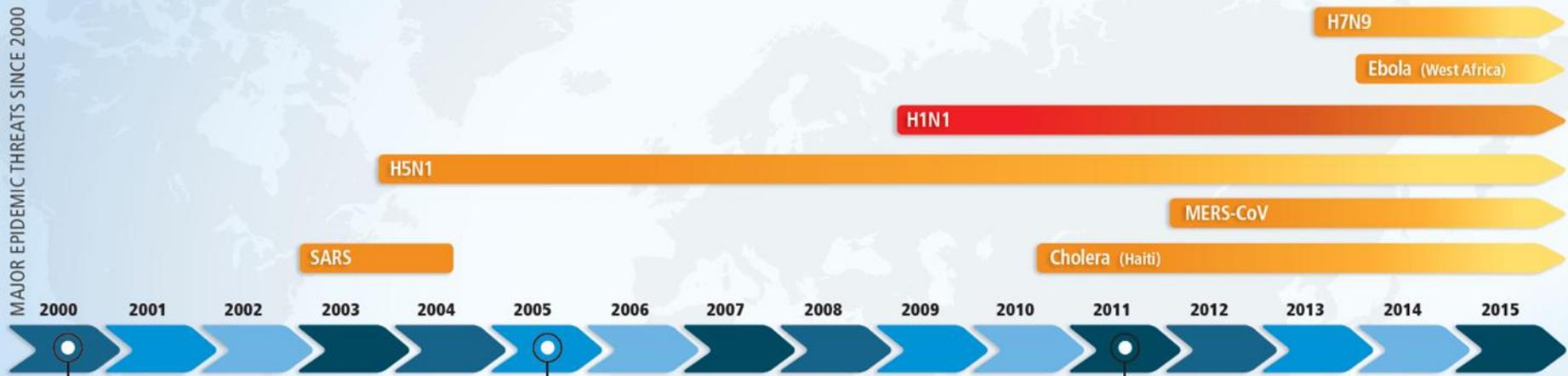
Ebola outbreak in West Africa : Shift in paradigm

Dr S.C Briand, Director Pandemic and Epidemic Diseases department,

WHO – Geneva

MAJOR EPIDEMIC THREATS SINCE 2000

INTERNATIONAL COLLABORATION EFFORTS TO FIGHT EPIDEMIC THREATS



GAVI

Gavi, the Vaccine Alliance, is an international organisation that was created in 2000 to improve access to new and underused vaccines for children living in the world's poorest countries.

GOARN

The Global Outbreak Alert and Response Network (GOARN) is a technical collaboration of existing institutions and networks who pool human and technical resources for the rapid identification, confirmation and response to outbreaks of international importance.

IHR (2005)

The International Health Regulations (2005) or IHR (2005) are an international law which helps countries work together to save lives and livelihoods caused by the international spread of diseases and other health risks. The IHR (2005) aim to prevent, protect against, control and respond to the international spread of disease while avoiding unnecessary interference with international traffic and trade.

PIP Framework

The Pandemic Influenza Preparedness (PIP) Framework brings together Member States, industry, other stakeholders and WHO to implement a global approach to pandemic influenza preparedness and response. Its key goals include:

- to improve and strengthen the sharing of influenza viruses with human pandemic potential; and
- to increase the access of developing countries to vaccines and other pandemic related supplies.

LEGEND

- Epidemic
- Pandemic



Timeline

Major infectious threats in the 21st Century & collaboration mechanisms to fight against them

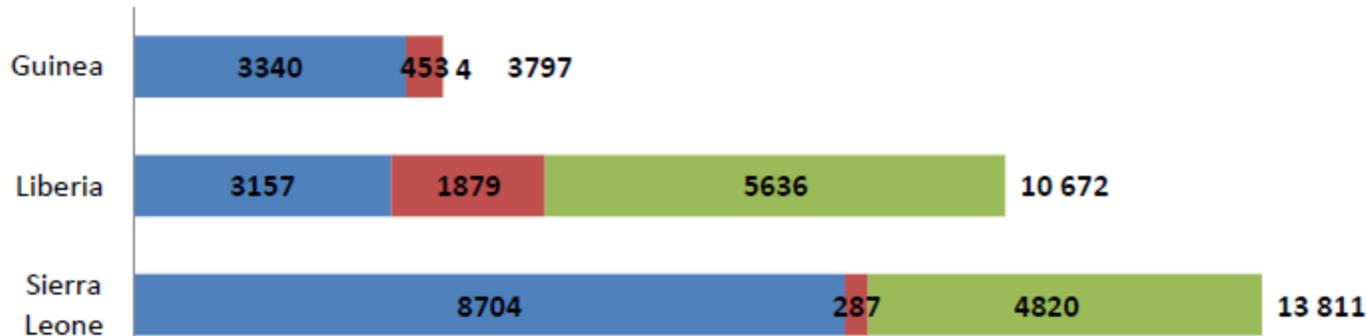
EVD West Africa: many "first time"

- Enormous epidemic in the affected countries requiring changes in strategic approach and long term approaches for recovery (issue of the survivors)
- International spread: exported cases in 6 countries
- Unprecedented international response with engagement of all UN agencies (UNMEER) and hundreds of partners including military from USA, UK, and France.
- Community approaches and emphasis on culturally adapted measures
- Research and innovation

Situation Summary (Guinea, Sierra Leone and Liberia)

Cumulative cases

Confirmed Probable Suspected



Data as of

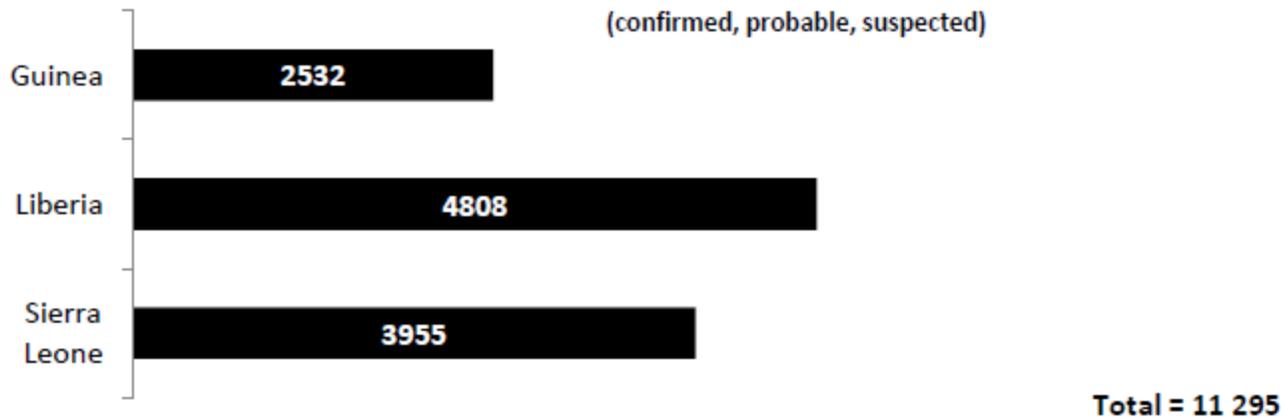
19 Sept

13 Sept

19 Sept

Cumulative deaths

(confirmed, probable, suspected)



Data as of

19 Sept

13 Sept

19 Sept

INTERNAL USE ONLY – WHO



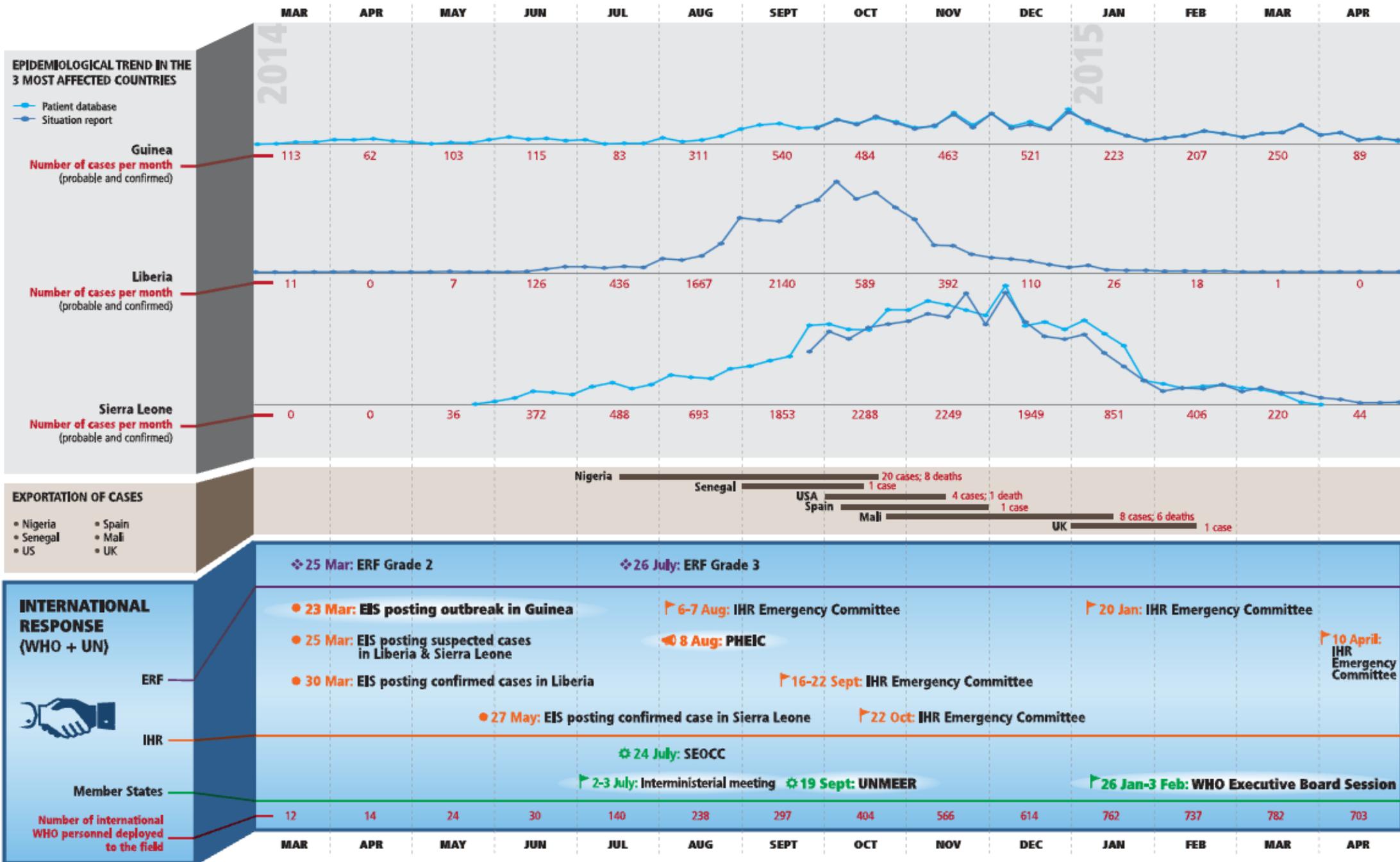
Ebola Outbreak History

- Since the discovery of Ebola in 1976 until December 2013:
 - 23 outbreaks
 - 2,388 human cases and 1,590 deaths
- As of 22nd September 2015 , Guinea, Liberia, and Sierra Leone have reported 28,280 cases, including 11,295 deaths

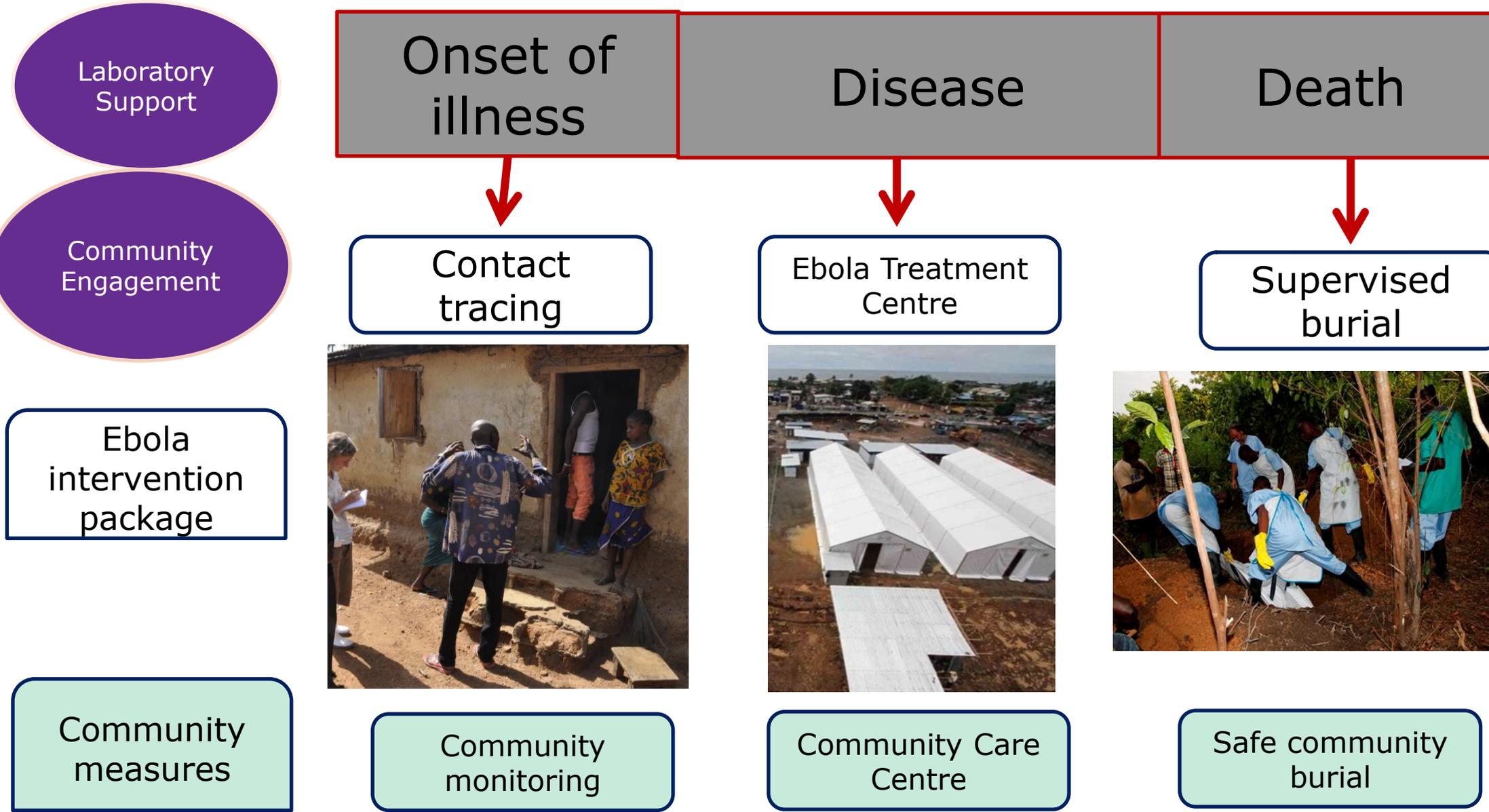
→ **Largest EVD outbreak ever recorded**

Country	Year	Number of cases	Number of deaths
Cote d'Ivoire	1994	1	0
Uganda	2012	7	4
Gabon	1994	52	31
DRC	2007	264	187
Uganda	2000	425	224

A few examples of previous EVD outbreaks



Strategies for containment



Laboratory Support

Community Engagement

Ebola intervention package

Community measures

Onset of illness

Contact tracing



Community monitoring

Disease

Ebola Treatment Centre



Community Care Centre

Death

Supervised burial



Safe community burial

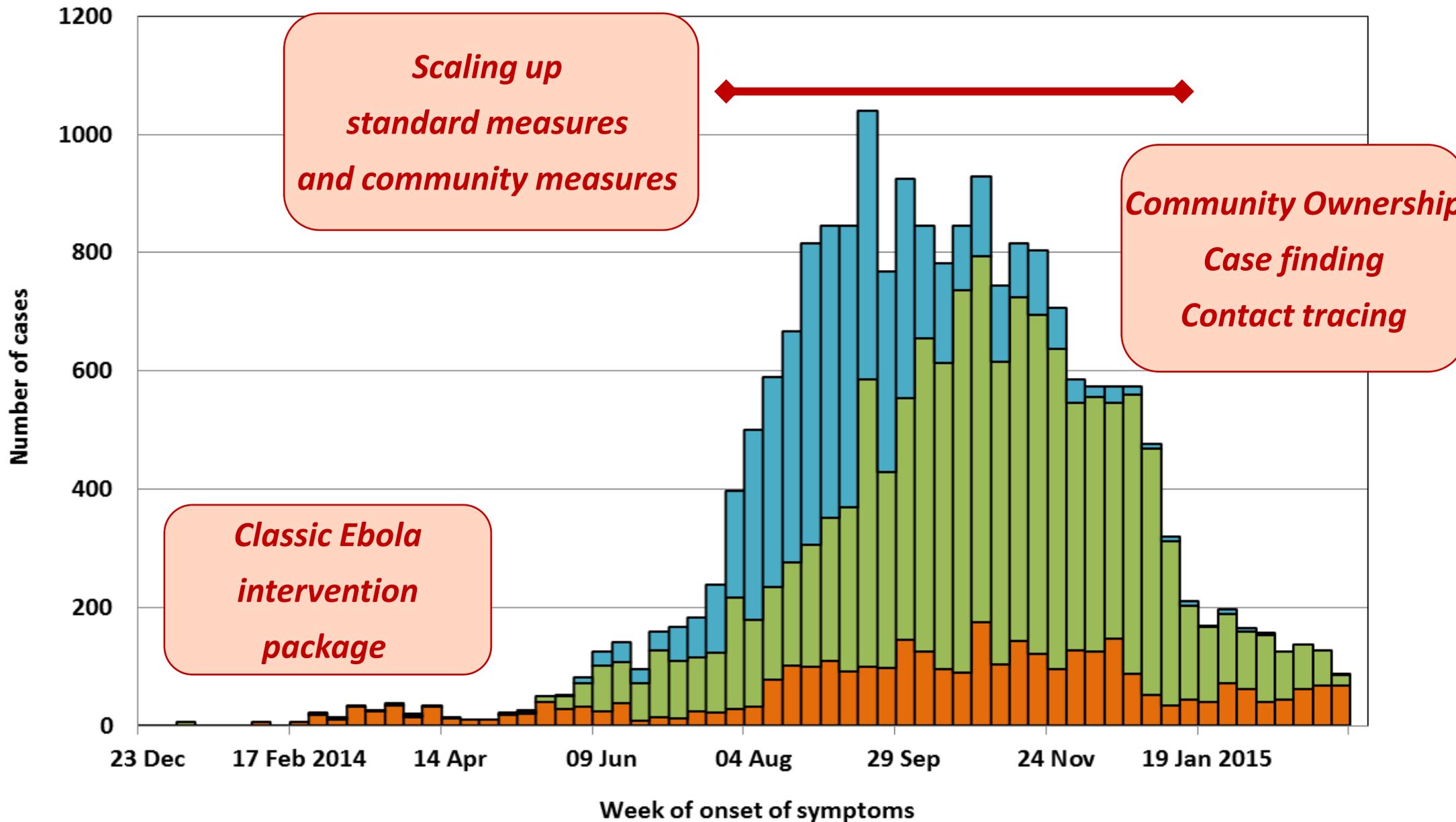
Outbreak Containment: Successes

High vigilance, rapid detection & control measures →
3 countries with transmission declared Ebola-free:

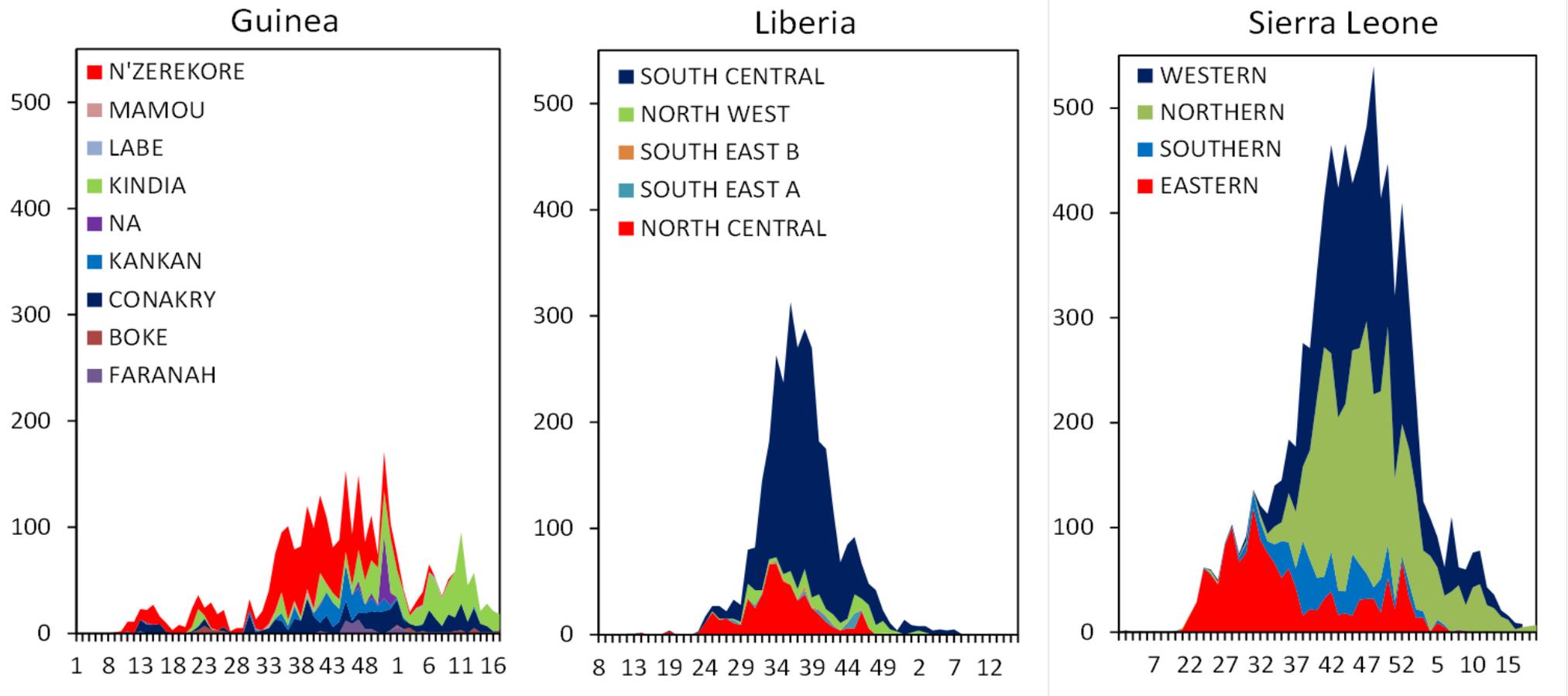
- 17 October 2014: **Senegal** is declared Ebola free
 - Introduction of a case (Dakar) on **29 August**, by road from Guinea
- 20 October 2014: **Nigeria** is declared Ebola-free
 - Import of case (Lagos) on **20 July** by air from Liberia – confirmed 23 July
 - Import of 2nd case (Port Harcourt) on 1 Aug – symptoms 10 Aug
 - 20 cases – 8 deaths
- 18 January 2015: **Mali** is declared Ebola-free
 - First confirmed case on **23 Oct** (child from Guinea)
 - Another unrelated case confirmed on **25 Oct** (Imam from Guinea)
 - 8 cases – 6 deaths



West Africa Epidemic Curve and strategic changes



Overview of the situation



3 different epidemics
Importance of urban
transmission

Week 36, 37, 38 (31 August to 20 September 2015)



Ebola Frontline responders



Country	Physicians density: Number of physicians for 100 000 population	Nurses & Midwives density: Number of nurses and midwives per 100 000 population	Total population
Guinea	1 / 100 000	No data	11 451 000
Liberia	1 / 100 000	27 / 100 000	4 190 000
Sierra Leone	2 / 100 000	17 / 100 000	5 979 000

Data source: WHO countries profiles / CIA World Factbook

Already weak health systems impacted by high numbers of HCWs infected

→ Situation among HCWs, as of 6 May 2015: 868 confirmed cases of HCW and 507 reported deaths:

- ✓ Guinea: **94**
- ✓ Liberia: **192**
- ✓ Sierra Leone: **221** (data as of 17 February)

Ebola in West Africa : Some numbers of an unprecedented response

As of April 2015

- Treatment : 72 ETCs, 85 CCCs, 58 FMTs, 240+ Cubans and 800+ AU medical brigades
- Surveillance and contact tracing: 27 mobile + 3 national labs
- Safe and dignified burials: > 280 functional burial teams
- Logistic support: 2,800 US and 750 UK military personnel, UNMEER (WFP, UNICEF, UNFPA, etc.)



WHO by the numbers (April 2015)

- Technical support and coordination
 - 2 013 experts to high trans. countries; 562 through GOARN
 - 108 experts to Nigeria, Mali & Senegal
- Treatment
 - 5 ETC built and staffed
 - More than 4000 clinicians and health workers trained
 - 1.42 million PPE sets
- Pre-deployment training : 1520 people
- Currently
 - 732 staff
 - 77 field sites



> 45 Guidance Documents Since March 2014

Based on **evidence** and **expert review**

Covering all aspects of **outbreak response**

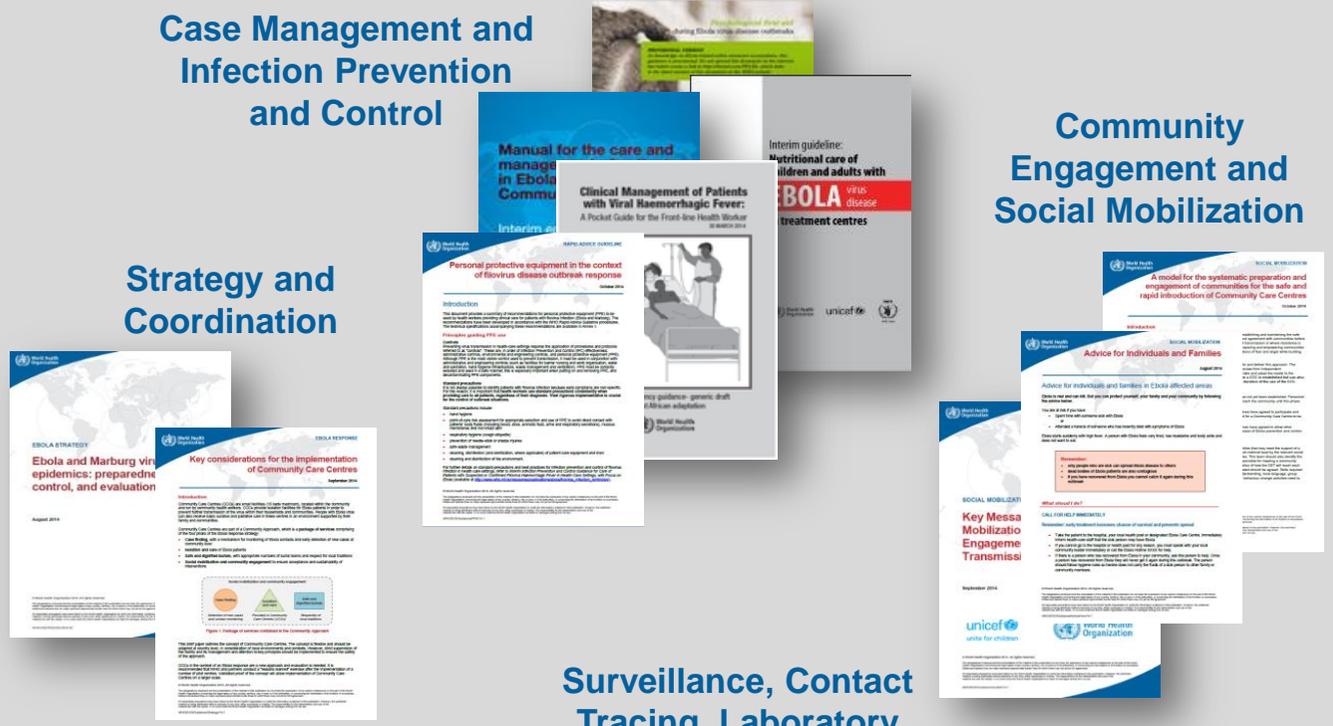
Responsive to **needs** from the field

Strengthening **national capacities** to prepare and respond

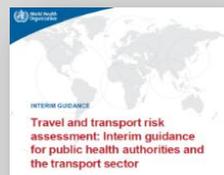
Case Management and Infection Prevention and Control

Strategy and Coordination

Community Engagement and Social Mobilization

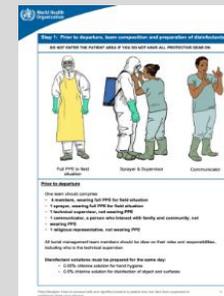


Surveillance, Contact Tracing, Laboratory



Travel

Safe and Dignified Burial



Paradigm shift: Community measures

- Community Care Centers: innovative approach to reduce transmission within communities
- Efficiency demonstrated
- CCC enabled rapid isolation of patients within the community, reducing the movement and contacts of infectious persons and encouraging, safe and dignified burials practices.

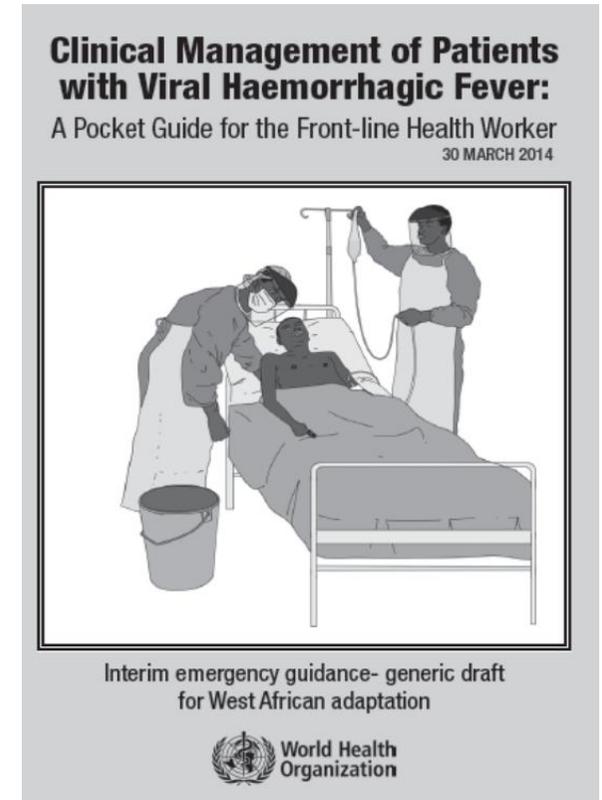


*Michael L. Washington, Martin L. Meltzer, **Effectiveness of Ebola Treatment Units and Community Care Centers – Liberia**, September 23–October 31, 2014 MMWR, January 30, 2015 / 64(03);67-69*

*Adam J. Kucharski et al, **Evaluation of the Benefits and Risks of Introducing Ebola Community Care Centers, Sierra Leone**, Emerging Infectious Diseases, Volume 21, Number 3 - March 2015,*

Clinical management of VHF

- High-quality supportive care can reduce mortality
- Retrospective study in Guinea (for March and April 2014) shows reduction in CFR:
After receiving highly supportive care, only 43% of the patients died, CFR lower than that recorded at other sites at the same period and in previous Ebola Zaire outbreaks



E.I. Bah et al, "Clinical Presentation of Patients with Ebola Virus Disease in Conakry, Guinea" N Engl J Med 2015; 372:40-47 January 1, 2015

Community Engagement's importance

- Understanding cultural background is critical for effective response
- Anthropologists and social scientists = translator between response teams and communities
- Cultural practices are adaptive and can be negotiated



Laboratory support

- **EDPLN** (Emerging and Dangerous Pathogens Laboratory Network) = 23 WHO Collaborating Centres to support
 - early detection
 - outbreak response and preparedness
 - rapid development of diagnostic assays for emerging and infectious diseases
- Deployment of **32 labs** in Guinea, Liberia and Sierra Leone and Nigeria to provide safe and high quality laboratory diagnostic services (laboratory testing capacity in **less than 24 hours** across the countries)
- Laboratory platform to collate multiple data sources and provide real-time reporting: as of 19 April, 2015 the database is compiled of **86,154 samples**
- WHO enhanced **laboratory research** (ex. **RDT**)



Diagnostic test

- Research for developing **rapid and easy to use diagnostic tests:**
 - Target Product Profile issued by WHO in October 2014
 - As of 30 March 2015, **one PCR kit and one RDT have been approved for UN procurement;** Realstar® Filovirus RT-PCR kit 1.0 and the ReEBOV™ Antigen Rapid Test kit.
 - The Antigen Rapid Test Kit (Corgenix) showed a sensitivity of 91.8% and specificity of 84.6%
 - Work continues to assess additional rapid assays for use in the current or future Ebola outbreaks



R&D activities on Ebola

● Treatment options and clinical management

- Zmapp (3 monoclonal antibodies), Mill77 → *Targets the virus before it enters the cell*
- Whole blood / convalescent plasma → *Targets the virus before it enters the cell*
- TKM, Favipiravir, Brincidofovir → *Interferes with viral production*
- Interferons → *Bolster human cells*
-

● Vaccines

- Agreement on accelerated pathway for Ebola vaccine development in September 2014
- GSK: ChAd3-ZEBOV
- Merck + NewLinks Genetics: rVSV-ZEBOV
- J&J + Bavarian Nordic: Ad26-EBOV and MVA-EBOV

→ Diagnostic test (RDT)

→ Exploring the unknown:

- Transmission: sources of transmission (pigs?)? Sexual transmission? Breastfeeding?
- Ebola survivors: sequelae, pregnant women



Other sources : pigs?

Currently, on-going investigations in Sierra Leone

Moa Wharf cluster of cases: 6 EVD confirmed cases involved in pig farming (April 2015)

- **What do we know?** (Previous pigs investigations):

2008 in the Philippines (investigation with US-CDC) during Ebola Reston outbreak

First known occurrence of Ebola-Reston in pigs, Specific antibodies were found in pig farmers

Study showed the virus can be transmitted from pigs to humans

http://www.who.int/csr/don/2009_02_03/en/

2012 in DRC (with PHA Canada) during Ebola Isiro outbreak

- Transmission of the Zaire strain of Ebola from pigs to macaques without direct contact between them

Gary P. Kobinger et al, Replication, Pathogenicity, Shedding, and Transmission of Zaire ebolavirus in Pigs , J Infect Dis. 2011 Jul 15;204(2):200-8

Hana M. Weingart et al Transmission of Ebola virus from pigs to non-human primates, Scientific Reports 2: 811, 2012



briands@who.int

THANK YOU

Babel Epidemic, Sybile Vardin, Ed L'harmattan