

DEPARTMENT OF AFRICAN AND AFRICAN AMERICAN STUDIES



EBOLA IN WEST AFRICA: FROM **DISEASE** OUTBREAK TO HUMANITARIAN **CRISIS**



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of Science



OUTLINE OF PRESENTATION

1. Introduction

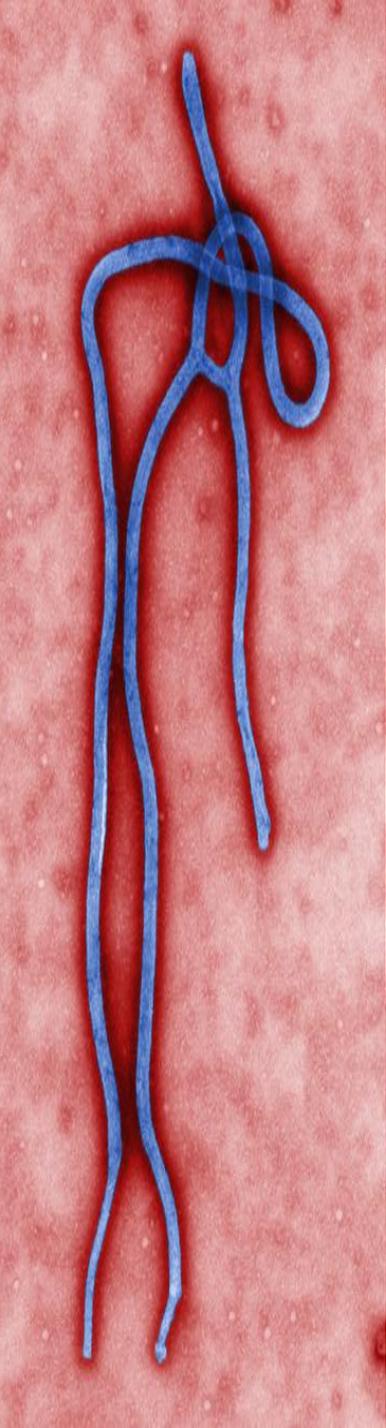
**2. Ebola & the unprepared:
From 1 case to >25,000 cases**

**3. Why were we so unprepared
and so utterly helpless?**

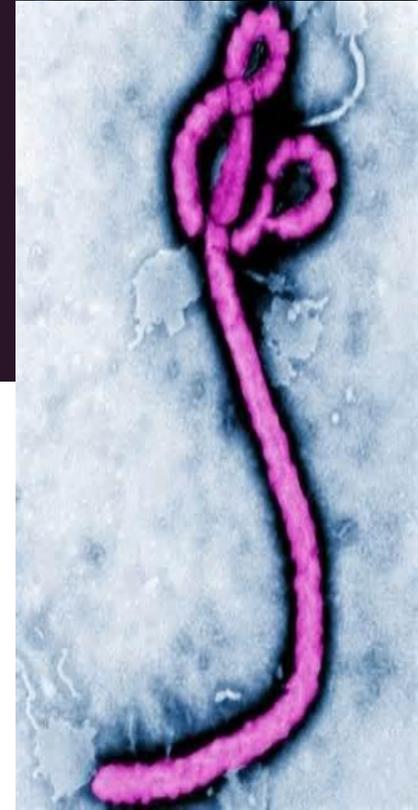
4. What should we have done?

**5. More important:
What should we do from now on?**

6. Final words:

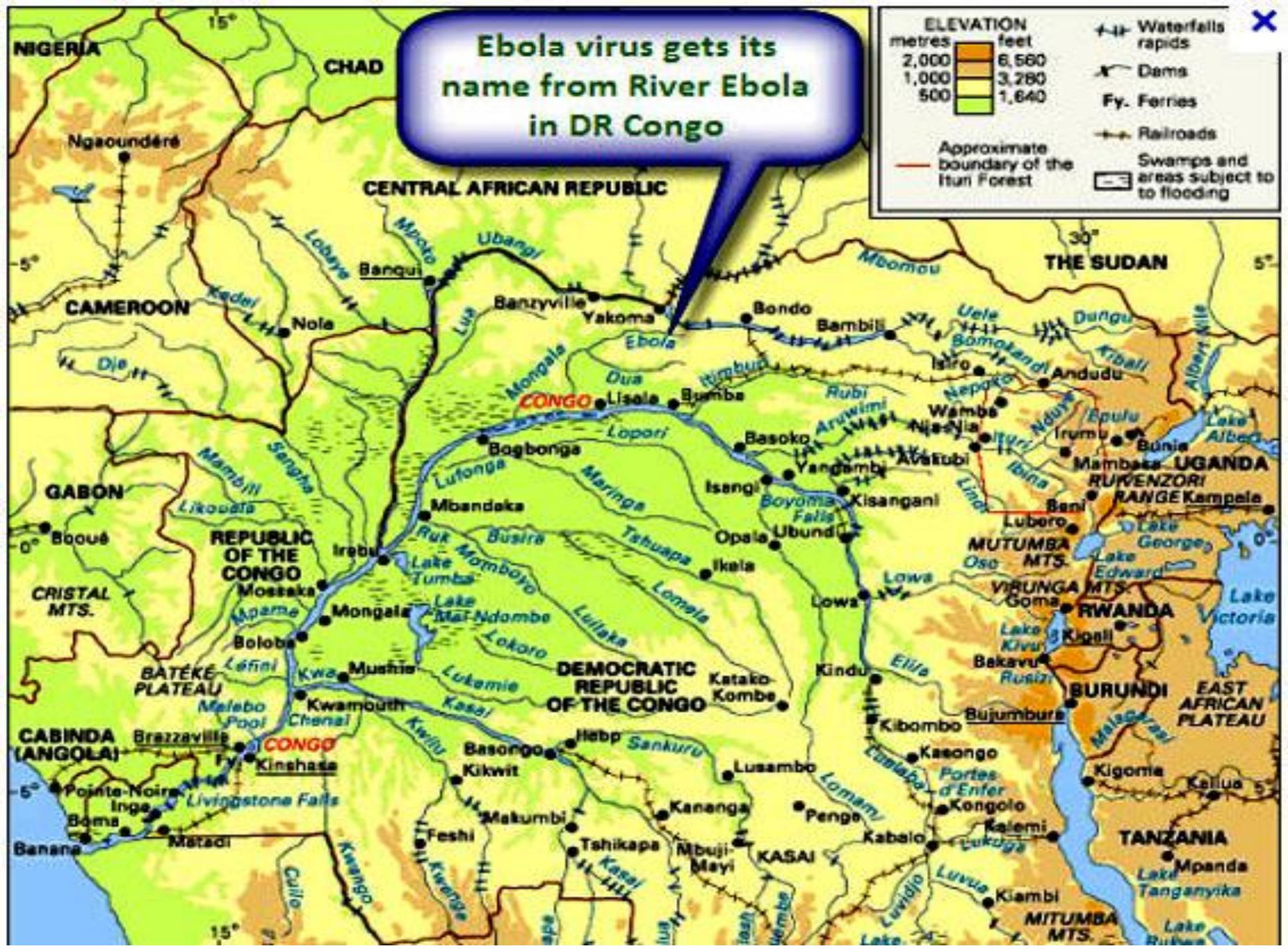


Ebola came to West Africa, spreading, and swimming in the ocean of national apathy, denial and unpreparedness.



Ebola virus gets its name from River Ebola in DR Congo

ELEVATION		
metres	feet	
2,000	6,560	Waterfalls rapids
1,000	3,280	Dams
500	1,640	Fy. Ferries
Approximate boundary of the Ituri Forest		Railroads
		Swamps and areas subject to flooding

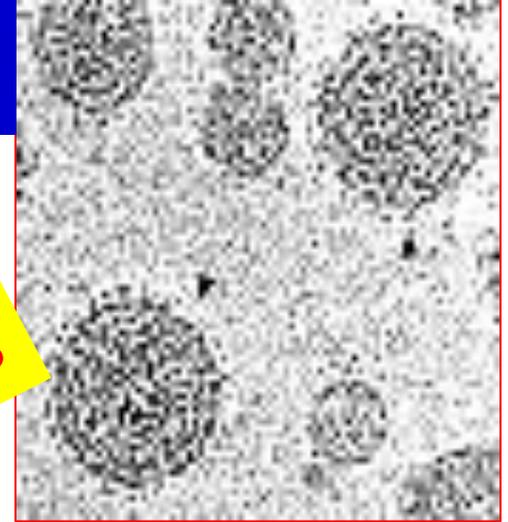


EBOLA VIRUS FAMILY

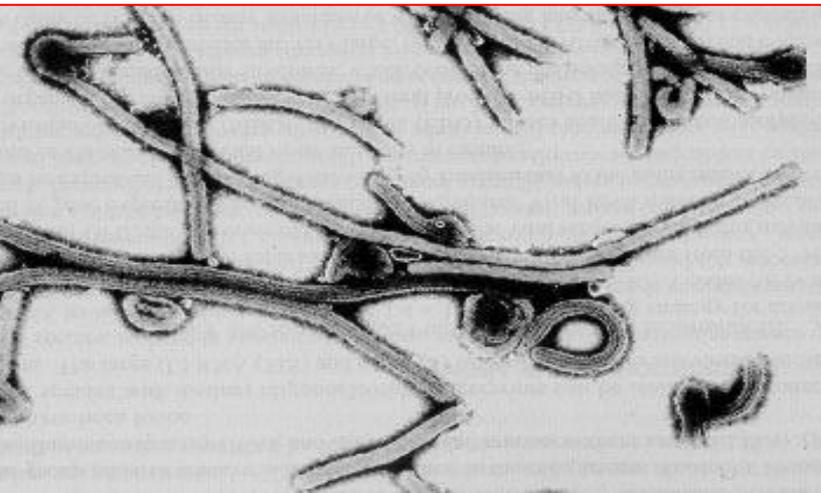


Flaviviridae
(YF, DEN,)

Haemorrhagic Fever Viruses

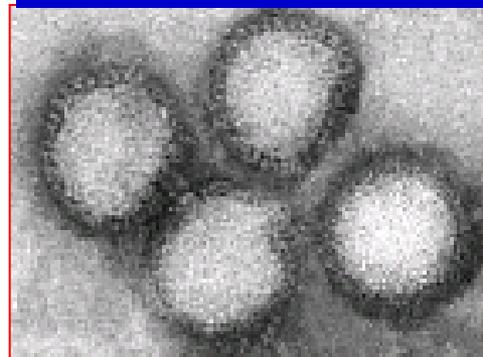


Arenaviridae
(Lassa, Junin,



Filoviridae
(Ebola, Marburg)

Bunyaviridae
**(CCHF, RVF,
Hantaviruses)**

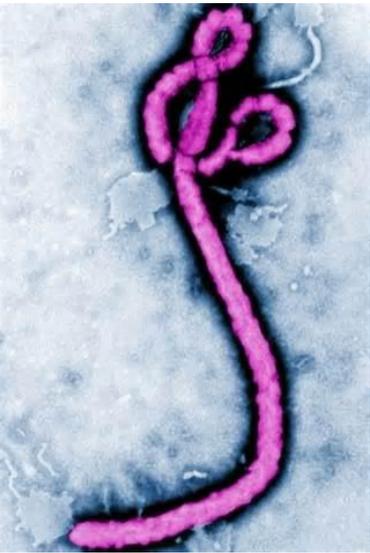


EBOLA FAMILY MEMBERS

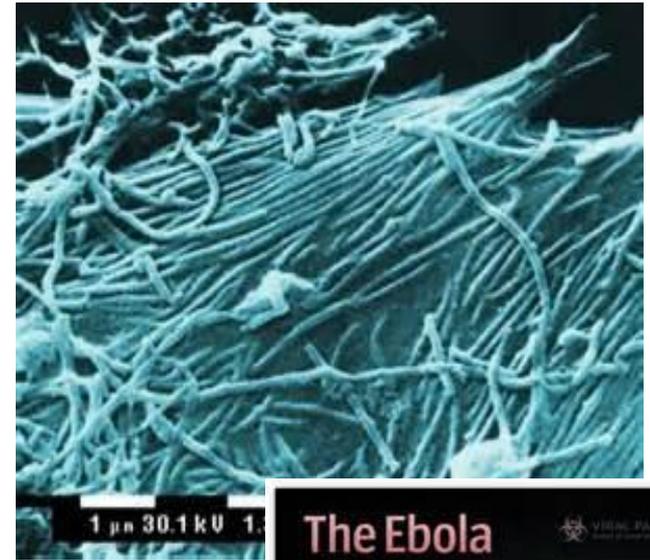
- **Family – Filoviridae filamentous viruses**
- **Family members**
 - **Ebolavirus genus**
 - **Marburg virus genus**
 - **Cuevavirus genus**

-

Ebola Family

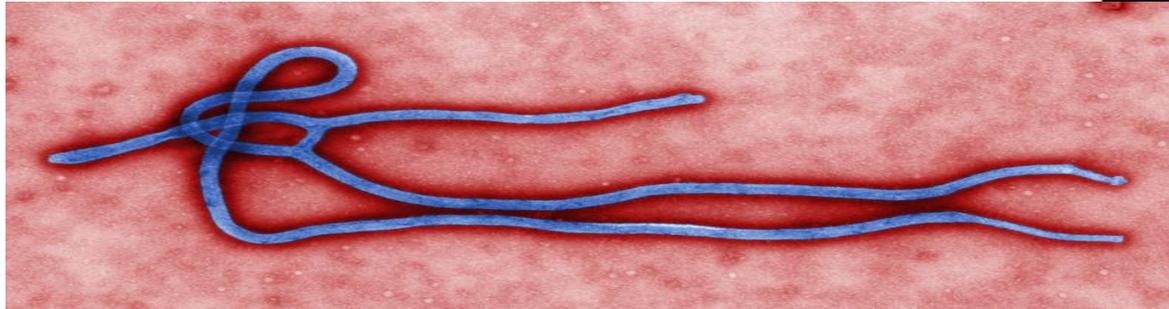


**Family – Filoviridae
filamentous viruses**



Family members (genus)

- **Ebolavirus**
- **Marburg virus**
- **Cuevavirus**



EBOLA FAMILY MEMBERS

Genus Ebolavirus - 5 distinct species:

- ✓ ***1976 - Zaire ebolavirus (EBOV)***
- ✓ ***1976 - Sudan ebolavirus (SUDV)***
- ✓ **1989 - Reston ebolavirus (RESTV)**
- ✓ **1994 - Tai Forest ebolavirus (TAFV)**
- ✓ ***2002- Bundibugyo ebolavirus (BDBV)***

Liberian viral samples 99% identical to Guinea and Sierra Leone viruses and 97% similar to original 1976 virus

EBOLA VIRUS DISEASE (EVD) – KEY FACTS

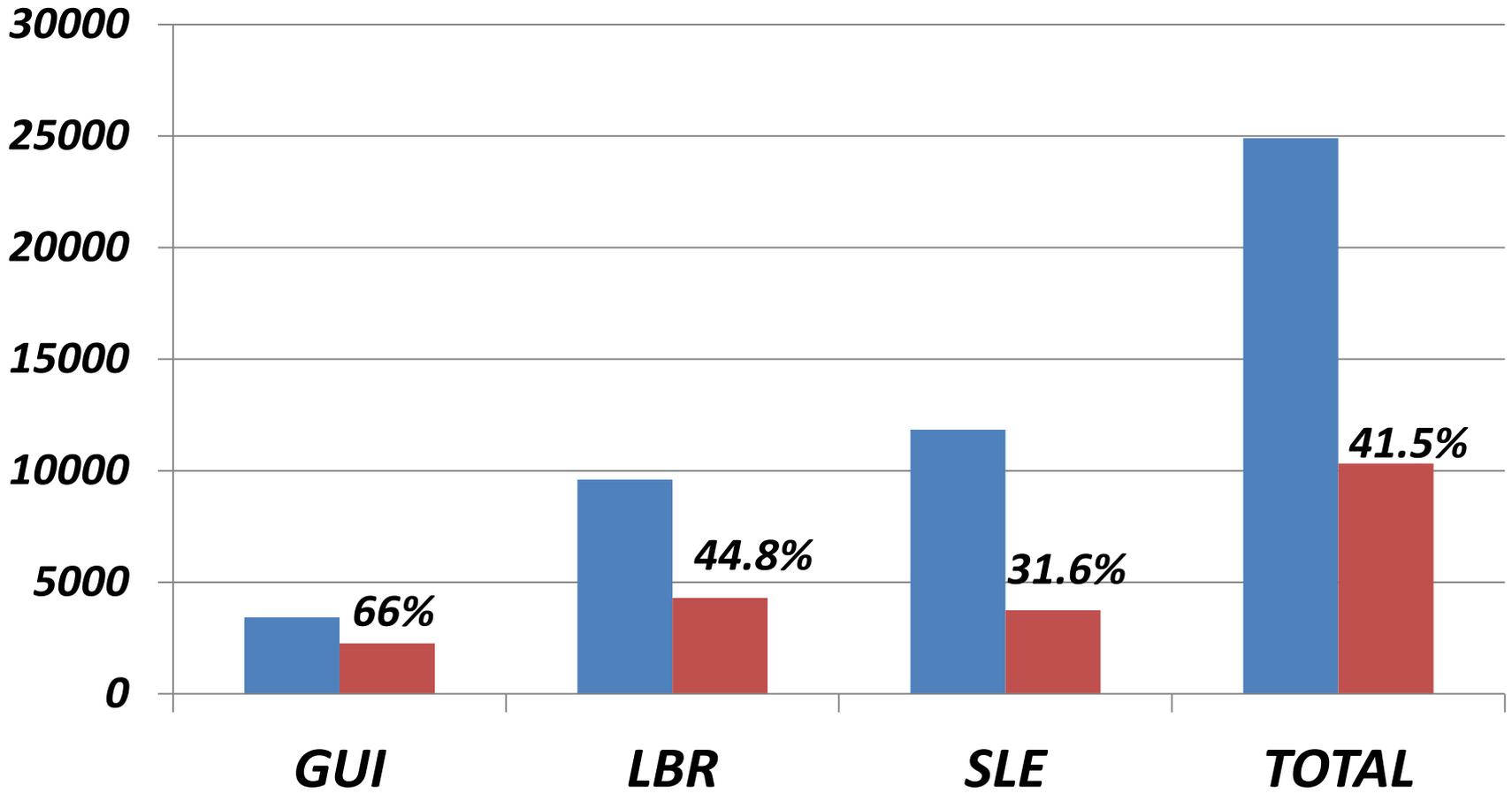
Ebola virus disease (EVD), formerly Ebola haemorrhagic fever.

Severe, fatal illness in humans, with case fatality rate up to 90%. *(Current : 32%-66%, overall 42%)*

Occur primarily in remote villages in C. & W. Africa, near tropical rainforests.

Transmitted to humans from wild animals

Ebola Cases and Deaths



WHO DATA AS OF 25 MARCH 2015

EBOLA VIRUS DISEASE (EVD) – KEY FACTS

Spreads in the human population through human-to-human transmission.

Fruit bats (family *Pteropodidae*) considered to be the natural host of the Ebola virus.

Severely ill patients require intensive Supportive care.

No licensed specific treatment or vaccine

Ebola Virus Disease- Transmission

- close contact with the blood, secretions, organs or other bodily fluids of infected animals.**
- handling of infected chimpanzees, gorillas, fruit bats, monkeys, forest antelope & porcupines found ill or dead or in the rainforest.**
- Spreads in the community through human-to-human transmission,**
 - direct contact (through broken skin or mucous membranes) with the blood, secretions, organs or other bodily fluids of infected people**

Ebola Virus Disease- Transmission

- **indirect contact with environments contaminated with such fluids.**

- **Burial ceremonies direct contact with corpse**

- **Recovered men transmit the virus through semen up to 7 weeks post recovery**

- **Health-care workers can be infected while treating patients with suspected or confirmed EVD.**

- **Failure of infection control precautions**

Early Symptoms

Ebola can only be spread to others after symptoms begin. Symptoms can appear from 2 to 21 days after exposure.

- **Fever**
- **Stomach pain**
- **Headache**
- **Unexplained bleeding or bruising**
- **Diarrhea**
- **Muscle pain**
- **Vomiting**

When is someone able to spread the disease to others?

Ebola only spreads when people are sick.

A patient must have symptoms to spread the disease to others.



MONTH						
S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

After 21 days, if an exposed person does not develop symptoms, they will not become sick with Ebola.



U.S. Department of
Health and Human Services
Center for Disease
Control and Prevention

CG25031

How do you get the Ebola virus?

Direct contact with

- 1** **Body fluids of a person who is sick with or has died from Ebola.** (blood, vomit, urine, feces, sweat, semen, spit, other fluids)
- 2** **Objects contaminated with the virus** (needles, medical equipment)
- 3** **Infected animals** (by contact with blood or fluids or infected meat)

Ebola virus is **not** spread through

- **Casual contact**
- **Air**
- **Water**
- **Food grown or legally purchased in the U.S.**

EVD- Diagnosis

Rule out other diseases - malaria, typhoid fever, shigellosis, cholera, leptospirosis, plague, rickettsiosis, relapsing fever, meningitis, hepatitis and other viral haemorrhagic fevers.

Laboratory diagnosis: - ELISA, antigen detection tests, serum NT, RT-PCR assay, EM, virus isolation by cell culture

Ebola samples extreme biohazard risk; test under maximum biological containment

EVD- Vaccine & Treatment

- **No licensed vaccine for EVD is available.**
- **No specific treatment is available.**
- **Severely ill patients require intensive supportive care.**

Patients dehydrated, require oral rehydration with electrolyte solutions or intravenous fluids.

New drug therapies-being evaluated

Therapy

Vaccines

- Convalescent serum
 - Zmapp
 - Hyperimmune globulin
 - Lipid Nanoparticle Small interfering RNAs (siRNA)
 - AVI 6002 (Sarepta)
 - Favipavir/T-705
 - BCX4430
 - Interferons
 - Clomiphene & toremifene
 -
- Chimpanzee adenovirus serotype 3 (ChAd3)
 - Vesicular Stomatitis virus (rVSV)

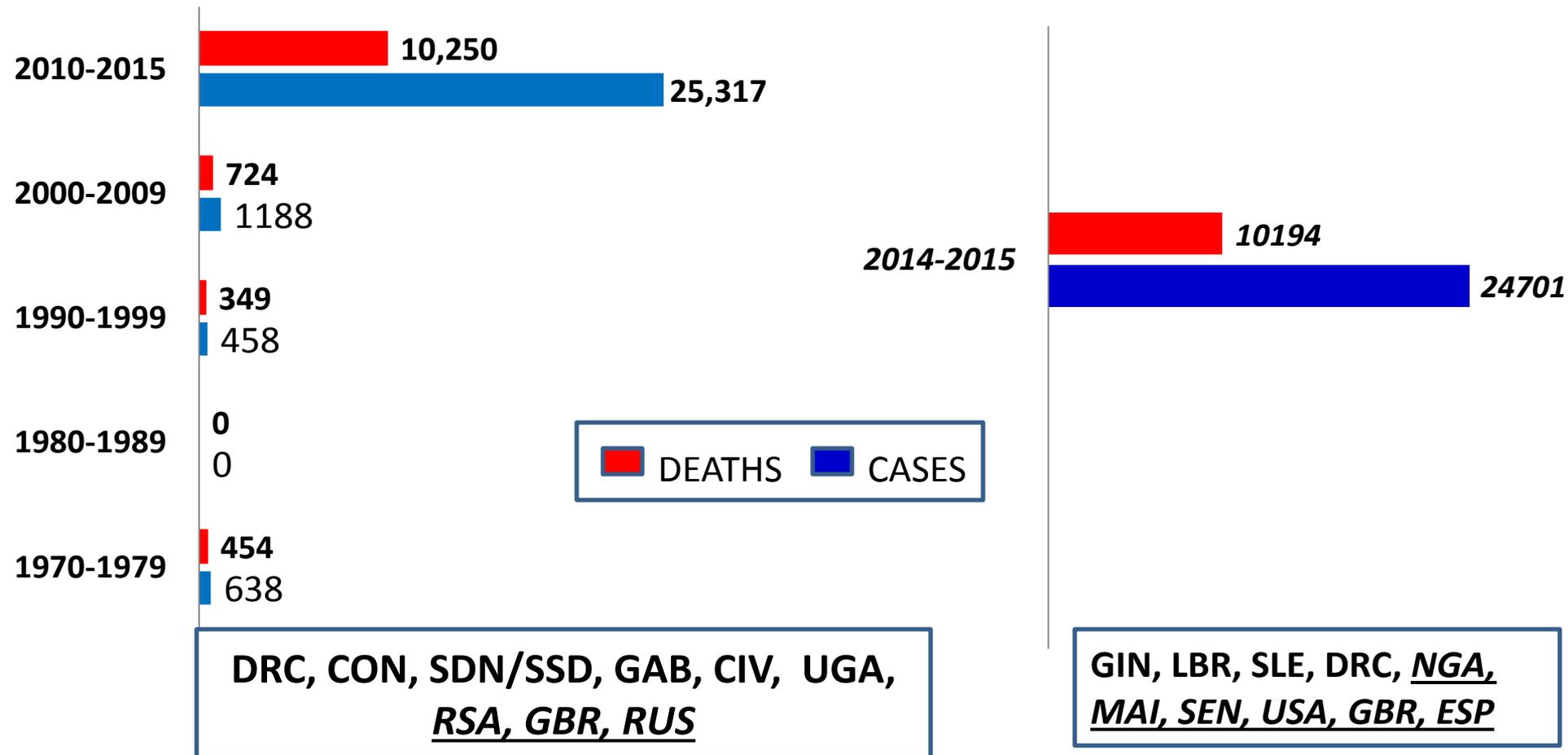
EBOLA: ALL CASES AND DEATHS

1970-2015* -GLOBAL

**, as at 15 March 2015*

2014-2015*

W. AFRICAN ORIGIN

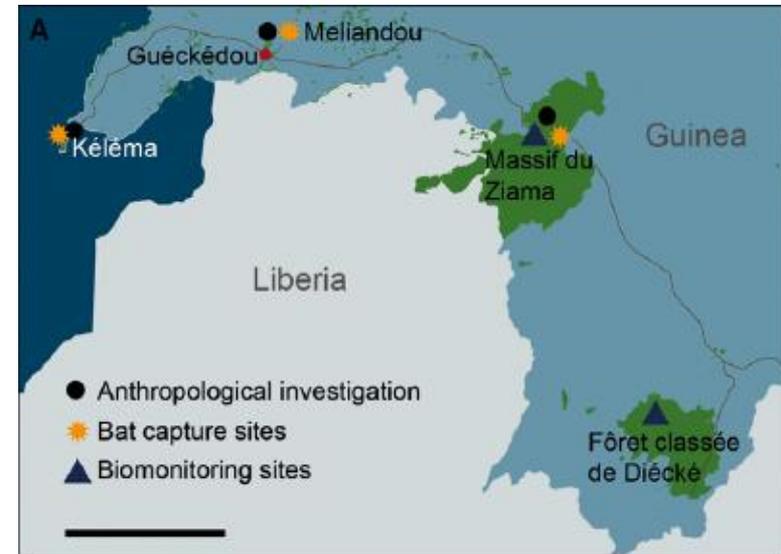
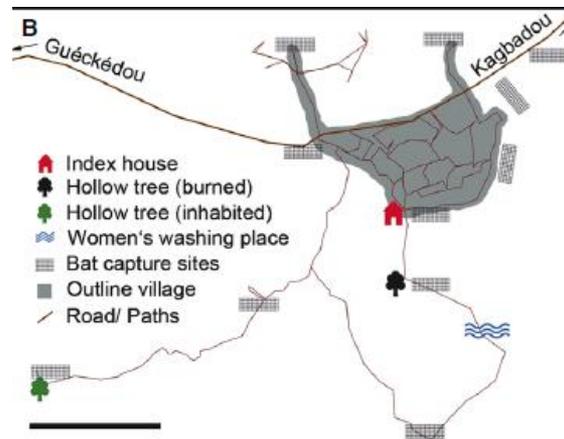


DEVELOPMENT OF A HUMANITARIAN DISASTER

- A fairy tale from the jungle, bats residing in the hollow of a burnt tree, a 2 yr old playing, and **BOOM**



- December 2013 – 2 yr old boy infected in Meliandou, near Gueckedou, Guinea



Saez et. al. EMBO Mol. Med. (2015)

- 23 March 2014 – Guinea notified WHO: 49 cases/29 deaths , with suspected cases already in SLE and LBR.

DEVELOPMENT OF A HUMANITARIAN DISASTER

- 28 May 2014 SLE reports 16 cases, in Kailahun district sharing borders with Gueckedou in Guinea and also with Liberia.
- 25 July 2015- Liberian case imported into Nigeria
- 08 August 2015 – WHO declares Ebola outbreak a PHEIC
- 15 months from index case.....

15 MONTHS FROM THE INDEX CASE, EBOLA

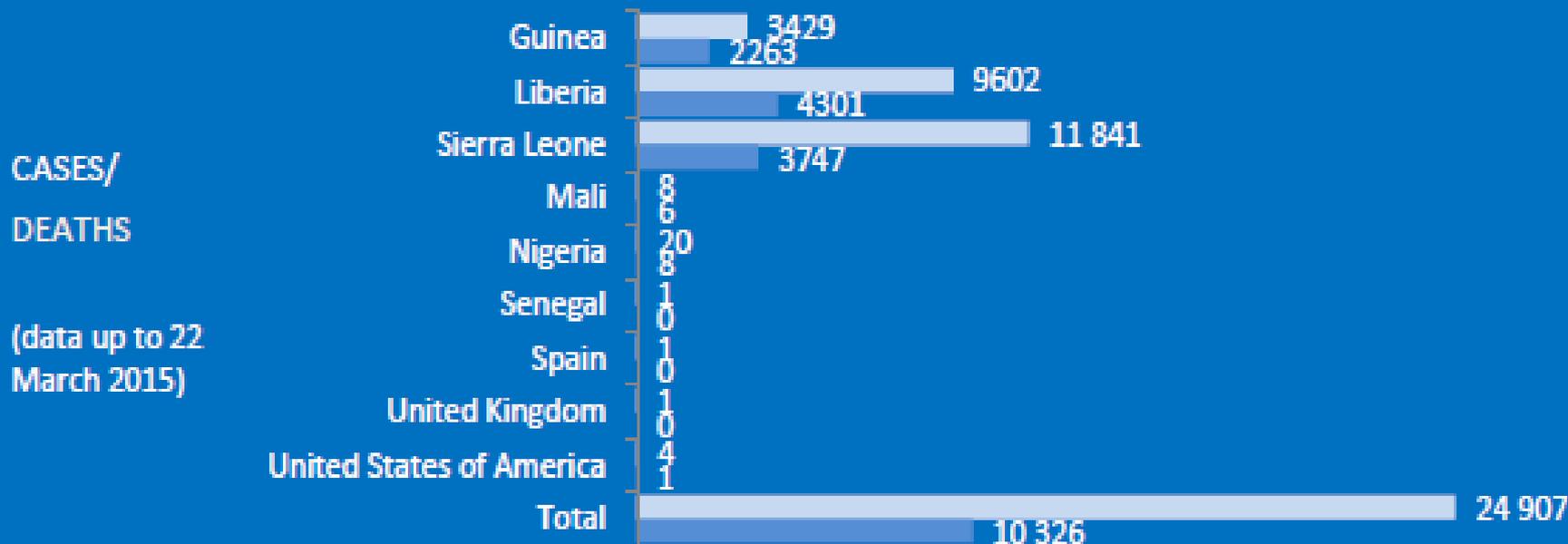


World Health
Organization

EBOLA SITUATION REPORT

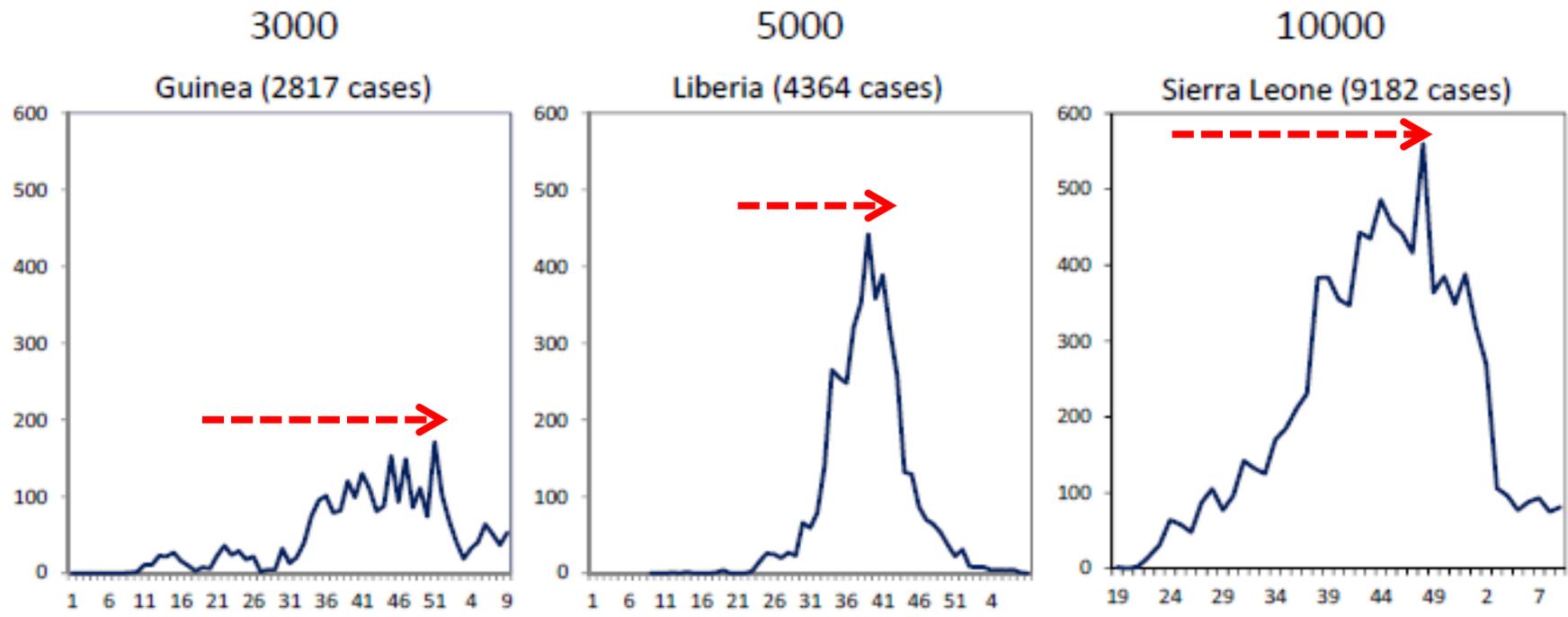
INCORPORATING THE WHO ACTIVITY REPORT

25 MARCH 2015



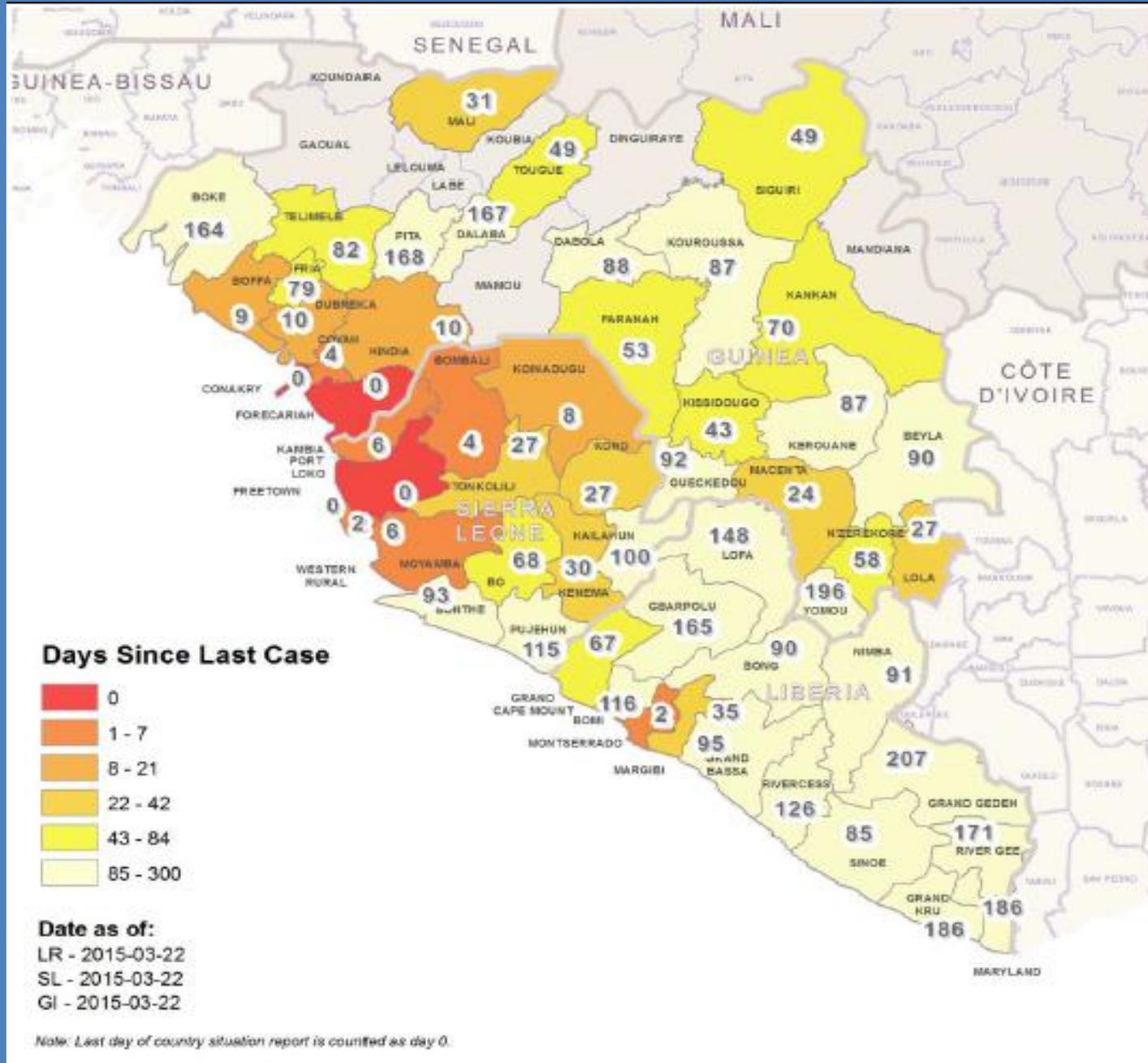
**REPORTED IN 9 COUNTRIES, WITH
25,000 CASES AND >10,000 DEATHS**

Ebola epidemics: Guinea, Liberia and Sierra Leone confirmed cases each week

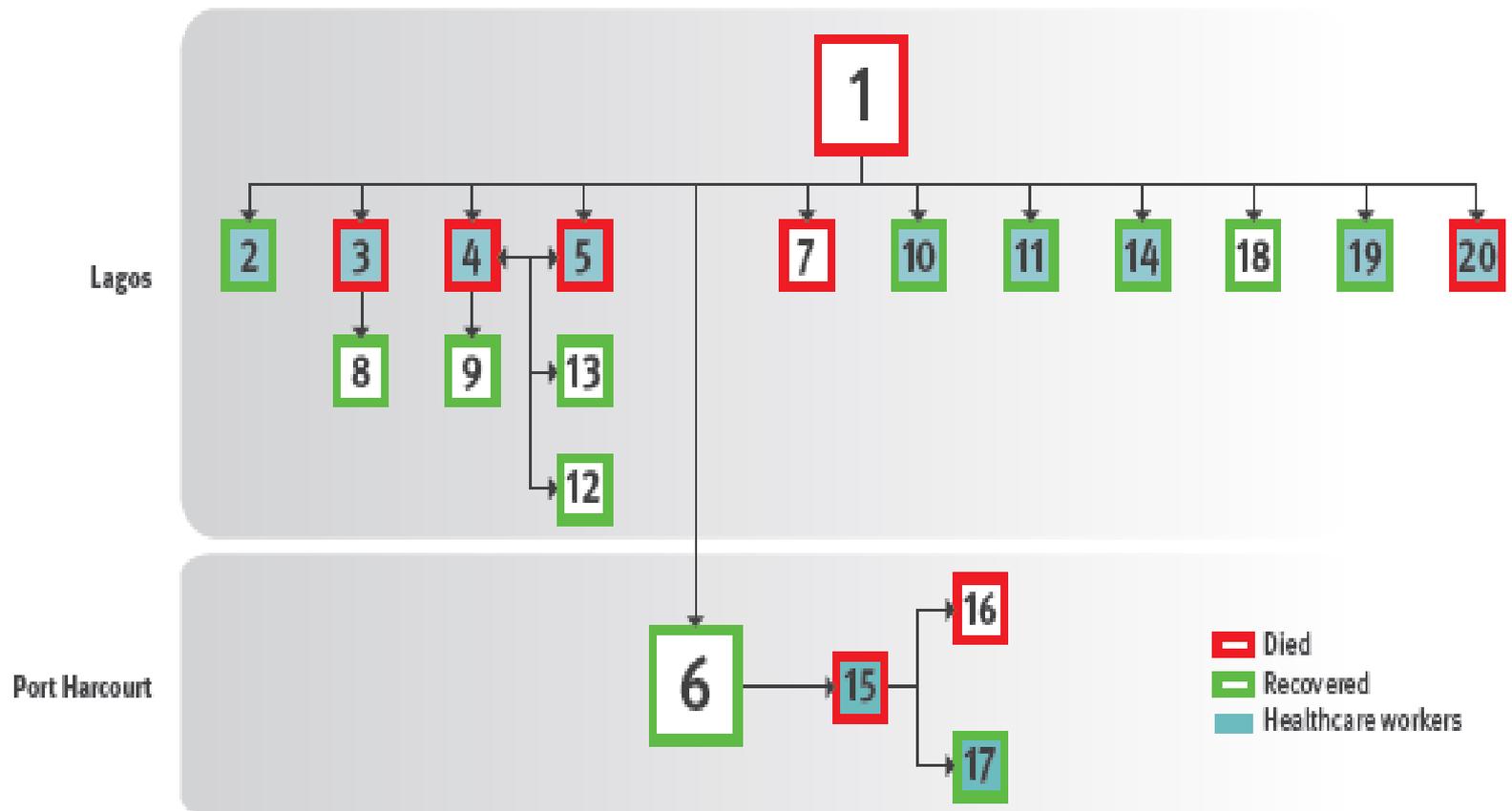


Weeks from January 2014 – March 2015

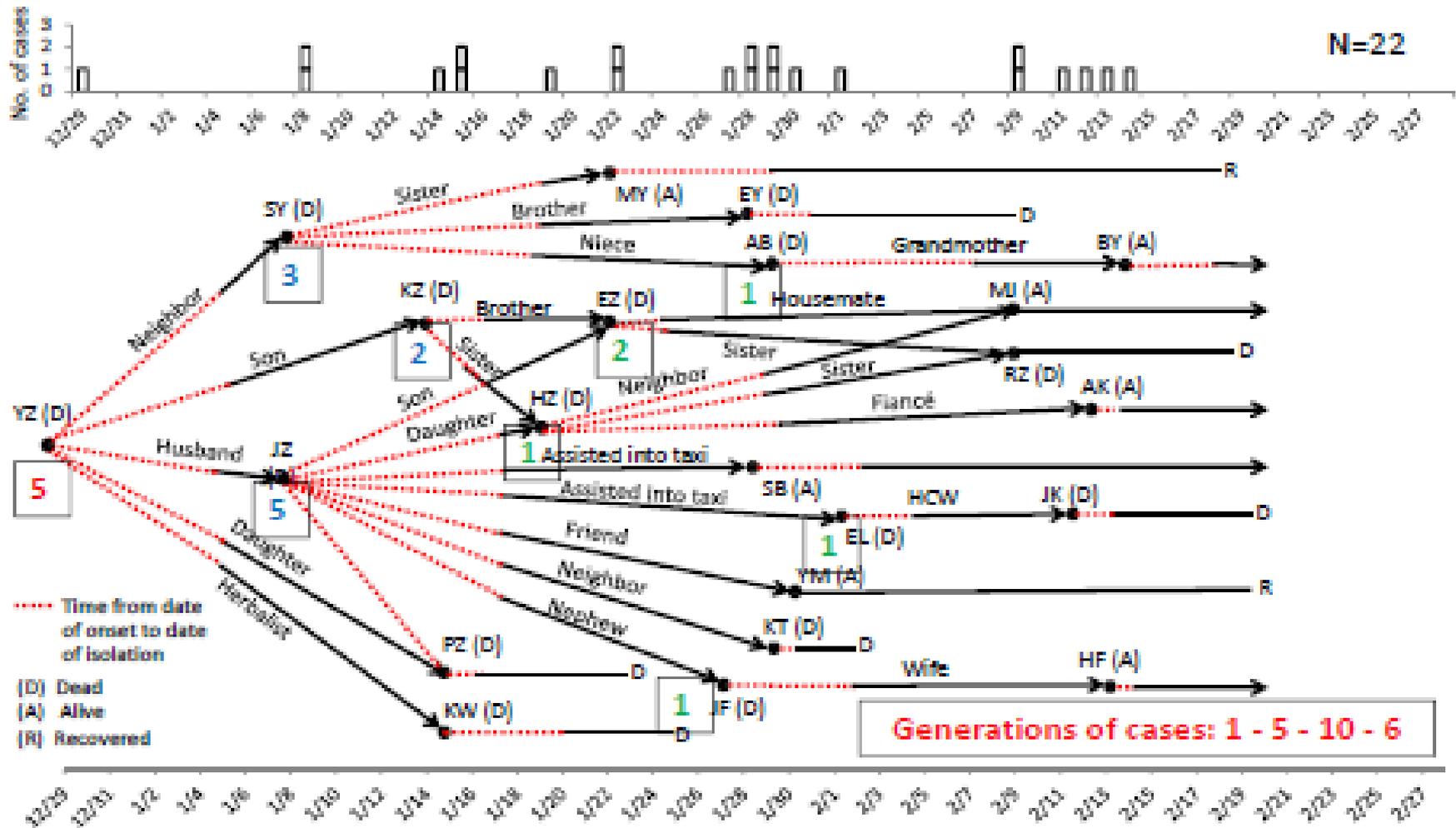
DAYS SINCE LAST CONFIRMED EBOLA CASE | GUI/LBR/SL



Transmission tree of the Ebola virus disease outbreak in Nigeria, July–September 2014

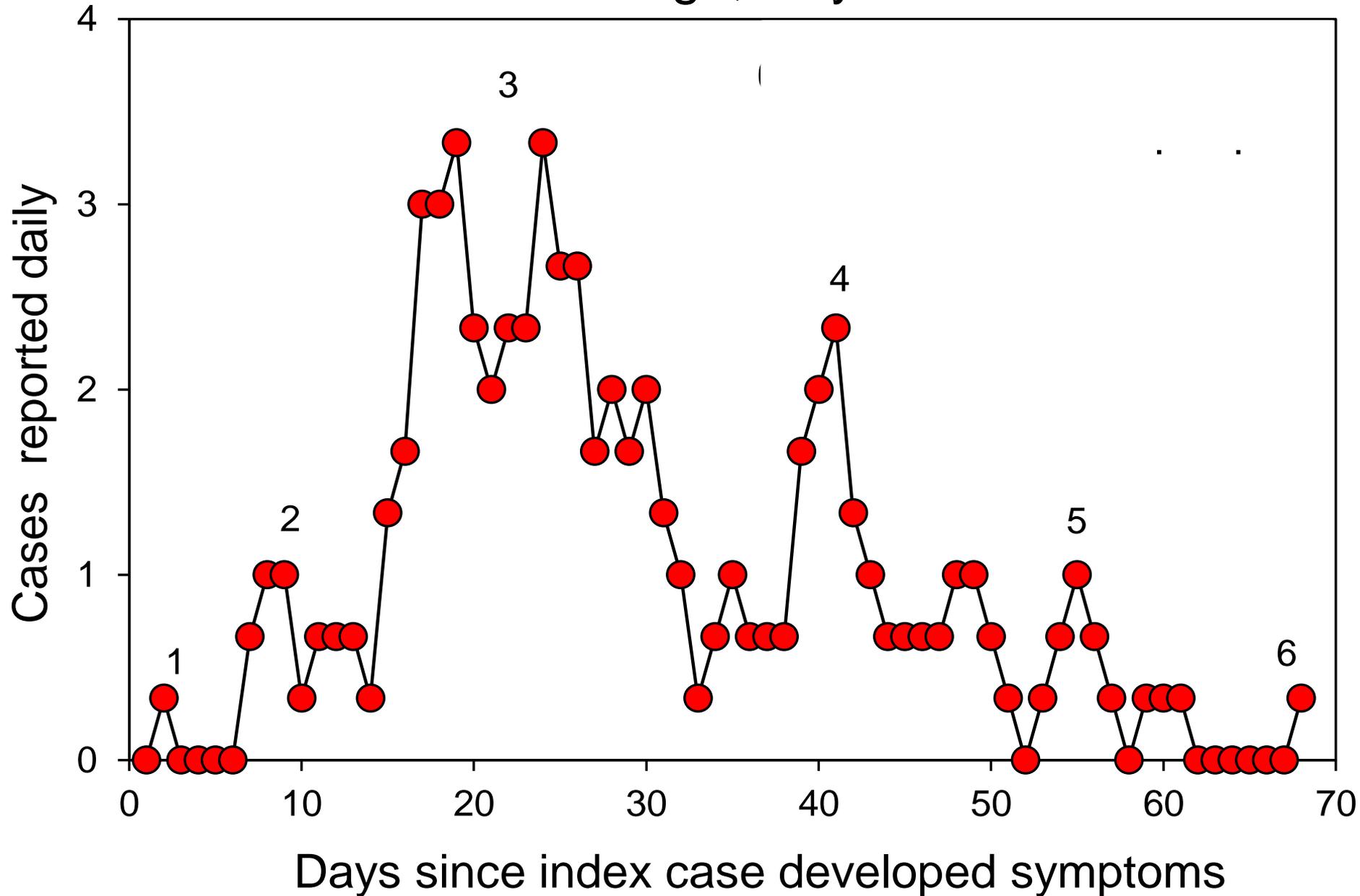


Transmission Diagram of St Paul Bridge Cluster, Dec 29-Feb 20, 2015 By Date of Onset*, Liberia

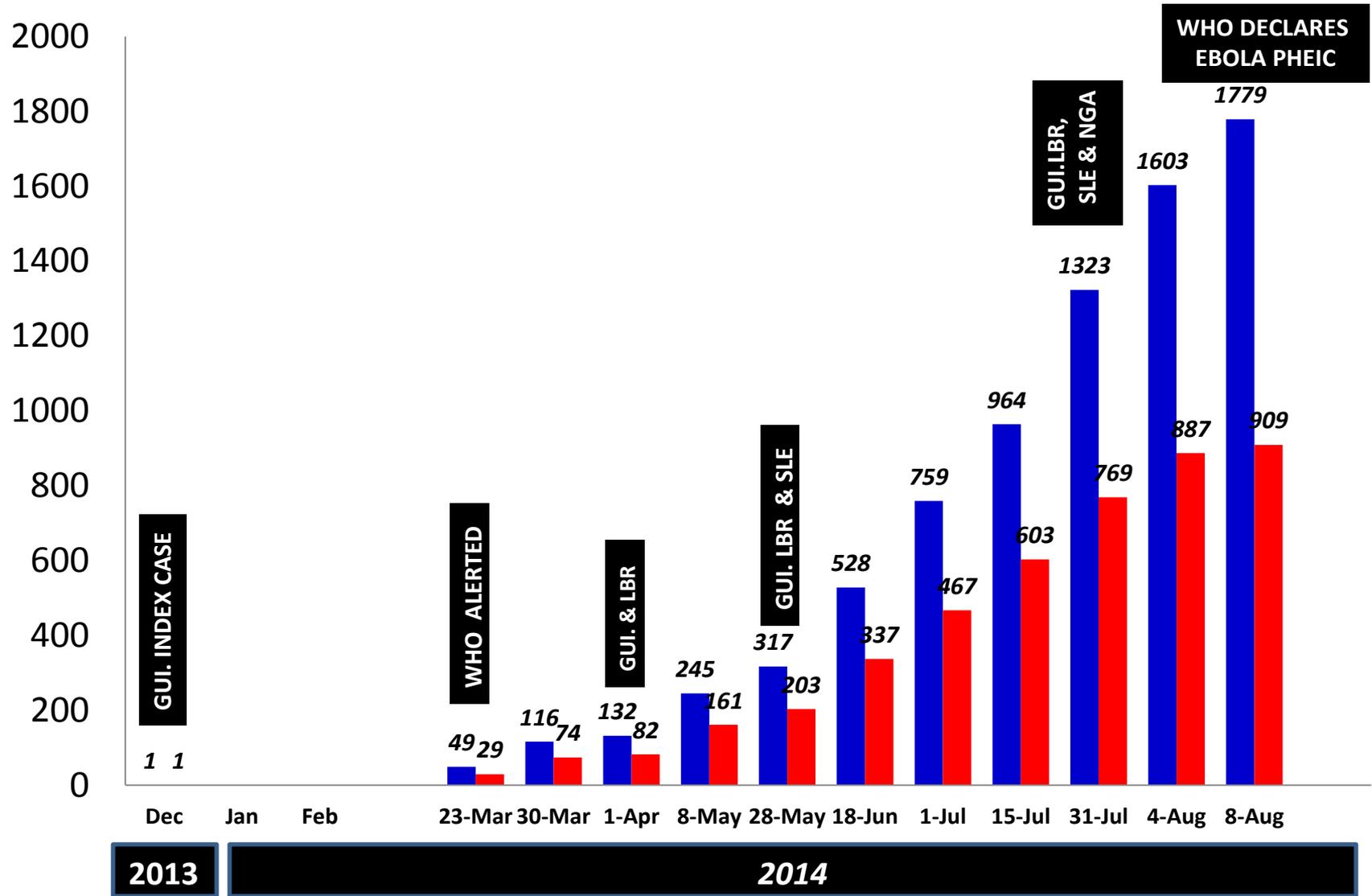


*Date of onset is abstracted from CIF or ETU medical record; if dates of onset differ between the two, the earliest date was used.

Ebola in DR Congo, July-October 2014

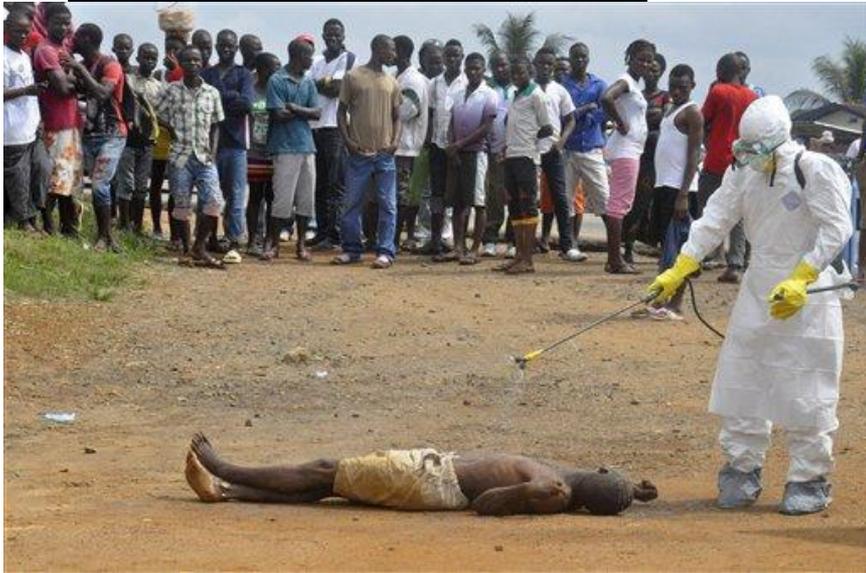


CUMULATIVE EBOLA CASES & DEATHS, 2013-2014



EBOLA KILLS AND AFFRONTS THE LIVING

DEHUMANISES



© Getty Images



© EPA



© Getty Images

EBOLA DEVASTATES THE LIVING



SORROW, PAIN & AGONY ARE EBOLA'S TRAVEL COMPANIONS



EBOLA PITCHES GOVERNMENTS AGAINST CITIZENS



WE HAD AIDS ORPHANS, NOW, EBOLA ORPHANS

..forgotten victims of self-induced humanitarian crisis



EBOLA DESTROYS E BASIC HEALTH STRUCTURES



INSTEAD OF PROVIDING BASIC PROTECTIVE MATERIALS IN HEALTH FACILITIES, SANITIZERS WERE GIVEN PRESIDENTIAL APPROVAL AND ORDERED IN LORRY LOADS



EBOLA SPECIFIC GELS AND "NANO SILVER"

EBOLA: FEAR, DENIAL, & IRRATIONAL BEHAVIOUR

Sacking of Ebola treatment Center.



Ebola Outbreak: Missing Liberia Patients Found After Fleeing Health Centre in Monrovia [Lydia Smith](#) August 19, 2014



EBOLA DESTROYS THE ECONOMY



HOW DID WE GET TO THIS LEVEL?

How did a single Ebola case become a plague killing >10,000?

Why was Africa so, so helpless?

Why did it take the world so long to wake up?

Why did Integrated Disease Surveillance and Response (IDSR) fail to work?

What happened to the “toothless” IHR (2005)?

Why is this the biggest ever epidemic?

Five possible reasons (west v equatorial Africa)

1. Behaviour - customs in West Africa carry a higher risk of infection than in equatorial Africa
2. Virus - EBOV genetic variants cause more severe and more infectious disease
3. Susceptibility – people less resistant to infection than in equatorial Africa, innate or pre-exposure
4. Contact - populations more mobile with higher contact rates than in remote forested areas
5. Response - to outbreak was slower in West Africa

Essentials of Ebola control

same for small and big outbreaks

- Case finding – sample widely
 - Diagnosis – sample early, report promptly
 - Isolation – all suspects immediately
 - Treatment – early case management
 - Burial – IPC safe
 - Contact tracing – comprehensive, 21 days
-

Reducing the risk of Ebola infection in people

No effective treatment and no human vaccine,

PREVENT ANIMAL-HUMAN TRANSMISSION

- avoid contact with infected fruit bats or monkeys/apes

- do not consume raw meat of fruit bats , monkeys or apes



- thoroughly cook animal products (blood and meat) before eating

- handle animals with gloves and appropriate PPE

Reducing the risk of Ebola infection in people

PREVENTING HUMAN-HUMAN TRANSMISSION

✓ avoid direct or close contact with infected patients, particularly with their bodily fluids

✓ avoid close physical contact with Ebola patients



✓ wear gloves and appropriate personal protective equipment when taking care of ill patients at home

Reducing the risk of Ebola infection in people

Since no effective treatment and a human vaccine, raise awareness of the risk factors for Ebola infection

PREVENTING HUMAN-HUMAN TRANSMISSION

- ✓ wash hands after visiting patients in hospital, or after taking care of patients at home
- ✓ inform community about nature of the disease and about outbreak containment measures
- ✓ avoid contact with dead bodies, bury corpses promptly and safely

Reducing the risk of Ebola infection in people

TRANSMISSION IN HEALTHCARE SETTINGS

HCWs must apply standard precautions consistently with all patients

- basic hand hygiene,

- respiratory hygiene,

- use of personal protective equipment

- safe injection practices

- safe embalming and burial practices.

Trained laboratory workers should handle Ebola suspect samples and processed in suitably equipped laboratories.

NIGERIA AND EBOLA

NIGERIA AND EBOLA

**Not because we were prepared, but
fortune smiles on us**

**PS was sick at the airport, and went
through the VIP section and not the
mass exit'**

**Doctors were on strike, so he ended up
in a private hospital**

NIGERIA AND EBOLA

So all these limited his contacts

Our Minister had boasted that we were prepared with stocks of Ebola medicine and vaccines

When Ebola came, we went for bitter kola and Nano-Silver pesticide

Our labs had to wait for international support to confirm Ebola

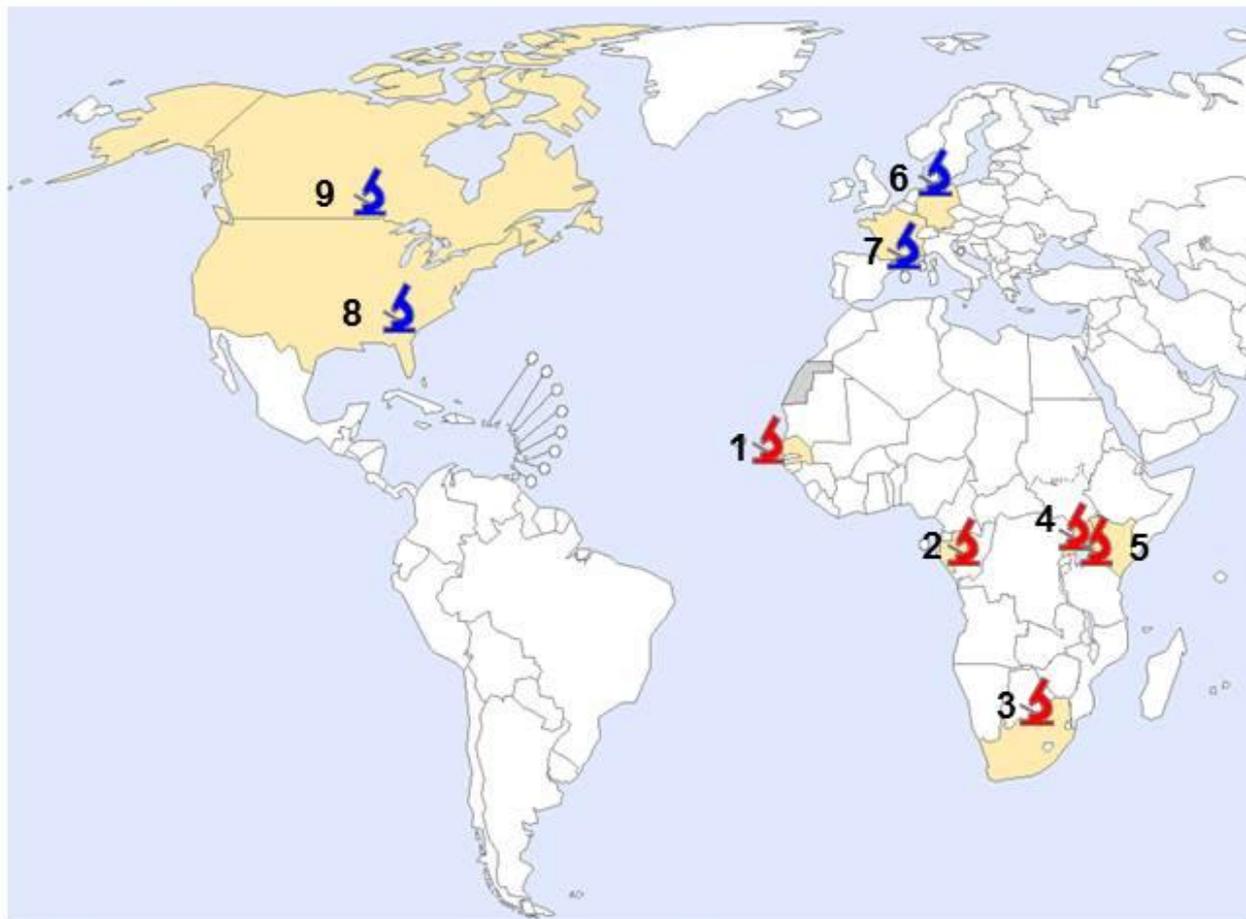
NIGERIA AND EBOLA

All functioning and performing labs in Nigeria depend on time-limited support and financing.

From CDC, APIN, Harvard, MacArthur, Bill Gates, we take and give nothing in return

Ebola Virus Disease in West Africa

EDPLN laboratories for Ebola or Marburg virus diagnostic



EDPLN : Emerging and Dangerous pathogens Laboratory Network

- | | | |
|---|---|---|
| 1 |  | Senegal
Institut Pasteur de Dakar |
| 2 |  | Gabon
Centre International de Recherches Médicales de Franceville |
| 3 |  | South Africa
National Institute for Communicable Diseases |
| 4 |  | Uganda
Uganda Virology Research Institute |
| 5 |  | Kenya
Kenya Medical Research Institute (KEMRI) |
| 6 |  | Germany
Bernhard-Nocht-Institut für Tropenmedizin (BNI) |
| 7 |  | France
Institut Pasteur Lyon et Paris |
| 8 |  | United States of America
Centers for Disease Control and Infection |
| 9 |  | Canada
National Microbiology Laboratory
Public Health Agency of Canada |



AFR-EDPLN laboratories with capacity for Ebola or Marburg virus diagnostic



Global EDPLN laboratories supporting the Guinea Ebola outbreak response

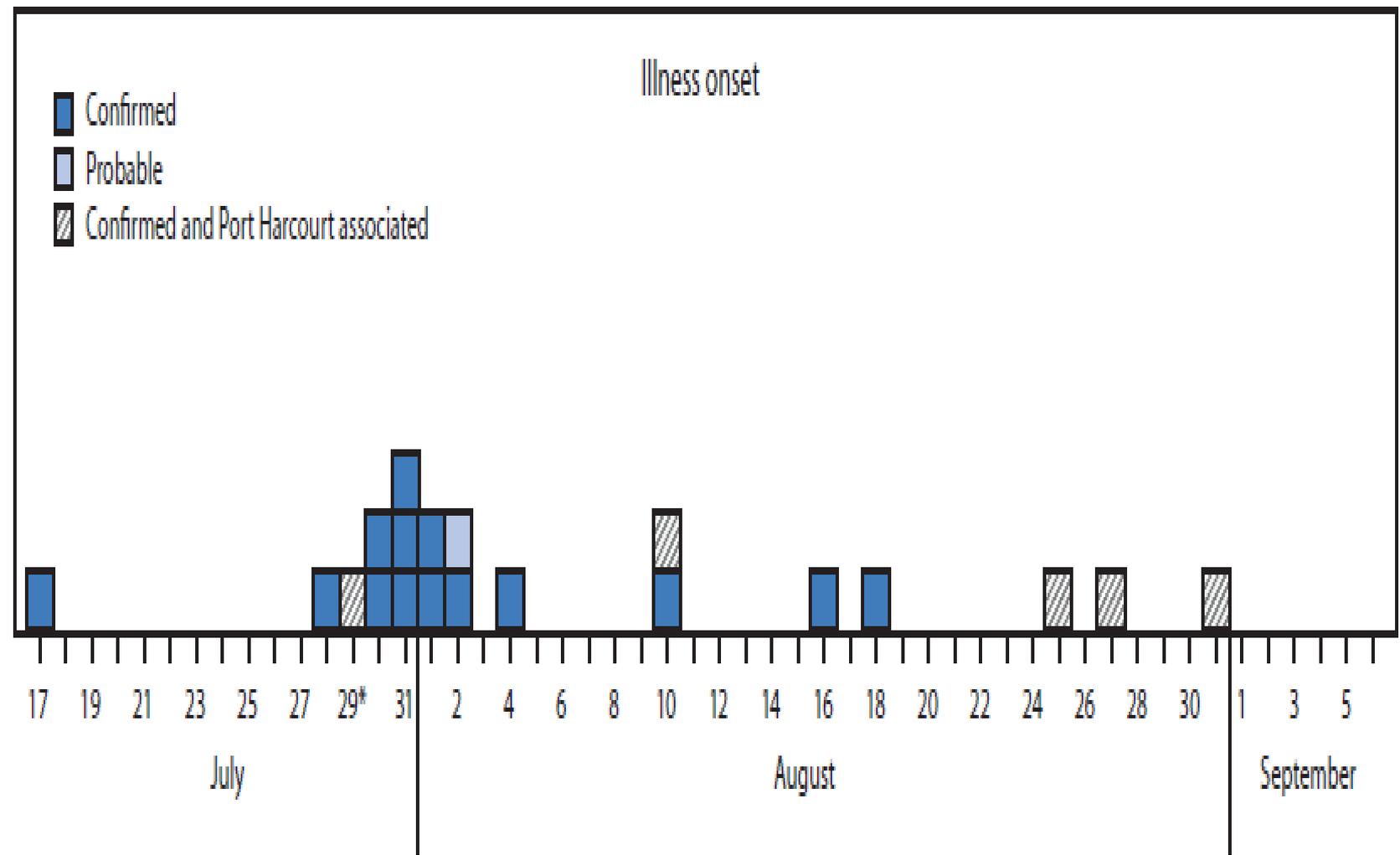
Source: WHO, 10 April 2014

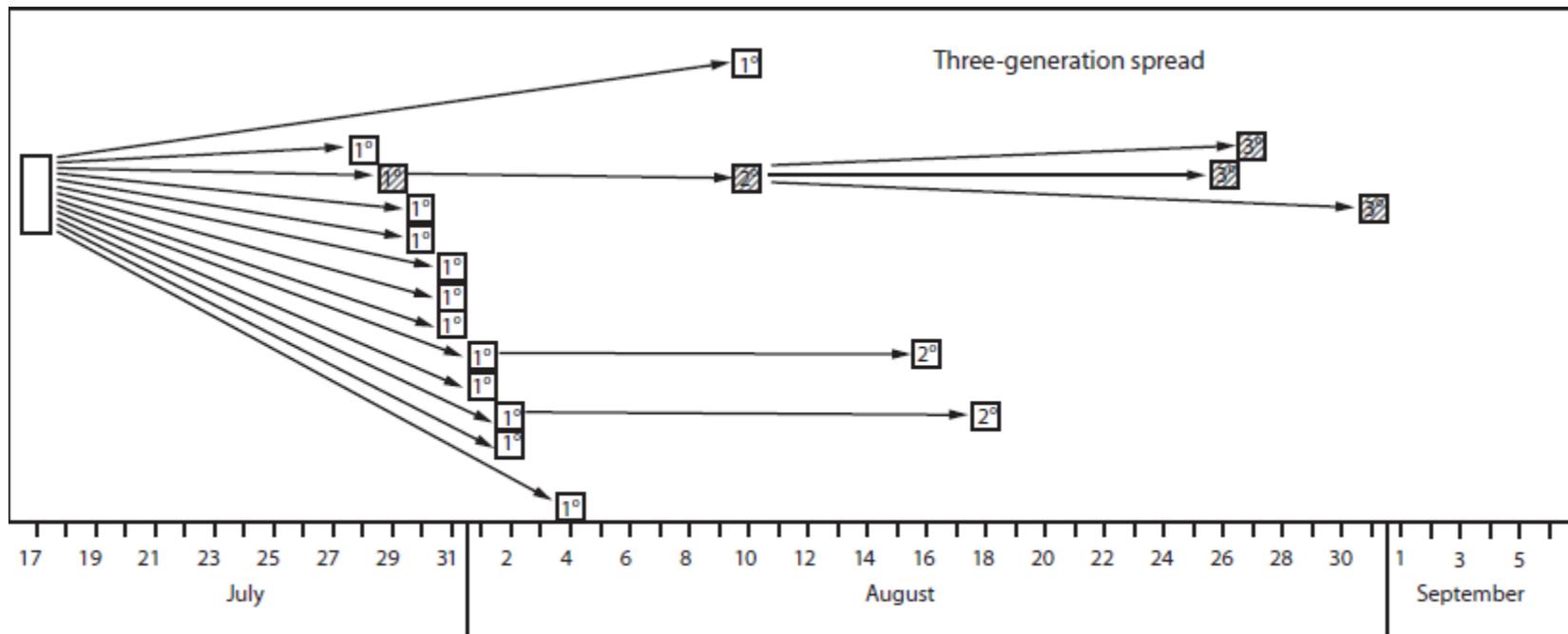
The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers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

- Confirmed
- Probable
- Confirmed and Port Harcourt associated





* The patient with July 29 illness onset was exposed in Lagos, traveled to Port Harcourt for treatment and initiated the Port Harcourt case cluster.

THERE IS NOTHING NEW UNDER THE SUN

Forum on Emerging Infections

CONSIDERATIONS FOR VIRAL DISEASE ERADICATION

*Lessons Learned and
Future Strategies*

Workshop Summary

INSTITUTE OF MEDICINE

INTERNATIONAL HEALTH

REGULATIONS

(2005)

SECOND EDITION



World Health
Organization



SUSTAINING GLOBAL
SURVEILLANCE AND
RESPONSE TO EMERGING
ZOOONOTIC DISEASES

ACHIEVING SUSTAINABLE
GLOBAL CAPACITY FOR
SURVEILLANCE AND RESPONSE
TO EMERGING DISEASES
OF ZOOONOTIC ORIGIN



W O R K S H O P S U M M A R Y

INSTITUTE OF MEDICINE AND
NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

INSTITUTE OF MEDICINE AND
NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES



**LOOKING
FORWARD**



Oyewale TOMORI
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of Science

HOW PREPARED IS AFRICA?

Since 1976,

- **Over 24 Ebola outbreaks in Africa**
- **25,000 cases with 10,000 deaths**
- **West African outbreak – Dec '13 to date**
- **Other African outbreaks controlled within 1-3months**

HOW PREPARED IS AFRICA?

In 1995, after the Kikwit outbreak, I predicted that should here be another Ebola or any other epidemic 10 or 20 years , after Kikwit, in any African country, that country would call for external help, to the detriment of the local scientists.

Come 2014, I was proved right!

Africa has not only been unable to contain any of the outbreaks, but it has become powerless, confused, disoriented and totally helpless, resorting to seeking international aid and begging for everything, as earlier predicted

Some food for thought

African poverty is not a lack of resources, but the misuse of our resources

Some African leaders do more damage to their citizens than Ebola can ever do

External aid often benefits the giver, more than the recipient.

African intellectual: too timid, too afraid, protecting his little advantage

Some food for thought

African poverty is not of a lack, but of the misuse of her resources, but in the process of

Senegal – with HDI = 0.485, ranked 166 out of 169 nations, built the African Renaissance Monument at a cost of \$27 million.



12 Nigerians placed orders for private jets at a cost of \$480 million in 2014.

Nigeria 's HDI = 0.504, ranked 152 f 166 nations)





**BEFORE EBOLA, AFRICA HAD
LEADERS, SOME LESS VICIOUS &
DESTRUCTIVE AS EBOLA, BUT OTHERS..**

Some food for thought

Often, external aid benefits donor more than receiver

<http://thebulletin.org/how-confront-emerging-pathogens7032>

Pathogen outbreaks ultimately become opportunities for foreign researchers and health agencies to fine-tune their skills, leaving scientists in resource-poor countries permanently dependent on outsiders—reduced to mere sample collectors, unable to control the next pathogen outbreak on their own.

. But above all, each African country must commit its resources to ensuring appropriate surveillance for emerging and re-emerging pathogens. *Meanwhile, developed countries should ease off on their dominance and control of the processes of global disease surveillance.*

Only then can developing countries truly “own” these processes

Acts 20 verse 35 says

It is more blessed to give than to receive

As it is with economic aid, so it is with scientific collaboration.

Scientific collaboration as aid, favours the donor more than the receiver.

The British is confirming this with the MRC in Fajara, Gambia. The USA is validating this in Kenya's KEMRI. The French is authenticating it through the Institut Pasteurs

Acts 20 verse 35 says

It is more blessed to give than to receive

That is why no matter the contribution of an African in any research collaboration, he can only achieve secondary status!

The piper not dictates the tune but also directs how to dance to the tune

THIS IS THE CHARACTER OF AID

Africa needs to REVERSE her dependency

THE WORLD IS ASKING

In London, Paris, Washington, Atlanta, & Geneva, they are asking on Ebola

- What next?
- Where did we go wrong?
- What can we have done differently?

AFRICA IS ALSO ASKING (the wrong ?s)

In Conakry, Freetown, Monrovia, Brazzaville, & Addis Ababa, the questions they are asking , are

- Is Ebola worse than Charles Taylor whose 1st & 2nd wars killed >50,000?
- **How much aid did we get for Ebola?**
- Who has not yet given us aid?
- **Who else is bringing aid and what type?**



**Audit
Service
Sierra
Leone**

**REPORT ON THE
AUDIT OF THE
MANAGEMENT OF
THE EBOLA FUNDS**

MAY TO OCTOBER 2014

“IT IS CLEAR FROM OUR AUDIT CONDUCTED, THAT THERE CONTINUES TO BE LAPSES IN THE FINANCIAL MNAGEMENT SYSTEM IN SIERRA LEONE AND THESE HAVE ULTIMATELY RESULTED IN THE LOSS OF FUNDS AND A REDUCTION IN THE QUAITY OF SERVICE DELIVERY IN TE HEATH SECTOR”



APPENDIX 'A2'

**WITHDRAWALS FROM MISCELLANEOUS ACCOUNT NUMBER 003001115131030175
WITHOUT PAYMENT VOUCHERS AND SUPPORTING DOCUMENTS**

Date	Details / Payee	Cheque No.	Amount Le
6/6/14	Withdrawals	2366933	19,902,500
10/7/14	Withdrawals	2367001	30,000,000
10/7/14	Withdrawals	2367000	27,765,000
10/7/14	Safiatu Foday	2367008	54,600,000
10/7/14	Withdrawals	2367007	75,820,000
10/7/14	Bassie Turay	2367006	75,000,000
10/7/14	Senesie Margao	2367019	100,000,000
	TOTAL		453,571,500

WHEN NEXT EBOLA RE-EMERGES



WILL AFRICA BE READY?

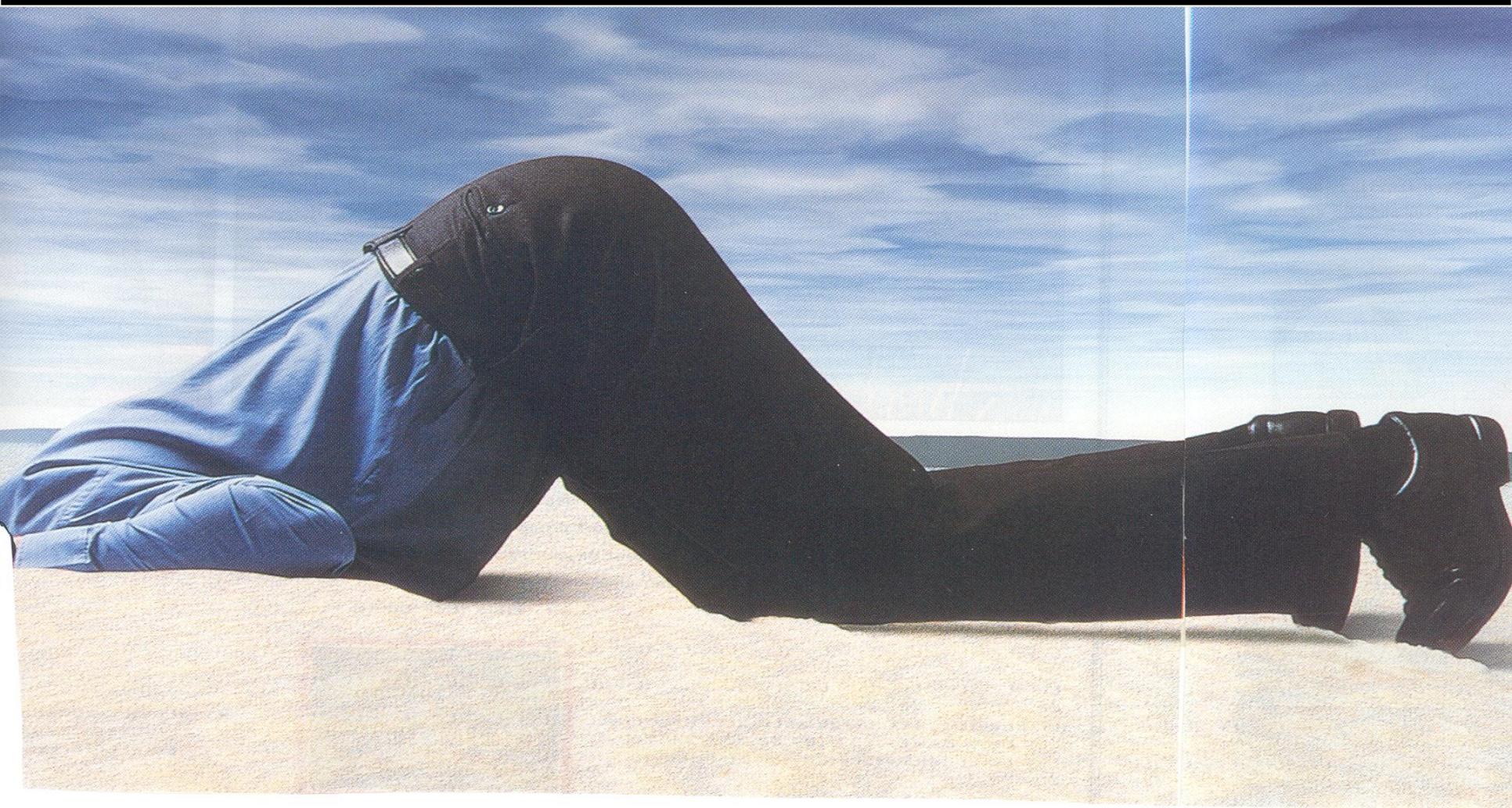


**Africa's
NEW
DEAL**

Some food for thought

**The African intellectual:
too timid, too afraid,
protecting his little advantage to the
disadvantage of the poor of his
country who looks up to him**

THE SAND OF COMPLACENCY , DECEIT & IGNORANCE



WE ARE TOO AFRAID TO SPEAK

SPEAKING



NO EVIL

SEEING



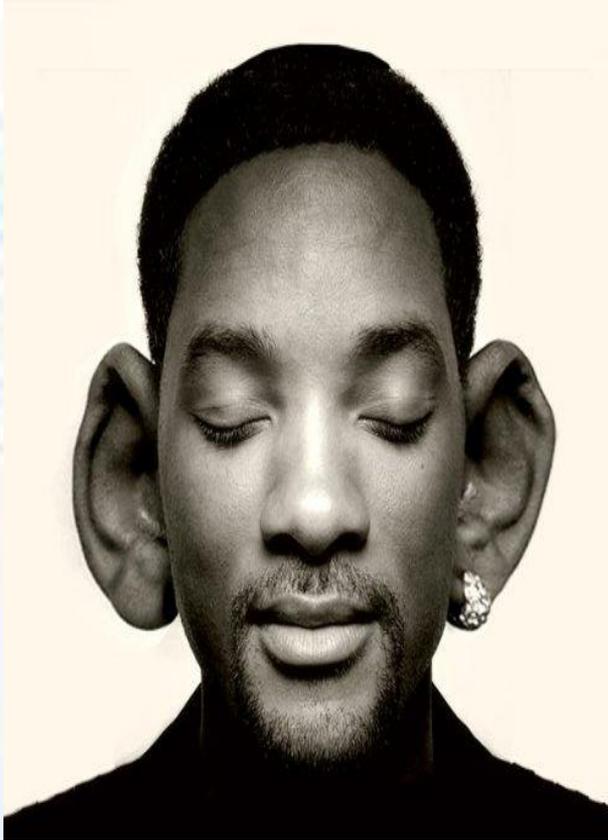
NO EVIL

HEARING



NO EVIL

WE NEED BIG EYES, EARS & MOUTHS



to

SEE ALL

HEAR ALL

SAY ALL

THE EBOLA MAGIC BULLET

EBOLA HAS GIVEN AFRICA A DEATH BLOW SMACK IN THE FACE

WE ARE SO CONFUSED AND DISORIENTED AS WE SEARCH FOR THE “MAGIC BULLET” TO KILL EBOLA DEAD!



THE MAGIC BULLET IS RIGHT AT HOME AND WITH US, BUT WE CANNOT SEE WHAT WE HAVE NEGLECTED FOR SO LONG.

THOSE BASIC RULES/PROCESSES OF INFECTION CONTROL

THIS IS NOT AN X-RATED PRESENTATION, BUT ONE OF AFRICA'S WISE SAYING FROM OLD MAN OWINO



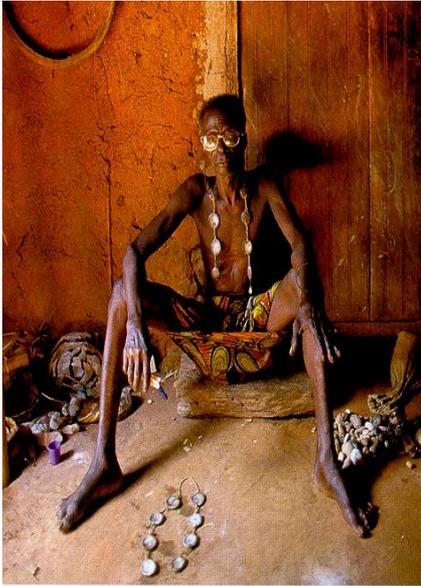
**A child can play with its mother's breasts,
but not with its father's testicles.**

**AFRICA HAS ALLOWED EBOLA TO
CRUSH HIS TESTISCLE, MAKING
HIM IMPOTENT**

BUT

**THE GOOD NEWS IS THAT ONLY
ONE OF THE TESTISCLES
IS CRUSHED**

A PEEP INTO THE FUTURE



- TODAY IS THE MOTHER-FATHER OF TOMORROW
- **ANOTHER SCANDAL, ANOTHER DISEASE**
- TITANIC STRUGGLE OF THE MASSES TO EKE OUT A DAILY LIVING
- **INORDINATE ORGY OF THE LEADER TO AMASS ILLEGAL WEALTH**
- A COLLECTIVE MEMORY WIPE OUT, A SELECTIVE DELETE OF LEARNED LESSON
- **AND ANOTHER HUMANITARIAN DISASTER IS IN THE OFFING – WHEN?**
- TOMORROW, MAY BE, YES, PERHAPS

Dr. Afose A. Aworawo III
PhD, Cosmology
D.Sc. Futurology

Unless we change in another 10 20 years, it may be another disease, Africa will again call for international assistance.

Ebola and other such vicious diseases would have destroyed the foundations of our economy, social structure and orderly development, as it is doing in Guinea, Liberia and Sierra Leone

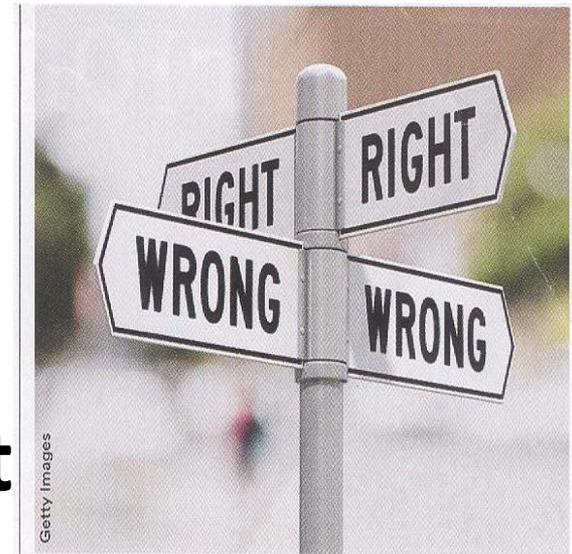
**Ebola came devastating an
unprepared West Africa,
compounding years of
misplaced priorities.**

**Only time (bringing another
epidemic), will reveal lessons
learned (if any, or forgotten)
from the current Ebola
epidemic.**

Africa must DISENTAGLE her future from the current state of decadence.

It is time to make the good choice for development and take the right way to progress

We need all assistance we can get as we strive to put an end to our decadence & dependency



YET OUT OF THE DEPTHS OF MY SORROW

OUT OF THE DEBRIS AROUND US

**LET HOPE SPRING IN OUR HEARTS
AS WE **INSPIRED ONE ANOTHER****

FOR AN AFRICAN RENNAISSANCE





DAVID BOWIE



Nothing has changed.



I think my time is up

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**I thank Professor JK Olupona, and his staff
for the invitation.**

Distinguished Ladies & Gentlemen

