IMED VIENNA 2018: ANATOMY OF THE EVD W AFRICA OUTBREAK (2013-2016)

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- EV activity ‘silent’ from 1979-1994, after which EV outbreaks reemerged with vigor
  - Intervals between recorded outbreaks shorter; recurring on 1-2 yearly basis; sometimes 2-3 times within one
- Ebola West Africa (2013-16) largest EVD outbreak in history
- West Africa: history of civil conflict
  - Poverty
  - Poor healthcare delivery and health facilities
  - Low levels of education
  - Large population movement & displacement

Deaths:

- **8 May 2016: 28,616 cases; 11,310 deaths (overall case fatality: 40%) & > 10 000 survivors**
- **W African healthcare workers (HCW): 875 infections 875; 509 deaths, case fatality: 58% (In Sierra Leone: 72%)**

Public health impact far greater than case counts:

- **Crippling of an already weakened health sector & HCW losses**
- **Significant impact on other endemic diseases (e.g. malaria) & associated mortality**
- **Substantial economic losses for entire sub-region**
- **Social disruption**

- Exposures: hunting, food-handling, butchering, community activities; burials
- Host susceptibility
- Poor hygiene
- Poor education
- Overcrowding
- Belief systems
- Mobility

Microbe: Zaire Ebolavirus

- ssRNA
- Reservoir: evidence for bats; other?
- Transmission: initially zoonotic, then human-to-human contact, mechanical aerosols
- Low infectious dose
- High virulence
- Contact blood/bodily fluids (saliva, breast milk, urine, stool and tears); convalescence: breast milk, semen
- No evidence of risk from casual skin contact with asymptomatic people
- Persistence & reinfection after ‘convalescence’
- Survivors; post-infection sequelae

Epidemiological characteristics of the 2013-2016 West African Ebola outbreak

Summary of Ebola outbreak characteristics in West Africa		
Term	**Definition**	**Current estimates**
Reproductive number (R_0):	Number of healthy people one sick individual infects over the course of his/her illness.	Guinea: 1.71 Liberia: 1.83 Sierra Leone: 2.02
Serial interval:	Time between consecutive people falling ill in a chain of transmission.	15.3 days
Incubation period:	Amount of time passed between a person becoming exposed to Ebola and when they start to show symptoms of the disease.	11.4 days
Doubling time:	Time taken for the number of sick individuals to double.	Guinea: 15.7 days Liberia: 23.6 days Sierra Leone: 30.2 days
Confirmed case fatality rate:	Number of people who die of confirmed Ebola infection.	Guinea: 70.7% Liberia: 72.3% Sierra Leone: 69.0%
Unconfirmed case fatality rate:	Number of people who die of suspected but not confirmed Ebola infection.	Guinea: 13% Liberia: 58% Sierra Leone: 35%

Source: Doi:10.1371/journal.pntd.0003652.t002

Complexity of PPE

[2017: WHO Task Force on IPC, 1 Task Group looked at evidence for PPE]

- **Differences in PPE items contained in packaged kits**
- **Discordant donning/doffing protocols; multiple steps (complexity)**
- **Regular training required**
- **Thermal discomfort & impaired mobility**
- **Scant evidence-based research regarding role of individual PPE items**

Environment

Physical:

- **Geographical & geophysical**
- **Location of epicentre**
- **Encroachment on tropical forest ecosystems (animal –human interface)**
  - **Guinean forest surrounding outbreak area: major biodiversity spot contains one quarter of all African mammalian fauna**
  - **Human encroachment; cumulative forest loss estimated to be between 83%-86%**
- **Porosity of borders**

Cultural, religious, belief systems, political


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Obstacles to the epidemic response

Poor infection prevention and control practices, inadequate healthcare facility infrastructure, poor healthcare delivery

Early outbreak population dynamics:

- **Initial mistrust & hostility towards multinational Teams**
- **EVD attributed to witchcraft, zombification**
- **Denial of EVD existence, a ploy of government to get international funds**
- **Anger; towards government and public health messages**
- **Behavioral, religious & cultural diversity**
- **Stigma of survivors, the infected or thought to be infected**


Fear!
Panic!!
Denial!
Media (social and conventional)
Rumors

Challenges inc. controversial public health messages

- ‘Do not eat bush game’
- Social distancing; no handshaking
- Closure of markets (economic implications) and recreational areas e.g. bars and discotheques
- Inequity regarding who gets vaccination / treatment
- Stopping of flights; border closures; travel bans
- Closure of mining operations (*force majeur*) - serious economic consequences for the W African sub-region

Cultural insensitivities …

A healthcare worker checks a Liberian girl's temperature …

A health worker checks a Liberian girl's temperature. | Getty Images

- **Burial rituals and culture: dignity in burial**

- **Understanding Muslim burials**
  - **Engagement with Imams, Muftis and other influential community leaders**
  - **understanding how last rites are performed on the deceased (washing and preparation of the body);**
  - **identifying infection risks and looking at ways to overcome these**
  - **In Islam, 3 conditions exist where body preparation processes are curtailed: (i) death by water, persons who have died in a lake or water, (ii) death by burns/accidents, (iii) 'other' –permission of the highest ranking authority in a region**

Social media: the blame and misconceptions

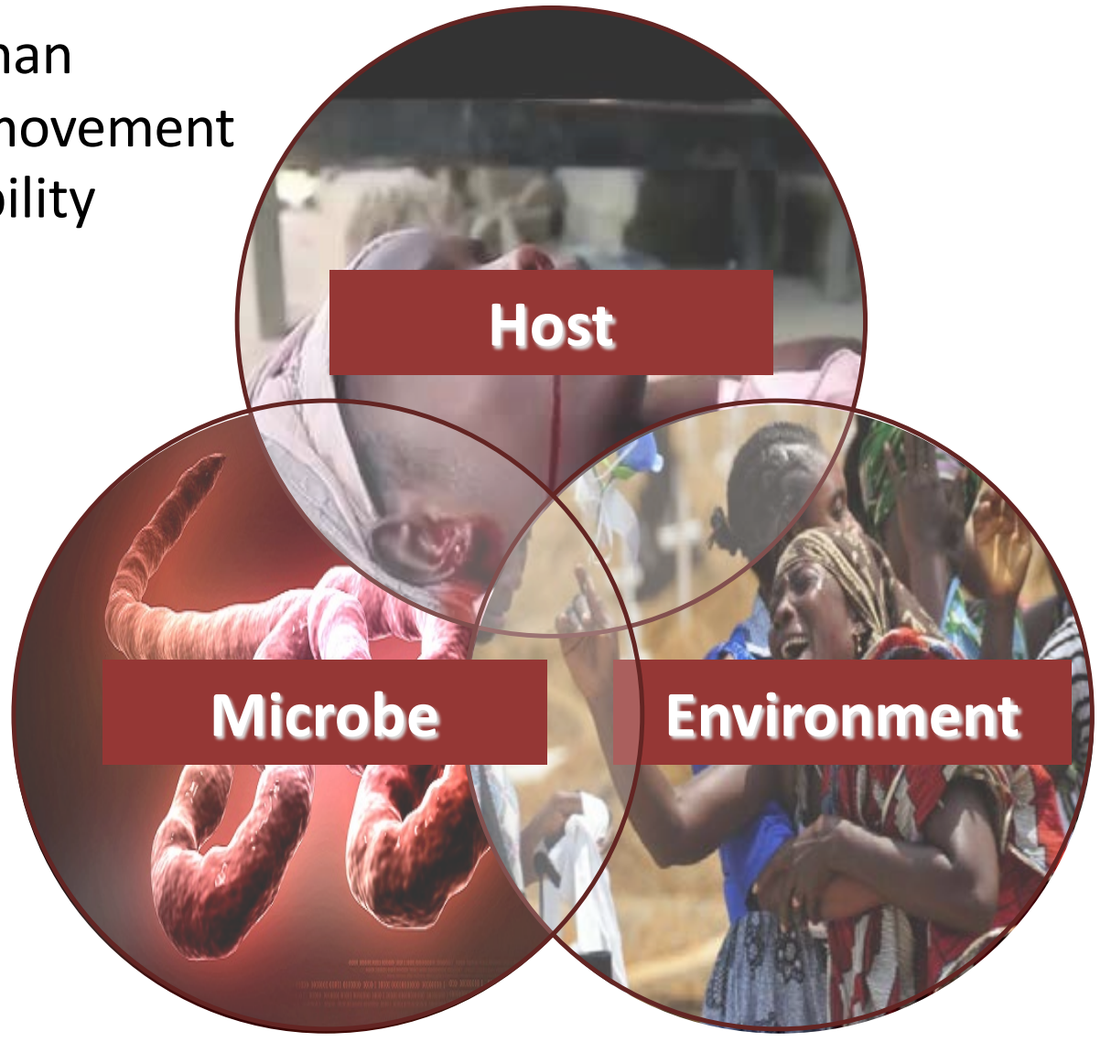
Catholic Archbishop: Ebola is punishment from God for homosexuality

October 24, 2014 by Michael Stone 38 Comments

Gays are under attack in Liberia after many Christian leaders, including Catholic Archbishop Lewis Zeigler of Monrovia, declared Ebola to be a punishment from God for the act of homosexuality.

Individual human behavior and movement
Host susceptibility

EBOV



Geo-climatic, geographical and ecological

Socio-cultural
- Traditional beliefs,
- Traditional healers and Witchdoctors,
- Religion,
- Burial practices

Suspicion and misconceptions

Political
Low-socioeconomic


THANK YOU