

13th Annual Canadian Blood Services International Symposium

Blood-Borne Pathogens: Defend, Detect, and Destroy

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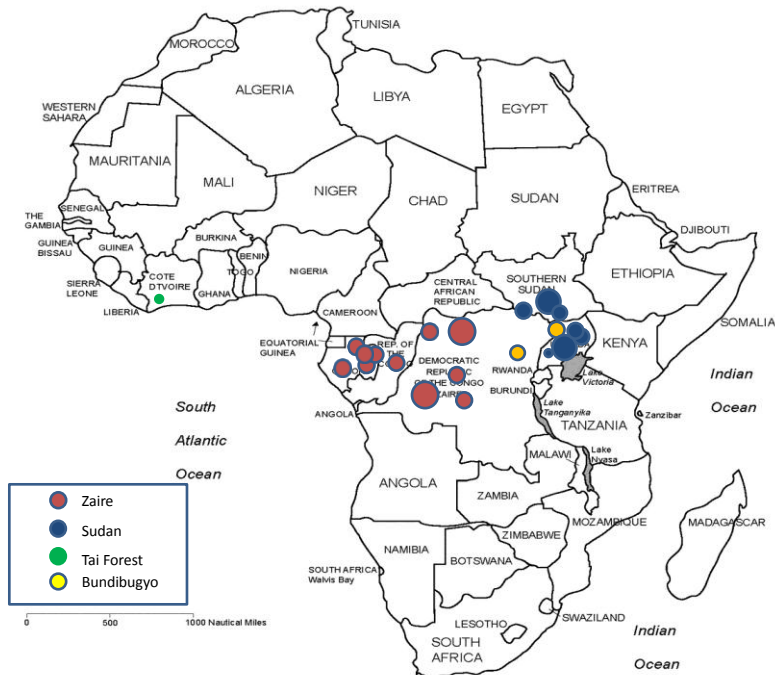
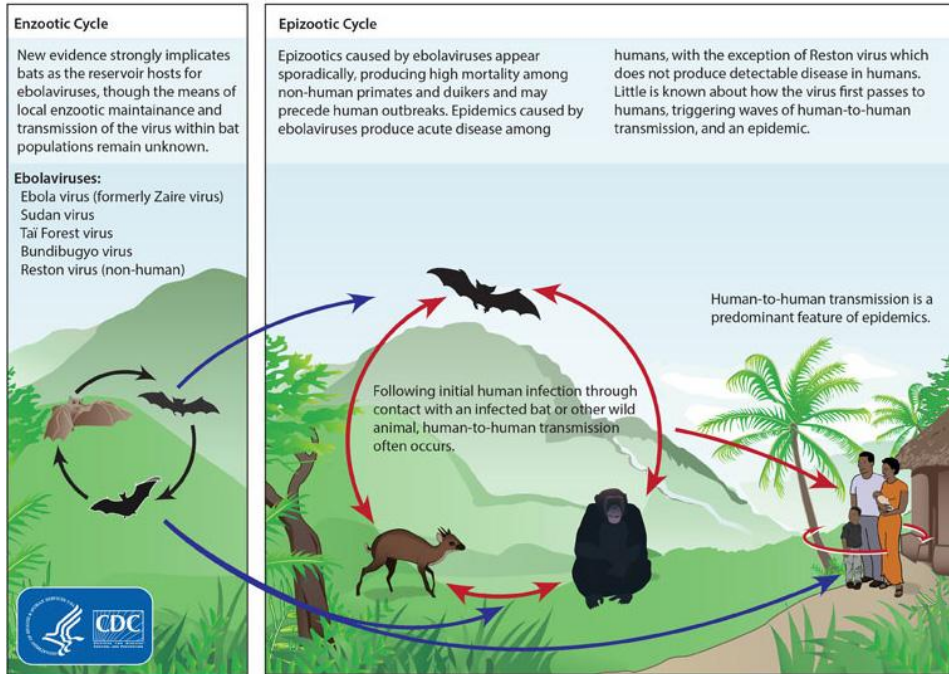


Preventing the spread of pathogens around the globe



Dr. Allison McGeer
University of Toronto

Ebolavirus Ecology



Country	Population 2012 (millions)	Median age 2012 (years)	Literacy levels 2010 or 2012 (percent)	Expenditures on health 2012 (per capita total expenditures at average exchange rate - US)
Guinea	11.5	18.5	25 / 41	\$ 32
Liberia	4.2	18.4	61	\$ 66
Sierra Leone	6	20	43	\$ 96
Canada	34.8	40		\$ 5741

World Health Organization. Global Health Observatory Data Repository
<http://apps.who.int/gho/data/node.country.country-CAN?lang=en>
 Geneva: World Health Organization; 2014 [accessed 2014 Aug 31]



Number of doctors per 100,000 population

LIBERIA: 1.4



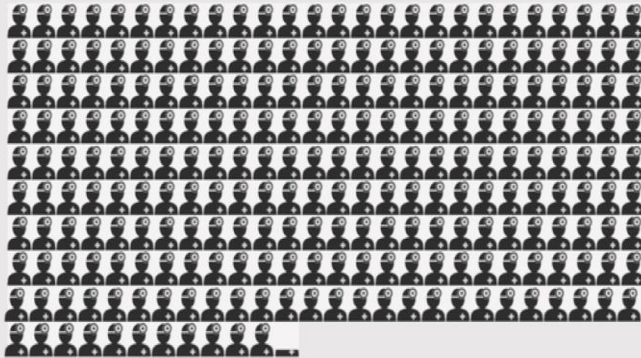
SIERRA LEONE: 2.2



GUINEA: 10



UNITED STATES: 245.2



SOURCE: WHO

From: <http://www.vox.com/2014/10/24/7059743/why-is-ebola-virus-outbreak-american-africa-nina-pham>





Why did this outbreak happen?

- Spread of EBV to reservoir in West Africa
- Development/population growth/deforestation
- Political borders were drawn by geography, not population
- Absence of public health and health care infrastructure
- Global recession and “the Africa problem”



Baize et al. NEJM 2014



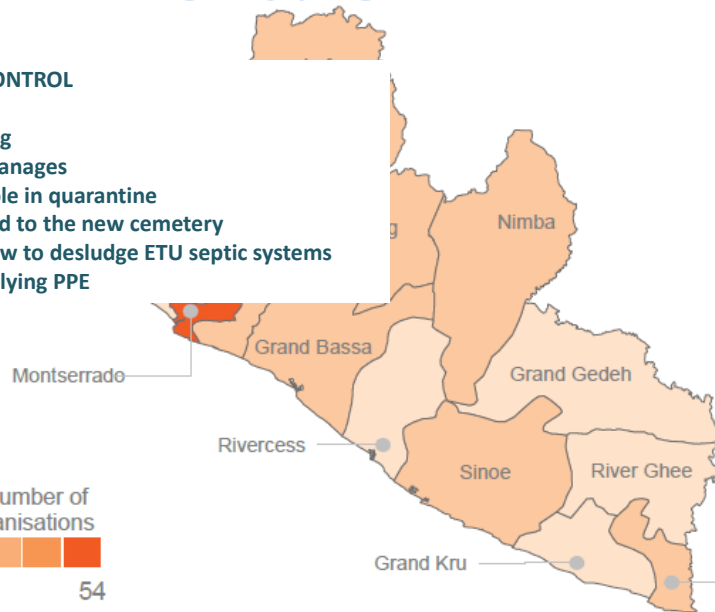
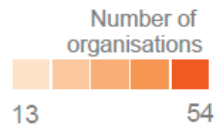
August-September 2014

- ETUs and burial systems overwhelmed
 - HCW infections occurring in ETUs
 - Lab testing unavailable for most suspect cases
- Hospitals closed because of HCW cases (~5%) and deaths
 - Dispensers in medicine shops increasingly infected
- 80% of patients with EVD being managed at home
- Hospital serving West Point becomes holding center for EVD, fills to 300% capacity
- President quarantines West Point

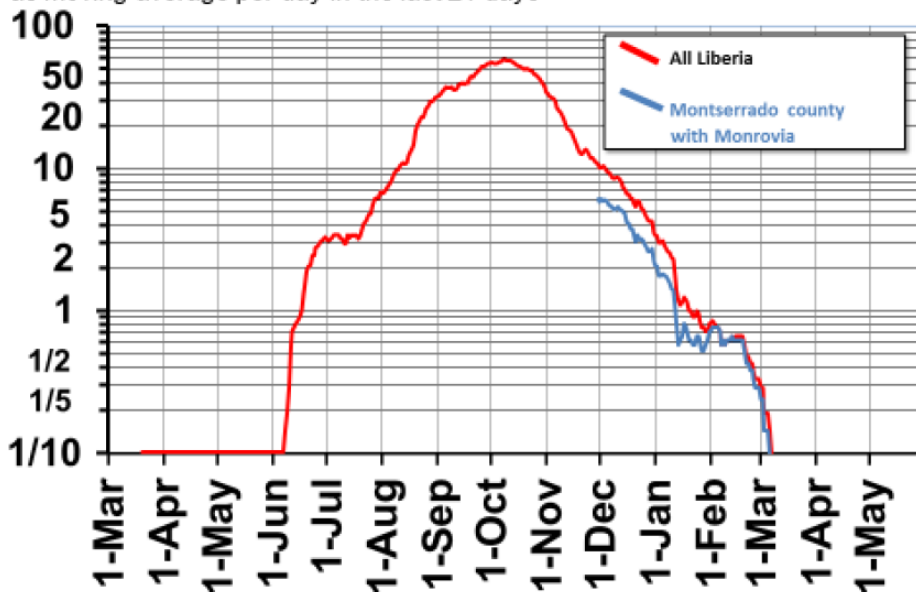
103 Organizations responding with emergency programs

OUTBREAK CONTROL

- Medical care
- Contact tracing
- Opening orphanages
- Food for people in quarantine
- Building a road to the new cemetery
- Identifying how to desludge ETU septic systems
- Sourcing supplying PPE



Number of Confirmed Ebola Cases/Day up to 12th March 2015
as moving average per day in the last 21 days



What has been accomplished?

- The outbreak is coming under control
 - over in Liberia
 - <10 cases per week since July in Sierra Leone/Guinea (2 last week)
- Understanding the infection
- Clinical trial of “Canadian” vaccine

1. Adequately investing in prevention is REALLY DIFFICULT

- World Bank estimates that a prior \$26M investment in public health in West Africa would have prevented “second wave”
- Current UNMEER estimate of cost of response, \$1.6B

If you think preparedness is
expensive, try disease

*Mary Lasker
(paraphrased)*



Fineberg, H
JAMA
2013;
310:85-90

Box 1. Reasons Prevention Is Difficult

- Success is invisible.
- A lack of drama makes prevention less interesting.
- Statistical lives have little emotional effect.
- There is usually a long delay before rewards appear.
- Benefits often do not accrue to the payer.
- Advice is inconsistent or changes.
- Persistent behavior change may be required.
- Bias against errors of commission may deter action.
- Avoidable harm is accepted as normal.
- Prevention is expected to produce a net financial return, whereas treatment is expected only to be worth its cost.
- Commercial interests may conflict with disease prevention.
- Advice might conflict with personal, religious, or cultural beliefs.

2. We need a global system that has the capacity to respond to unprecedented outbreaks

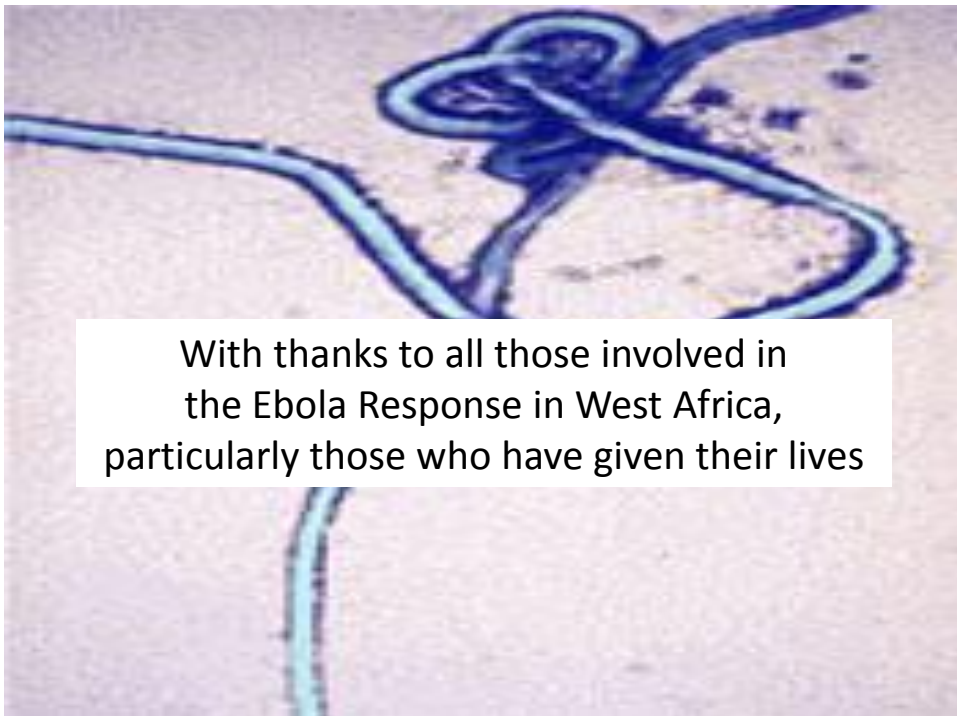
- Global emergency response (e.g. to hurricanes/earthquakes) has definition and structure
- Prior to this outbreak, no global capacity/coordination for an outbreak response for communicable diseases



Cuba sent 2 160 person medical/nursing teams

But they need

- hospitals
- hospital support staff
- occupational health/medical care
- capacity to communicate



With thanks to all those involved in
the Ebola Response in West Africa,
particularly those who have given their lives