DELAYING THE INEVITABLE:
Lessons Learned From Ebola Airport Screening

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I have no financial conflict of interest to disclose
I am a former CDC DGMQ employee
I was deployed to Guinea, West Africa in August 2014
The views expressed here are my own and do not reflect CDC policy
Fotos are my own
Ebolaviruses:
- Ebola virus (formerly Zaire virus)
- Sudan virus
- Tai Forest virus
- Bundibugyo virus
- Reston virus (non-human)

Following initial human infection through contact with an infected bat or other wild animal, human-to-human transmission often occurs.

Human-to-human transmission is a predominant feature of epidemics.
A mysterious disease began spreading in a small village in Guinea on December 26, 2013 but was not identified as Ebola until March 21, 2014.
Within a few weeks, this highly infectious and deadly disease, previously confined to Central Africa and Gabon, cropped up in another distant part of the continent. And this strain, Ebola Zaire, was the most lethal in the family of five distinct Ebola species.

On March 23, 2014, the WHO published formal notification of an outbreak of Ebola virus disease in Guinea on its website. On 8 August, WHO declared the epidemic to be a "public health emergency of international concern".

The outbreak spread through porous borders to neighboring Sierra Leone and Liberia, overwhelming medical and emergency facilities.

**Overall, over 11,000 people reportedly died, over 28,000 reportedly infected. Many cases were not reported.**

Considered officially over for the 3 countries in January 2016, there was a flare up in Sierra Leon that was quickly managed.
EBOLA INFECTION

- Incubation period ranges from 2–21 days
- Not considered contagious until symptoms appear (fever)
- Virus is easily killed with standard hygiene and disinfection practices
EBOLA VIRUS DISEASE

Symptoms usually begin abruptly and include fever and:

- severe headache
- muscle pain
- vomiting
- diarrhea
- stomach pain
- unexplained bleeding or bruising

Rapid spread occurred when it entered highly urban areas and market places
EBOLA TRANSMISSION

- Transmission by direct contact with
  - Body fluids of an infected person
  - Objects that have been contaminated with infected body fluids
- Often transmitted by preparation of dead body for burial
- Not transmitted through:
  - Air borne particles
  - Cooked food
  - Water supplies

This is the first time in history with sustained human to human transmission
WHY NOT JUST CLOSE AIRPORTS TO PREVENT INTERNATIONAL SPREAD?

International and humanitarian assistance must continue and airlines are needed to transport teams and essential supplies to control the outbreak.

ECONOMIC ISSUES
Serious economic disruption arises if commerce is stopped.
INTERNATIONAL HEALTH REGULATIONS (IHR)
– from policy to people’s health security

5 reasons why the IHR matter

1. HEALTH THREATS HAVE NO BORDERS
   The IHR strengthen countries’ abilities to control diseases that cross borders at ports, airports and ground crossings.

2. TRAVEL AND TRADE ARE MADE SAFER
   The IHR promote trade and tourism in countries and prevent economic damage.

3. GLOBAL HEALTH SECURITY IS ENHANCED
   The IHR establish an early warning system not only for diseases but for anything that threatens human health and livelihoods.

4. DAILY THREATS ARE KEPT UNDER CONTROL
   The IHR guide countries to detect, assess and respond to threats and inform other countries quickly.

5. ALL SECTORS BENEFIT
   The IHR prepare all sectors for potential emergencies through coordination and information sharing.

Until all sectors are on board with the IHR, no country is ready.

What are the IHR?
The IHR are legally binding and help countries work together to protect lives threatened by the spread of diseases and other health risks, including radiation and chemical hazards.

www.euro.who.int/ihr
PUBLIC HEALTH PRIORITIES

- **Interrupt Ebola transmission in W. Africa**
  - Case identification, isolation and care (MSF)
  - Contact identification and monitoring (MSF, MoH, CDC)
  - Transmission risk factor identification and mitigation
    - Health Care Worker protection and infection control (MoH)
    - Funeral and burial safe practices (Red Cross)

- **Prevent Ebola transmission to other countries**
  - Prevention of undiagnosed cases entering unaffected countries (MoH, CDC)
  - Prevention of transmission from diagnosed cases during and after repatriation (MoH, CDC)
Exit and entry screening come with challenges and should:

- not interfere any more than necessary with commerce & travel
- be able to provide services & personnel to areas of need
- properly assess criteria and implement plans
- be applied universally (no VIP exclusion)
- be reasonable & flexible – risk cannot be zero
- balance the needs of society with travel liberties
- alleviate fears of flight crews & airport workers
- have access to medical & public health care
- provide ongoing training at all levels
- include public & private health case sector
Is it me or is something different about airport security these days?

Welcome Home! Been to Asia or Canada?

Spit.

Cough.

Is that a metal detector?

Nope. It's a thermometer. Be brave.

Joking about S.A.R.S. is a punishable offense.
WHEN I ARRIVED

- Medical students & nurses working 24 hour shifts under Guinea MoH
- TV cameras on arrival & departure
- Basic questionnaire only
- Non-contact thermometers
  - limited, not enough batteries
- No secondary screening
- No private areas
- No isolation areas
- No EMT or ambulance services
- Security outside checking ID and tickets
  - no gloves or PPE
- No drills or training available
EBOLA EXIT SCREENING TIMELINE

- MoH started screening
  - Volunteer nurses and medical students
  - Non-contact thermometers

- Enhanced screening process:
  - Improved visual screening
  - Questionnaires
  - Secondary screening
  - PPE Training

Ebola outbreak reported

March  April  August

Conakry Gbessia International Airport
ENHANCED SCREENING RECOMMENDATIONS

- Enhanced primary screening process (revise initial screening questionnaire)
  - Prevent people who have been infected but do not yet have signs or symptoms
  - Identify and categorize contact with Ebola victims
  - Improved visual assessments
- Develop secondary screening for passengers identified as possible Ebola contacts
- Build and supply isolation rooms at strategic locations
- Train proper personal protective equipment (PPE) use throughout airport employees
CDC’s Enhanced Exit Screening at Conakry-Gbessia International Airport

Primary Screening of Traveler:
- Temperature
- Visual Inspection
- Questionnaire

- No Fever or Visible Signs of Illness and no Significant Exposure to Ebola
  - Authorized to Board

- No Fever or Visible Sign of Illness but Had Contact with an Ebola Patient
  - Secondary Screening

- Fever OR Visual Signs of Illness
  - Currently: denied boarding

- Fever AND Visual Signs of Illness
  - Recommended 2nd Screening; Currently: isolation
  - Call Supervisor
CHALLENGES

- Insufficient number of screeners
  - Current volunteer screeners working 24/hour shifts
  - No room to take turns sleeping when there are no flights
  - Not enough staff available to perform entry screening, if implemented

- Lack of Equipment (PPE, Non-contact thermometers)

- Airlines fearful
  - Regional carriers had stopped flying
  - Air France relied on volunteer crews
CHALLENGES

- **Rapid Ebola testing not available**
  - Screening process includes turning people away based on fever which probably is not related to Ebola (malaria)
  - Travelers may not have a local home to return to while awaiting testing or recovery from non-Ebola febrile illness

- **Airport and airlines being asked to take a large role in responding to outbreak**
  - Financially and operationally strained
  - Screeners are volunteers and are becoming exhausted
Built in 24 hours after unfortunate incident

But special supplies took weeks (toilet)
115 National Ebola Hotline

- 4 doctors taking calls on cell phones
- IT & coverage problems
- Triage – deaths referred to Red Cross
- Severe illness to MSF
- No ambulance after 6 pm
PARTNERS: WHO
DOCTORS WITHOUT BORDERS (MSF)
- Screener fatigue (med students 24x7), poor pay and rest facilities
- Reassurance of airline personnel: screeners of staff at hotel
- Interface with MoH, WHO in French
- Poor public health / medical infrastructure (worse in Sierra Leone and Liberia)
- Technical issues – 115 cell phones
- Red Cross – corpse removal - overwhelmed
- MSF – treatment – unable to assess after 6 pm
- Hospitals overwhelmed- other medical issues get ignored (MI at the airport)
- Health care workers dying
- High prevalence of fever in population (malaria)
- Lack of basic supplies (thermometers, gloves, PPE)
- Lack of training (screeners, airport staff)
- Lack of infrastructure – no place to house sick pax overnight at the airport

Many local challenges
September 30, 2014

CDC confirmed the first laboratory-confirmed case of Ebola to be diagnosed in the United States in a man who had traveled to Dallas, Texas from Liberia. He infected two nurses, one of whom traveled by commercial aircraft during incubation period.
October 8, 2014 Enhanced Ebola Screening began at five US airports and new tracking program for all people entering the US from Ebola-affected countries. Canada and England initiated similar measures.

1. John F. Kennedy International Airport (JFK)
2. Newark Liberty International Airport (EWR)
3. Washington-Dulles International Airport (IAD)
4. Chicago O'Hare International Airport (ORD)
5. Hartsfield-Jackson Atlanta International Airport (ATL)

December 28, 2014 All travelers departing Guinea, Sierra Leone and Liberia and entering the US are routed through one of these five airports to conduct enhanced entry screening.
During August 2014–January 2016, approximately 300,000 travelers were screened in Guinea, Liberia, and Sierra Leone.

Only four cases of Ebola were exported through air travel to other countries (United States [two cases], United Kingdom [one case], Italy [one case]) after exit screening was implemented; none of the infected travelers were overtly symptomatic at the time of travel. No Ebola cases were reported to have been detected during exit screening.
US FEDERAL TRAVEL RESTRICTIONS FOR PERSONS WITH HIGHER-RISK EXPOSURES TO COMMUNICABLE DISEASES OF PUBLIC HEALTH CONCERN

EMERGING INFECTIOUS DISEASES • WWW.CDC.GOV/EID • VOL. 23,

LESSONS LEARNED FROM EBOLA AIRLINE PASSENGER SCREENING

- Ebola came into the US because exit screening does not work when people are motivated to hide exposure history

- The weak link in the US was at the level of primary care in a highly skilled urban medical facility (front line failed – we assumed our medical facilities were prepared to recognize Ebola and provide proper isolation)

- The strong link was due to self monitoring by a high risk individual (MSF doctor in NY - public health awareness worked)