

Update on Ebola Virus Disease

Sarah Y. Park, MD

State Epidemiologist

Chief, Disease Outbreak Control Division

Hawaii Department of Health



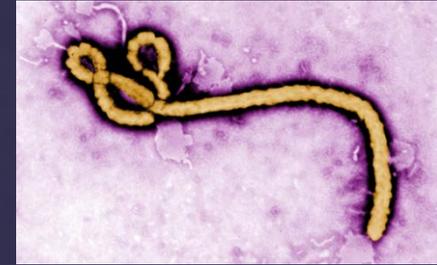
Viral Hemorrhagic Fever

- ⌘ Describes severe syndrome: fever and bleeding disorders that can progress to high fever, shock, and death
- ⌘ Four distinct virus families: arenaviruses, filoviruses, bunyaviruses (e.g. Hantavirus), flaviviruses (e.g., dengue)
 - ⌘ Animal or insect host
 - ⌘ Geographically restricted to areas their host species reside
 - ⌘ Infection in humans incidental; sporadic outbreaks
 - ⌘ Usually no cure or established drug treatment



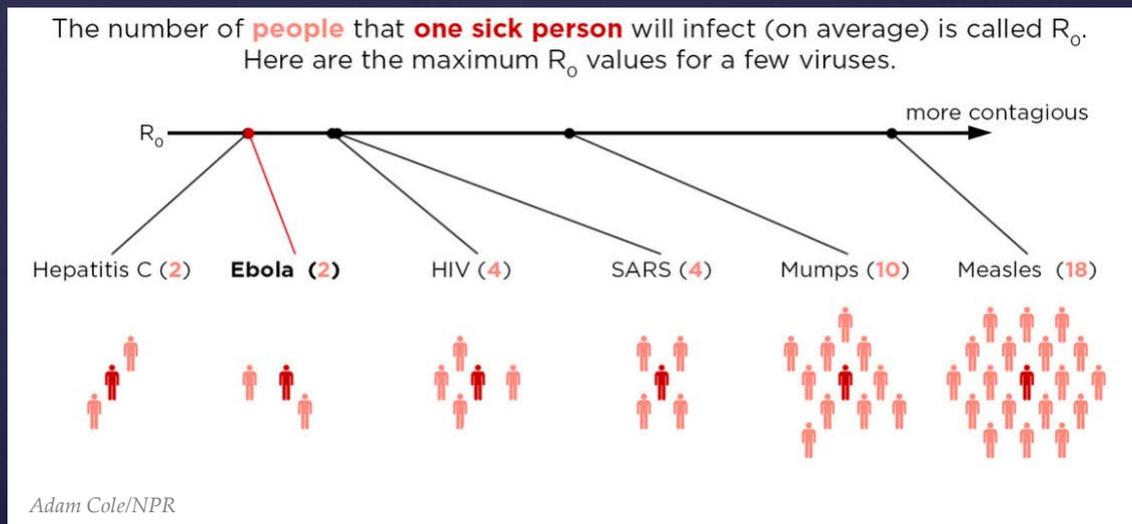
Ebola Virus—Epidemiology

- ⌘ Filovirus family; tubular (filo, “thread”), extraordinary length, bizarre configurations
- ⌘ First identified in 1976—two concurrent outbreaks, southern Sudan and northwestern Democratic Republic of the Congo (formerly Zaire)
- ⌘ Natural host unknown but likely animal native to Africa—specifically fruit bats
- ⌘ Spread in nature and to index case unclear



Clinical Presentation and Course

- ⌘ Incubation (period between infection and start of symptoms) usually 8–10 days, range 2–21 days
- ⌘ Associated with very severe disease and high mortality
- ⌘ **Not very infectious; requires DIRECT contact**
 - ⌘ Must enter through mucous membranes, breaks in skin, or venous route (i.e., introduced via needle)
 - ⌘ NOT airborne



Clinical Presentation and Course (cont'd)

- ⌘ Initial symptoms, sudden and nonspecific: FEVER ($>38.6^{\circ}\text{C}$ or 101.5°F), muscle aches, chills, headache
- ⌘ After few days, may develop nausea, vomiting, diarrhea, and stomach pains
 - ⌘ Worsen progressively with profound amounts of fluid loss
 - ⌘ Particularly prominent in cases of current outbreak
- ⌘ May develop cough, sore throat, red eyes
- ⌘ By end of first week, profound weakness and red rash over body; may bleed and ooze blood easily from sites where blood drawn/IV placed



Clinical Presentation and Course (cont'd)

- ⌘ Death, if occurs, usually in 6–12 days
 - ⌘ Reported range of proportion of deaths, 50–90%
 - ⌘ Death occurs as gradual deterioration, not sudden
 - ⌘ Immune system never had a chance to respond
- ⌘ Convalescence for survivors long (at least months) and prone to complications



Management

⌘ Supportive

- ⌘ Very complicated and intensive—need for very close monitoring and replenishment of lost fluids, electrolytes, etc.
- ⌘ STRICT infection control with close monitoring for adherence required

⌘ Some experimental therapies; none approved or proven



West Africa Outbreak Case Count

- ⌘ Largest EVD outbreak in history and 1st in W Africa
- ⌘ As of October 17, 2014, according to WHO:
 - ⌘ 9,191 cases with 4,546 deaths—49% death proportion
 - ⌘ Number of cases who are HCWs: 423 (5% of total cases, but represent large proportion of existing HCWs), 239 deaths
- ⌘ Likely gross under-reporting
 - ⌘ No public health infrastructure to conduct disease investigations and surveillance
 - ⌘ Stigma, distrust
 - ⌘ Lack of basic resources (e.g., food, clean water, medical equipment, etc.)





300% increase in
population in Africa
over the past 40
years — mostly in urban
slums



Evaluation to Determine EVD Case Status

- ⌘ SPECIFIC TRAVEL and occupation (e.g., whether healthcare worker and what capacity) HISTORY critical
- ⌘ Implement appropriate infection control precautions to limit spread
- ⌘ Other potentially fatal diseases that MUST be considered— e.g., MALARIA, typhoid fever, Lassa fever, yellow fever, Rift Valley fever, influenza, bacterial/rickettsial infxns (tuberculosis)



Clinical and Epidemiological Criteria for Suspect Ebola Infection

⌘ FEVER greater than 38.6°C (101.5°F) and additional symptoms such as severe headache, muscle aches, vomiting, diarrhea, stomach pain, or unexplained bleeding

AND

⌘ Travel history in the last 21 days of being in a country where an EVD outbreak is occurring (specifically Guinea, Liberia, Sierra Leone).



EVD Diagnosis

- ⌘ Specimen collection for testing should only be conducted for those in quarantine; **REQUIRES HDOH approval and coordination**
- ⌘ Follow OSHA bloodborne pathogen standards
- ⌘ **Virus only detectable in blood AFTER SX (USUALLY FEVER) ONSET; usually detectable by molecular testing FROM 3–10 DAYS after sxs appear**



Prevention—Infection Control in Healthcare Setting

- ⌘ PPE: Use at least minimum recommended to prevent infection but *use what one is comfortable using to minimize potential for inadvertant contamination*
- ⌘ Limit procedures to those absolutely necessary
- ⌘ Limit number of persons involved in care
- ⌘ Enforce frequent hand hygiene
- ⌘ Review infection control policies and PRACTICE them
- ⌘ Use BUDDY SYSTEM for PPE use and monitoring
- ⌘ Assign one person to review all policies, enforce them, and assure close monitoring/adherence to infection control

Refer to <http://www.cdc.gov/vhf/ebola/hcp/infection-prevention-and-control-recommendations.html> and <http://www.cdc.gov/vhf/ebola/pdf/ppe-poster.pdf> for more details



Prevention – Environmental Issues

- ⌘ Medical waste for persons with suspect or confirmed Ebola infection from healthcare facilities and first responders will be consolidated
 - ⌘ If suspect case determined by HDOH as not infected, then normal medical waste management
 - ⌘ If suspect case confirmed, medical waste to be handled per further guidelines from HDOH
- ⌘ Waste generated by quarantined persons: similar protocol as with healthcare facilities



HDOH Ongoing Activities

- ⌘ Monitoring disease surveillance systems
- ⌘ Discussions with multiple state stakeholders and provision of guidelines and general protocols/plans
- ⌘ Public health messaging
- ⌘ Discussions with colleagues at federal (e.g., CDC) level and in other states
- ⌘ Reviewing and enhancing internal procedures and resources



HDOH Ongoing Activities

- ⌘ Monitoring disease surveillance systems
- ⌘ Discussions with multiple state stakeholders and provision of guidelines and general protocols/plans
- ⌘ Public health messaging
- ⌘ Discussions with colleagues at federal (e.g., CDC) level and in other states
- ⌘ Reviewing and enhancing internal procedures and resources



Focus Areas for Hawaii's Ebola Response Preparedness

Pre-Hospital

- First responders
- Transportation (air/sea)

Hospital

- Laboratories

Post-Hospital

- Fatality management

- Healthcare

- Legal partners
- Law enforcement
- Waste agencies
- Emergency management
- Various community partners



Focus Areas for Hawaii's Ebola Response Preparedness

Pre-Hospital

Hospital

Post-Hospital

**Healthcare Ebola
Infection Prevention
Work Group
(DOH/HAH)**



Issues for US (Hawaii) to Remember

- ⌘ Risk of EVD in Hawaii extremely low, although imported case must be considered given today's air/sea transportation
- ⌘ EVD not very infectious— must have direct contact with contaminated blood or fluids; however, unforgiving if infected
- ⌘ Healthcare systems should review infection control policies, practice, assure resources; all others should BE AWARE OF ISSUES, HOW MAY BE IMPACTED, AND PREPARE APPROPRIATELY
- ⌘ Management of any suspect or confirmed EVD pts and prevention of potential transmission will require close collaboration between HDOH and healthcare providers as well as other stakeholders





Mahalo!