TUESDAY, DECEMBER 9:
THE EBOLA VIRUS & A VISIT TO SIERRA LEONE
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Ebola Outbreak in Sierra Leone

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Iowa Department of Public Health
Outline

• General clinical information on Ebola
• Situation in West Africa
• Sierra Leone experience
• IDPH preparation
Ebola Hemorrhagic Fever

- Severe, often fatal disease in humans and nonhuman primates.

- Caused by infection with a virus of the family Filoviridae, genus Ebolavirus.

- First discovered in 1976 in Democratic Republic of the Congo near the Ebola river.
Five subspecies of *Ebolavirus* have been identified

1. *Zaire ebolavirus* (1976)
2. *Sudan ebolavirus* (1976)
• Reservoir host – Likely to be bats

• In Africa, infection has been documented through handling of infected chimpanzees, gorillas and monkeys.

• Zoonotic transmission through direct contact with blood, secretions, organs or other bodily fluids of infected animals.
Human to human transmission

- Direct contact (through broken skin or unprotected mucous membranes)
  - Sick person’s blood or body fluids, including saliva, sweat, urine, feces, vomit, and semen
  - Breast milk (virus has been detected but transmission from mothers to infants through breastfeeding is not established)

- Nosocomial transmission
  - Contaminated needles and syringes
  - Exposure to infectious tissues, excretions, and hospital wastes
Funeral exposures

- Preparation of body for burial (washing body)

Not transmissible between person to person prior to onset of symptoms.
Clinical Manifestations

- Incubation period: 2-21 days (Average: 8-10 days)
- Abrupt onset
  - Fever, headache, muscle pain
  - GI symptoms: Vomiting, diarrhea, abdominal pain
  - Hemorrhagic symptoms in approx. 45% of cases
    - Mild: petechiae, epistaxis, ecchymosis, bruising
    - Severe: GI hemorrhage, shock
Risk of Exposure

- People at highest risk includes:
  - Healthcare workers not using appropriate PPE
  - Family and friends of patients with Ebola
  - Burial team
Diagnosis

- Blood and sera are the best specimens for testing in live patients.
- Tissues (spleen, liver) may be tested if patient is deceased.
- Oral swabs are also used to confirm Ebola in deceased patients.
General diagnostic tests

- Real-time RT-PCR (detects virus)
- Antigen ELISA (detects virus)
- IgM ELISA (detects early antibody)
- IgG ELISA (detects late antibody)
- IFA (Indirect Fluorescent Antibody)
- IHC (Immunohistochemistry)
Treatment

- No specific vaccine or medicine has been proven to be effective against Ebola.
- Timely supportive treatment is important but challenging because the disease is difficult to diagnose clinically.
- Supportive care
  - Intravenous fluids
  - Medicines for pain and vomiting
  - Nutritional support
  - Antibiotics for secondary infections
Patient Recovery

- Depends on good supportive care and the patient’s immune response
- People who recover from Ebola infection develop antibodies that last for at least 10 years, and possibly longer
- It isn’t known if people who recover are immune for life or if they can become infected with a different species of Ebola
- Some people who have recovered from Ebola have developed long-term complications (joint and muscle pain, and vision problems)
Prevention

- Raising awareness of the risk factors for Ebola infection and the protective measures individuals can take.
- Avoiding physical contact and contact with blood and body fluids of infected patients.
- Regular hand washing after visiting or taking care of ill patients.
Prevention

- Not handling items that may have come in contact with an infected person’s blood or body fluids.
- Avoiding funeral or burial rituals that require handling the body of someone who has died from Ebola.
- Avoiding contact with bats and nonhuman primates or blood, fluids, and raw meat prepared from these animals.
2014 Ebola Outbreak

- On August 8, the World Health Organization (WHO) declared that the current Ebola outbreak is a Public Health Emergency of International Concern

- This is the largest Ebola epidemic in history

- CDC’s response to Ebola is the largest international outbreak response in CDC’s history
Situation in West Africa
## Facts and Figures
(As of Nov. 28\textsuperscript{th}, 2014)

### Countries with Widespread Transmission

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Cases</th>
<th>Total Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Guinea</td>
<td>2155</td>
<td>1312</td>
</tr>
<tr>
<td>Liberia</td>
<td>7635</td>
<td>3145</td>
</tr>
<tr>
<td>Sierra Leone</td>
<td>7109</td>
<td>1530</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>16,899</strong></td>
<td><strong>5987</strong></td>
</tr>
</tbody>
</table>
Facts and Figures
(As of Nov. 28\textsuperscript{th}, 2014)

Countries with an initial case or cases and/or localized transmission

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Cases</th>
<th>Total Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mali</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>United States</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Total</td>
<td>12</td>
<td>7</td>
</tr>
</tbody>
</table>
Facts and Figures
(As of Nov. 28\textsuperscript{th}, 2014)

Previously affected countries

<table>
<thead>
<tr>
<th>Country</th>
<th>Total Cases</th>
<th>Total Deaths</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nigeria</td>
<td>20</td>
<td>8</td>
</tr>
<tr>
<td>Senegal</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Spain</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>22</td>
<td>8</td>
</tr>
</tbody>
</table>
The outbreaks of Ebola in Senegal, Nigeria and Spain were declared over by WHO on October 17, October 19, and December 2\textsuperscript{nd} respectively.

On October 23, Mali reported its first confirmed case of Ebola in a child who traveled there from Guinea. The child passed away on October 24.
My work in Sierra Leone
General Information

- Officially known as Republic of Sierra Leone.
- Borders:
  - Northeast – Guinea
  - Southeast – Liberia
  - Southwest – Atlantic Ocean
- Population : 6,190,280
- Official Language : English
Ebola in Sierra Leone

• First case of Ebola was reported in May 2014.
• Number of cases and deaths have been increasing since.
• All districts are affected.
• 7109 suspected and confirmed cases and 1530 deaths.
Pre Deployment

- Orientation on Ebola outbreak in West Africa
- Training on Viral Hemorrhagic Fever Database
- Training on preventive measures along with the use of personal protective equipment (PPEs)
- Report on daily basis about our activities and health status
First few days

- Deployed from 3\textsuperscript{rd} August – 27\textsuperscript{th} Aug.

- Met with the Government officials and international partners (WHO, MSF, Public Health England) to assess the situation

- Identified three districts with most cases

- Decided to split into groups of two epidemiologists and go to those three districts
Objective

- Objective:
  - Help the Government with surveillance system
  - Implement and train people to use the database
  - Train people for data collection and data entry
  - Training of contact tracers and supervisors
In the Field

- Deployed to Bo district.
- Met with local Government officials and international partners (WHO, MSF, UNICEF)
- Meeting with Surveillance officers, district supervisors and local supervisors
- Assess the situation and identified the challenges
Challenges

- Poor healthcare system and infrastructures
- Limited manpower and resources
- Fear among healthcare workers
- Lack of trust between healthcare providers and the community
- People escaping and hiding
- Porous borders
Challenges

- Poor surveillance system
  - Collecting and recording information
  - Data management
  - Case finding
  - Reporting
- Stigma associated with Ebola
Local Government Efforts

- Working with the Government hospital to motivate doctors and nurses to work in the isolation ward
- MSF/Doctors without borders to open treatment center in the district
- Using various media to educate community
- Working with CDC to improve surveillance system
Government Efforts

- Instituted quarantine measures for communities affected by Ebola
- Travel in and out of those communities are restricted until a medical team clears them
- Instituted restrictions on public and other mass gatherings
- Authorized house-to-house searches to locate and quarantine Ebola patients
Government Efforts

- Authorized police and military personnel to help enforce these and other prevention and control measures
- Mobilized police personnel to quarantine the houses of contacts for 21 days
- Passing a new law, making it a criminal offence to shelter Ebola patients
Our Achievements

- Implemented the database and trained people to use the database.
- Trained people for data collection and data entry
- Helped the surveillance team to get organized
- Trained contact tracers and supervisors on how to do the follow ups for contacts
Our Achievements

- Assisted surveillance team to come up with their action plans
- Implemented preventive measures within the office
- Helped them with finding out the information on missing people
Post Deployment

- Debriefing to CDC

- Monitor temperature twice daily for 21 days

- Reporting back to CDC travel clinic on weekly basis for 3 weeks
CDC Efforts

- Activated Emergency Operations Center (EOC) to help coordinate technical assistance and disease control activities with partners.

- Providing logistics, staffing, communications, analytics, management, and other support functions.

- Deploying several teams of public health experts to the West Africa region
CDC Efforts

- Providing assistance to the affected countries with various response efforts, including surveillance, contact tracing, database management, laboratory testing and health education.

- Working with airlines, airports, and ministries of health to provide technical assistance for developing exit screening and travel restrictions in the affected areas.
CDC Efforts

- Health Promotion Team are working closely with country embassies, UNICEF, WHO, ministries of health and NGOs to develop public health messages and implement social mobilization activities.

- CDC experts have been deployed to non-affected border countries to conduct assessments of Ebola preparedness in those countries.
CDC Efforts

- Actively working to prepare U.S. healthcare facilities about how to safely manage a patient with suspected Ebola virus disease.

- CDC and Customs and Border Protection are doing enhanced entry screening to detect possible cases of Ebola at 5 U.S. international airports.
What IDPH is doing?
U.S. Airport Screening Process for Returning Travelers

- Required to travel through one of the 5 screening airports:
  - JFK, Newark, Chicago, Atlanta, Washington D.C.
- Stopped if ill
- Destination state notified if continue via secure notification system
Evaluating Returned Travelers

**High Risk**
- Percutaneous (e.g., needle stick) or mucous membrane exposure to blood or body fluids of known and symptomatic Ebola-infected patients
- Exposure to the blood or body fluids (including but not limited to feces, saliva, sweat, urine, vomit, and semen) of a person with Ebola while the person was symptomatic without appropriate personal protective equipment (PPE)
- Processing blood or body fluids of a person with Ebola while the person was symptomatic without appropriate PPE or standard biosafety precautions
- Direct contact with a dead body without appropriate PPE in a country with widespread Ebola virus transmission
- Having lived in the immediate household and provided direct care to a person with Ebola while the person was symptomatic

**Some Risk**
- In countries with widespread Ebola virus transmission: direct contact while using appropriate PPE with a person with Ebola while the person was symptomatic
- Close contact in households, healthcare facilities, or community settings with a person with Ebola while the person was symptomatic
Evaluating Returned Travelers

Low (But Not Zero) Risk

- Having been in a country with widespread Ebola virus transmission within the past 21 days and having had no known exposures
- Having brief direct contact (e.g., shaking hands), while not wearing appropriate PPE, with a person with Ebola while the person was in the early stage of disease
- Brief proximity, such as being in the same room for a brief period of time, with a person with Ebola while the person was symptomatic
- Traveled on an aircraft with a person with Ebola while the person was symptomatic

No Identified Risk

- Contact with an asymptomatic person who had contact with a person with Ebola
- Contact with a person with Ebola before that person developed symptoms
- Having been in a country with widespread Ebola virus transmission more than 21 days previously
- Having been in a country without widespread Ebola virus transmission and not having any other exposures as defined above
<table>
<thead>
<tr>
<th>Exposure Level</th>
<th>Clinical Criteria (21 days)</th>
<th>Public Health/Healthcare Actions</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Risk of Exposure</td>
<td>Fever ($\geq 100.4^\circ F$) OR Other Consistent Symptoms</td>
<td>• Standard, Contact, and Droplet Precautions Recommended</td>
</tr>
<tr>
<td></td>
<td>• Vomiting</td>
<td>• Test for Ebola Infection</td>
</tr>
<tr>
<td></td>
<td>• Diarrhea</td>
<td>• Issue Mandatory Facility Isolation</td>
</tr>
<tr>
<td></td>
<td>• Unexplained bruising or bleeding</td>
<td></td>
</tr>
<tr>
<td>Asymptomatic</td>
<td></td>
<td>• Issue Mandatory Home Quarantine</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Some Risk of Exposure</td>
<td>Fever ($\geq 100.4^\circ F$) OR Other Consistent Symptoms</td>
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<td></td>
</tr>
<tr>
<td>Asymptomatic</td>
<td></td>
<td>• Issue Mandatory Home Quarantine</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Based upon individual situation, IDPH will consider approving non-congregate activities</td>
</tr>
<tr>
<td>Low (But Not Zero) Risk Exposure</td>
<td>Fever ($\geq 100.4^\circ F$) OR Other Consistent Symptoms</td>
<td>• Use Standard, Contact, and Droplet Precautions</td>
</tr>
<tr>
<td></td>
<td>• Vomiting</td>
<td>• Rule out more likely causes of illness (i.e., Malaria)</td>
</tr>
<tr>
<td></td>
<td>• Diarrhea</td>
<td>• May test to rule out Ebola</td>
</tr>
<tr>
<td></td>
<td>• Unexplained bruising or bleeding</td>
<td></td>
</tr>
<tr>
<td>Asymptomatic</td>
<td></td>
<td>• Issue Order to Submit to Self Monitor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Travel via air, train, boat, long-distance bus with IDPH permission</td>
</tr>
<tr>
<td>No Identifiable Risk</td>
<td>Symptomatic (any)</td>
<td>• Routine medical evaluation and management</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Testing for Ebola will not be performed</td>
</tr>
<tr>
<td>Asymptomatic</td>
<td></td>
<td>• No actions needed</td>
</tr>
</tbody>
</table>
Monitoring

- Person under high risk and some risk category
  - Direct active monitoring for 21 days

- Person under low (but not zero) risk category
  - Ask for self monitoring and reporting to local public health twice a day for 21 days

- Asked to call IDPH immediately if they develop any signs and symptoms
Putting a system in place for Ebola management

- IDPH is in its final stage of putting a system in place for the transfer and management of Ebola patients

- Identifying designated EMS providers to transfer patients

- Identifying designated hospitals for screening and treating patients with Ebola

- Coordinating transfer of patients from their residence to the hospital
Thank You
THANKS FOR ATTENDING!

JOIN US TUES, JAN 13:
THE LATEST UPDATE ON 340B
FOR HOSPITALS & PHARMACIES

Questions? Contact Laura Miller at lmiller@iarx.org or 515-270-0713