Supplemental Materials

for

The Use of Stuffed Microbes in an Undergraduate Microbiology Course Increases Engagement and Student Learning

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Ebola virus

- Filamentous virus

- Symptoms: Fever, headache, body aches, weakness, diarrhea, vomiting, stomach pain, lack of appetite

- Sometimes: rash, sore throat, internal and external bleeding
Transmission

• Incubation time 2-21 days (8-10 most common)

• Fruit bat reservoir

• Transmitted through contact with blood or bodily secretions of an infected person or exposure to objects that have been contaminated with bodily secretions (ex., needles)
Treatment

• Supportive care
  – Fluid and electrolytes
  – Maintaining oxygen and blood pressure

• Early treatment is important
  – Often difficult since early signs are general
  – 25-100% mortality rate (Average outbreak=50% mortality rate)

• Prevention
  – Protective clothing (masks, gloves, gowns, goggles)
  – Sterile medical equipment
  – isolation
Appendix 2: Sample whooping cough PowerPoint.

Whooping cough

Catch the bug

CDC, Pertussis
Whooping cough

- *Bordatella pertussis*
  - Gram negative coccobacillus
- Transmitted through respiratory system (cough, sneeze)
- Average incubation period 5-10 days
Whooping cough

Symptoms:

• Initial symptoms (catarrhal stage):
  – Cold-like symptoms, mild cough, fever

• Paroxysmal stage: 1-2 weeks after catarrhal stage
  – severe coughing
  – Violent, rapid coughing → gasps to get air=whooping sound
  – Vomiting, exhaustion

• Convalescent stage
  – Gradual recovery
<table>
<thead>
<tr>
<th>Stage 1</th>
<th>Catarrhal Stage</th>
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<tbody>
<tr>
<td></td>
<td>May last 1 to 2 weeks</td>
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<tr>
<td></td>
<td>Symptoms: runny nose, low-grade fever, mild, occasional cough</td>
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<td>Highly contagious</td>
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**Stage 2 - Paroxysmal Stage**

- Lasts from 1-6 weeks; may extend to 10 weeks
- Symptoms: fits of numerous, rapid coughs followed by "whoop" sound; vomiting and exhaustion after coughing fits (called paroxysms)

**Stage 3 - Convalescent Stage**

- Lasts about 2-3 weeks; susceptible to other respiratory infections for many
- Recovery is gradual. Coughing lessens but fits of coughing may return.

CDC, Pertussis
Whooping cough

• Bacteria attach to and damage cilia on airway epithelial cells
• Mucus builds up → extreme coughing
• Treatment:
  – Antibiotics
• Prevention
  – Vaccine (DTaP)
  – Tdap booster every 10 years
Appendix 3: Follow-up questions.

“Catch the bug” Questions:

Ebola:
(After throwing the Ebola stuffed microbe)
- What disease does this cause?
- What are the symptoms of Ebola?
- How is Ebola treated?
- How is Ebola transmitted?
- What is the incubation period of Ebola?
- What is the natural reservoir of the Ebola virus?

Whooping cough:
(After throwing the whooping cough stuffed microbe)
- What disease does this cause?
- What is the gram stain and shape of the bacteria that cause whooping cough?
- What are the symptoms of whooping cough?
- How is whooping cough treated?
- How is whooping cough transmitted?
- What is the incubation period of whooping cough?
- What causes the extreme coughing during whooping cough?
- What is the name of the vaccine for whooping cough?