

In questions 1-4, you are a doctor working in an HMO in North Carolina. It is a nice early November day.

1. (6 points) Your first patient of the morning is a 14 year old boy who returned on a plane yesterday from a camping trip in the California mountains. He has a very high fever, very dark, swollen lymph nodes in his groin and a cough.

What is this disease likely to be? What causes it?

Is the disease treatable? yes or no (circle one)

If so, with what? _____

What public health measures should you take?

2. (12 points) Your second patient is a young man, who is working at one of the turkey farms in Goldsboro. He has been complaining about fever and cough which have been going on for a few weeks now, clearly he has a respiratory infection. This is his second visit in three days and you already had him tested for strep which came out negative.

What is this disease and what causes it?

Where did the patient acquire this disease, and what are the major stages in the life cycle of this organism in the host?

How would you treat this patient? Why?

3. (10 points) Your next patient is a 28 year old woman who has been suffering from fever, stomach cramps, and very bloody diarrhea. Yesterday, she had a salad at a run-down restaurant in rural eastern North Carolina. Other than that she has eaten at home. The rest of her family is healthy.

What is this disease likely to be? What causes it?

What is the organism's major virulence factor?

How does this virulence factor work?

What is the effect on the virulence of the organism if the gene for the major virulence factor is deleted?

Would you treat this disease with drugs? yes or no (circle one)

If yes, what would you use? If no, how would you treat it? _____

You contact the public health officer for the county where she ate. What should the public health officer do?

1.

2.

4. (10 points) Your next patient is a 9 year old child who just returned a week ago from visiting her grandmother in Thailand. She is bleeding from the gums and there is blood in her stool. Additionally, her skin is blotchy and she is very weak. You find that she had bad flu-like symptoms for a week that cleared up only yesterday evening. The girl was born in Thailand and moved to the U.S. last year. Following a hunch, you prepare to treat her for shock.

What is this disease likely to be? What causes it?

Is the disease treatable with drugs? yes or no (circle one)

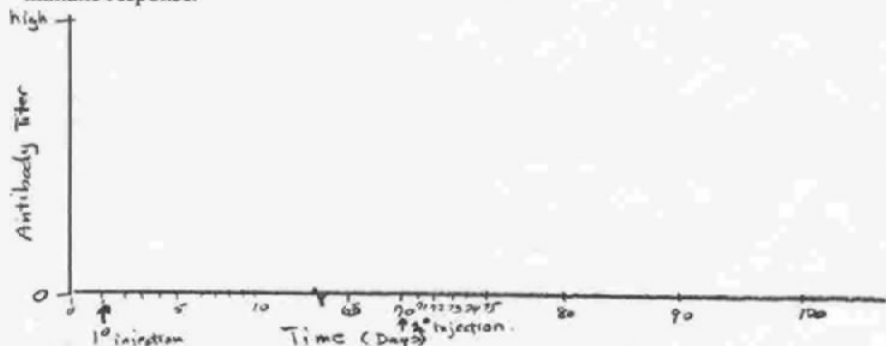
If yes, what would you use? If no, how would you treat it?

How is this disease spread and maintained within a population?

You do a blood test and find a very high level of non-neutralizing anti-body for the disease agent. Is this good or bad news? _____

Why?

5. (12 points) Fill in the graph below to show a primary immune response and a secondary immune response.



- What cells are responsible for the primary immune response? _____
- What cells are responsible for the secondary immune response? _____
- If someone has a disease which destroys all of their T cells can they still make a primary immune response? yes or no (circle one)
- Can they still respond to tetanus toxin to which they were immunized when they were a child before the onset of the disease which destroyed their T cells? yes or no (circle one)
- What kind of cells are responsible for immunity to viruses? _____
- What kind of cells are responsible for immunity to streptococcal infections? _____

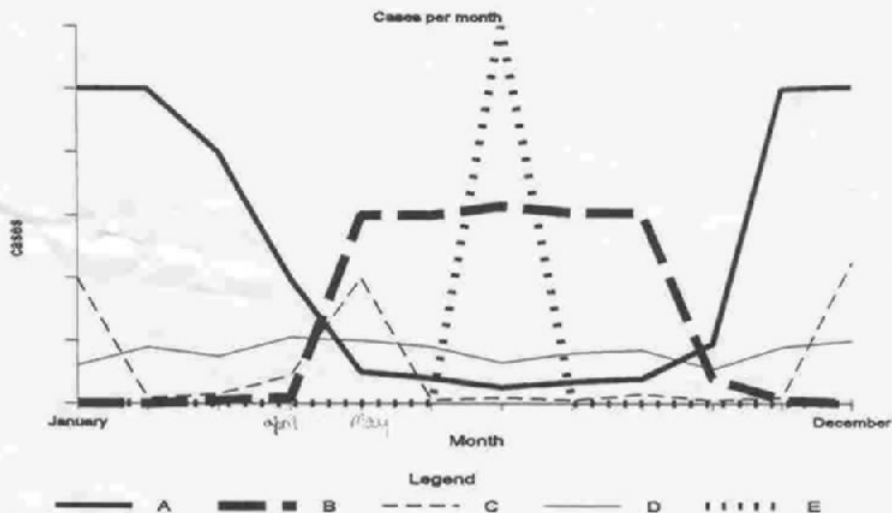
6. (8 points) Why is it that the immunization for yellow fever has remained effective and unchanged for more than 50 years while we need to use a new immunization for influenza each year?

7. (2 points) Why is there more known about the effects of *Chlamydia trachomatis* infection on women than men?

8. (11 points) Which of the following diseases could be eradicated?

Disease	Eradicable? (Yes or No)	Most important reason(s)
Tuberculosis		1.
Chlamydia (STD)		1. 2.
Yellow Fever		1.
Polio		1. 2. 3.

9. (12 points) The disease incidence curves were obtained by a public health official for Orange County, North Carolina.



Match each disease with a curve on the graph (Curves may be used more than once):

Disease	Curve	Reason for match
Influenza		
Rocky Mountain Spotted Fever		
Lyme Disease		
Syphilis		
<i>S. pneumoniae</i>		
Legionellosis		