Reading Guide 09 – Tuberculosis

Reading: Chapter 4 – The White Death in Killer Germs

Directions: Fill out the reading guide as you read. Again, the reading guide is designed to help you take notes from your reading. Along the way, I will ask you some Critical Thinking questions that are designed to help stimulate your thinking as to how the concepts and vocabulary from the book can be used to help explain our Essential Question.

As you read, keep our Essential Question in mind:
→ How is this information helping me to explain how antimicrobials work?

The BIG concepts that you’ll apply in this reading: our current model for how antibiotics work.

Killer Germs Chapter 4 – Tuberculosis

Critical Thinking 1: This week we have been working on a model that explains how antibiotics work. Using the following words, write a flow diagram that might explain how antibiotics work:

Antibiotics
Enzymes
Cellular structures
Bacterial growth

1. At least how old is tuberculosis as a human disease?

2. What are the historical statistics for morbidity and mortality caused by tuberculosis?

3. Check the copyright page of this book. When was it published?

4. What are the statistics for morbidity and mortality in world at the time that this book was published?

5. Check the WHO statistics on worldwide tuberculosis and write down what the statistics were for 2011: http://www.who.int/gho/tb/en/index.html

7. Describe the course of the tuberculosis disease in the human body.

8. Why was tuberculosis also commonly known as “consumption”?

9. What is the etiologic agent of tuberculosis?

10. Why can tuberculosis germs “coughed out into the air” remain alive for weeks or months?

11. When was the bacterium that causes tuberculosis discovered and by whom?

12. Compare the growth rate of tuberculosis bacteria to *E. coli* bacteria.

13. How long does tuberculosis take to kill a person? Why does it take this long?

14. Describe the difference between “active TB” and “inactive TB.”

15. How are tuberculosis bacteria transmitted?

16. When was the vaccine to tuberculosis developed?

17. Who were the two scientists who developed the TB vaccine?

18. What is the TB vaccine?

19. Where is the TB vaccine currently used?

20. What are the four reasons discussed in the book as to why the TB vaccine is NOT used in the US?
   a. First:
   
   b. Second:
   
   c. Also:
   
   d. Last:
21. Describe the progress on a new TB vaccine:

22. What is a tuberculosis “sanatorium”?

23. How long did sanatoriums last in the US and why did they close?

24. What is the tuberculin skin test?

25. Why do people get a chest x-ray when they have a positive tuberculin test?

26. Describe Koch’s relationship with tuberculin.

27. Describe the contributions of the following drugs to the treatment of tuberculosis:
   a. Streptomycin
   b. PAS
   c. Conteben
   d. Isoniazid
   e. Rifampin
   f. Ethambutol

28. How long is the “short course” of antibiotic treatment for TB?

Critical Thinking 2: Using your model of how antibiotics work and the growth rate of TB, can you propose an hypothesis as to why someone must take antibiotics for so long to combat a TB infection?
29. Why did the incidence of tuberculosis go up 12% in the mid-1980’s to early 1990’s?

30. Where do the nation’s most severe drug-resistant TB cases go for treatment and what is their cure rate?

31. What are the statistics for drug-resistant TB in inner-city hospitals at the time that this book was written?

32. Explain how “a person with run-of-the-mill, non-drug-resistant form of tuberculosis” could come down with a relapse of TB.

33. What is combination therapy?

34. Explain how resistant bugs might flourish by using patient “John” as an example.

35. Explain why “DOT…reduced TB by 21 percent since 1992.”

36. Why can it take “up to 3 months to determine which antibiotics are effective against a particular strain of TB”?

37. Has TB been eliminated from the US by 2010?

38. What effects have HIV had on TB prevalence?

39. What are the HIV statistics at the time of the writing of this book in developing nations?

40. Why do the authors think that “we are facing the greatest public health disaster in recorded history”?