MATH 107 Activity: Zombies

Complete the tables for the problems below. Answer all of the questions in complete sentences with proper grammar and spelling.

1. A “zombie” outbreak has infected 1 in 5000 of the 7 Billion people on earth and will turn them into zombies. A “cure” has been developed that will kill any infected humans and prevent them from infecting anyone else. However, the “cure” will kill 2 out of every 3 humans who are not actually infected.

A test has been developed that can be given to all 7 billion people on earth.

a. Create a table showing the number of positive and negative test results for a test with 99% accuracy (specificity and sensitivity)
b. Create a table showing the number of positive and negative test results for a test with 99.9% accuracy (specificity and sensitivity)
c. Under each of the two tests, (99% and 99.9%), how many zombies would go undetected?
d. Under each of the two tests, how many humans will die if the cure is administered to everyone who tests positive?
e. What ratio of those treated with the “cure” are not actually infected under each of the above scenarios?
f. The 99% accuracy test costs $0.50 per test and the 99.9% accuracy test costs $150 per test. If you were an advisor to the president, what would be your public policy regarding the zombie outbreak? Would you recommend he administer the test? Which one? Would you have him administer the cure? Prepare a report that would be easily understood by our current president explaining your position.

2. Repeat steps a-e above for an infection rate of 1 in 100. If the infection rate is increased to 1 in 100, how does that impact your answer to part f?