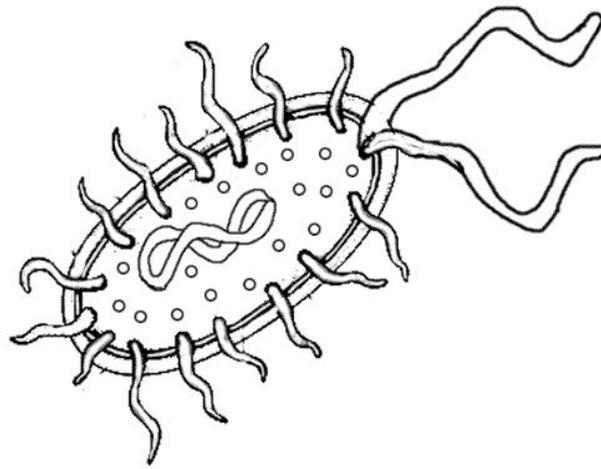


TEAM/SCHOOL: _____

TEAM NUMBER: _____

FAIRFAX INVITATIONAL
SCIENCE OLYMPIAD DIVISION C

Disease Detectives



DO NOT WRITE BELOW THIS LINE

Final Score: _____/48

Rank Number:

Tiebreaker Score: _____/16

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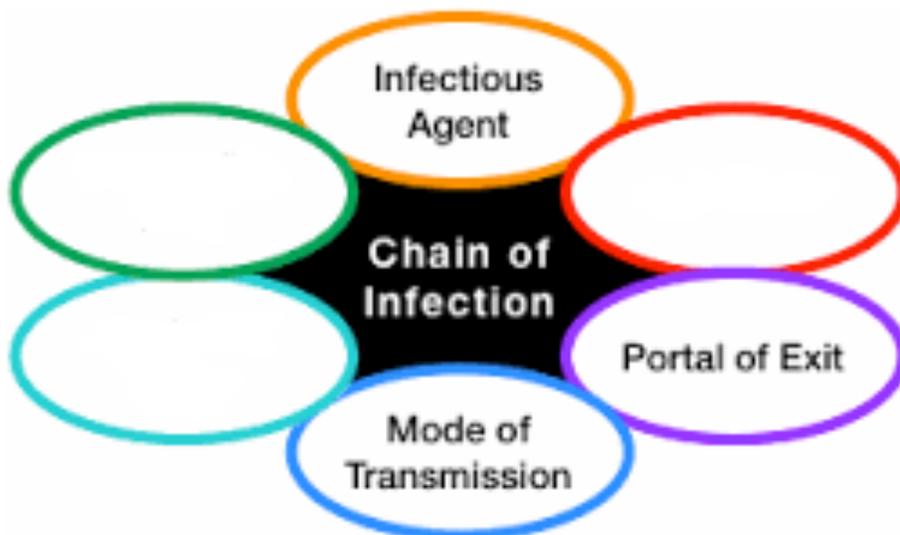
4. In a separate case, there was a confirmed salmonella outbreak in an elementary school. A study was performed and found that 17 out of the 20 of the afflicted students had eaten the tomato salad served by the school cafeteria. In the study, an odds ratio of **1.01** was found using a confidence interval of 95%. No other common risk factors were able to be identified.
- With the information provided by the study, can the school's tomato salad be pinpointed as the source of the outbreak? Why or why not? **(3 points)**
 - What does the odds ratio tell us about a possible connection between the tomato salad and the salmonella outbreak? **(4 points)**
5. Name 3 possible ways a pathogen may enter the human body **(5 points)**.
6. Give **TWO** examples of each of the following:
- Biological cause for disease **(2 points)**
 - Chemical cause for disease **(2 points)**
 - Physical cause for disease **(2 points)**

7. List and describe 5 ways to prevent the spread of food-borne illness (**10 points**).

8. Calculate the odds ratio for the following fictional disease and vaccine (**5 points**):

Hemiacetal Vaccine	Incidence of Hemicitalia	
	Yes	No
Yes	139	58
No	550	953

9. Fill in the chain of infection diagram below (**5 points**):



10. TIEBREAKER (*ONLY* grade to resolve ties. **DO NOT** include this in final score of exam)

List the 10 steps for investigating an outbreak (**1 point each, 10 points total**):

STUDENTS: Points will be assigned based on writing the steps IN THE CORRECT ORDER. No points will be given for a correct step written in the wrong position.

1.

2.

3.

4.

5.

6.

7.

8.

9.

10.

11. TIEBREAKER #2 (DO NOT include in final score of exam): Define random error, systematic error, selection bias, and confounding bias (**2 points each, 6 points total**).