

Model Answers: Hard

1

The correct answer is **A** because:

- The data in the table does not show the number of overall cases of *S. aureus* infections, only the number of deaths, so this statement cannot be supported by the data in the table.

All the other statements are true about MRSA

2

The correct answer is **C** because:

- The zones of inhibition decrease significantly or to nothing in the case of bacteria 2 and 4.
- The reduction in the zone of inhibition shows that no susceptible (non-resistant) strains of bacteria remain (as is the case for types 2 and 4) or that the numbers of susceptible bacteria are decreasing as resistance in the population becomes more prevalent (as is the case for type 3)

A is incorrect as it is impossible to tell that the bacteria would never become resistant to the antibiotic.

B is incorrect as the data shows that it is not effective against all bacteria.

D is incorrect as while it is true that some bacteria become resistant over time, not all will develop resistance

3

The correct answer is **B** because:

- The zones of inhibition around the streptomycin is small but still present
- There is no zone of inhibition present around the penicillin disc which is highly suggestive that all of the bacteria growing now have resistance

4

The correct answer is **D** because:

- A reduction in the use of tetracycline would result in less of a selection pressure for resistance, hopefully reducing the levels of resistance to this antibiotic (as there likely no survival advantage to bacteria with resistance in comparison to those without (susceptible) otherwise
- A compound that has a different mode of action to antibiotics can be used to treat resistant strains

A & B are incorrect as this would not explain how they could help in the fight against antibiotic resistance. This explains why resistance is less likely to develop to cathelicidins

C is incorrect as bacteria can become resistant to synthetic molecules, many antibiotics are synthetic molecules based on natural ones.

5

The correct answer is **C** because:

- There are zones of inhibition around discs 2 and 3 on the plate grown with bacteria A
- These zones are almost the same size of each other, with the zone around disc 2 slightly bigger (and therefore suggesting Penicillin V if slightly more effective than carboxypenicillin)

A is incorrect as these only show results for these two bacteria, it does not show other bacteria. Penicillin V is not showing efficacy against bacteria B.

B is incorrect as penicillin V is not effective against bacteria B, there is no zone of inhibition

D is incorrect as penicillin V is not showing any efficacy against bacteria B