Oxford Cambridge and RSA

GCSE Biology B (Twenty First Century Science)

J257/03 Breadth in Biology (Higher)

Question Set 29

(see below)

(see below)

1 Whooping cough is a communicable disease caused by bacteria.

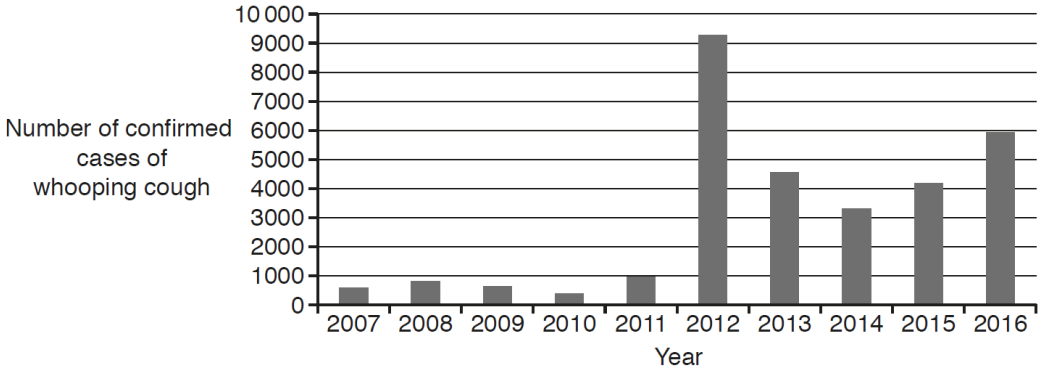
(a) Explain how vaccines are used to prevent the spread of diseases such as whooping cough.

[3]

Vaccine contains dead or weakened form of pathogen (bacteria) that has the specific antigen but would not cause any harm to the body. The antigen triggers the immune response leading to production of antibodies (complementary to the antigen). Vaccination allows people to be immune to communicable disease before getting the disease. If most of the population is vaccinated, herd immunity occurs. When vaccinated person contacts the bacteria or virus, they won't be spreading the disease as they wouldn't become ill (would be immune).

(b) The graph shows the number of confirmed cases of whooping cough in England from 2007 to 2016.

[3]

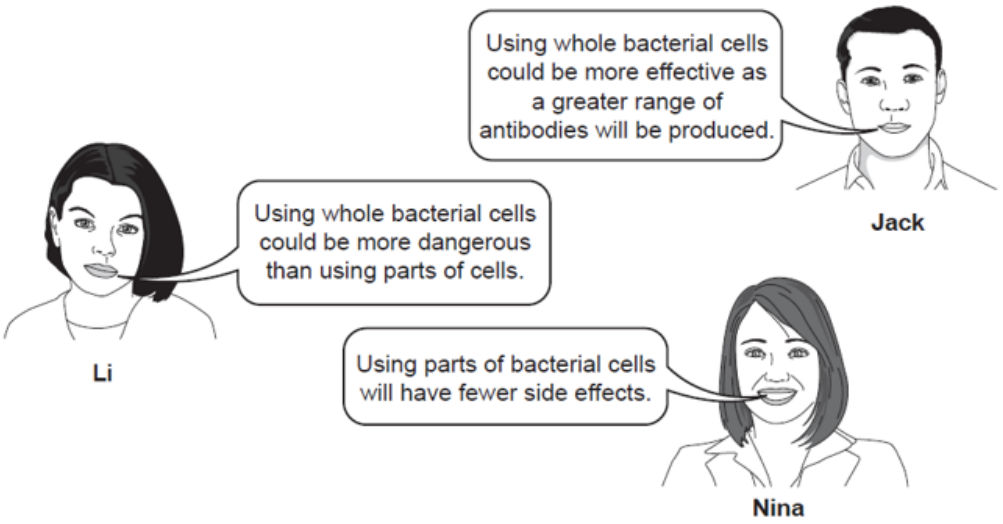


Describe the trends shown in the graph and suggest a reason for the trends.

Initially the number of Whooping cough cases was low due to herd immunity via vaccination. However from 2012, the number of cases dramatically increased. This could be because a new variant of Whooping cough spreading across the England and the vaccination does not work against the new variant. After 2012, the number of cases decreased by preventing the spread (e.g. via washing hands more frequent or isolating those who are infected)

(c) The first vaccine for whooping cough contained whole bacterial cells. Today vaccines contain parts of the bacterial cells.

Some friends are discussing the different vaccines for whooping cough.



(i) Who is suggesting a benefit of using whole bacterial cells?

Tick (✓) **one** box.

Jack	☑
Li	☐
Nina	☐

[1]

(ii) Who is suggesting a benefit of using parts of bacterial cells?

Tick (✓) **one** box.

Jack	☐
Li	☐
Nina	☑

[1]

(iii) Why do you think using whole bacterial cells could be more dangerous?

Because there is a possible risk of bacteria cells causing disease - leading to people getting ill. **[1]**

(d) Scientists are continually developing new drug treatments for diseases. Many tests must be carried out before a new drug is made available for use on humans.

The statements, **A–F**, describe the testing process of a new drug but they are in the wrong order.
Put the statements in the correct order by writing a letter in each box.

One has been done for you.

A Drugs are tested on animals for safety and effectiveness.

B Drugs are tested on a small number of healthy humans to check the drugs are safe touse.

C Drugs are tested on a small number of humans with the disease to check for safety and effectiveness.

D Drugs are modelled in the lab using computer software.

E Drugs are tested on cells and tissues in the lab.

F Larger clinical trials are conducted.

D	E	A	B	C	F

[3]

Total Marks for Question Set 29: 12