PapaCambridge

Cambridge International AS & A Level

BIOLOGY (9700) P1

TOPIC WISE QUESTIONS + ANSWERS | COMPLETE SYLLABUS

PapaCambridge

PapaCambridge

Chapter 10

Infectious disease

10.1 Infectious diseases

1404. 9700_m20_qp_12 Q: 35

A disease is an abnormal disruption to the functioning of an organism or part of an organism.

Which disruption to function is an example of an infectious disease?

A Airflow to one lung is disrupted by uncontrolled cell division forming a mass of cells.

B Airways become inflamed due to exposure to smoke.

C Oxygen transport is disrupted due to changes in protein shape in red blood cells.

D Lung tissue is disrupted by the multiplication of prokaryotic cells.

1405. 9700_m20_qp_12 Q: 36

The number of people at risk of contracting malaria has increased due to an increase in the distribution of *Anopheles* mosquitoes.

What could be the cause of this increase in the distribution of *Anopheles* mosquitoes?

A antibiotic resistance

B drug resistance in *Plasmodium*

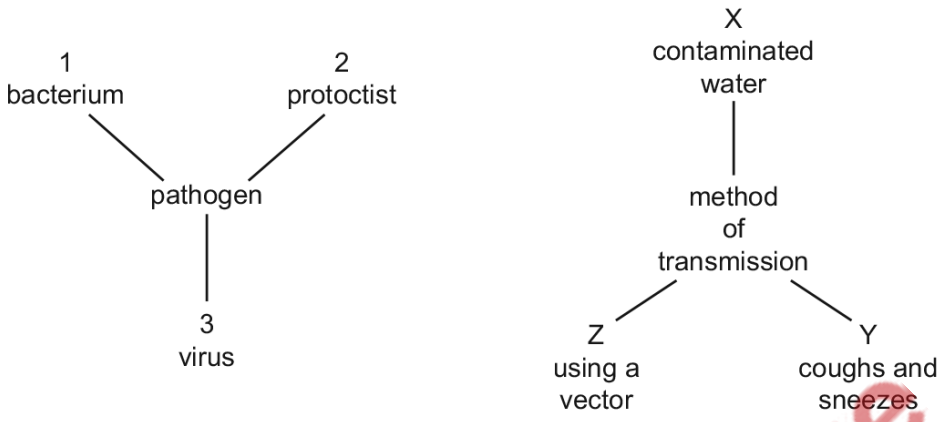
C no effective vaccine

D global warming

PapaCambridge

1406. 9700_s20_qp_11 Q: 36

The diagram shows some of the pathogens that cause disease in humans and some of the ways they are transmitted.



Which row matches the correct number for the pathogen with the correct letter for their mode of transmission for cholera and measles?

	cholera	measles
A	1 and X	3 and Y
B	1 and Y	3 and Y
C	2 and X	2 and Z
D	3 and Z	1 and X

1407. 9700_s20_qp_11 Q: 37

Which factors would increase the global distribution of malaria?

1 a fall in annual rainfall

2 an increase in the use of antibiotics

3 a rise in global air temperatures

4 increasing irrigation of land for farming

A 1, 2 and 3 **B** 1 and 2 only **C** 2, 3 and 4 **D** 3 and 4 only

---

PapaCambridge

1408. 9700_s20_qp_12 Q: 35

Which of these causative agents of disease can be transmitted by droplet infection?

1 *Vibrio*

2 *Mycobacterium*

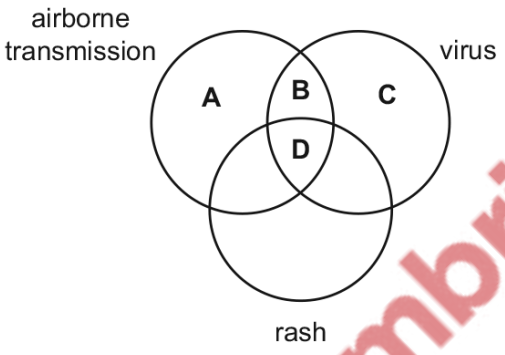
3 *Morbillivirus*

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

---

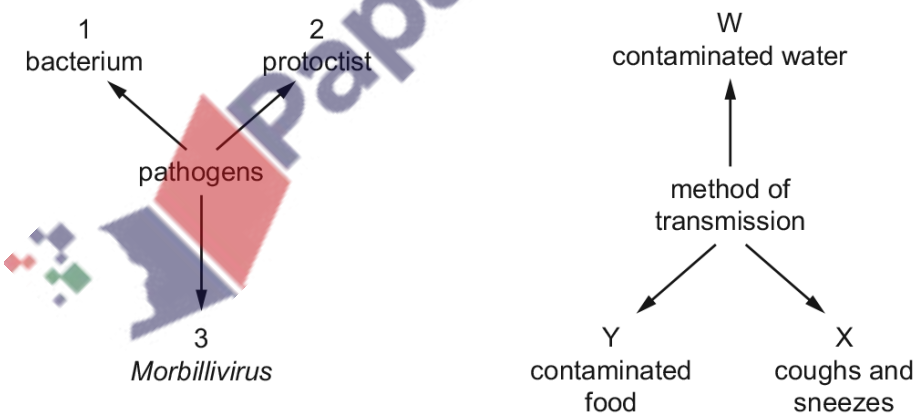
1409. 9700_s20_qp_13 Q: 37

What is correct for tuberculosis (TB)?



1410. 9700_w20_qp_11 Q: 35

The diagrams show some of the pathogens that cause disease in humans and some of the ways they are transmitted.



What is the correct pathogen and method of transmission for the disease TB?

A 1 and W **B** 1 and X **C** 2 and X **D** 3 and Y

PapaCambridge

1411. 9700_w20_qp_11 Q: 36

The proportion of the local population who have malaria in area R is higher than the proportion in area S.

Which factor causes this difference?

A Area R has a more humid climate than area S.

B Area R is nearer the equator than area S.

C There is a higher population in area R than area S.

D There is less sewage treatment in area R than area S.

1412. 9700_w20_qp_12 Q: 36

An earthquake caused damage to sanitation systems in a large tropical village.

Drinking water became contaminated with sewage. Heavy rain then caused flooding and left large pools of water in the village. Housing was destroyed and people in the village had to live in very overcrowded conditions.

Which infectious diseases could increase in the village population as a result of the earthquake and heavy rain?

1 cholera

2 malaria

3 tuberculosis

A 1, 2 and 3 **B** 1 and 3 only **C** 1 only **D** 2 and 3 only

---

1413. 9700_w20_qp_13 Q: 35

Which row is correct?

	disease	transmission	infectious or non-infectious
A	HIV/AIDS	genetic	infectious
B	lung cancer	pathogen	infectious
C	sickle cell anemia	genetic	non-infectious
D	TB	pathogen	non-infectious

PapaCambridge

1414. 9700_w20_qp_13 Q: 37

The statements are about infectious diseases.

1 Disease may be spread between humans by contact.

2 Disease-causing organism has many antigenic variations.

3 Spread of disease may be influenced by climate.

4 A vaccination programme is available.

Which row matches the correct statement numbers with each disease?

	cholera	measles	malaria
A	1	1 and 2	1 and 3
B	1 and 4	4	2
C	2 and 3	1 and 3	1 and 4
D	4	1 and 4	2 and 3

1415. 9700_m19_qp_12 Q: 35

Which two diseases are transmitted by airborne droplets?

A cholera and malaria

B malaria and measles

C measles and tuberculosis (TB)

D tuberculosis (TB) and cholera

1416. 9700_m19_qp_12 Q: 36

Which features do the causative agents of measles, malaria and tuberculosis (TB) have in common?

	cytoplasm	the ability to produce ATP	surface antigens
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

key

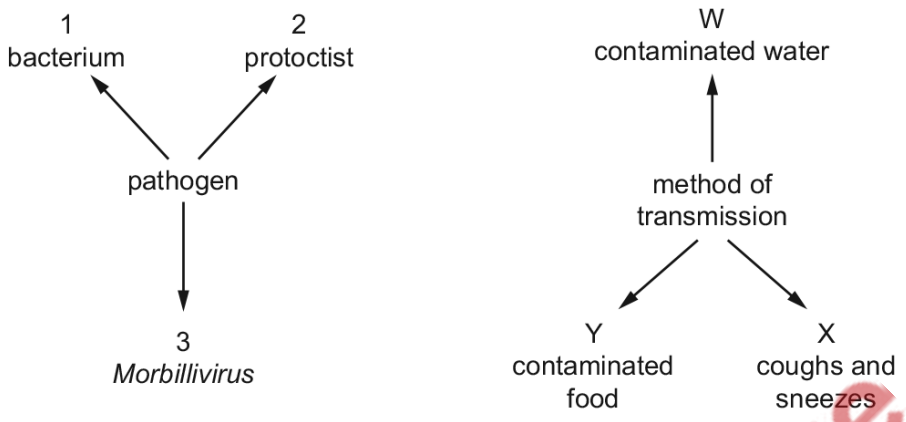
✓ = have in common

✗ = do not have in common

PapaCambridge

1417. 9700_s19_qp_11 Q: 37

The diagram shows some of the pathogens that cause disease in humans and some of the ways they are transmitted.



What is the correct pathogen and method of transmission for measles?

A 1 and X **B** 2 and W **C** 3 and W **D** 3 and X

1418. 9700_s19_qp_11 Q: 38

Which row is correct for each disease?

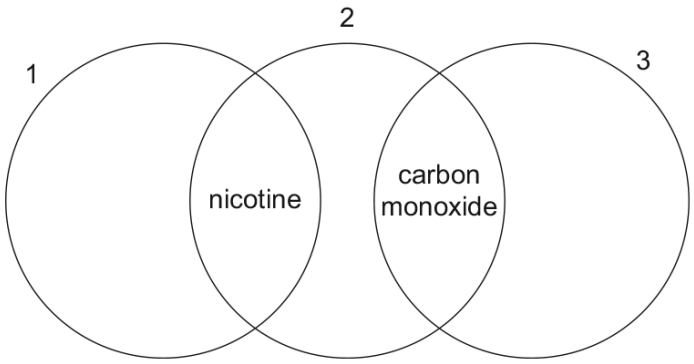
	cholera	HIV / AIDS	malaria	measles
A	caused by a bacterium	can be transmitted in breast milk and across placenta	eradication programme unsuccessful	caused by a virus
B	eating raw shellfish can be a source of infection	may be carried by a vector	carried by male *Anopheles* mosquitoes	can cause blindness
C	air borne infection	caused by a retrovirus	causative agent is a eukaryote	symptoms usually include a rash
D	can be caught by swimming in contaminated water	causes reduction in number of T-lymphocytes	mainly kills children under five years	no effective vaccination available

---

PapaCambridge

1419. 9700_s19_qp_12 Q: 34

The diagram shows some of the effects of nicotine and carbon monoxide in cigarette smoke.



Which row is correct?

	1	2	3
A	increase in heart rate	short-term effect on cardiovascular system	combines more readily with haemoglobin than oxygen
B	increases diameter of small arteries	can cause chronic bronchitis	combines irreversibly with haemoglobin
C	reduces the oxygen carrying capacity of blood	short-term effect on gas exchange system	reduces the blood supply to hands and feet
D	stimulates goblet cells to secrete more mucus	highly addictive	increases risk of blood clotting

---

1420. 9700_s19_qp_12 Q: 35

Which row correctly identifies the causative organism of each disease?

	cholera	measles	smallpox	tuberculosis
A	*Variola*	*Morbillivirus*	*Vibrio*	*Mycobacterium*
B	*Variola*	*Mycobacterium*	*Vibrio*	*Morbillivirus*
C	*Vibrio*	*Morbillivirus*	*Variola*	*Mycobacterium*
D	*Vibrio*	*Mycobacterium*	*Variola*	*Morbillivirus*

PapaCambridge

1421. 9700_s19_qp_12 Q: 36

The following advice was given to a person travelling to a country where there had been an outbreak of an infectious disease.

- cook food well and eat it hot
- peel fruit and vegetables
- drink only cool, boiled water
- wash hands often with soap and cool, boiled water

Which infectious disease would this advice help to protect against?

A cholera

B malaria

C measles

D tuberculosis

1422. 9700_s19_qp_12 Q: 37

What is a **social** factor that affects the spread of malaria?

A an increase in drug resistant forms of malaria

B climate change

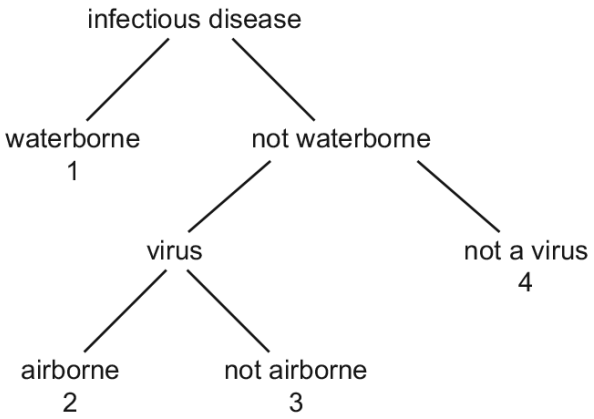
C difficulty in producing a vaccine

D migration of people because of wars

PapaCambridge

1423. 9700_s19_qp_13 Q: 37

The diagram has been used to identify four infectious diseases.



Which row correctly identifies the infectious diseases?

	1	2	3	4
A	cholera	measles	HIV / AIDS	TB
B	cholera	smallpox	malaria	measles
C	malaria	HIV / AIDS	TB	cholera
D	malaria	TB	measles	cholera

1424. 9700_s19_qp_13 Q: 39

Growth factors are chemicals that stimulate a cell to divide.

Growth factors are transported around the body in the blood, and they attach to cells that have complementary growth factor receptors on their surface.

Some cells have too many growth factor receptors on their surface and so the cells continue to divide, forming a tumour.

Trastuzumab is used as a treatment for some cancers.

Trastuzumab works by binding to a specific growth factor receptor on a tumour cell. This stops the cell dividing and the cell dies.

What is trastuzumab?

A a monoclonal antibody

B a vaccine

C an antibiotic

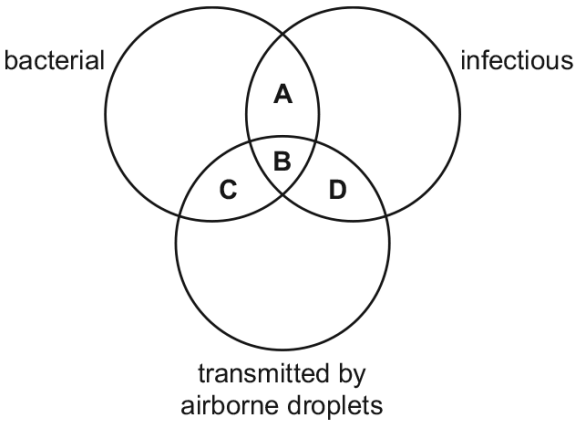
D an enzyme inhibitor

PapaCambridge

1425. 9700_w19_qp_12 Q: 35

The diagram shows properties of diseases.

Which shows the properties that are common to tuberculosis (TB) and measles?



1426. 9700_w19_qp_13 Q: 36

The statements refer to the disease tuberculosis (TB).

1 The pathogen lives inside human cells so is not accessible to the immune system.

2 The bacterial pathogen reproduces slowly.

3 The pathogen is not very sensitive to antibiotics.

Which explains why antibiotic treatment for TB takes a long time?

A 1, 2 and 3 **B** 1 and 2 only **C** 1 only **D** 2 and 3 only

---

1427. 9700_m18_qp_12 Q: 36

Which of these terms can be used to describe the role of mosquitoes in the transmission of malaria?

1 malarial parasite

2 pathogen

3 vector

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 3 only

---

1428. 9700_s18_qp_11 Q: 35

Which statements about a non-infectious disease may be correct?

1 It can result from a mutation.

2 It can be transmitted by an insect vector.

3 It can be transmitted from mother to child.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

---

1429. 9700_s18_qp_12 Q: 36

Which row identifies both the type of pathogen that causes cholera and the way in which cholera is transmitted from person to person?

	type of pathogen	method of transmission
A	bacteria	drinking water contaminated with the pathogen
B	bacteria	inhaling water droplets contaminated with the pathogen
C	virus	drinking water contaminated with the pathogen
D	virus	inhaling water droplets contaminated with the pathogen

---

1430. 9700_s18_qp_12 Q: 37

Why do people with HIV/AIDS have a higher occurrence of malaria than people without HIV/AIDS?

A HIV/AIDS and malaria are both diseases where the pathogen travels in blood.

B HIV/AIDS and malaria are both transmitted in blood.

C HIV/AIDS infects T-lymphocytes which are used by the malaria pathogen.

D HIV/AIDS suppresses the immune response to the malaria pathogen.

PapaCambridge

1431. 9700_s18_qp_13 Q: 39

Where are antigens found?

	on the surface of pathogen	on the surface of macrophage	in blood plasma
A	✓	✓	✗
B	✓	✗	✓
C	✗	✓	✗
D	✗	✗	✓

key

✓ = antigens found

✗ = antigens not found

1432. 9700_w18_qp_11 Q: 36

Which list contains only infectious diseases?

A cholera, HIV/AIDS, lung cancer and malaria

B cholera, malaria, tuberculosis (TB) and sickle cell anaemia

C HIV/AIDS, malaria, measles and tuberculosis (TB)

D lung cancer, measles, sickle cell anaemia and tuberculosis (TB)

1433. 9700_w18_qp_11 Q: 37

Which disease is caused by a eukaryote?

A cholera

B malaria

C measles

D smallpox

1434. 9700_w18_qp_12 Q: 36

Which statements about infectious diseases are correct?

1 Cholera has a vaccine available and is caused by a bacterial pathogen of the *Vibrio* group.

2 Measles has a vaccine available and is caused by a pathogen called *Morbillivirus*.

3 Smallpox was eradicated by vaccination and was caused by a bacterial pathogen called *Variola*.

A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 2 only

PapaCambridge

1435. 9700_w18_qp_13 Q: 35

Which factors affect the distribution of the disease malaria?

1 draining swamps
2 vaccination
3 antibiotics
4 migration of people due to conflict
5 climate

A 1, 2 and 4 **B** 1, 4 and 5 **C** 2, 3 and 5 **D** 3, 4 and 5

1436. 9700_m17_qp_12 Q: 38

The global mortality figures for some diseases in 2002 are shown in the table.

cause of death	millions of deaths	percentage of all deaths
HIV/AIDS	2.8	4.4
TB	1.6	2.7
malaria	1.3	2.2
measles	0.6	1.1

How many millions of people died from viral diseases listed in the table in 2002?

A 2.2 **B** 3.4 **C** 3.8 **D** 4.4

1437. 9700_s17_qp_11 Q: 39

The global mortality figures for some diseases in 2002 are shown in the table.

cause of death	millions of deaths	percentage of all deaths
HIV / AIDS	2.8	4.4
TB	1.6	2.7
malaria	1.3	2.2
measles	0.6	1.1

How many millions of people died in 2002 from the bacterial diseases listed in the table?

A 0.6 **B** 1.6 **C** 2.2 **D** 2.7

PapaCambridge

1438. 9700_s17_qp_12 Q: 36

What could cause an outbreak of malaria in a country after it had been eliminated?

1 mosquitoes become resistant to insecticides

2 migration of population due to war

3 malarial parasites become resistant to quinine

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

---

1439. 9700_s17_qp_12 Q: 37

Which disease is caused by a bacterium and can be spread by airborne droplets?

A cholera

B measles

C smallpox

D tuberculosis (TB)

1440. 9700_s17_qp_12 Q: 38

Smallpox has been eradicated, but malaria and cholera have not.

Which statements correctly explain this?

1 Cholera pathogens in the intestines are not destroyed by antibiotics.

2 Plasmodium antigens change during the life cycle.

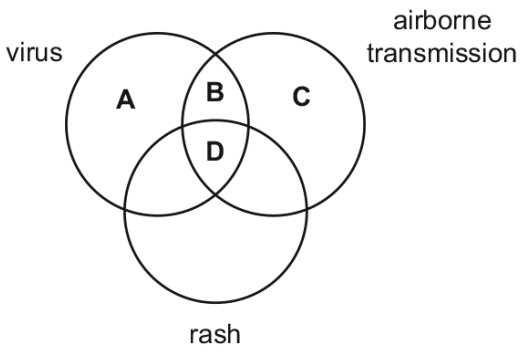
3 Smallpox antigens remain stable.

4 Vaccines only work against viruses.

A 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

1441. 9700_s17_qp_13 Q: 35

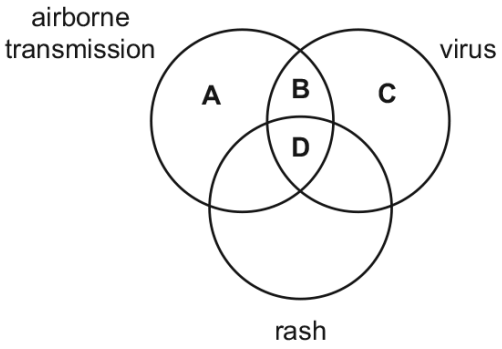
Which is correct for measles?



PapaCambridge

1442. 9700_w17_qp_11 Q: 35

What is correct for tuberculosis (TB)?



1443. 9700_w17_qp_12 Q: 37

What is the causative agent and method of transmission of smallpox?

	causative agent	method of transmission
A	*Morbillivirus*	direct contact
B	*Morbillivirus*	waterborne
C	*Variola*	direct contact
D	*Variola*	waterborne

1444. 9700_w17_qp_13 Q: 38

Which pathogens are spread by droplet infection?

1 *Mycobacterium tuberculosis*

2 *Vibrio cholerae*

3 *Morbillivirus*

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

---

1445. 9700_m16_qp_12 Q: 35

Which of the following increase the risk of contracting TB?

1 drinking unpasteurised milk

2 eating shellfish which have fed on raw sewage

3 living in overcrowded conditions

A 1 and 2 **B** 1 and 3 **C** 2 and 3 **D** 3 only

1446. 9700_m16_qp_12 Q: 36

One control method to reduce the spread of malaria is to use an insecticide. It can be used to treat mosquito nets.

Another control method is to completely cover areas of water with insoluble polystyrene balls that float on the surface.

Using this information, what are the reasons for these control methods?

	nets treated with insecticide	polystyrene balls
A	kills all male mosquitoes	prevents adult mosquitoes from laying eggs
B	kills all mosquitoes	releases toxins that kill mosquito larvae
C	kills some mosquitoes	restricts the breathing of the mosquito larvae
D	prevents mosquitoes from breeding	reduces nutrient supply for mosquito larvae

---

1447. 9700_s16_qp_11 Q: 37

A person whose immune system is suppressed may become more susceptible to certain diseases.

Which disease will this person **not** become more susceptible to?

A cholera

B measles

C sickle cell anaemia

D TB

1448. 9700_s16_qp_11 Q: 38

Which disease is treated with drugs that have a similar molecular structure to DNA nucleotides?

A cholera

B HIV/AIDS

C malaria

D TB

PapaCambridge

1449. 9700_s16_qp_12 Q: 35

The table shows the names of five pathogens.

Which row matches the pathogens with the diseases they cause?

	Morbillivirus	*Mycobacterium*	*Plasmodium*	*Variola*	*Vibrio*
A	cholera	measles	TB	malaria	smallpox
B	malaria	smallpox	cholera	measles	TB
C	measles	TB	malaria	smallpox	cholera
D	TB	malaria	smallpox	cholera	measles

1450. 9700_s16_qp_12 Q: 36

Which disease exhibits all the following features?

- It can be transmitted by animals to other animals, including humans.
- One mode of transmission is by transfusion with contaminated blood.
- The causative organism can show multiple drug resistance.
- The majority of humans who die from the disease are children.

A cholera

B HIV / AIDS

C malaria

D tuberculosis

1451. 9700_s16_qp_12 Q: 37

The proportion of the local population who have malaria in area R is higher than the proportion in area S.

Which factor causes this difference?

A Area R has a more humid climate than area S.

B Area R is nearer the equator than area S.

C There is a higher population in area R than area S.

D There is less sewage treatment in area R than area S.

1452. 9700_s16_qp_13 Q: 36

More people are exposed to the risk of contracting malaria due to an increase in the distribution of *Anopheles* mosquitoes.

What could be the cause of this increase?

A drug resistance in *Plasmodium*

B global warming

C insecticide resistance

D no effective vaccine

1453. 9700_s16_qp_13 Q: 38

Which of these pathogens can be transmitted by air?

1 *Plasmodium*

2 *Morbillivirus*

3 *Mycobacterium*

4 *Vibrio*

A 1 and 2 **B** 2 and 3 **C** 2 and 4 **D** 3 and 4

1454. 9700_w16_qp_11 Q: 36

Why is it difficult to control the spread of malaria?

1 Global air travel for commerce and tourism has increased.

2 The mosquito vector rapidly evolves resistance to insecticides.

3 The *Plasmodium* pathogen shows great antigenic variability.

4 Civil unrest and poverty result in overcrowded living conditions.

A 1, 2 and 3 **B** 1, 2 and 4 **C** 2 and 3 only **D** 3 only

---

PapaCambridge

1455. 9700_w16_qp_11 Q: 37

Which description gives the correct cause and transmission for TB, measles and HIV/AIDS?

	TB		measles		HIV/AIDS	
	cause	transmission	cause	transmission	cause	transmission
A	bacteria	airborne droplets	virus	airborne droplets	virus	bodily fluids
B	bacteria	water borne	bacteria	airborne droplets	protoctist	insect vector
C	protoctist	airborne droplets	bacteria	insect vector	virus	airborne droplets
D	virus	bodily fluids	protoctist	bodily fluids	bacteria	bodily fluids

---

1456. 9700_w16_qp_12 Q: 37

Which disease is **not** likely to be passed directly from parents to child?

A cholera

B malaria

C sickle cell anaemia

D tuberculosis

1457. 9700_w16_qp_12 Q: 38

Why is it difficult to control the spread of measles?

1 Global air travel for commerce and tourism has increased.

2 The virus that causes measles rapidly evolves resistance to antibiotics.

3 The virus that causes measles shows great antigenic variability.

4 Civil unrest and poverty result in overcrowded living conditions.

A 1, 2 and 4 **B** 1, 2 and 3 **C** 1 and 4 only **D** 4 only

---

1458. 9700_w16_qp_13 Q: 35

Which row is correct?

	disease	pathogen	method of infection
A	cholera	bacterium	food borne
B	malaria	prokaryote	insect bite
C	measles	bacterium	water borne
D	tuberculosis (TB)	virus	airborne

PapaCambridge

1459. 9700_w16_qp_13 Q: 36

What do pathogens of HIV/AIDS, malaria and TB have in common?

	they have a cell surface membrane	they have genes	they have ribosomes
A	✓	✓	✓
B	✓	✗	✗
C	✗	✓	✓
D	✗	✓	✗

key

✓ present in each causative agent

✗ not present in each causative agent

1460. 9700_w16_qp_13 Q: 37

Which factor might have contributed to the spread of HIV/AIDS?

A few clinics and hospitals

B insufficient education

C malnutrition

D poor sanitation

1461. 9700_s15_qp_11 Q: 34

The first column in the table contains statements about disease. Columns headed 1-4 represent four different named diseases.

statements	1	2	3	4
infectious disease		✓	✓	✓
can be treated with antibiotics			✓	✓
caused by a virus		✓		
degeneration of lung tissue	✓			✓

key

✓ = true

What is the correct set of column headings for the table above?

	1	2	3	4
A	bronchitis	measles	TB	smallpox
B	emphysema	HIV/AIDS	cholera	TB
C	emphysema	measles	cholera	lung cancer
D	lung cancer	HIV/AIDS	measles	TB

PapaCambridge

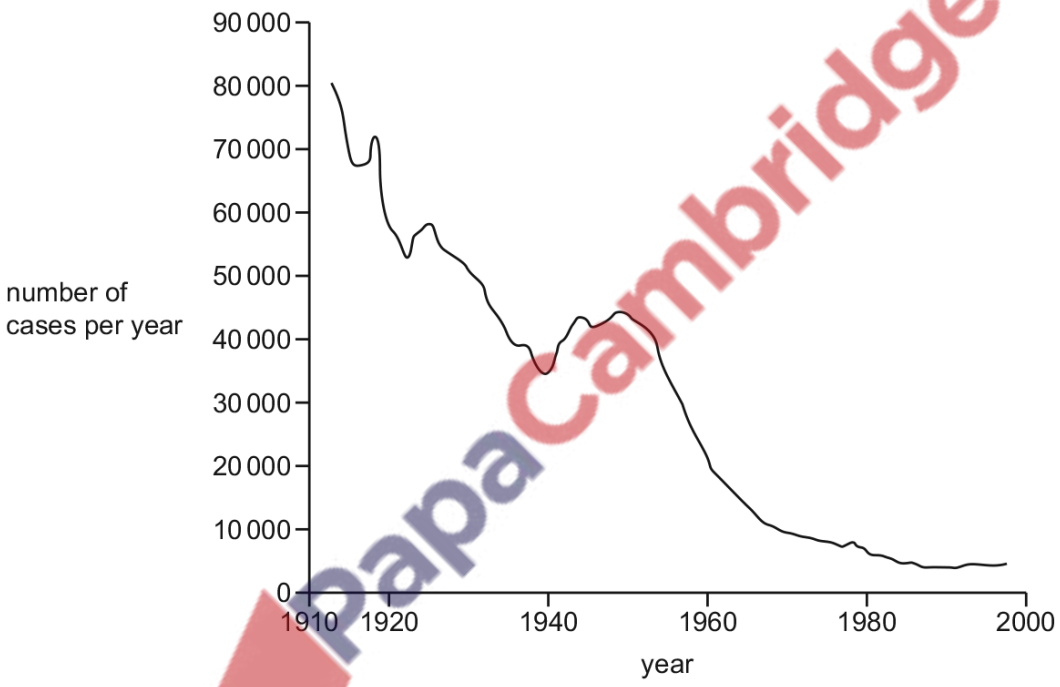
1462. 9700_s15_qp_11 Q: 35

Which row is correct for malaria?

	nature of disease	method of transmission	pathogen
A	infectious	insect vector	species of *Plasmodium*
B	infectious	water-borne	species of *Vibrio*
C	non-infectious	insect vector	species of *Plasmodium*
D	non-infectious	water-borne	species of *Vibrio*

1463. 9700_s15_qp_12 Q: 34

The graph shows the fall in cases of tuberculosis (TB) in a country between 1910 and 2000.



Which factors could have contributed to the fall over this period?

1 pasteurisation of milk

2 the provision of new housing

3 chemical treatment of sewage

4 identification of contacts of people infected with TB

A 1, 2 and 4 **B** 2, 3 and 4 **C** 1 and 3 only **D** 1 and 4 only

---

PapaCambridge

1464. 9700_s15_qp_12 Q: 35

Which row is correct for cholera?

	nature of disease	method of transmission	causative agent (pathogen)
A	infectious	insect vector	species of *Plasmodium*
B	infectious	water-borne	species of *Vibrio*
C	non-infectious	insect vector	species of *Plasmodium*
D	non-infectious	water-borne	species of *Vibrio*

1465. 9700_s15_qp_13 Q: 35

Strains of *Mycobacterium* have been found that are:

- multiple drug-resistant (MDR) – resistant to the drugs most commonly used to control tuberculosis (TB)
- extensively drug-resistant (XDR) – resistant to the drugs most commonly used to control TB and to some of the drugs less commonly used to control TB
- totally drug-resistant (TDR) – resistant to all known drugs used to control TB.

Comparisons of some of these strains of *Mycobacterium* found differences in the thickness of their cell walls, as shown in the table.

Mycobacterium	thickness of cell wall / nm
non-resistant	15
MDR	17
TDR	20

What conclusions may be drawn from this information?

A Bacteria secrete thicker cell walls when in contact with a mixture of drugs.

B The cell walls of TDR bacteria are impermeable to drugs.

C Thicker cell walls may form a physical barrier to drugs.

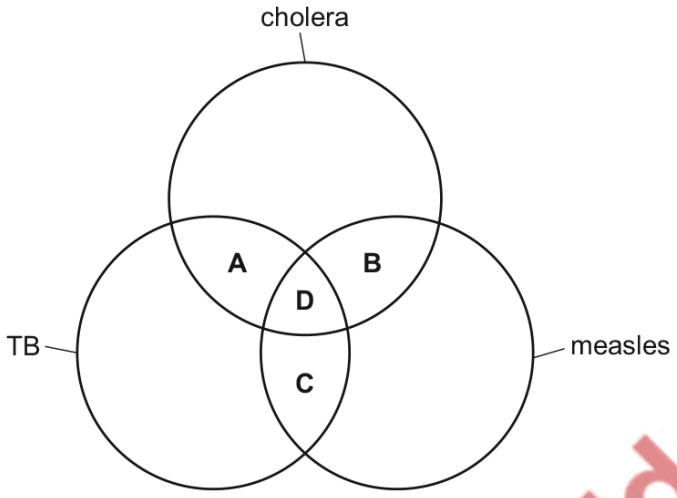
D XDR bacteria have cell walls between 17 and 20 nm thick.

PapaCambridge

10.2 Antibiotics

1466. 9700_m20_qp_12 Q: 37

Which diseases are treated with antibiotics?



1467. 9700_s20_qp_11 Q: 38

The antibiotic teixobactin was discovered in January 2015. Teixobactin kills some bacteria such as *Staphylococcus* and *Mycobacterium*.

Most antibiotics work by binding to proteins. Teixobactin binds to lipids that are used in the synthesis of bacterial cell walls. This means that it is unlikely that bacteria will quickly develop resistance to teixobactin.

Which statements explain why bacteria are unlikely to quickly develop resistance to teixobactin?

1 A mutation in the gene coding for a protein allows selection for resistance.

2 Teixobactin binds to a lipid rather than to a protein.

3 The structure of a lipid is not encoded by DNA.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

---

PapaCambridge

1468. 9700_s20_qp_12 Q: 36

The table compares total antibiotic use (X) and the percentage of antibiotic-resistant pneumonia cases (Y) in five countries.

country	(X) total antibiotic use / defined dose per 1000 people per day	(Y) percentage of penicillin-resistant pneumonia cases
Austria	13	10
Denmark	11	4
Iceland	17	15
Spain	30	50
USA	24	33

What is supported by the data?

A When X decreases there is an increase in Y.

B When X increases there is an increase in Y.

C When X increases it causes an increase in Y.

D There is no relationship between X and Y.

1469. 9700_s20_qp_12 Q: 37

Which statement about the development of resistance to antibiotics in bacteria is correct?

A All mutations in bacteria result in resistance to antibiotics.

B Antibiotics increase the rate of mutation in bacteria.

C Mutations leading to antibiotic resistance only occur when antibiotics are used to treat pathogenic bacteria.

D The proportion of antibiotic-resistant bacteria in a population only increases if the antibiotic is used.

1470. 9700_s20_qp_13 Q: 38

Some common antibiotics are listed. The action of each antibiotic is described.

1 rifampicin – inhibits RNA polymerase

2 streptomycin – inhibits 70S ribosomes

3 neomycin – inhibits DNA synthesis

4 ampicillin – inhibits peptidoglycan synthesis

Which of these antibiotics will affect the activities of bacterial cells **only**?

A 1, 2, 3 and 4

B 1, 2 and 3 only

C 2 and 4 only

D 4 only

1471. 9700_w20_qp_11 Q: 37

Species X is a single-celled eukaryote.

Species X has been genetically modified to produce penicillin, which does not harm the cell walls of species X.

What may be concluded from this information?

1 The cell walls of species X are chemically different from those of bacteria.

2 The cell walls of species X are made of peptidoglycan.

3 The cell walls of species X are made of cellulose.

A 1 and 2 **B** 1 only **C** 2 only **D** 3 only

1472. 9700_w20_qp_12 Q: 37

Which statements about the use of antibiotics could cause an increase in antibiotic-resistant bacteria?

1 Patients do not always complete the course of antibiotics.

2 Patients keep unused antibiotics from previous prescriptions and take them at a later date in smaller doses than prescribed.

3 Antibiotics are used in farming to prevent infections.

4 Doctors prescribe narrow spectrum antibiotics that only kill a few types of bacteria.

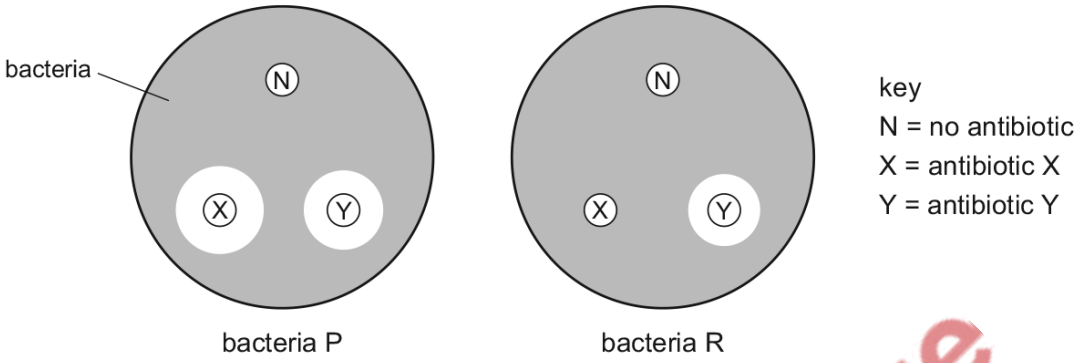
A 1, 2 and 3 **B** 1, 2 and 4 **C** 1, 3 and 4 **D** 2, 3 and 4

PapaCambridge

1473. 9700_w20_qp_13 Q: 36

The diagrams show the result of incubating two species of bacteria, P and R, on separate Petri dishes each containing nutrient agar.

Three filter paper discs have been added to each Petri dish.



Which statement is correct?

A Antibiotics X and Y are resistant to bacteria P.

B Bacteria P are resistant to both antibiotics.

C Bacteria R have a mutation that makes them resistant to antibiotic Y.

D N is a control disc showing bacteria R grow when antibiotic Y is not present.

1474. 9700_m19_qp_12 Q: 37

What explains why most viruses that cause diseases in humans are unaffected by antibiotics?

A Viral antigens do not bind to antibiotics.

B Viral nucleic acids are protected by a protein coat.

C Viruses contain no ribosomes or mRNA.

D Viruses reproduce inside living eukaryotic cells.

1475. 9700_s19_qp_13 Q: 38

How does penicillin affect bacteria?

A It inhibits DNA replication by binding to nucleotides.

B It inhibits translation by preventing tRNA binding to ribosomes.

C It is a competitive inhibitor of an enzyme in cell wall synthesis.

D It is a competitive inhibitor of an enzyme in protein synthesis.

PapaCambridge

1476. 9700_w19_qp_11 Q: 36

Outbreaks of cholera commonly occur in refugee camps that are set up after a major natural disaster such as earthquakes.

The list shows some measures that can be taken to limit the spread of cholera in the refugee camps.

1 treating all drinking water supplies with a high concentration of chlorine

2 setting up an emergency treatment centre to isolate cases of cholera and treat them with antibiotics

3 using concentrated disinfectant to clean sewage disposal areas and infected bedding

4 health workers visiting regularly to detect cases

5 keeping good records of the number of cases and deaths at treatment centres

Which features of these control measures involve an economic factor?

A 1, 2, 3, 4 and 5

B 1, 3 and 5 only

C 2, 3, 4 and 5 only

D 2 and 4 only

1477. 9700_w19_qp_11 Q: 37

Which use of antibiotics helps to reduce the spread of resistance in bacteria?

A using high concentrations of the antibiotic to kill all the bacteria

B giving routine preventative antibiotics to people who are having an operation

C regularly changing the type of antibiotic used to treat particular bacterial infections

D giving antibiotics to treat low level infection caused by a bacterium

---

1478. 9700_w19_qp_12 Q: 37

Different antibiotics function in different ways. It is important that the antibiotic kills the bacteria, but does not harm the infected human.

The antibiotic tetracycline has been found to affect the way in which human mitochondria function.

Which statements could explain why human mitochondria function is affected by tetracycline?

A The antibiotic prevents the synthesis of peptidoglycan cell walls.

B The antibiotic prevents synthesis of linear DNA.

C The antibiotic prevents translation of circular DNA.

D The antibiotic prevents translation by binding to 70S ribosomes.

PapaCambridge

1479. 9700_m18_qp_12 Q: 37

Bacteria that infect skin wounds can become resistant to the antibiotic commonly used to kill them.

Which statement explains how these bacteria could become resistant to the antibiotic?

A Exposure to the antibiotic causes a change in the bacterial cell wall, preventing the antibiotic from working.

B Other bacteria that normally protect the skin against infection are killed by the antibiotic, allowing the infectious bacteria to survive.

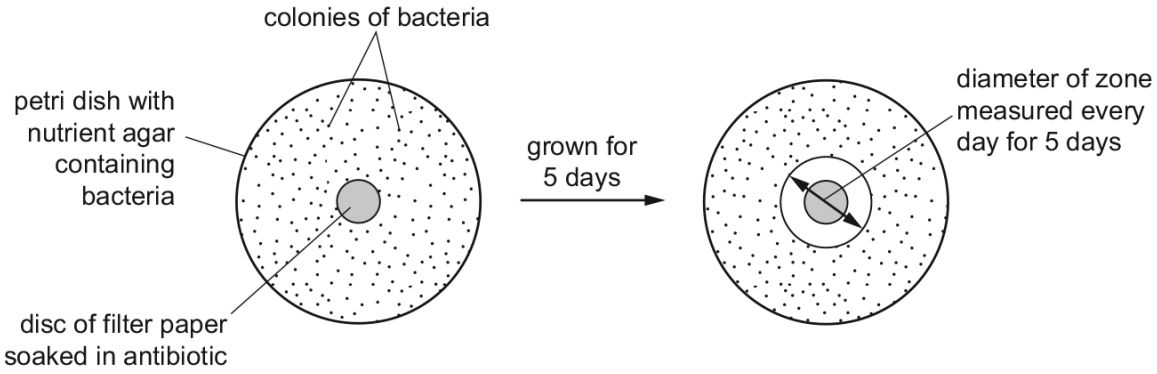
C Random mutations in DNA allow some of the bacteria to survive in the presence of the antibiotic.

D The antibiotic causes the bacterial DNA to mutate, allowing the bacteria to survive in the presence of the antibiotic.

PapaCambridge

1480. 9700_s18_qp_11 Q: 36

The diagram shows one way of testing the effect of an antibiotic on bacteria.



The table shows the results of testing five different types of bacteria.

Zones of less than 13.0 mm show the presence of resistant bacteria.

type of bacteria	diameter of zone / mm				
	day 1	day 2	day 3	day 4	day 5
1	24.1	21.9	19.0	17.6	14.3
2	18.6	15.4	12.2	9.0	2.0
3	17.9	12.8	12.4	11.1	10.9
4	19.4	15.3	13.2	8.1	2.0
5	22.0	21.0	20.5	20.4	20.4

Which statement can be supported by this data?

A All the types of bacteria become resistant to antibiotics over time.

B Only types 2, 3 and 4 of the bacteria show resistance to the antibiotic.

C The antibiotic can be used to treat types 1 and 3 only.

D Type 5 of the bacteria can never become resistant to the antibiotic.

1481. 9700_s18_qp_11 Q: 37

Some animals have genes that code for small peptides called cathelicidins. These peptides kill a wide range of bacteria by attaching to lipids in bacterial membranes, so weakening or disrupting them.

Scientists have produced a synthetic version of the cathelicidin that kills bacteria that are resistant to a number of antibiotics such as tetracycline.

Which pair of statements explain how this synthetic cathelicidin might help with the problem of antibiotic resistance?

1 It is synthetic so bacteria can never become resistant to it.

2 It could be used instead of tetracycline, allowing tetracycline resistance to be reduced.

3 The only way a bacterium could develop resistance to it is by altering all the lipids in its membranes.

4 It could be used to kill multidrug-resistant strains of bacteria for which there is no effective antibiotic.

A 1 and 3 **B** 1 and 4 **C** 2 and 3 **D** 2 and 4

1482. 9700_s18_qp_13 Q: 38

Some antibiotics work by binding to ribosomes.

Which statement explains why these antibiotics kill bacteria cells but do not kill most human cells?

A mRNA in bacteria is formed in the cytoplasm from naked DNA.

B The antibiotics cannot pass through human cell membranes.

C The codes used for amino acids in bacteria are different from those used by humans.

D The ribosomes of bacteria have a different structure from those of humans.

1483. 9700_w18_qp_12 Q: 37

The antibiotic tetracycline binds to the small subunit of bacterial ribosomes, stopping protein synthesis.

Bacteria have become resistant to tetracycline due to the effect of mutations.

Which effect could produce resistance to tetracycline?

A preventing tetracycline from binding to the bacterial cell wall

B preventing tetracycline from entering the bacterial cell

C preventing tetracycline from inhibiting transcription

D preventing the production of tetracycline by ribosomes

PapaCambridge

1484. 9700_w18_qp_13 Q: 36

Which diseases **cannot** be treated with antibiotics?

1 cholera
2 HIV/AIDS
3 measles

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

---

1485. 9700_s17_qp_12 Q: 35

Some common antibiotics are listed. The action of each antibiotic is described.

1 rifampicin – inhibits RNA polymerase
2 streptomycin – inhibits 70S ribosomes
3 neomycin – inhibits DNA synthesis
4 ampicillin – inhibits peptidoglycan synthesis

Which of these antibiotics will affect the activities of bacterial cells **only**?

A 1, 2, 3 and 4
B 1, 2 and 3 only
C 2 and 4 only
D 4 only

1486. 9700_s17_qp_13 Q: 36

Some antibiotics are used in animal feed to reduce disease.

What explains why these antibiotics should **not** be used in the treatment of human diseases?

A Human cells may stop responding to these antibiotics.
B Humans may be allergic to these antibiotics.
C Pathogenic bacteria may develop resistance to these antibiotics.
D Useful gut bacteria may be killed by these antibiotics.

PapaCambridge

1487. 9700_s17_qp_13 Q: 37

In what order do the following processes occur to produce a population of bacteria that are resistant to a new antibiotic?

1 change in reproductive success of bacteria

2 increase in frequency of the resistance allele in the population

3 increase in genetic variation within the population

4 random mutation occurs in bacterial DNA

A 1 → 3 → 2 → 4

B 2 → 1 → 3 → 4

C 3 → 4 → 1 → 2

D 4 → 3 → 1 → 2

1488. 9700_w17_qp_12 Q: 38

A scientist investigated the effect of an antibiotic on the treatment of cholera.

320 people suffering with cholera were split into two groups. One group was treated with an antibiotic while the other group was not given antibiotics. Both groups were given fluids containing sugars and mineral salts (oral rehydration therapy).

The scientist recorded the number of days that each person suffered from diarrhoea.

The table shows the results.

treatment	mean time person had diarrhoea / days
antibiotic and oral rehydration therapy	3.2
oral rehydration therapy	5.3

What is the percentage decrease in the mean time that a person suffered from diarrhoea when they were treated with the antibiotic?

A 39.6% **B** 60.4% **C** 165.6% **D** 252.4%

1489. 9700_w17_qp_13 Q: 37

The antibiotic penicillin prevents the formation of cross-links between peptidoglycans during bacterial cell wall synthesis by blocking the enzyme transpeptidase.

Which statements describe the action of penicillin on bacteria?

1 It is an enzyme inhibitor.

2 It weakens the bacterial cell wall.

3 It will work at any stage during the bacterial life cycle.

A 1, 2 and 3 **B** 1 and 2 only **C** 1 and 3 only **D** 2 and 3 only

---

1490. 9700_m16_qp_12 Q: 37

What is **not** an example of antibiotic action?

A damage to cell surface membranes

B prevention of protein synthesis

C prevention of synthesis of new cell walls

D stimulation of antibody production

1491. 9700_s16_qp_13 Q: 37

An antibiotic inhibits the formation of cross-links between the molecules that form cell walls in bacteria.

Which statements explain why bacteria are killed by the antibiotic?

1 The bacterial cell is destroyed by osmotic lysis.

2 Cellulose molecules cannot form hydrogen bonds.

3 The cell wall is no longer selectively permeable.

A 1 and 2 only **B** 2 and 3 only **C** 1 only **D** 2 only

1492. 9700_w15_qp_12 Q: 34

Why is it necessary for a person with a bacterial infection to take antibiotics at evenly spaced time intervals?

A to increase the concentration of antibiotic slowly to a level which is lethal to the bacteria

B to maintain a concentration of antibiotic in the body which is lethal to the bacteria

C to prevent the development of resistant strains of bacteria

D to select and kill the resistant strains of bacteria

PapaCambridge

1493. 9700_w15_qp_13 Q: 35

The data shows how the number of human deaths caused by the bacterium *Staphylococcus aureus* has changed over a period of five years.

Methicillin is an antibiotic used to treat a disease caused by *S. aureus*.
MRSA is methicillin-resistant *S. aureus*.

year	total number of deaths caused by *S. aureus*	total number of deaths caused by MRSA
1	369	355
2	452	431
3	456	681
4	420	890
5	428	1512

Which statement is **not** supported by this data?

A More people have MRSA so the disease spreads.

B MRSA is more likely to lead to death than *S. aureus*.

C Resistant strains of MRSA are becoming more common.

D *S. aureus* will always cause humans to die.

PapaCambridge