



Health risks, evidence and treatment: practice questions

10 questions · 40 marks · mark scheme at the back

For Pearson Edexcel International AS Biology XBI11 and International A Level Biology YBI11. **A Level only** is IA2 content (Units 4 to 6), not needed for the International AS.

Name

Total / 40

1 UNIT 1 STYLE

[6 marks]

The table shows the percentage of adults who smoke and the death rate from coronary heart disease (CHD) in five regions (data for practice). (i) Describe the relationship shown by the data. (2) (ii) Calculate the percentage increase in the death rate from region A to region E. (2) (iii) Explain why these data do not prove that smoking causes CHD. (2)

Smoking and CHD death rates		
Region	Adults who smoke (%)	CHD deaths per 100 000 per year
A	12	95
B	18	130
C	25	160
D	31	190
E	38	215

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[3 marks]

[illegible]

[4 marks]

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[3 marks]

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5 UNIT 1 STYLE**[5 marks]**

The table shows blood cholesterol results for four people. (i) Identify the person with the highest risk of CVD and justify your choice. (3) (ii) Explain why a high concentration of HDL is associated with lower risk of CVD. (2)

Blood cholesterol results / mmol dm ⁻³			
Person	Total cholesterol	HDL	LDL
A	4.5	1.6	2.2
B	6.8	0.9	4.9
C	5.4	1.4	3.3
D	6.2	1.8	3.8

6 UNIT 1 STYLE**[4 marks]**

Describe the evidence for a causal relationship between blood LDL cholesterol and cardiovascular disease.

[4 marks]

Answer = ...

[illegible]

[4 marks]

[illegible]

[1 mark]

- A. ☐ They reduce the stickiness of platelets
- B. ☐ They lower blood pressure by relaxing artery walls
- C. ☐ They lower blood LDL cholesterol
- D. ☐ They prevent fibrinogen forming

Discuss the benefits and risks of using statins and platelet inhibitors to treat cardiovascular disease.

Mark scheme

One mark for each point unless a maximum is given. Words in brackets are not needed for the mark.

1. [6]

- (i) positive correlation / as percentage of smokers rises, CHD death rate rises (1)
- quotes figures, e.g. from 95 at 12 % to 215 at 38 % (1)
- (ii) $(215 - 95) \div 95 \times 100$ (1)
- = 126 % (1)
- (iii) correlation does not show causation (1)
- other variables (for example diet, age, exercise, or other differences between regions) could affect death rate / data are for regions not individuals (1)

2. [3]

- different sample sizes / different groups of people studied (age, gender, ethnicity) (1)
- different ways of measuring salt intake (self-reported or measured) (1)
- different lengths of study / different variables controlled (1)
- chance / one study may have had bias (1)
- Max 3

3. [4]

- sample is small, so results are not reliable / more affected by chance (1)
- volunteers from one gym are not representative of the population / are likely to be health-conscious, so bias (1)
- diet recalled from memory / self-reported, so not valid / not accurate (1)
- no control group / other variables (exercise, smoking) not controlled / short duration, so cannot conclude low-fat diet prevents CVD (1)
- Max 4

4. [3]

- the harm builds up over many years / long delay before disease appears, so people feel healthy now (1)
- people enjoy / are used to the behaviour, or think it will not happen to them (1)
- they see relatives or others who did not develop the disease (personal experience) (1)
- media focus on more dramatic risks / statistics are not well understood (1)
- Max 3

5. [5]

- (i) person B (1)
- highest total cholesterol (6.8) and highest LDL (4.9) (1)
- lowest HDL (0.9) / highest total cholesterol : HDL ratio (7.6) (1)
- (ii) HDL carries cholesterol from the tissues / artery walls to the liver (1)
- so less cholesterol is deposited in the artery wall / less atheroma forms (1)

6. [4]

- population studies show higher CVD rates in people with higher total / LDL cholesterol (1)
- people with inherited very high cholesterol develop CVD at a young age (1)
- LDL is found in plaques / the mechanism of foam cell formation is known (1)
- trials show lowering LDL (for example with statins) reduces heart attacks and strokes (1)
- Max 4

7. [4]

- $BMI = \text{mass} \div \text{height}^2 = 92 \div 1.80^2$ (1)
- $= 28.4 \text{ kg m}^{-2}$ (1)
- waist-to-hip ratio $= 104 \div 100 = 1.04$ (1)
- ratio above the 0.85 commonly used for women, so higher risk (excess abdominal fat) (1)

8. [4]

- reduce saturated fat in the diet to lower LDL cholesterol / less atheroma (1)
- reduce salt to lower blood pressure (1)
- take regular exercise to lower blood pressure / raise HDL / control body mass (1)
- do not smoke, to avoid carbon monoxide / nicotine / endothelial damage (1)
- use BMI or waist-to-hip ratio to monitor body mass (1)
- Max 4

9. [1]

C C: they lower blood LDL cholesterol

10. [6]

- statins lower LDL cholesterol by reducing cholesterol production in the liver (1)
- so slow atheroma formation / reduce the risk of heart attack and stroke (1)
- risks of statins: muscle pain / digestive upset / rarely liver damage (1)
- platelet inhibitors stop platelets sticking together (1)
- so reduce clot formation in arteries / risk of heart attack and stroke (1)
- risks of platelet inhibitors: bleeding / stomach irritation or ulcers (1)
- treatment decided by weighing benefit against risk for each patient, with lifestyle changes (1)
- Max 6