



H14-10min Crude and Standardised Rates: 10-minute Pack

EDEXCEL 1ST0 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / ____

Answer ALL questions. Show all your working.

- 1** To compare mortality between areas fairly, statisticians often use a standard population with known age-specific death rates. The table below shows the standard population's age-specific death rates used throughout this pack.

Age band	Standard age-specific death rate (per 1000)
Under 40	1
40-64	5
65 and over	50

- (a) Explain why simply comparing two areas' crude death rates can be misleading if their populations have different age structures, and state what problem standardisation is designed to solve. (2)
- (b) State what is used, alongside a local area's own population figures, to calculate its expected number of deaths in this method. (1)

(Total for Question 1 is 3 marks)

2 The standardised mortality ratio (SMR) compares the observed number of deaths in an area with the number of deaths that would be expected if the area had the standard population's age-specific death rates.

(a) Which of the following is the correct formula for the SMR? **(1)**

- ☐ A) $(\text{Expected deaths} / \text{Observed deaths}) \times 100$
- ☐ B) $(\text{Observed deaths} / \text{Expected deaths}) \times 100$
- ☐ C) $(\text{Observed deaths} / \text{Total population}) \times 1000$
- ☐ D) $(\text{Observed deaths} - \text{Expected deaths}) \times 100$

(b) Write down the value that an SMR is always compared against. **(1)**

.....
(Total for Question 2 is 2 marks)

3 Trust Marlow has an SMR of 140. The expected number of deaths at Marlow, based on the standard population's age-specific rates, was 250.

(a) Calculate the actual (observed) number of deaths recorded at Trust Marlow. **(3)**

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(b) Trust Nesbury has an SMR of 80 and recorded 240 observed deaths. Calculate the expected number of deaths for Trust Nesbury. **(3)**

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(Total for Question 3 is 6 marks)

Mark scheme · H14-10min Crude and Standardised Rates: 10-minute Pack

Question 1

- (a) **B1** identifies that crude rates are affected by age structure, e.g. an area with more older people will tend to have a higher crude rate even with the same underlying health, oe
- (a) **B1** states that standardisation is designed to adjust for/remove this effect of differing age structures, allowing a fairer comparison of underlying mortality between areas, oe
- (a) **Answer: Crude rates can be misleading because they are affected by an area's age structure, not just its underlying health, so an older population will tend to show a higher crude rate anyway. Standardisation is designed to adjust for these age differences so that areas can be compared fairly.**
- (b) **B1** the standard population's age-specific death rates cao
- (b) **Answer: The standard population's age-specific death rates, applied to the local area's population in each age band.**

Question 2

- (a) **B1** B cao
- (a) **Answer: B) (Observed deaths / Expected deaths) x 100**
- (b) **B1** 100 cao
- (b) **Answer: 100**

Question 3

- (a) **M1** 140 / 100, oe (finds the SMR as a decimal multiplier)
- (a) **M1** their multiplier x 250, oe (dep)
- (a) **A1** 350 cao
- (a) **Answer: 350**
- (b) **M1** 240 / 80, oe
- (b) **M1** their value x 100, oe (dep)
- (b) **A1** 300 cao
- (b) **Answer: 300**