Solutions

Marking: **M1** a correct method, **A1** the correct answer, **B1** an independent mark.

Each answer shows the steps, then the **result**.

2.1

prevalence on 1 January: $200/5000 = \mathbf{4\%}$

people at risk: $5000 - 200 = 4800$

one-year risk: $48/4800 = \mathbf{1\%}$

2.2

person-time $= 3 + 2 + 5 + 4 = 14$ person-years; 2 cases

$2/14 \approx$ **0.14 per person-year** (143 per 1000)

2.3

drug keeps HIV patients alive longer: **raises**

cure for hepatitis C: **lowers**

more flu cases: **raises**

2.4

$18 \div 400$

$= \mathbf{4.5\%}$

3.1

(a) A: $300/20\,000 =$ **15 per 1000**; B: $120/20\,000 =$ **6 per 1000**

(b) **Town B**

(c) A has many old people, who die more often, so its crude rate is high even though its death rate at each age is lower

(d) it applies each town's age-specific rates to the same standard population, so the age mix no longer differs

3.2

(a) $0.020 \times 2 =$ **0.04**, about 4%

(b) it **rises**

(c) prevalence counts everyone who has the disease now, and they all need care; incidence counts only new cases

3.3

(a) $40/1000 = \mathbf{4\%}$

(b) $960 \times 5 + 40 \times 2.5 = 4900$ person-years

(c) $40 \div 4900 \times 1000 \approx$ **8.2 per 1000 person-years**

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(d) they already had asthma, so they were not at risk of becoming a new case

(e) person-time counts only the time each person was followed, so people who leave early still count correctly; risk assumes everyone was followed for all 5 years