

CHAPTER 2: Measuring disease frequency

QUESTIONS

1. What effect would the following have on (i) the incidence, (ii) the prevalence and (iii) the duration of disease and why?
 - (a) The introduction of a new drug that cures a previously incurable but non-fatal disease
 - (b) The introduction of a new drug that prolongs survival but does not cure a fatal disease
 - (c) The introduction of a new vaccine that prevents people from developing a disease
2. For each of the following calculate a summary measure of disease and identify what type of measure it is:
 - (a) 2,000 babies were born at a hospital during one year, of these 70 had a congenital defect.
 - (b) In a city with an average population of 1,200,000 people there were 18 new diagnoses of HIV infection in a one year period.
 - (c) 100 people attended a barbeque lunch and the following day 24 experienced nausea and vomiting.
 - (d) 1500 people in a community answered a health survey and, of these:
 - i. 75 reported that they had diabetes
 - ii. 15 reported that they had been newly diagnosed with diabetes during the previous year
 - (e) In the US Nurses' Health Study, 95,396 post-menopausal women reported their levels of physical activity in 1986 and were then followed for up to 20 years with a total of 1,203,929 person-years of follow-up. A total of 4,782 women have developed invasive breast cancer.
3. The following excerpt is from an official government report: 'As at 30 June 2002, the number of people living with HIV in Australia was 13,120. This represents a prevalence rate of 65.6 per 100,000 population.' Although the term prevalence rate is commonly used it is not strictly correct. Why not?
4. What is the difference between a cumulative incidence and incidence rate?
5. In January 2001, 4,500 men aged 45-54 years joined a new health insurance plan and were offered a free health check, 1000 of the men were found to be overweight or obese. Ten years later the men were checked again and 700 men who were normal weight in 2001 were now overweight or obese, while 200 of those who were overweight or obese in 2001 had lost weight and were now in the normal range.
 - (a) What was the prevalence of overweight and obesity in the men in (i) January 2001 and (ii) January 2011?
 - (b) What was the incidence of overweight/obesity in this group?
 - (c) What was the incidence of weight-loss among overweight/obese men?

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6. The population of Australia in 2005 was 20,395,000 with 10,128,000 males and 10,267,000 females. At the end of 2004, 654,977 living persons had been diagnosed with cancer at some time in the last 23 years. During 2005, 22,017 males and 17,080 females died from cancer, 1119 males and 1062 females were diagnosed with pancreatic cancer and 964 males and 1062 females died from pancreatic cancer.
- (a) What was the prevalence of cancer in Australia on 1 January 2005?
 - (b) What was the cancer-specific mortality rate in 2005?
 - (c) What were the sex-specific incidence rates for pancreatic cancer in 2005?
 - (d) Estimate the case-fatality rate for pancreatic cancer.
 - (e) What proportion of all cancer deaths are due to pancreatic cancer?

Data from: AIHW (Australian Institute of Health and Welfare) & AACR (Australasian Association of Cancer Registries) 2008. Cancer in Australia: an overview, 2008. Cancer series no. 46. Cat. no. CAN 42. Canberra: AIHW.

7. (a) Define life expectancy (i) at birth and (ii) at age 50.
- (b) Are measures of life expectancy likely to under- or over-estimate the actual number of years someone will live?
 - (c) Why is the 'Disability-adjusted life year' (DALY) a more useful summary measure of health than life expectancy?
 - (d) If statistics show that life expectancy at birth is 58 years but life expectancy at age 50 is 16 years (i.e. an expected final age of 66 years) is this likely to be an error and, if not, why not.