Statistical Literacy Guide

Incidence and prevalence

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When looking at levels of disease and illness in society two of the most commonly used terms are incidence and prevalence. These terms are often confused and or used incorrectly. This note provides a simple explanation of the two terms and the difference between them.

1 What is incidence?

Incidence is the number of new cases of an illness identified, or of persons becoming ill (or dying or being injured etc) during a given period, usually a year. Incidence includes only new cases, not ongoing cases of existing conditions.

Since it is often of interest to compare the incidence of diseases/conditions across different areas (e.g. countries, regions, health authorities) incidence is often reported as a standardised rate per 100,000 of the population.[1]

For example, Office for National Statistics (ONS) cancer registration data shows that there were 242,184 new registrations of cancer in England in 2006. The mid 2006 population estimate for England was around 50.8 million, so the incidence of all cancers in England was 477 per 100,000 population; ie

$$\text{Cancer incidence rate per 100,000} = \frac{\text{number of new cases (242,184)}}{\text{total population (50.8 million)} * 100{,}000} = 477 \text{ per } 100{,}000$$

2 What is prevalence?

Prevalence refers to the current number of people suffering from an illness/condition at a given point in time. Prevalence figures include all those who may have been diagnosed in prior years, as well as in the current year. For instance the incidence of cancer as shown above is around 242,000 new cases a year. However the prevalence of cancer in 2006 was around 462,000. This is because the prevalence figures include cancer survivors who were diagnosed in previous years.

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[1] Since it is very common for levels of illness or disease to vary with age, incidence rates are often reported for an age standardised population. Age standardisation controls for differences in the age profile of populations, allowing for unbiased comparisons of incidence in different regions to be made.

Prevalence rates can also be calculated. These are expressed as a percentage and are calculated by dividing the total number of cases of a disease by the population in which they occur. For example the prevalence rate of cancer in 2006 was 0.91%, that is equivalent to just under 1 case for every 100 people.

$$\text{Cancer prevalence rate} = \frac{\text{total cases of cancer (462,000)}}{\text{total population (50.8 million)}} = 0.91\%$$

3 Which is the best measure to use?

As outlined above, incidence and prevalence are different measures of a disease's occurrence. The prevalence of a condition means the total number of people who currently have the condition, whereas incidence refers to the number of people who have been newly diagnosed with the condition over a given period of time.

Incidence is the most informative measure when considering short acute conditions, eg measles, commons colds. These conditions may have a relatively high incidence rate over a given period, such as winter months, so it can be helpful to monitor changes in period specific incidence.

Prevalence data can be more informative when dealing with chronic diseases and conditions such as diabetes, coronary heart disease, obesity. Such conditions can have a relatively low incidence over a given period but higher prevalence rates. This is because the prevalence is the cumulative sum of past year incidence rates.

In some cases both incidence and prevalence are of interest. For instance a rise in the incidence of a long term condition like diabetes would suggest resource implication for health services in future years.