The difference between incidence and prevalence

This paper is one of a series of short papers on aspects of research by Linda Shields and Alison Twycross

Linda Shields PhD, FRCNA, Professor of Nursing, University of Limerick, Ireland;
Alison Twycross RSCN, RGN, MSc, RMN, CertEd, DMS, Senior Lecturer in Children's Nursing, Glasgow Caledonian University and Senior Nurse for Research Development, Yorkhill NHS Trust, Glasgow

ACKNOWLEDGEMENTS
During this work, the first author was supported by the National Health and Medical Research Council of Australia Public Health Postdoctoral Fellowship Number 997096 and National Health and Medical Research Council of Australia Travelling Fellowship Grant ID 235610.

TAXI

Epidemiologists study the health of population groups within societies or countries. This information helps plan health programmes, to know how one country's health compares with another, and many other things that are useful for all who work in a health setting. Two of the most commonly used terms in epidemiology are prevalence and incidence, and they are often mixed up or used incorrectly.

What is incidence?

Many research reports talk about incidence, but in strict epidemiological terms there are different concepts that surround the word, including incidence proportion, incidence density and others. However, true incidence is 'the number of instances of illness commencing, or of persons becoming ill' (or dying or being hurt in injuries, or whatever) 'during a given period in a specified population' (Last 2001). When most people use the term they mean the incidence rate, which differs slightly in that it is the rate at which events occur in a population (Last 2001). In other words, incidence usually means something that is measured within a set number of people and in a time period (Rothman 2002).

Incidence can tell us how many new cases of a particular illness have been suffered by a community, or it might tell us how patterns of a condition within a population change over time. Auckland, in New Zealand, often has epidemics of meningococcal disease, with annual incidences of up to 16.9/100,000 people (Baker *et al* 2000). No one knows why, but by examining ways that the incidence changes over time, and with environmental factors, an understanding of how the disease is spread has been gained. Incidence rates allow comparisons to be made. In the same time frame as the Auckland epidemics were occurring Queensland, in Australia, had an incidence of 2.8/100,000 in one year (Ward *et al* 2000). Because incidence is expressed as a rate, it does not matter that the population of Queensland, at about 3.5 million people, is larger than the population of Auckland (about 1 million). This information tells health planners that in a year, Auckland suffers, in population terms, a more serious outbreak of meningococcal disease than Queensland. Some care has to be taken when determining incidence as different groups within a community, for example age groups, will need to be considered when doing the calculations.

What is prevalence?

Prevalence (or to be more correct, prevalence proportion and sometimes point prevalence) gives a figure for a factor at a single point in time (Jekel *et al* 2001). We may want to know how many children are overweight in a country. By measuring the height and weight of every child of a particular age in a sample of children and calculating their body mass index, we will have some idea of how many children, at that point in time, in that sample of children, (not necessarily new cases) are overweight. This is the prevalence. The important words are 'at that point in time' because prevalence can tell us only what is happening at a certain point. A recent Scottish study showed that the prevalence of obesity in a group of children aged from three to four years was 12.8 per cent at the time when the data were collected (Armstrong and Reilly 2002).

When to use prevalence or incidence depends on what you want to know. Administrators in paediatric hospitals know that the prevalence of respiratory infections is highest in the winter months, so plan staffing levels accordingly. Hence, children's hospitals in Britain make sure few of its staff are on holidays during January when the prevalence of respiratory disease is highest PN

REFERENCES

Armstrong J, Reilly JJ (2002) Child health information team. *Lancet*. 359, 2003-2004.

Baker M *et al* (2000) Household crowding a major risk factor for epidemic meningococcal disease in Auckland children. *Pediatric Infectious Disease Journal*. 19, 10, 983-990.

Jekel JF *et al* (2001) *Epidemiology, Biostatistics, and Preventive Medicine (2nd edition)*. Philadelphia, WB Saunders.

Last JM *et al* (2001) *A Dictionary of Epidemiology (4th edition)*. Oxford, Oxford University Press.

Rothman KJ (2002) *Epidemiology: An introduction*. Oxford, Oxford University Press.

Ward J *et al* (2000) Enhanced surveillance for meningococcal disease in Queensland in 1999. *Communicable Diseases Intelligence*. 24, 11, 332-225.