

year ending in 1 (e.g. 1991, 2001).

There are two methods (namely direct and indirect) of calculating age-standardised rates. The direct method is generally used for comparisons between study groups.

Formula:

Direct method:-

$$SR = (\text{SUM}(r_i * P_i)) / \text{SUM} P_i$$

Indirect method:-

$$SR = (C / \text{SUM}(R_i * p_i)) * R$$

Where:

SR is the age-standardised rate for the population being studied

r_i is the age-group specific rate for age group i in the population being studied

P_i is the population of age group i in the standard population

C is the observed number of events* in the population being studied

$\text{SUM}(R_i p_i)$ is the expected number of events in the population being studied

R_i is the age-group specific rate for age group i in the standard population

p_i is the population for age group i in the population being studied

R is the crude rate in the standard population

* 'Events' can include deaths, incident or prevalent cases of disease or other conditions, or health care utilisation occurrences.

For the purposes of comparisons of population rates for Australia over time, and/or populations within Australia (e.g. States and Territories, Indigenous and non-Indigenous) the standard population to be used is the final 30 June estimated Australian resident total population (males plus females) for the most recent year ending in 1 (e.g. 1991, 2001).

There are two methods (namely direct and indirect) of calculating age-standardised rates. The direct method is generally used for comparisons between study groups.

The indirect method is recommended when the age-specific rates for the population being studied are not known but the total number of events is known or when calculating rates for small populations where fluctuations in age-specific rates can affect the

reliability of rates calculated using the direct method.

The standard population used for purposes of international comparisons is generally the World Standard Population as recommended by the World Health Organization or the European Standard Population.

Five year age groups should normally be used, with the age group 0-4 separated into 0 and 1 to 4, and ages over 85 years combined, thus 0, 1-4, 5-9, 10-14, , 80-84, 85+. If these age groups are not used, the actual age groups should be detailed in notes accompanying the age standardised population rate information.

Standardisation separately for males and females is not usually undertaken but may be appropriate for some applications, for example, hospitalisation rates for caesarean section is best undertaken using a female standard population rather than a standard population for both sexes. If standardisation is undertaken in this way this should be detailed in notes accompanying the age standardised population rate information.

When indirect age standardisation is undertaken for comparisons with or between Indigenous populations, the latest available rates could be used as the standard. In addition, age groups older than 70-74 years could be excluded. This is as recommended in the National Performance Indicators for Aboriginal and Torres Strait Islander Health Technical Specifications.

Related metadata: relates to the data element Crude rate version 1

Administrative Attributes

Source Document: Textbooks of epidemiology, demography and biostatistics.
The notation used in this data element is based on Armitage P & Berry G 1994. Statistical Methods in Medical Research. Oxford: Blackwell Scientific Publications.

Source Organisation: AIHW

Comments: Standardised rates are generally multiplied by 1,000 or 100,000 to avoid small decimal fractions. They are then called standardised rates per 1,000 or 100,000 population.

The indirect method is also used to calculate standardised mortality ratios (SMRs) and other standardised ratios, for example for health service utilisation. These ratios express the overall

