# Age-standardised rate

Important note: This is an archived metadata standard from the AIHW Knowledgebase. For current metadata standards and related information please access METeOR, the AIHW's Metadata Online Registry at <a href="http://meteor.aihw.gov.au">http://meteor.aihw.gov.au</a>

# Identifying and Definitional Attributes

Data Dictionary: NHDD

Knowledgebase ID: 000769 Version number: 1

Metadata type: DERIVED DATA ELEMENT

Registration NHIMG Admin status: SUPERSEDED

Authority: Effective date: 01-MAR-05

Definition: A method of adjusting the crude rate to eliminate the effect of

differences in population age structures when comparing crude rates

for different periods of time, different geographic areas and/or

different population sub-groups (e.g. between one year and the next

and/or States and Territories, Indigenous and non-Indigenous populations).

Adjustments are usually undertaken for each of the comparison populations against a standard population (rather than adjusting one

comparison population to resemble another). Sometimes a comparison population is referred to as a study population.

Context: Population health and health services research:

For valid comparisons of rates in different populations, such as incidence rates, prevalence rates, mortality rates and health service

utilisation rates.

# Relational and Representational Attributes

Datatype: Numeric

Representational QUANTITATIVE VALUE

form:

Representation NNNNNN.N

layout:

Minimum Size: 1 Maximum Size: 8

Guide For Use: 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.

Formula:

Direct method:-

SR= (SUM (ri \* Pi))/SUM Pi

Indirect method:-SR=(C/SUM(Ri \*pi))\*R

#### Where:

SR is the age-standardised rate for the population being studied ri is the age-group specific rate for age group i in the population being studied

Pi is the population of age group i in the standard population C is the observed number of events\* in the population being studied

SUM(Ripi) is the expected number of events in the population being studied

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

pi 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

experience of a comparison population in terms of the standard population by calculating the ratio of observed to expected deaths in the comparison population:

SMR = C / Sum(Ri \* Pi)

The standard population used to calculate SMRs can be any population to which the comparison population is being compared. For example, if death rates for birthplace groups are compared to those of the Australian-born population using SMRs, the standard population would be the Australian-born population.

Sometimes the SMR is multiplied by 100 to express the ratio as a percentage, although this is not universally accepted. Not multiplying by 100 has the benefit of being able to say that the SMR was, for example, 2.3 times that expected rather than 130% higher.

Standardised ratios for hospitalisations and other events can be calculated using similar techniques.

## Data Element Links

Information Model Entities linked to this Data Element
NHIM Program evaluation

Data Agreements which include this Data Element