

2 Methodology

2.1 Data collection

2.1.1 Perth, Western Australia

The population defined for the MONICA Study in Perth was persons aged 25–64 years who were normally residents of the Perth Statistical Division, effectively the Perth Metropolitan Area. There were 195,417 men and 199,636 women aged 35–64 years in the study population in 1991. Coronary events were registered for 10 full years from 1984 to 1993 using the 'cold pursuit' method. That is, non-fatal events were ascertained by surveillance of routinely collected statistics compiled from diagnoses recorded at discharge from hospital. These cases were identified from records bearing the Ninth Revision of the International Classification of Diseases (ICD-9) codes for AMI or sub-acute ischaemic heart disease (ICD codes 410 and 411 respectively). Additionally, three times during the year, computerised hospital separation records for all hospitals in Western Australia were searched systematically for mention of these codes in records of persons normally resident in the Perth Statistical Division and this resulted in a small number of additional cases being registered. Information about coronary deaths in Perth was obtained either by notification from the Coroner's pathologist or by regular searches of death registrations. Supplementary information was obtained from hospitals and coroner's records and from medical practitioners involved in managing the cases. In Perth, information on medical treatment was collected continuously during the 10 years of registering coronary events.

Three surveys of risk factors were conducted in Perth during the study period, the first in 1983, the second in 1989 and the third in 1994.

2.1.2 Newcastle, New South Wales

The population for the MONICA Project in Newcastle was residents aged 25–69 years of the five local government areas of Newcastle, Lake Macquarie, Port Stephens, Maitland and Cessnock. There were 76,831 men and 76,502 women aged 35 to 64 years in the study population in 1991.

Registration of coronary events began in Newcastle in August 1984 and continued until March 1994. The 'hot pursuit' method was used to identify patients; that is, study nurses monitored all hospitals in the area and registered every patient likely to meet the study criteria. Patients were interviewed while they were in hospital and information was extracted from their medical records at that time (rather than retrospectively). Fatal events were ascertained by continuous surveillance of all death certificates and details of fatal cases were obtained from death certificates, post-mortem records and from doctors, relatives or other informants. Information on the use of medical treatment during and after hospitalisation was collected in Newcastle from August 1984 to December 1985 and from July 1988 to March 1994 but information on the use of medical treatment before hospitalisation was collected continuously throughout the period.

Three surveys of risk factors were conducted during the study period, the first in 1983, the second in 1988 and 1989 and the third in 1994.

2.2 Age standardisation

All means and percentages are calculated by direct age standardisation. Age standardisation allows comparisons between populations with different age distributions. The age distribution of the reference population used for age standardisation needs to bear some relationship to the age distribution of the phenomena under study lest important artifacts be introduced by the calculations. For this reason two different populations are used for age standardisation in this document. All data for the surveys of risk factors and all rates of coronary events are age-standardised to the 1991 Australian population as these phenomena relate to the whole population (Table 2.1).

Table 2.1: Australian population by sex and age group, 1991

Age group (years)	Population	
	Men	Women
35–39	664,228	664,159
40–44	655,138	639,133
45–49	526,498	502,647
50–54	433,762	413,172
55–59	367,302	358,648
60–64	366,779	370,089

Data on treatments for people who suffer an AMI or coronary death, and case fatality of AMI are age-standardised to the distribution of events in the MONICA populations in Australia (Table 2.2).

Table 2.2: Weightings for MONICA populations by sex and age group

Age group (years)	Weightings	
	Men	Women
35–39	311	46
40–44	673	96
45–49	1,097	188
50–54	1,512	331
55–59	2,328	622
60–64	3,260	1,168

This is appropriate as both treatment and outcome of AMI are related to the cases of the disease and not to the general population.

Separate weights are used for men and women in both situations, therefore a comparison of age-standardised rates between men and women is not strictly valid.

There is no weighting for any response differences (e.g. by age, sex, country of birth or area). This is different from the way in which data on risk factors are published by the National Heart Foundation.

2.3 Trends in rates of events

The annual percentage change in rates of events is calculated from the estimated value of α from a Poisson regression model. The outcome variable is the number of events in each age group and the predictor variables are year and age group.

Based on α , an average annual rate of change has been derived as follows:

$$\text{percentage change} = [e^{\alpha} - 1] \times 100\%$$

2.4 Trends in levels of medical treatment and trends in levels of risk factors

Trends in the use of medication in those who suffer coronary events and trends in levels of risk factors and the use of medications in the general population are estimated using linear regression. Individual data are fitted to the model, the outcome variable is the risk factor or treatment of interest, and the predictor variables are year and age group. The coefficient of year from this model is the estimate of annual change. Data on events and the use of medical treatment are presented in three-year periods but estimates of trend are based on data for individual years.

2.5 Definition of previous AMI

Patients were classified as having a history of AMI if:

- there was any evidence in the medical records indicating that the subject had suffered a definite, possible or suspected AMI; or
- the patient or their relative responded yes when asked if the patient had previously suffered a heart attack.

If medical records were not seen and there was no response to the question on whether the patient had suffered a heart attack, history of AMI was classified as unknown. Status on previous AMI was unknown for less than 4% of non-fatal events but for substantially more fatal events (Figures 2.1 and 2.2). Previous MONICA records were not used to determine status on previous AMI because there would have been no such records at the start of the study and 10 years of records at the end. Therefore, using the MONICA records would have introduced bias.

