



Computer
Assisted
Telephone
Interviewing
Technical
Reference
Group

Population Health Monitoring and Surveillance:
Question Development Background Paper

Cardiovascular Disease
in Australia

May 2003

CATI Technical Reference Group
National Public Health Partnership

Computer Assisted Telephone Interviewing (CATI) is a methodology widely used for surveillance of health behaviours and health outcomes in populations in Australia. The National CATI Health Survey Technical Reference Group (CATI TRG) is an advisory committee to the National Public Health Information Working Group under the National Public Health Partnership. Members of the CATI TRG include representatives from State/Territory Health Departments, the Commonwealth Department of Health and Ageing (DoHA), the Australian Bureau of the Statistics, the Australian Institute of Health and Welfare and the Public Health Information Development Unit at the University of Adelaide. Since its inception in 1999, the CATI TRG has been a forum for the development and promotion of national standards, valid methods and capacity for CATI health surveys and health surveillance.

To embark in the efforts towards 'harmonisation' of CATI health surveys in Australia, the CATI TRG has identified the need to develop question modules for behavioural risk factor and chronic disease topics based on well-developed conceptual frameworks that underpin the data requirements for health surveillance. The proposed question modules are set to undergo a rigorous process of cognitive and field-testing under the guidance of the CATI TRG and the results will be published in a question module manual as a key reference to those interested in CATI health surveys in Australia.

This paper has been prepared by the CATI TRG as part of a series, with funding predominantly from the DoHA. Its preparation has involved input from all State and Territory jurisdictions, DoHA, the Australian Bureau of Statistics, the Australian Institute of Health and Welfare and the Public Health Information Development Unit at the University of Adelaide as well as recognised content experts.

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1 Introduction

The purpose of this background paper is to present the conceptual framework that underpins the concepts and data requirements for the ongoing monitoring and surveillance of cardiovascular disease in Australia. This will assist in the development of nationally agreed computer assisted telephone interview (CATI) survey questions to monitor the prevalence of cardiovascular disease and its associated impact on individuals.

In 1996, cardiovascular disease was identified as one of the National Health Priority Areas in recognition of the extent of the disease in Australia, the impact on the health of the population and the scope for prevention and improvements. Although the death rates from cardiovascular disease have fallen over the past thirty years, it continues to be the leading cause of morbidity and mortality in the Australian population. The high prevalence of cardiovascular conditions is of particular concern for health authorities and the general public given that it impacts greatly upon the ageing population (AIHW & DHAC 1999). Cardiovascular conditions also place a heavy burden on society in terms of illness, disability and economic cost. There is great scope for improvements in the mortality and morbidity rates from cardiovascular disease as much of it is preventable.

This paper is divided into five sections. Following the introduction, there are separate sections outlining a profile of cardiovascular disease; factors influencing the health of people with cardiovascular disease; data requirements and concepts to be measured; and issues in monitoring cardiovascular disease. Specifically it addresses areas such as prevalence and incidence, risk factors, the burden of disease, treatment and rehabilitation.

This paper will provide a valuable resource to those interested in the monitoring and surveillance of cardiovascular disease.

2 Profile of cardiovascular disease

2.1 Types of cardiovascular disease

Cardiovascular disease, or diseases of the circulatory system includes all diseases of the heart and blood vessels. In Australia, these diseases mostly result from impeded or diminished supply of blood to the heart, brain or leg muscles. Diseases of the circulatory system are classified according to the International Classification of Diseases (ICD). The most recent revision (ICD-10) was implemented in Australia in 1999 and comprises the following conditions for cardiovascular disease:

- acute rheumatic fever and chronic rheumatic heart diseases (I00-I09);
- hypertensive diseases (I10-I15);
- ischaemic heart diseases (I20-I25);
- pulmonary heart disease and diseases of pulmonary circulation (I26-I28);
- other forms of heart disease (I30-I52);
- cerebrovascular diseases (I60-I69);
- diseases of arteries, arterioles and capillaries (I70-I79);
- diseases of veins, lymphatic vessels and lymph nodes, not elsewhere classified (I80-I89); and
- other and unspecified diseases of the circulatory system (I95-99). (ABS 2002)

The underlying problem in cardiovascular disease is atherosclerosis, a process that clogs blood vessels with deposits of fat, cholesterol and other substances. When blood supply to the heart is affected, it can result in angina, a heart attack or sudden death. Conversely, a stroke may be caused as a result of insufficient supply of blood to the brain (AIHW 2000).

2.2 The extent of the problem

Cardiovascular disease was identified as one of the National Health Priority Areas (NHPA) in 1996 in recognition of the severe impact it has on the health and well being of the population through high levels of mortality and morbidity. The NHPA initiative brings together the efforts of various levels of government and non-governmental sources with the ultimate aim of reducing both the incidence and impact of cardiovascular disease in Australia. This commitment directs attention to the broad scope for prevention and reduction in the extent of cardiovascular disease in Australia. With such a focus, strategies are now in place or are being developed to improve the risk factor profile of Australians and to treat, manage and rehabilitate those with cardiovascular disease (AIHW & DHAC 1999).

2.2.1 Mortality

Despite declines in mortality rates in the past thirty years, cardiovascular disease remains one of the leading causes of death in Australia in 2000, accounting for 49,700 or 39% of all deaths according to ICD-10 classifications (ABS 2002). Cardiovascular disease is also one of the largest causes of premature death in Australia (AIHW & DHAC 1999).

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The two leading causes of death from cardiovascular disease are ischaemic heart disease and cerebrovascular disease (stroke). In 2000, ischaemic heart disease accounted for 59% of men's deaths and 48% of women's deaths from cardiovascular disease. Stroke has been the second most common cause of cardiovascular death since 1968, accounting for 21% of men's and 28% of women's deaths from cardiovascular disease in 2000 (ABS 2002).

In terms of hospitalisation, the Australian Institute of Health and Welfare (AIHW) reported that those hospitalised for stroke have the highest in-hospital mortality (11% of stroke hospitalisations). Heart failure (9%) had the next highest rate, followed by peripheral vascular disease (8%), coronary heart disease (3%) and rheumatic fever and rheumatic heart disease (2%) (AIHW 2001a).

2.2.2 Hospitalisation/ separations

In 1998-99 cardiovascular disease was the principal diagnosis for 437,717 hospitalisations in Australia. More than a third (36%) of hospitalisations were attributable to coronary heart disease, 12% to stroke and 10% to heart failure.

The average length of stay in hospital for cardiovascular disease has declined since 1993-94 from 7.6 days to 5.5 days in 1998-99 (AIHW 2001a). This variable increases with age and is higher for females (5.8 days) than males, (5.3 days). Furthermore, the number of same-day patients has increased, particularly for coronary heart disease (67%) (AIHW 2000).

2.2.3 Visits to general practitioners

Cardiovascular problems have been one of the most predominant reasons for visits to general practitioners over the past few years. For the period 2000-01, diseases of the circulatory system accounted for 11% of total problems managed in general practice, which is down from 12.5% for the period 1990-91. Hypertension remained the most common individual problem managed, of all diseases related to the circulatory system. In 2000-01, hypertension was managed at a rate of 8.6 per 100 encounters, which accounted for 6% of all problems managed. Females and people aged over 45 years were the predominant visitors to a general practice where a cardiovascular problem was managed (AIHW 2001b).

2.2.4 Disability

The NHPA 1998 report showed that around 2% of Australians are disabled by heart, stroke and vascular disease. Of all cardiovascular conditions, stroke was identified as the most prominent cause of disability in terms of the effect on a person's functioning. Stroke was found to disable approximately one-third of all sufferers with some degree of paralysis on one side of the body, difficulty in communicating or a range of other problems that have the potential to affect a person's quality of life and ability to function in society (AIHW & DHAC 1999). According to the 1998 ABS Survey of Disability, Ageing and Carers, the rate of disability due to stroke is influenced considerably by age. Nearly 1% of the Australian population aged 45 and over who were classified as disabled with stroke (as primary cause of disability) compared with approximately 6% for the population aged 85 and over.

2.2.5 Prevalence

National Health Survey (NHS) results indicate the prevalence of cardiovascular disease in the adult population had increased from 17% (2.2 million) in 1989-90 to 21% (2.8 million) in 1995 (refer to Table 1) (ABS 1995). The prevalence rate of cardiovascular disease increases

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with age, peaking at 61% for people aged 75 and over, as compared with 4% for people aged 18-24. There was no substantial difference in the numbers of females (16%) and males (14.5%) with cardiovascular disease in the results from the 1995 National Health Survey.

Indigenous Australians have one of the highest prevalence rates of rheumatic heart disease in the world at 13.3 per 1,000 population in 1999. In the Northern Territory for example, 93% of people with the disease were Aboriginal and Torres Strait Islanders people. By comparison, the rate for non-Indigenous Australians was 0.34 per 1,000 in 1999.

Table 1. Prevalence of cardiovascular conditions, persons aged 18 years and over

| Type of condition | 1989-90 | | 1995 | |
|--|---------|------|---------|------|
| | '000 | % | '000 | % |
| Hypertension | 1 535.1 | 12.3 | 1 932.5 | 14.4 |
| Heart disease | 440.1 | 3.5 | 493.5 | 3.7 |
| Atherosclerosis | 45.7 | 0.4 | 25.5 | 0.2 |
| Stroke (and other cerebrovascular diseases) | 89.6 | 0.7 | 115.7 | 0.9 |
| Other diseases of the circulatory system | 274.8 | 2.2 | 694.8 | 5.2 |
| Ill defined signs and symptoms of heart conditions | 256.2 | 2.1 | 337.5 | 2.5 |
| All cardiovascular conditions (a) | 2 164.7 | 17.4 | 2 795.5 | 20.9 |
| All cardiovascular conditions standardized (b) | 2 244.4 | 18.0 | 2 795.5 | 20.9 |

a) Each person may have reported more than one type of condition, and therefore components may not add to totals.

b) Data have been age and sex standardised

Source: ABS 1995, National Health Survey: Cardiovascular and Related Conditions, Australia, 1995 (4372.0). (Table 9.12)

2.2.6 Incidence

The national incidence of selected cardiovascular diseases such as acute myocardial infarction, stroke, unstable angina pectoris and congestive heart failure is determined using existing national datasets in particular hospital admission databases (AIHW 2001c). Due to the complexities associated with certain cardiovascular diseases it would be difficult to monitor incidence using CATI health surveys.

2.3 Burden of Disease

Cardiovascular disease places a significant burden upon the community and institutions in terms of health, social, economic, and emotional costs (AIHW 1999a). Such a burden exceeds that of any other disease and is expected to become more acute over the next few decades as the number of elderly Australians continues to increase, among whom cardiovascular disease is most common (AIHW & DHAC 1999).

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In 1996, cardiovascular disease constituted 22% of the burden of disease in Australia. Such a measure is indicative of the difference between current health status and the ideal of living into old age without disease and disability. In 1996, cardiovascular disease accounted for more than half the years of life lost among people aged 75 years and over (AIHW 1999a). Cardiovascular disease was also estimated to account for 33% of premature mortality and 9% of years of equivalent 'healthy' life lost through disease, impairment and disability (AIHW 2000).

Mortality, disability, impairment, illness and injury arising from cardiovascular disease are measured using a common metric known as the Disability Adjusted Life Year (DALY). DALYs for cardiovascular disease are calculated as the sum of the years of life lost due to premature mortality (YLL) in the population and the years lost due to disability (YLD).

Coronary heart disease and stroke account for the majority of the total burden of disease for all cardiovascular conditions. Since 1985 there has been a 30% to 40% decrease in the burden of disease from these two conditions in Australia (AIHW 1999b). In 1996, coronary heart disease and stroke accounted for nearly 57% and 25% of total disease burden for cardiovascular disease, respectively (AIHW 2001a).

2.3.1 Burden on Society

The burden on society from cardiovascular disease includes intangible and indirect costs such as those due to pain, suffering and anxiety (AIHW & DHAC 1999).

2.3.2 Economic Burden

The financial burden of cardiovascular mortality, morbidity and disability is varied. It ranges from lost production as a consequence of sickness, disability and premature death to the financial costs borne by individuals and the community. It includes expenditure on pharmaceuticals, practitioner's fees, health and accident insurance, treatment, and the need to supplement wages. There is also the financial burden upon families resulting from disability.

2.3.3 Health Care Costs

The health system costs for cardiovascular disease are the highest in Australia for all diseases and are expected to increase over the next few decades. Cardiovascular disease accounted for the largest proportion of the total health system costs, amounting to \$3.719 billion in total direct costs during 1993-4. When risk factors are taken into account, cardiovascular disease is responsible for \$3.9 billion of total recurrent health expenditure (AIHW & DHAC 1999).

2.4 Trends in mortality

There has been a significant decrease in cardiovascular death rates in the past three decades (66%). This trend is occurring for both males and females, and has been more rapid than declines for non-cardiovascular mortality (22%) (AIHW 2000).

The age standardised death rates for cardiovascular diseases peaked for males in the late 1960s at 843 per 100,000, and for females in the early 1950s at 558 per 100,000 (ABS 2002). Since this time there has been a continuous decline in mortality which has been faster in the younger age groups, particularly for coronary heart disease, which has declined annually

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between 1985 and 1996, in the age group 25-74 at a rate of 5.6% for males and 6.2% for females (AIHW & DHAC 1999).

The death rates for the two leading causes of cardiovascular mortality (ischaemic heart disease and stroke) have decreased significantly between 1968 and 2000. Over this period, there was a rapid decline in ischaemic heart disease death rates, from 498 to 150 deaths per 100,000 for men, and from 250 to 84 deaths per 100,000 for women (ABS 2002). Within this time, one of the most prominent decreases occurred between 1989 and 1999, when the standardised death rate for ischaemic heart diseases decreased by 39% (ABS 2001a). Similar decreases occurred for stroke between 1968 and 2000, as the death rate for both men and women fell by 71% (ABS 2002).

Mortality rates for cardiovascular disease increase dramatically with age. The AIHW reported that 82% of all cardiovascular deaths occur among those aged 70 and over, compared with less than 5% for those aged under 55 (AIHW 2000). Cardiovascular mortality rates are higher for males across all age groups, for people in socio-economically disadvantaged groups and for Indigenous Australians (AIHW 2000). Furthermore, cardiovascular deaths are higher for rural than for remote populations for males, yet not for females. Declines in mortality are comparable for urban, rural and remote areas.

Among Aboriginal and Torres Strait Islander peoples, the situation is considerably worse. The mortality rate for Indigenous Australians is twice that of non-Indigenous Australians. In 1999, cardiovascular disease was the leading cause of death among Indigenous Australians in Western Australia, Queensland, South Australia and the Northern Territory, accounting for one third of total deaths of Indigenous Australians (AIHW 2000).

Advances in treatment, increased use of medical services and more intensive and coronary care units have contributed to a significant decline in cardiovascular disease mortality in Australia over the past thirty years (ABS 2002). However, the decrease is largely the result of lifestyle changes such as a reduction in smoking (particularly among middle-aged men), and the consumption of less animal fats as well as increased fitness levels. It is estimated that eliminating cardiovascular disease in Australia would result in the greatest increase in disability-free life expectancy (AIHW & DHAC 1999). For example, there would be an increase in life expectancy of nearly three years of healthy life for females, and five years for males.

2.5 Trends in morbidity

Cardiovascular disease continues to generate a considerable burden on the Australian population in terms of illness and disability. The issue of morbidity will become more acute in the future as the number of older Australians increases, among whom cardiovascular disease is more common. However, decreases in the rates of those suffering with heart, stroke and vascular related illness and disability in the future are viable as much of the morbidity is preventable.

Disabilities and core activity restrictions can be long-term consequences of cardiovascular conditions, particularly stroke, and can have a severe impact on the quality of life of the sufferer. Cardiovascular disease is a leading cause of disability in Australia. In 1995, the rate of morbidity and disability from this disease was 2.8 per 1,000 population. Cardiovascular morbidity directly affects one in three Australian families. In 1993-94 it accounted for the major proportion of total recurrent health expenditure (12% or \$3.9 billion) (AIHW 2001d).

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In 1998, of all cardiovascular conditions, stroke was the principal cause of serious long-term disability in adults in Australia. The 1998 Survey of Disability, Ageing and Carers estimated that there were 63,530 Australians with a disability caused mainly by stroke (ABS 1998).

2.6 Population groups at higher risk

There are several population groups who are at greater risk of cardiovascular disease. These population groups often have a higher prevalence of associated risk factors and higher mortality rates. Much of the risk is due to behaviour and lifestyle and thus, may be modifiable.

2.6.1 Indigenous Australians

Aboriginal and Torres Strait Islander peoples have significantly higher mortality rates due to cardiovascular disease than those of non-Aboriginal and Torres Strait Islander peoples. For Indigenous adults in the working ages, the rate of death is six to nine times higher than non-Indigenous Australians for males and females respectively (AIHW & DHAC 1999).

Indigenous Australians have a higher prevalence of all the major risk factors for cardiovascular disease (AIHW & Heart Foundation of Australia 1999). Data from the 1995 National Health Survey indicates that health risk factors such as smoking, not participating in sport, and obesity are more predominant in the Indigenous population.

2.6.2 Lower socioeconomic groups

In Australia, people in lower socio-economic groups are at greater risk of cardiovascular disease and related mortality. Such a difference has persisted through the 1970's to current times. The death rates for such groups are double that of people living in less socio-economically disadvantaged areas (AIHW & DHAC 1999). In 1997, in the 25 –64 age group, the number of deaths from cardiovascular disease in those living in the most disadvantaged areas was twice the rate of those living in the least disadvantaged areas. Risk factors such as high-risk drinking, physical inactivity, obesity, smoking and high blood pressure are also more common in low rather than in high socio-economic groups.

Cardiovascular disease trends within socio-economic groups are influenced by age and sex. For example, in 1995, 82% of women in the lowest socio-economic group reported risk factors (i.e. tobacco smoking, overweight and obesity, high blood pressure, or physical inactivity) as compared with 69% in the highest group (AIHW 2001a).

2.6.3 Age and sex

Age and sex are two variables that have an impact on cardiovascular disease mortality, morbidity and risk factor rates. Data from the 1995 National Health Survey indicates the prevalence of cardiovascular disease increases with age, from 4% for 19-24 year olds to 61% for those aged 75 and over. Cardiovascular conditions were also more prevalent among women when standardised for age, at 22% of women and 20% of men. However, males are twice as likely to die from such conditions (ABS 1995). In 1995, 15% of men and 10% of women had three or more risk factors such as tobacco smoking, being overweight or obese, high blood pressure and physical inactivity.

2.6.4 Employment characteristics

After age and sex standardisation, cardiovascular conditions were found to be more prevalent among persons not in the labour force (18%) than those unemployed (15%) and employed (12%). Of employed persons, managers and administrators had the highest prevalence of cardiovascular conditions (13.2%) followed by clerks (11.8%). The lowest prevalence of cardiovascular conditions was recorded for tradespersons (9.1%) (ABS 1995). Unemployment was also found to be associated with smoking status, with 28% of unemployed persons smoking on a daily basis, as compared to 25% of employed persons (AIHW 2001a).

2.6.5 Birthplace

When standardised for age and sex, the highest proportions of the overseas population that reported having a cardiovascular condition were those born in the Middle-East (25%) and the lowest in the New Zealand born population (18%). The standardised prevalence rate of cardiovascular conditions was slightly higher in the Australian-born population (21%) than the overseas-born population (20%) (ABS 1995). Of Australian residents, those born in Australia are more likely to die from cardiovascular disease than those born overseas (AIHW 2001a).

2.6.6 Rural, urban and remote areas

In 1995, there were no significant differences in the prevalence of at least one risk factor for people living in rural, urban or remote areas. Individuals living in remote (37%) areas of Australia had higher rates of physical activity than those living in urban (34%) and rural (32%) areas. More individuals in rural and remote areas (26%) were reported to be daily smokers than those in urban areas (21%). Furthermore, 53% of women in remote areas were overweight in 1995. This is higher than the figure for overweight women in urban and rural areas, which is about 47%. No significant difference was found for men. For 1996-98 rural areas had higher death rates from cardiovascular disease than urban areas. Death rates from cardiovascular disease in remote areas were not significantly different to those experienced in both rural and urban areas (AIHW 2001a).

2.6.7 Overweight and obese

According to the World Health Organisation's 1997 obesity report, the number of Australians who are overweight and obese has increased. Australia is now ranked among those developed nations with the highest proportion of overweight and obese people, following the United States of America (WHO 1997). The 2000 Australian Diabetes, Obesity and Lifestyle Study (AUSDIAB) indicated that of those aged 25 and over, an estimated 67% of males and 52% of females were classified as overweight or obese. In terms of children and adolescents in Australia, 20% were considered to be overweight or obese. Furthermore, those reporting cardiovascular disease have a significantly higher rate of obesity than the total population (DoHA 2002).

3 Factors influencing the health of people with cardiovascular disease

3.1 Risk factors

The AIHW defines risk factors as determinants, characteristics or exposures that are associated with a greater risk of ill health. Risk factors are strongly influenced by variables such as a person's economic resources, working conditions, education, social support and access to health care and social services (AIHW 2001a).

The specific risk factors for cardiovascular disease, such as smoking and alcohol consumption, are strongly influenced by the wider circumstances in which people live and work. Importantly, the behavioural and physiological risk factors are critical as they can be modified, unlike heredity, sex and age (AIHW & Heart Foundation of Australia 1999).

The risk factors for cardiovascular disease are:

Demographic and hereditary factors

- age
- sex
- family history of CVD disease

Behavioural risk factors

- tobacco smoking
- physical inactivity
- poor nutrition (diet high in saturated fats)
- high consumption of alcohol

Physiological risk factors

- high blood pressure/ hypertension
- high blood cholesterol
- elevated blood lipids
- overweight and obesity
- diabetes mellitus
- atrial fibrillation
- non-valvular atrial fibrillation
- transient ischaemic attack.

Collection of information on the following subset of risk factors may be possible using CATI methodology: tobacco smoking; physical inactivity; nutrition; alcohol consumption; overweight/obesity; and diabetes mellitus.

3.2 Prevention

Major advances in cardiovascular health have already taken place in Australia as a result of both prevention and medical treatment. It is prevention, however, which offers the greatest scope for future improvement. There is great potential for averting cardiovascular disease through reducing the number of people with cardiovascular risk factors.

Reductions in the level of one risk factor can influence a decline in the level of another, given that people are often at risk of more than one risk factor. For example, by exercising in order to reduce one's blood pressure, a person is also influencing their weight, both of which are risk factors for coronary heart disease. Evidence also suggests that when risk factors such as smoking, are reduced with the purpose of preventing stroke, there are subsequent declines in the rates of other health problems such as risk of cancer (AIHW & Heart Foundation of Australia 1999). Thus, in terms of prevention, cardiovascular diseases and risk factors should not be viewed in isolation.

3.3 Management of cardiovascular disease

Managing patients with cardiovascular disease is done in an effort to reduce mortality, morbidity and to improve quality of life. It also aims to relieve the symptoms, reduce complications, and identify and treat high-risk patients. In the long term the focus shifts to modifying risk factors, controlling symptoms, rehabilitation and continuing with medical treatment.

In Australia there are several major organisations or groups that are involved in promoting and guiding the management of cardiovascular disease. These key groups include the Heart Foundation, and State Governments.

3.4 Health related actions

Over the last three decades there has been a reduction in the likelihood of people dying from cardiovascular disease. The age-standardised death rate for men increased from 376 to 843 per 100,000 persons between 1907 and 1968, before falling to 256 per 100,000 persons at the turn of the century. For women, the rate increased from 328 to 583 per 100,000 persons between 1907 and 1952, and fell to 173 in 2000 (AIHW 2000).

Much of this decrease in the rates of cardiovascular disease mortality over the past few decades can be attributed to treatment through medical advances and behavioural changes. Treatment in itself, along with medical care, has advanced considerably over the past twenty years. The majority of people who had a recent cardiovascular condition took some health related action for the condition. The 1995 National Health Survey results indicate that 97% of adults with a cardiovascular condition reported taking one or more health related actions in the two weeks prior to the interview. Visiting a doctor was the most common action followed by use of medications (ABS 1995).

Drugs also assume an important role, particularly in lowering the death rates and improving the quality of life of people with cardiovascular disease. The AIHW and the Heart Foundation of Australia reported that one fifth of all drug prescriptions in 1997 were for cardiovascular drugs (AIHW & Heart Foundation of Australia 1999).

3.5 Follow-up care and rehabilitation

In about 60% of all cases of stroke, rehabilitation assumes an important role in helping stroke sufferers to maximise their potential for recovery and equipping them with practical ways of dealing with ongoing disability. Given the ageing of the Australian population and the recent slowing down of the decline in stroke death rates, the number of people surviving stroke with a permanent disability is likely to increase in the future (AIHW 2001a).

Rehabilitation offers opportunities to reduce the future risk of cardiovascular events through focusing on risk factors, providing counselling and support and encouraging physical activity.

Exact figures of the number of Australians currently participating in rehabilitation programs are unavailable. It is known however, that there are geographical discrepancies in the provision and nature of services. For example, only a proportion of eligible patients are invited to, or attend, a structured rehabilitation program (AIHW 2001a).

4 Data requirements and concepts to be measured

4.1 Rationale for monitoring

Monitoring cardiovascular disease provides the necessary information to assess the impact of the disease on the population and to support and guide the provision and development of cost-effective strategies for its prevention and treatment (AIHW 1995). The following factors need to be monitored to ensure that the scope for prevention is fully exploited:

- improvements in cardiovascular health;
- the financial and human costs of the disease (cost of treatment and premature mortality and other morbidity);
- progress toward national goals and targets;
- cardiovascular disease's impact on the population;
- reductions in the differences in cardiovascular health between different groups in the population, such as rural and remote residents, and different age groups and sexes;
- integration of delivery of prevention, early detection, treatment, education and support services;
- the development of targets at the local level which are aimed at reflecting the important health needs of local communities; and
- developments in health status at the local, state and national level in addition to recognising the significant behavioural, social and environmental risk factors that underlie health conditions in the community (DHS 1994).

The available data sources on cardiovascular disease are of two main types: administrative by-product, and survey information (ABS 2001a). Survey information in particular, is needed on groups that are especially at risk such as the Indigenous population, people of low socio-economic status, and rural and remote communities. Without these elements represented in a nationwide monitoring system there will be a limited capacity to address the problem of cardiovascular disease in the future (AIHW 1995).

There are different methods and strategies for collecting information on cardiovascular disease and certain aspects may be better suited to a particular strategy or method. The CATI TRG is focusing on data requirements for measuring risk factor behaviour for cardiovascular disease as information on prevalence and incidence can be more efficiently collected through administrative data.

4.2 Data requirements to monitor cardiovascular disease

The priorities for monitoring cardiovascular diseases are the prevalence and incidence rates of particular cardiovascular diseases, the trends and patterns of cardiovascular diseases in the population and risk factor behaviours. Concepts to be monitored and measured include risk factor behaviours (the CATI TRG will be focusing on these):

- prevalence and incidence of cardiovascular disease;
- morbidity;

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- mortality rates;
- quality of life;
- burden of disease and disability;
- use of health services;
- management and treatment;
- prevention and rehabilitation;
- disease costs;
- the provision of education programs;
- progress toward national goals and targets; and
- standards

Particularly with respect to variation by: demographic factors; economic factors; geographic factors; cultural factors and social factors (population groups).

4.3 Data requirements to monitor prevalence

Prevalence is an important measure of the magnitude of cardiovascular disease in Australia. It is important to measure the changes and pattern in the prevalence of cardiovascular disease as a whole, and the individual cardiovascular diseases over time.

4.4 Data requirements to monitor incidence

Monitoring incidence in a valid, reliable and sustainable method over time is necessary in order to monitor the progress towards goals and allow for forward planning in health care (AIHW 2001e). This may involve predicting morbidity and mortality patterns and costs, which is in the interests of public health policy makers.

4.5 Data requirements to monitor risk factors

There is a need to monitor the risk factors for cardiovascular disease to identify the proportions of the population that have one or more of the cardiovascular risk factors and this is the prime focus of the CATI TRG (see 3.1 Risk Factors). Age and sex are important predictors of cardiovascular disease and need to be monitored. Monitoring the proportions in each age group is particularly important with increasing numbers moving into higher risk age groups.

The modifiable risk factors such as tobacco smoking, physical inactivity, overweight and obesity and high alcohol consumption, should be monitored to identify the proportion of the population who engage in one or more of these activities and the CATI TRG are developing modules to explore these factors.

Ongoing information on the proportion of the population with high blood pressure/hypertension, high blood cholesterol, elevated blood lipids, and diabetes mellitus is also important. Monitoring co-morbidities, is essential when looking at the proportion of people affected by cardiovascular diseases.

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Due to the higher proportion of Indigenous people who suffer from cardiovascular diseases it is necessary to identify the proportion of the population who identify as being of Aboriginal or Torres Strait Islander origin.

There is a need to collect information over time, on the proportion of people living in rural and remote areas with one or more risk factors. There is also a need to collect information on the access to medical services, treatment, and prevention and rehabilitation programs, of people living in rural and remote areas.

The following indicators may be derived to monitor cardiovascular risk factors in a population:

- The proportion of people under 65 and over 65, either male or female who have one or more risk factors.
- The proportion of Aboriginal and Torres Strait Islander Peoples, male and female who have one or more risk factors
- The proportion of the whole population with one or more risk factors
- The proportion of the population with an existing condition who have one or more risk factors

4.6 Data requirements to monitor population groups at most risk of cardiovascular disease

It is important to consider the population groups most at risk of cardiovascular disease and to ensure that these groups are identified in questionnaires.

Concepts to be monitored and measured

The following population groups in Australia warrant special focus:

- Indigenous Australians aged over 18, who are overweight and obese;
- Indigenous Australians who smoke;
- Indigenous Australians aged over 18, who do little or no physical exercise;
- Men and women who had three or more risk factors such as tobacco smoking, overweight and obesity, high blood pressure, physical inactivity;
- Women, particularly women aged 55-79 years with at least one major modifiable risk factor;
- Australians aged 14 and over who smoke on a regular basis;
- Australians aged 25-64 from lower socio-economic groups;
- Australians aged over 25 who are overweight and obese; and
- Australians aged over 25 who have high blood cholesterol.

4.7 Data requirements to monitor mortality

Deaths from cardiovascular disease can be monitored by information that is collected by State and Territory registrars of births, deaths and marriages. The Australian Bureau of Statistics' causes of deaths data collection provides information on the number of people who die from a cardiovascular condition. The National Centre for Monitoring Cardiovascular Disease monitors and reports on trends and differentials in cardiovascular mortality (NHF 1993).

4.8 Data requirements to monitor morbidity

Information pertaining to morbidity can be obtained from self-reported questionnaires, however, there are other administrative sources which also provide data. All State and Territory health authorities maintain hospital morbidity data collections, which are based on admitted patient episodes. They include information relating to demographic, diagnostic, and procedural characteristics and duration of stay information. Hospital separation data give important information on acute episodes of disease.

The Australian Institute of Health and Welfare maintains the National Hospital Morbidity Database, which is comprised of information provided by the States and Territories (AIHW 1998). Examples of concepts to be measured and monitored:

- The proportion of the population whose main condition is stroke
- The prevalence and incidence of disability

4.9 Data requirements to monitor quality of life and disability

Monitoring the quality of life and disability associated with cardiovascular disease is an integral part of any data collection. Questions that assess the impact of cardiovascular disease on a person's lifestyle in any way are necessary to monitor the quality of life of a person with cardiovascular disease. Examples of such questions relate to reporting days away from school or work, their inability to take part in sporting or social events and recreational activities. Perception of health and well being could be measured using the SF36 or the SF12.

4.10 Data requirements to monitor use of health services (including treatment and management)

Information on use of health services is valuable for the future planning and provision of health services in Australia. This information can be obtained from self reported or administrative sources. When monitoring the use of services, the following should be considered:

- demographic characteristics of patient (age, sex, socio-economic variables);
- trends in visits and consultation (day clinic, casualty/emergency, GP, surgeon);
- cardiovascular diseases which dominate visits;
- cost of health services;
- time away from work/study/normal duties;

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- specific population group and risk factor considerations (Indigenous Australians);
- access to health care services (socio-economic and physical barriers); and
- equitable resource allocation e.g. is resource allocation equitable in terms of health need relative to the urban population (AIHW 1995, DHAC 2001).

When monitoring use of medication for each condition, the following should be considered:

- Use of vitamins/minerals, natural herbal or other medication in the reference period;
- types of medication used (generic type, coded from medication name);
- trends in drug use/prescription; and
- frequency and duration of use, and whether prescription needed to obtain medication.

4.11 Data requirements to monitor prevention

There is a continuing need to inform public health professionals and policy makers of the considerable scope for prevention of cardiovascular conditions and of the areas where attention is needed (AIHW 2001a). There are currently no major data sources which monitor prevention nor have indicators been developed specifically for primary or secondary prevention (AIHW 1995).

5 Issues in measuring cardiovascular disease

5.1 Issues in measuring current cardiovascular prevalence

Studies suggest that people's perceptions of their own health generally provide a good indication of their physical condition. However, there are several factors that may constrain or influence the measurement of cardiovascular disease prevalence in surveys. Firstly, it has been found that those cardiovascular conditions that have a considerable effect on the respondent are more likely to be reported than conditions having lesser effects. Respondents may also be unaware that they have a particular condition especially if they have not been professionally diagnosed. Furthermore, with conditions such as stroke where people are admitted to hospital for the episode, they may be too sick to respond at the time of the interview. It has also been found that estimates for less prevalent conditions may be subject to high standard errors. Finally, people may be reluctant to report some conditions and this may influence data consistency (ABS 2001b). Each of these issues has an impact on measuring the data requirements for the surveillance of cardiovascular disease and thus, need to be considered.

5.2 Issues in measuring current cardiovascular incidence

Of particular concern is the issue of measuring either the number of people in the population with cardiovascular conditions, or the number of cases. The tendency for individuals to have more than one condition has the potential to influence the measurement.

5.3 Issues in measuring risk factors

It is possible to measure a number of risk factors using CATI methodology including: tobacco smoking, physical inactivity, nutrition, alcohol consumption, overweight/obesity and diabetes mellitus. Concept papers are being developed on each of these risk factors and these papers give details of particular issues relating to their measurement.

5.3.1 Geographic constraints

Geographic constraints particularly limit the monitoring of risk factors. In Australia there is a lack of national data across urban, rural and remote areas (AIHW 2001a). Monitoring is limited in the sense that there is variability in the frequency of the surveys within State and Territory capital cities, and also in the coverage and measurement of variables such as blood cholesterol.

The NSW Department of Health reported a lower proportion of people from rural health areas reported having their blood cholesterol measured in the last 12 months in comparison to those from urban health areas. Reliable data on blood cholesterol is generally available for adults aged 20–69 years living in the State or Territory capital cities only (NSW Health Department 2000). This has important implications for measurement and analysis because the variation by area may relate to differences in access or frequency of testing rather than actual differences in prevalence of high blood cholesterol (AIHW & DHAC 1999).

5.4 Issues in measuring Indigenous trends

Data on Indigenous trends are constrained in terms of the absence of national data for a number of variables and also by the limitations in the quality and availability of the data that are collected. As previously discussed, there is a lack of national data on several risk factors such as cholesterol and blood pressure. The following limitations on data on the health of Aboriginal and Torres Strait Islander peoples must be taken into account:

- incomplete and inaccurate identification in both surveys and administrative data sets;
- difficulties in estimating the size and composition of the Indigenous population;
- the extent to which Indigenous people are included in national surveys;
- concerns about whether the survey methods employed are always the most suitable;
- the errors which can occur throughout the registration and processing phases;
- the extent to which people are identified as Indigenous, and the propensity to identify which itself is determined by who completes the form (e.g. the person in question, a relative, or an official);
- the perception of how the information will be used;
- social attitudes Indigenous persons have about making what amounts to public statements about their heritage;
- education programs about identifying as Indigenous; and
- emotional reaction to identifying as Indigenous.

These limitations in the quality and availability of data, and under-identification of deaths to Indigenous Australians occur to some degree in all jurisdictions. As a result, there is an underestimation of the number of Indigenous deaths actually occurring, and, by extension, an underestimation of the difference in mortality between the Indigenous population and the rest of the Australian population. In addition to these constraints, comparisons and analysis between populations and over time are difficult. Therefore, although it is well known that there are clear differences in the health status between Indigenous and non-Indigenous Australians throughout the lifecycle, the precise magnitude of these differences is difficult to determine.

Measures of mortality such as crude death rates, age standardised death rates, and indirectly and directly standardised death rates are all affected by the incomplete identification of Indigenous deaths. Finally, care must be taken not to excessively enumerate Indigenous Australians. The burden on the respondents, particularly the timing and regularity of surveys conducted for this population group needs to be considered.

5.5 Length of a reference period

There needs to be consistency in measuring risk factors, health service use etc. Currently, 'the last week', 'two weeks' and 'twelve months' are standards generally employed. Even though it can be expected that a larger section of the population would report taking a certain action if a longer reference period had been used, it is essential to determine whether this increase is proportionate to the increase in time.

5.6 Measuring quality of life and disability

Asking questions pertaining to days off work or reduced activity is suitable for cardiovascular conditions, particularly where there is a low level of associated disability. For conditions such as stroke on the other hand, the classification from the International Classification of Impairments, Disabilities and Handicaps (ICIDH) could be utilised to develop more focused measures of disability and quality of life.

Factors that can affect measures of quality of life and disability are duration criteria used to identify disability, minimum severity, wording of questions and collection methods in surveys and questionnaires and screening questions (AIHW 1999b). There are also problems when attempting to define physical disability based on activity limitations. For example, complex activities such as driving may be difficult to label because many different abilities are used in unison. Depending upon the reference period, there may be difficulties in recalling the precise number of days off work or reduced activity. There may also be problems relating to definition of days off work or reduced activity for those people engaged in home duties.

The definition of disability experience may also influence the measurement. Within the ICIDH framework are three dimensions of disability experience; impairment, activity and participation (AIHW 1999b). Other dimensions for consideration are restrictions and limitations, as those found in the ABS's definition of disability. Each of these factors is subject to variation and influence. For example, studies have found that '...using impairment-based screening questions in population surveys tends, in practice, to result in estimates of prevalence that are lower than those obtained using activity-based screening questions. This is probably because the number of impairments listed in survey screening questions is often limited. Also, in many cases, a person may have an activity limitation that is not obviously associated with an impairment' (AIHW 1999b). Additionally, disabilities that are not being treated will also need to be measured. Questions, which rely solely upon action taken for disability, will limit the measurement of all disabilities in surveys. These issues require clarification.

5.7 Issues in measurement of rehabilitation and use of services

The number of Australians currently participating in a rehabilitation program (inpatient or outpatient) is unknown due to a lack of data (AIHW 2001a). There is a distinct absence of state and local data referring to secondary prevention, rehabilitation and long term management of the clinical population with coronary heart disease. There is also little data for emergency care of people suffering acute cardiac events.

Without existing collections, the National Cardiovascular Disease Monitoring Centre suggests that information for each cardiac patient be recorded for future collections on cardiac rehabilitation. Information such as 'date of entry to program', 'principal diagnosis', 'date completed program' and 'reason for dropout' could be recorded. (Recommendations for Cardiac Rehabilitation Australian Cardiac Rehabilitation Association inc)

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