Rural, regional and remote health

Information framework and indicators

Version 1

The Australian Institute of Health and Welfare is Australia's national health and welfare statistics and information agency. The Institute's mission is to improve the health and well-being of Australians by informing community discussion and decision making through national leadership in developing and providing health and welfare statistics and information.

Rural, regional and remote health

Information framework and indicators

Version 1

15 April 2003

Australian Institute of Health and Welfare
Canberra

AIHW cat. no. PHE 44

This publication is part of the Australian Institute of Health and Welfare's Rural Health Series. A complete list of the Institute's publications is available from the Publications Unit, Australian Institute of Health and Welfare, GPO Box 570, Canberra ACT 2601, or via the Institute's web site (http://www.aihw.gov.au).

ISBN 1 74024 284 X

Suggested citation

Australian Institute of Health and Welfare (AIHW) 2003. Rural, regional and remote health: information framework and indicators. Version 1. AIHW cat. no. PHE 44. Canberra: AIHW.

Enquiries about or comments on this publication are encouraged, and should be directed to:

Andrew Phillips
Australian Institute of Health and Welfare
GPO Box 570
Canberra ACT 2601

Phone: (02) 6244 1027

E-mail: andrew.phillips@aihw.gov.au

Published by Australian Institute of Health and Welfare

Printed by Pirion

Contents

Acknowledgments

This report has been commissioned by the Office of Rural Health (ORH) in the Department of Health and Ageing.

This work has been guided by the members of the Rural Health Information Advisory Committee (RHIAC):

Richard Eccles, Chair RHIAC and National Manager, ORH, DoHA.

Joanna Davidson, previous Chair RHIAC and National Manager ORH, DoHA.

Andrew Benson, Director Research and Data Section OATSIH, DoHA.

Kim Boyer, National Health and Medical Research Council.

Norma Briscoe, Health Section, Australian Bureau of Statistics.

Alan Browne, previous Assistant Director Information and Communication Section, ORH, DoHA.

Gemma Duffy, previous Director, Information and Communication Section, ORH, DoHA.

Dr Joy Eshpeter, Director, Public Health Information Development Section, National Population Health Planning Branch, Population Health Division, DoHA.

Associate Professor Lyn Fragar, Director, Australian Centre for Agricultural Health and Safety, University of Sydney.

Associate Professor Bob Gibberd, Health Services Research Group, The University of Newcastle.

Gordon Gregory, Executive Director, National Rural Health Alliance.

Professor John Humphreys, Monash University.

Jill Kurr, Director, Information and Communication Section, Rural Health and Palliative Care Branch, DoHA.

Rochelle Lenane, Health Capacity Development Branch, Workforce, Education and Training Section, Health Industry and Investment Division, DoHA.

Joanne Llewellyn, Assistant Director, Information and Communications Section, Rural Health and Palliative Care Branch, DoHA.

Marelle Rawson, Director, Health Section, Australian Bureau of Statistics.

Dr Janis Shaw, Director, National Centre for Aboriginal and Torres Strait Islander Statistics, Australian Bureau of Statistics.

Dr Ross Spark, Manager, Tropical Public Health Unit Network, Queensland Health.

Dr Laga Van Beek, previous Assistant Director, Information and Communication Section, ORH, DoHA.

Professor David Wilkinson, Director, South Australian Centre for Rural and Remote Health, University of South Australia (Whyalla Campus).

Jonathan Wraith, Director, Workforce Development Section, General Practice Branch, Health Services Division, DoHA.

Other people who contributed to the work include:

Barbara Gray (NACATSIS, ABS),
Kirrily Harrison (OATSIH, DoHA),
Phil Trickett (AIHW),
Terry Neeman (Covance),
Richard Franklin, Australian Centre for Agricultural Health and Safety (Moree),
Professor David Lyle, Department of Rural Health, Sydney University,
Michael Roden and John Paice, Demography Section, ABS,
Frank Blanchfield, Geography Section, ABS,
National Injury Surveillance Unit (NISU)

Andrew Philips is the author of this document. In developing this first in a series of AIHW rural health reports, he was assisted by Brendan Brady and Toni O'Brien . The work was conducted under the editorial guidance of Glenice Taylor and stewardship of Dr Anny Stuer.

Abbreviations

A&E	Accident and Emergency (Department)
ABS	Australian Bureau of Statistics
ACCC	Australian Competition and Consumer Commission
ACIR	Australian Childhood Immunisation Register (HIC)
AIHW	Australian Institute of Health and Welfare
AMS	Aboriginal Medical Service
ARIA	Accessibility/Remoteness Index of Australia
ASGC	Australian Standard Geographic Classification
ATO	Australian Taxation Office
ATSI	Aboriginal and Torres Strait Islander
ATSIHWIU	ATSI Health and Welfare Information Unit (ABS & AIHW)
BEACH	Bettering the Evaluation And Care of Health
BMI	Body Mass Index
CACP	Community Aged Care Package
CATI	Computer Assisted Telephone Interview (survey)
CD	Census Collectors District
CDEP	Community Development Employment Program
CDNA	Communicable Diseases Network, Australia
COPD	Chronic Obstructive Pulmonary Disease
CPI	Consumer Price Index
CSDA	Commonwealth/State Disability Agreement
DALE	Disability-adjusted Life Expectancy
DALY	Disability-adjusted Life Years
DEST	Department of Education, Science and Technology
DoHA	Department of Health and Ageing
DRG	Diagnostic Related Group
DSRU	Dental Statistics Research Unit (AIHW)
DVA	Department of Veterans' Affairs
EACH	Extended Aged Care at Home
FTE	Full Time Equivalent
GIS	Geographic Information System
GISCA	National Key Centre for the Social Applications of GIS
GP	General Practitioner
HACC	Home and Community Care
HIC	Health Insurance Commission

ICD9	International Classification of Diseases (9th Revision)
ICD10	International Classification of Diseases (10th Revision)
ICU	Intensive Care Unit
MBS	Medical Benefits Schedule/Scheme
NCATSIS	National Centre for Aboriginal and Torres Strait Islander Statistics (ABS)
NDSHS	National Drug Strategy Household Survey
NHMRC	National Health and Medical Research Council
NHPF	National Health Performance Framework
NHS	National Health Survey
NHTP	Nursing home type patient
NNDSS	National Notifiable Diseases Surveillance System
NOHSC	National Occupational Health and Safety Commission
NPSU	National Perinatal Statistics Unit (AIHW)
OATSIH	Office of Aboriginal and Torres Strait Islander Health (DoHA)
OECD	Organisation for Economic Co-operation and Development
ORH	Office of Rural Health (DoHA)
OT	Occupational therapist
PBS	Pharmaceutical Benefits Scheme
PIP	Practice Incentive Payment
RACGP	Royal Australian College of General Practitioners
RFDS	Royal Flying Doctor Service
RHIAC	Rural Health Information Advisory Committee
RRMA	Rural, Remote and Metropolitan Areas classification
RRSNC	Rural and Regional Statistics National Centre (ABS)
SEIFA	Socioeconomic Indexes for Areas
SIHC	Survey of Income and Housing Costs
SLA	Statistical Local Area
STI	Sexually transmitted infection
SWPE	Standardised Whole Patient Equivalent
WHO	World Health Organization
YLL	Years of life lost

Introduction

In 2001 the AIHW was commissioned by the Office of Rural Health (ORH) in the Department of Health and Ageing (DoHA) to develop a framework describing rural health information and a set of indicators against which to report on rural health.

As part of this process, the Rural Health Information Advisory Committee (RHIAC) was established for the purpose of advising the development of the framework. RHIAC has representatives from a range of organisations (including ORH) with an interest and expertise in rural health issues and information. The committee met in May 2001, at a workshop in November 2001 and again in May 2002.

The resulting framework was modelled on the National Health Performance Framework (NHPC 2001) and its purpose is to:

- develop a formal understanding of the types of information that are important for understanding rural health;
- review the usefulness of available data collections towards this understanding, so laying the foundations for an ability to report in a systematic way on rural health issues; and
- to assist in identifying gaps in the data that prevent effective reporting of rural health issues.

The framework provides a focus for discussion and development so as to foster its own improvement and take advantage of improvements in data quality and availability.

The framework also lays the foundation for a systematic process to report against rural, regional and remote health issues at regular intervals and so inform rural health policy.

The development of the framework occurred in the following stages:

- consideration of the framework and its development by RHIAC;
- modelling of the framework on the National Health Performance Framework (NHPF) (see page 178);
- selection of possible indicators to provide representation across a range of dimensions within the framework;
- development of documentation for each indicator in consultation with data experts;
- review of the draft framework and indicators by RHIAC and other invited experts at a workshop in November 2001; and
- further development of the framework in line with the advice from the workshop and further consultation with data experts.

During development of the report, the RHIAC identified that people who lived outside major cities lived in a range of settings that could broadly be categorised as rural, regional and remote areas. This terminology is adopted throughout the report, although the generic term 'rural' is frequently used when referring to non-metropolitan areas generally.

The Rural Health Information Framework

The Rural Health Information Framework seeks to identify all the types of information that are important to develop an understanding of, and to monitor, the health of rural, regional and remote populations.

This version of the framework is expected to be updated periodically as new or updated data become available and further development of indicators proceeds. Readers are encouraged to assist in the development of future versions of this framework by identifying other sources of data, offering new indicators to fill gaps or suggesting refinements to improve the relevance of existing indicators.

The National Health Performance Framework (Appendix 1) consists of three tiers: 'Health status and outcomes', 'Determinants of health', and 'Health system performance'. Within each of these tiers there are a number of dimensions (e.g. within 'Health status' the dimensions are *health conditions*, *human function*, *life expectancy and wellbeing,* and *deaths*).

The Rural Health Information Framework comprises all three tiers and all dimensions of the National Health Performance Framework.

The Rural Health Information Framework is described in this report as follows:

- A simple table with associated brief explanatory notes overviews the proposed framework (page 4).
- For each dimension, a number of desirable measures (similar where possible to those described in the National Health Performance Framework) are proposed and brief details of possible indicators are provided (page 6).
- Documentation for each available and selected indicator is then provided (from page 63).
- Where the currently available data lacks the capacity to develop and describe an indicator, the deficiencies are identified and discussed briefly from page 163.
- An overview of the desirable measures against which it currently is and is not possible to report are listed in Appendix 2.

Notes to the Rural Health Information Framework

A number of issues can have a substantial effect on, or be affected by, health status, determinants of health and health system performance in a rural environment.

- An individual's sex and age affect their health status, their likelihood of engaging in risky behaviour and their use of health services. Older people may migrate to less remote centres so as to access services.
- Many Indigenous people have poor health outcomes and they constitute a large proportion of the population in more remote areas, and consequently strongly affect health statistics in those areas. While it is important to describe any overall changes across geography of the population as a whole, it is also important to try to differentiate between the effects of Indigenous health and that of remoteness. In other words, is poorer health in more remote areas a result of poor Indigenous health or related to remoteness (or both)?

Consequently indicators have been designed, where possible, to report:

- by broad geographic area such as ASGC remoteness, ARIA or RRMA category;
- over time;
- by sex;
- by age group; and
- by Indigenous status.

Other factors, frequently difficult to measure in health statistics (which have not been considered in the development of the indicators), need to be considered in the interpretation of indicator statistics:

- socioeconomic status; and
- population density (i.e. whether the local setting is a large regional centre or an isolated farm or a small and remote community).

In addition to these criteria, there are groups of people that should, where possible, be examined more closely because of the relevance of their characteristics to a rural health information framework:

- Indigenous people;
- all age groups (especially the aged and youth);
- people with disabilities;
- farmers and farm workers;
- miners; and
- the health workforce.

Finally, in developing the indicators, we have specially taken care to cover the following areas:

- National Health Priority Areas (cardiovascular disease, cancer, diabetes, mental health, injury, asthma);
- specific rural health issues (occupational health, suicide, motor vehicle accidents, mental health); and
- Indigenous health issues (for example, renal disease, diabetes, early death).

Table 1: The Rural Health Information Framework

Health status and outcomes **How healthy are Australians? Is it the same for everyone? Where is the most opportunity for improvement?**			
Health conditions	**Human function**	**Life expectancy and wellbeing**	**Deaths**
Prevalence of disease, disorder, injury or trauma or other health-related states. *Chronic diseases, injury, mental health, oral health, communicable diseases and birth outcomes.*	Alterations to body, structure or function (impairment), activities (activity limitation) and participation (restrictions in participation). *Disability and days away from usual activity sick.*	Broad measures of physical, mental, and social wellbeing of individuals and other derived indicators such as Disability-Adjusted Life Expectancy (DALE). *Disability-adjusted life expectancy, life expectancy, disability-adjusted life years, self-assessed health status and self-assessed happiness.*	Age and/or condition-specific mortality rates. *Perinatal mortality, age-specific mortality, overall death rates, premature mortality, burden in each area.*

Determinants of health **Are the factors determining health changing for the better? Is it the same for everyone? Where and for whom are they changing?**				
Environmental factors	**Socioeconomic factors**	**Community capacity**	**Health behaviours**	**Person-related factors**
Physical, chemical and biological factors such as air, water, food and soil quality resulting from chemical pollution and waste disposal. *Water, sewerage, food availability, housing, recreational and cultural facilities, the workplace, environmental hazards.*	Socioeconomic factors such as education, employment, per-capita expenditure on health, and average weekly earnings. *Education, employment, after-tax income.*	Characteristics of communities and families such as population density, age distribution, health literacy, housing, community support services and transport. *Population characteristics, social issues and social capital, services, health literacy, perception of risk, housing, transport, cost of living, regional business health.*	Attitudes, beliefs, knowledge and behaviours, e.g. patterns of eating, physical activity, excess alcohol consumption and smoking. *Smoking, alcohol consumption, illicit drugs, physical activity, nutrition, sexual practices, driving practices.*	Genetic-related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight. *Genetically determined diseases, specific birth defects, blood pressure, cholesterol and body weight.*

(continued)

Table 1 (continued): The Rural Health Information Framework

Health system performance **How well is the health system performing in delivering quality health actions to improve the health of all Australians?** **Is it the same for everyone?**		
Effective	**Appropriate**	**Efficient**
Care, intervention or action achieves desired outcome. *Effectiveness of retrieval for victims of trauma, STI education, immunisation, breast cancer and cervical screening and of medical/surgical intervention.*	Care/intervention/action provided is relevant to the client's needs and based on established standards. *Female GPs, surgical procedure, specialist consultations, post surgical care and rehabilitation, aged care, accreditation, waiting times for elective surgery, reasons for visiting a GP.*	Achieving desired results with most cost effective use of resources. *Cost of providing services in each area, cost of providing services to service people from each area, cost of screening in each area, ratio of expenditure to positive outcomes.*
Responsive	**Accessible**	**Safe**
Service provides respect for persons and is client orientated and includes respect for dignity, confidentiality, participation in choices, promptness, quality of amenities, access to social support networks, and choice of provider. *Culturally appropriate, confidentiality, choice of GP, waiting times for elective surgery, response time in hospital emergency departments, bulk billing, waiting times to consult allied health workers and test results, closed books and level of satisfaction of the population.*	Ability of people to obtain health care at the right place and right time irrespective of income, physical location, cultural background, age and sex. *Physical distance to health services, reduced access due to discrimination, lack of access because of cost, ratio of health workers and health facilities to population, occasions of service per person per year, times when health services are not available.*	The avoidance or reduction to acceptable limits of actual or potential harm from health care management or the environment in which health care is delivered. *Rate of medical and surgical misadventure, survival rates in intensive care units.*
Continuous	**Capable**	**Sustainable**
Ability to provide uninterrupted, coordinated care or service across programs, practitioners, organisations and levels over time. *Rate of case-care conferencing.*	An individual's or service's capacity to provide a health service based on skills and knowledge. *Accreditation and rates of admission for surgical medical misadventure (also covered under 'safe' dimension).*	System's or organisation's capacity to provide infrastructure such as workforce, facilities and equipment, and be innovative and respond to emerging needs (research, monitoring). *Health students from rural areas, recruitment and turnover of GPs, hours worked and time on call.*

Note: Based on the National Health Performance Framework. Text in italics refers to specific rural, regional and remote issues considered in the Rural Health Information Framework.

Tiers and dimensions of the Rural Health Information Framework

Each of the tiers ('Health status', 'Determinants of health' and 'Health system performance') in the Rural Health Information Framework consists of a number of dimensions that allow for further structured understanding of the framework.

The following review of the framework under each tier and overview of the indicators is organised such that:

- the dimension is defined as in the National Health Performance Framework;
- the range of desirable information is outlined and a rationale is given for the choices;
- options and data limitations or issues are briefly discussed;
- indicators against which it is currently possible to report are listed (detailed documentation for each indicator is provided from page 63); and
- if the development of an indicator has not been possible because of conceptual or data problems, details are included from page 163.

For all indicators, it is desirable to report for the entire population, the Indigenous population and also the non-Indigenous population in each area. Consideration of Indigenous health is important because the health of Indigenous people can be worse than for other Australians and because summary measures of the health of people living in rural, and especially remote areas, can be strongly influenced by the health of Indigenous people. Without structured analysis, it is not possible to determine whether poor health outcomes in rural and remote areas are associated with remoteness or with Indigenous health issues (or indeed both).

Reporting for the Indigenous population can frequently be difficult or impossible because of problems with the accuracy of identification of Indigenous people in data collections. The problems can be associated with the information not being required at the time of collection, not provided, provided inaccurately or it can be associated with the change over time of the likelihood of identifying as an Indigenous person.

Reporting for non-Indigenous populations can be affected by the same sort of issues that affect reporting for Indigenous people, but to a lesser extent. In reporting for non-Indigenous populations it is desirable to also describe Indigenous health issues (either at a regional or national level). In some situations inaccurate inferences about regional Indigenous health might be made on the basis of presented data for non-Indigenous and the total population. These should be anticipated and addressed in the text wherever possible.

The geographic classification used in this report is the ASGC Remoteness Structure, recently developed by ABS and GISCA. However, any geographic classification could be used (including DoHA categoric ARIA and RRMA).

Indicators described in this framework are frequently suites of indicators. Where similar data is to be analysed and presented in a similar way (e.g. indicator 1.1.1, The prevalence of chronic diseases), there has been an attempt to avoid duplication and present these summary measures as a group under the heading of a single indicator.

It is desirable to keep indicators as simple as possible; however, it is clear that simple indicators run the risk of providing a distorted view of reality. For example, simply

describing how death rates change across geography, without also describing the effect of Indigenous health or that of migration of the aged, can give a very different impression of the pattern of regional death rates. Further, analysing across geography adds another level of complexity to the presentation of health statistics. Consequently indicators may require presentation across time, geography, by gender, Indigenous status and age, making presentation complex. Wherever possible, presentation should attempt to summarise the main issues and trends for complex issues.

In the documentation for each indicator, contact details have been provided for people who have provided input to this framework and who could provide further advice for updating or otherwise modifying indicators.

In using the framework, users are encouraged to seek feedback from experts in the field to test their findings, particularly in the light of the data constraints and gaps discussed in the last chapter.

Health status (Tier 1)

The four dimensions of this tier are:

1.1 Health conditions

1.2 Human function

1.3 Life expectancy and wellbeing

1.4 Deaths

1.1 Health conditions

The health conditions dimension provides information on the prevalence of disease, injury or other health-related states. Information on the prevalence, incidence and burden of disease and injury provides a baseline to evaluate trends in the population's health. The ultimate effectiveness of health programs and strategies can be indicated from this baseline data, although there may be social and/or economic circumstances that influence health conditions. A decline in the prevalence or severity of a disease or injury is an important goal of a well performing health system.

Possible indicators for this dimension may include prevalence, incidence or burden of disease such as:

- *trends in the prevalence/incidence of health conditions within the National Health Priority Areas such as diabetes, cardiovascular disease, cancer, mental health including depression, injury and asthma; and*
- *morbidity attributable to licit and illicit drugs.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- chronic diseases;
- injury;
- mental health;
- oral health;
- communicable diseases; and
- birth outcomes.

Chronic diseases

Chronic diseases are those that are ongoing or recur over a period of time. These include diseases such as cardiovascular diseases (e.g. coronary heart disease and stroke), cancers, diabetes, renal disease and respiratory diseases (e.g. chronic obstructive pulmonary disease (COPD), emphysema and asthma). As a group, these diseases are responsible for a large proportion of deaths. For these diseases generally, there is a need to be able to report on:

- the prevalence of disease in the community (i.e. the number of people who have these diseases);
- the incidence of illness events (e.g. coronary, stroke, or asthma attack) due to these diseases; and
- the rate of death due to these diseases.

Of these three (prevalence, incidence and death), data for death is most reliable and can serve as an indicator for the others.

Prevalence can be inferred through the National Health Survey but information is self-reported and there is little data collected from remote areas.

Incidence of heart attack could be estimated by admissions to hospital for this cause (however, the assumption has to be made that chances of admission are equal in each area; it is unclear whether this is the case). Admissions for asthma can be influenced by the local setting (e.g. precautionary admission in more remote hospitals), and so may not be a good indicator. Admission for conditions such as dialysis or renal transplant may be influenced by geographic location and cultural setting and so may not prove to be a good indicator of renal disease across geography.

Suggested indicator:

***1.1.1: The prevalence of chronic diseases*—** from the ABS National Health Survey, the prevalence of a range of conditions including diseases of the circulatory system, cancers, respiratory disease, diabetes and renal disease. See page 63.

Injury

Injury and death due to injury appear to be more common in non-metropolitan areas, as a result of occupational injury, motor vehicle accidents, suicide, interpersonal injury and environmental hazards (e.g. dog bite). So as to better understand the burden of injury across geographic zones, there is a need to report on:

- a measure of the burden of non-fatal injury, which varies from minor to serious and from temporary to permanent; and
- the rate of death due to the major injury causes of death, such as motor vehicle accidents, suicide, occupational injury and interpersonal violence.

Describing occupational injury is difficult because of lack of accurate identification about occupation both in census and mortality data. Another option is to use data on occupational injuries and diseases contained in the National Workers' Compensation Statistics database compiled by the National Occupational Health and Safety Commission (NOHSC) from information supplied by Commonwealth, State and Territory workers' compensation authorities. These agencies processed workers' compensation claims received from insurance companies, self-insurers and some government departments. Although the National data set can be used to report rates in each of the States, it is not currently possible to report at a finer geographic level.

Use of National Hospital Morbidity data may be misleading in describing differentials between areas because of the greater probability of precautionary admission in regional and remote area hospitals.

Suggested indicator:

***1.1.2: Prevalence of injuries*—** from the ABS National Health Survey, the prevalence of injuries. See page 65.

Mental health

More than one million Australians suffer from a mental disorder at any one time, with half of these affected long-term (AIHW 1999). Major disorders include affective disorders (mainly depression), substance use disorders and anxiety disorders. So as to understand the burden of poor mental health across geographic areas, there is a need to report on:

- prevalence of affective disorders (including depression), anxiety and substance use disorders; and
- rates of suicide and attempted suicide (reported in part under indicator 1.4.5).

Suggested indicator:

***1.1.3: Prevalence of depressive, anxiety and substance abuse disorders*—** percentage of males and females aged 18 years and over by area, who report depressive, anxiety and substance abuse disorders. See page 66.

Oral health

Oral health affects diet and the ability to eat, personal appearance and self-esteem, social inclusion and the need for assistance. This indicator aims to determine whether the oral health of people who live in rural and remote areas is similar to that of people who live in metropolitan areas by answering the following questions:

- Are people just as likely to have the same number of decayed, missing or filled teeth in metropolitan and non-metropolitan areas?
- Are non-metropolitan people just as likely to be edentulous, or have restorative dentistry or dentures as people from metropolitan areas?
- Can people afford to go to the dentist for a check-up and preventive work to the same extent in all geographic zones?
- Are waiting times for dental appointments of similar length in metropolitan and non-metropolitan areas?

The first and second issues are described by indicator 1.1.4 below. The last two issues relate to access: one is essentially an interplay between income and expenditure (described later under the 'Socioeconomic factors' dimension), the other relates to the 'Appropriate' dimension and cannot yet be reported against.

Suggested indicator:

***1.1.4: Oral health*—** the mean number of decayed, missing and filled teeth in 6 year olds, 12 year olds and 35–44 year olds, and the percentage of those older than 65 years who are edentulous in each area. See page 67.

Communicable diseases

As a result of the introduction of immunisation, antibiotics and improved sanitation last century, the incidence of communicable disease has declined. However, a number of significant communicable diseases continue to contribute a substantial burden, particularly for some communities. In addition, prevention strategies rely on continuous surveillance and intervention. This range of diseases includes childhood infectious diseases such as measles and pertussis, influenza, food poisoning, vector-borne and arboviral diseases such as Ross River virus and Murray Valley encephalitis, sexually transmitted infections (STIs, e.g. chlamydia and syphilis) and those also transmitted through needle sharing (including HIV, and hepatitis B and C).

Suggested indicator:

***1.1.5: Incidence of communicable diseases*—** rate of disease notifications for all arboviral disease, pertussis, food-borne disease and selected STIs. See page 69.

Birth outcomes

The health of children at birth influences their immediate survival and future health prospects. An understanding of variation in birth weight and/or gestation across geographic zones would be useful in assessing the extent of poorer health amongst newborn babies from non-metropolitan areas. Because of the suspected links between the health of babies and children with health at later life stages, understanding of birth outcomes may also indicate the potential for future health.

Issues of potential interest include:

- birth weight of newborn babies; and
- gestational period of newborn babies.

Both of these can be reported, but birth weight has been selected as it is likely to be a more useful measure, and the two are correlated.

Suggested indicator:

***1.1.6: Birth outcomes*—** mean and percentage of birth weights in each of a number of ranges (<1500, 1500–2499g, 2500–2199g, 4200+g) by Indigenous status of mother. See page 70.

1.2 Human function

The human function dimension captures information on the level of disability and impaired function in the population. It includes information on the prevalence of impaired functioning, activity limitations and restrictions in participation. It is one of the goals of the health system to maintain optimal function of people and limit impairment or disability related to injury, disease or other disorders.

Possible indicators for this dimension may include:

- *years lived with disability (YLD); and*
- *impairment ratings and levels of independence/dependence.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- severity of disability (profound, severe, moderate, mild);
- type of disability (psychiatric, intellectual, sensory and physical); and
- days off work or away from usual activity as a result of illness.

In addition it would be useful to know the extent to which any difference in the prevalence of disability across geographic zones is due to the possible migration of disabled people to less remote centres so as to access services. Currently, this information is not available.

Prevalence of disability

Both the severity and type of disability are important.

Suggested indicator:

***1.2.1: Prevalence of disability*—** the age-standardised prevalence rate in the population younger than 65 years with any disability and the age-standardised percentage of the same population with a profound/severe activity limitation. The indicator also presents the estimated number of people with disabilities in these two groups. See page 71.

Days away from usual activity as a result of illness

One possible measure of the burden of illness is a count of days off work as a result of illness. However, in areas where there is less work or higher levels of unemployment, this measure may substantially underestimate the day-to-day burden of illness. A better measure may be the number of days away from usual activity as a result of illness, as people who are not in the workforce are also counted; however, if activity is usually impaired by long-term illness, this measure may slightly understate the burden.

Suggested indicator:

***1.2.2: Days away from usual activity as a result of illness*—** the age-standardised mean of the number of days away from usual activity as a result of illness (using the ABS National Health Survey). Again, there may be some difficulty in reporting for the remote areas due to restricted sampling in those areas. See page 73.

1.3 Life expectancy and wellbeing

The life expectancy and wellbeing dimension includes broad measures of physical, mental and social wellbeing of individuals and other derived indicators. It is one of the goals of the health system to assist people to live a potentially achievable life span with minimal disability or disease.

Indicators that may give an impression of performance of the health system in achieving these goals are:

- *Disability-adjusted life expectancy (DALE);*
- *Disability-adjusted life years (DALY); and*
- *self-assessed health.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- disability-adjusted life expectancy (DALE);
- disability-adjusted life years (DALY);
- self-assessed health; and
- self-assessed happiness.

Disability-adjusted life expectancy (DALE)

A measure of life expectancy indicates how long people can expect to live, but, it does not take into consideration poor health and disability people may experience (for example) in the last few years of their life (i.e. the quality of life in all years is not taken into consideration). Disability-adjusted life years represent the average equivalent years of good health that a person can expect to live from birth. Differences in healthy life expectancy (DALEs) across geographic zones may prompt public health action. Calculation of DALEs, like DALYs, requires an understanding of the prevalence of disability in the area as a result of a range of conditions; such data is available nationally, but not for each area, consequently these summary statistics cannot be calculated by area. Local data is possibly available for Victoria, although the restricted range of remoteness categories in Victoria may reduce the usefulness of extrapolating to the rest of Australia.

Instead, life expectancy, unadjusted for disability, could be used to describe differences in life expectancy across geography.

Suggested indicator:

***1.3.1: Life expectancy*—** life expectancy at birth for males and females within each area, as well as the probability of living to age 55 and to age 65 years. See page 75.

While life expectancy can be calculated for each area, possible migration of sicker older people to less remote areas would be likely to bias life expectancy figures. A measure of the probability of reaching 55 years and 65 years of age would provide a hedge against this sort of bias.

Disability-adjusted life years (DALY)

Disability-adjusted life years (DALYs) are a composite measure of the number of years of life cut short by death plus the number of years lived with disability (weighted for severity). DALYs attempt to aggregate the burden imposed by death and the burden imposed by disability into a single measure. As such they are a good summary measure of the burden of

ill health. It is not currently possible to calculate DALYs for each area for the same reasons as for DALEs.

A proxy measure is the calculation of years of life lost (unadjusted for disability) or its converse, premature mortality. This statistic is reported in the 'Deaths' dimension of this tier.

Suggested indicator:

***1.4.4: 0–65 years mortality and premature mortality*—**as described on page 16.

Self-assessed health status

How healthy do people feel? Self-assessed health status from the ABS National Health Survey is a valuable measure of general health status as perceived by the individual.

Suggested indicator:

***1.3.2: Self-assessed health status*—**percentage of respondent's health status assessed as 'excellent, very good, good, fair, poor' in each area. See page 76.

Self-assessed happiness

What is health without happiness? A measure of happiness or how people feel about their life as a whole, is included because of happiness's intrinsic value as a common human goal and as it links comfortably with mental health.

Suggested indicator:

***1.3.3: Happiness or 'how people feel about their lives as a whole'*—**from the ABS National Health Survey, how people in each area feel about their lives. See page 77.

1.4 Deaths

The deaths dimension includes age and/or condition-specific mortality rates. Information on rates and causes of death by age, sex and population group will provide valuable information on the causes and conditions that lead to premature death and identify groups at risk. A reduction in premature deaths would indicate effective interventions across the health system.

Possible indicators may include:

- *perinatal and infant mortality;*
- *years of life lost (YLL) for certain health conditions; and*
- *leading causes of death.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- death rates;
- perinatal mortality;
- age-specific mortality;
- a measure of the burden of premature mortality; and
- a measure of the relative and absolute contribution to overall mortality and premature mortality of the leading causes of death.

Death rates

Overall measures of mortality (e.g. age-standardised death rates) summarise mortality for various population groups (e.g. Indigenous, non-Indigenous people, males and females). While DALYs and DALEs under the dimension 'life expectancy and wellbeing' describe the burden of ill health and mortality in a single measure, death rates are a useful measure of mortality alone. Comparison of 'all cause' death rates for a number of population groups adds to the understanding of mortality across geographic areas. Allowances should be made for anomalies in age-specific death rates (especially in the older age groups).

A single measure of death rate (or indeed any other variable) may suggest a level of uniformity within an area. So, in addition, a measure of the heterogeneity of overall death rates within broad rural, regional and remote areas may also be useful.

Suggested indicator:

***1.4.1: Overall mortality*—** indirectly age-standardised 'all cause' death rate, by sex in each area. Rates to be presented also as a trend over time. As a measure of the heterogeneity of death rates within broad geographic areas, death rates calculated for each SLA could also be presented for each broad geographic area. See page 78.

Perinatal mortality

High rates of stillbirth and the death of infants soon after birth are largely preventable. Perinatal mortality and the general health of the community are frequently related. Perinatal mortality is well suited to modification through public health action/primary health care; identification of differential rates of perinatal mortality may suggest targeted action.

Suggested indicator:

***1.4.2: Perinatal mortality*—** perinatal mortality per 1,000 births. Foetal, neonatal and overall perinatal death rate to be reported. See page 80.

Age-specific mortality

While the bulk of deaths occurs in older age groups, high mortality of the young in some areas can substantially contribute to differences in statistics such as years of life lost (YLL). Identification of areas where mortality in some age groups is particularly high may suggest strategies to reduce rates.

Suggested indicator:

***1.4.3: Age-specific mortality*—** age-specific death rates for males and females from each area. See page 81.

Premature mortality

Summary death rates (e.g. age-standardised rates) are heavily influenced by the mortality of older people in the community. Deaths of younger people are frequently preventable. A measure of the number of years of life lost as a result of premature mortality (both in an absolute and relative sense) would provide an awareness of the burden of mortality for younger people (i.e. those younger than 65 years) in the community.

Suggested indicator:

***1.4.4: 0–65 years mortality and premature mortality*—** indirectly age-standardised 'all cause' death rate for those younger than 65 years in each area. The total number of years of life lost (YLL) in each area for those who are younger than 70 years of age at death. The use of the two different ages is explained on page 82.

Leading causes of death and excess deaths

As a means of providing a sense of perspective, a measure of the contribution to overall and premature mortality of the leading causes of death has value. In addition, such a measure would indicate those conditions or injuries that are responsible for the excess[1] deaths (and also excess premature deaths). This indicator would also describe the number of excess deaths for major population groups within each geographic area and identify the causes that contribute most.

Suggested indicator:

***1.4.5: Leading causes of death and excess deaths*—** the number of deaths due to each major cause and the number of deaths in excess of that expected if Major City rates applied in each area. Specific causes of death to be described include cardiovascular diseases, cancer, respiratory diseases, diabetes, renal disease and injury (as well as a number of more specific causes under each of these). See page 84.

[1] Excess deaths are defined here as the number of deaths in excess of what would be expected if Major City age-specific death rates applied in each area.

Determinants of health (Tier 2)

The five dimensions of this tier are:

2.1 Environmental factors

2.2 Socioeconomic factors

2.3 Community capacity

2.4 Health behaviours

2.5 Person-related factors

2.1 Environmental factors

Environmental factors such as air, water, food and soil quality and access to clean water and fresh fruit and vegetables directly influence the health of Australians. Longer-term environmental impacts include the depletion of the ozone layer, increases in UV levels and increased salinity of our water systems.

Possible measures to monitor environmental factors include:

- *air quality—levels of pollution, dust and pollen counts, Legionella reports;*
- *stratospheric ozone levels;*
- *smoke—free homes and workplaces;*
- *water—pollutants, bacterial readings, blue green algae; and*
- *food quality—salmonella reports etc.*

Source: *National Health Performance Framework Report, August 2001.*

The physical environment in which people live plays an pivotal role in population health. Adequate air, water, food and shelter are basic necessities of life. Protection from pathogens, the extremes of temperature and ultraviolet radiation are other examples of environmental factors that affect health. Ultimately issues such as soil depth and quality, climate, biodiversity and sustainable utilisation of resources such as fisheries and forests are of critical importance to rural communities now, and indeed to the health of future populations generally, and are currently under threat (McMichael 1993).

Most nationally reported or suggested indicators (e.g. stratospheric ozone, etc.) may not be appropriate rural health indicators because variation across remoteness classes does not occur or its variation is unrelated to remoteness (e.g. stratospheric ozone). Instead, environmental indicators that relate to the following factors may be more appropriate in this framework:

Access to and/or quality of:

- water;
- sewerage;
- food;
- housing;
- recreational and cultural facilities or spaces;
- the workplace; and
- the levels of pollutants.

It is currently difficult to report against many of these factors, due to limited availability of national data. Some States have data and some factors have been investigated in one-off surveys.

Water

Adequate quantities of clean water are essential for the maintenance of health. The availability of biologically safe 'tap water' (or water which is otherwise the immediate source of household water), particularly regarding the degree of faecal contamination, is a basic necessity for the maintenance of health. In addition, the chemical quality of water (including the presence of salts and pollutants such as agricultural chemicals and heavy metals) may also be of relevance. Fluoridation of reticulated domestic water supplies has clear public dental health benefits.

Suggested indicator:

2.1.1: Fluoridated water— the percentage of 'local areas' in which reticulated water supplies have a fluoride concentration within the NHMRC guidelines. See page 86.

Sewerage

Decent sewage disposal is another basic requirement for health. Adequate sewage disposal is essential to prevent the spread of disease through direct human contact or through contamination of water supplies.

What constitutes effective sewage disposal may differ from place to place. Typically, it may consist of a sewerage system with primary, secondary and tertiary treatment of effluent, maintained by local government. However, it may also consist of a well maintained and sited septic system. It is likely impractical that small isolated communities or farm houses be connected to the sewer; septic systems are a reasonable alternative. However, at sites, or in communities, where the system is not well maintained, any sewerage system, but particularly a septic system, can fail and become a health hazard.

Food availability

The price of food is addressed under the dimension 'Community capacity' in this tier. However, irrespective of the price of food, the availability of certain foods can be restricted in more remote areas. For example, fresh fruit and vegetables, or their variety, may simply not be available. Availability of fresh fruit and vegetables is important for the maintenance of health.

A national data source has not been identified and this indicator requires development. A possible proxy is to report the results of individual State surveys (e.g. Public Health Services 2001).

Housing

Housing provides the most basic of the environments in which people live. Important issues include the degree of crowding (covered under the dimension 'Community capacity'), security aspects, the building's effectiveness in maintaining a comfortable internal temperature, appointment with furniture (e.g. appropriate numbers of beds), the functioning of household fixtures and appliances (does the toilet work, is there a functioning fridge, shower, kitchen sink). Additionally, is there appropriate personal space for people and a place for children to play, study or have privacy? Does the house have access to electricity and is the telephone connected?

Suggested indicator:

2.3.8: Overcrowding in households—as described on page 27.

Recreational and cultural facilities or spaces

Recreational and cultural facilities or open space provide people with the space or facilities for activity and learning that make life interesting or pleasant. Football grounds, bowling alleys, pubs, churches, libraries and museums, beaches, national parks, walking tracks, rivers and swimming pools are examples of some of these. Their importance lies in providing people with an opportunity for activity, enjoyment and learning, and as such, they also provide people with an opportunity to develop and interact with other people.

A data source has yet to be identified.

The workplace

Farming, mining and fishing are potentially dangerous occupations. Additionally, an under-supply of work may encourage workers to accept workplace standards that are less safe. A measure of the level of safety within workplaces and/or the rate of workplace accidents would be useful in identifying areas for improvement.

An indicator is not currently possible because the National Occupational Health & Safety Commission does not collect details of geographic location (other than State). Measures of mortality or hospital morbidity may be an alternative, but there are some concerns about the accuracy and completeness of details of occupation recorded in National Mortality databases and the ABS Census.

An indicator requires development.

Pollutants

It is likely that both the concentration of, and human exposure to, pollutants would be lower in non-urban environments. However, it is possible that exposure to small particulates may be greater in non-metropolitan areas because of the presence of dusts, smoke and pollens. Exposure to some hazardous materials may occur as a result of poorer living conditions through material or equipment no longer thought to be safe (e.g. asbestos sheeting, lead-lined equipment, etc.) and the consequence of 'making do' or of affordability.

Exposure to a number of agricultural chemicals is frequently raised as a potential health hazard, but the effects of this exposure are either so subtle or the identification of cases of ill health linked to exposure so inadequate as to make a causal link difficult to establish.

A data source has yet to be identified.

2.2 Socioeconomic factors

Research has shown clear associations between socioeconomic factors such as education, employment and income and the health status of Australians. Generally, population groups with lower socioeconomic status have poorer health than those with higher socioeconomic status. Reporting the socioeconomic factors affecting health will help to inform public policy. This could encourage greater intersectoral collaboration to help address health inequalities and improve health status and health outcomes.

Suitable indicators may include health outcomes or health determinants broken down by:

- *education level (primary/secondary/tertiary);*
- *employment status; and*
- *income.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- education;
- employment;
- income; and
- a combined measure of these three (SEIFA).

Education

Education provides opportunities for employment and income as well as a foundation for the development of life skills and awareness of the relationship between lifestyle, outlook on life and health outcomes. The educational background of the adult population will influence their health and that of their family, while educational opportunities for children influence their future life choices, and hence health. The lower prevalence in more remote areas of employment requiring higher education is likely to reduce the motivation of students to complete secondary or tertiary education. For those who do complete secondary education, the need to migrate to a metropolitan area so as to complete tertiary studies will act to maintain the lower average educational level of non-metropolitan communities, unless they return after completion. Additionally, reduced higher level employment opportunities in non-metropolitan areas for the general adult population (as for school leavers), can only help to maintain the lower average level of educational attainment within rural/remote communities.

There are two substantial aspects of this issue which need to be considered:

- the educational level of the rural and remote population compared to the metropolitan population; and
- the educational opportunities for children and young people living in rural and remote areas.

Educational level of the population relates to the population's socioeconomic status and hence predisposition to disease (e.g. through personal risk factors), as well as people's ability to take advantage of available services. An understanding of educational level may also be important in relation to targeting health information and in explaining disparities in health status and health service utilisation.

Educational opportunity for children and young people relates to future educational level, life opportunities, health status and health service utilisation. As such, it is important to be aware of educational opportunities and barriers for young people from rural areas; understanding these may assist in addressing future potential inequity.

Suggested indicators:

***2.2.1: Educational status of the adult population*—** as expressed by the proportion of people aged 20–39, 40–59 and 60+ who have completed primary school, Year 10, Year 12 and some tertiary qualification. Data pertaining to the level at which schooling was finished is unlikely to be possible; the proposed proxy is the age by which school was left (viz. before 12, 17 and 19 years). This provides a measure of educational status of the adult population. See page 87.

***2.2.2: High school retention rates*—** as expressed by the ratio of 17 year olds who are currently enrolled in secondary education to the average number of children aged 10–14, four years previously. This provides a measure of the educational opportunity for young people.

Actual high school completion rates would be preferable to current enrolments, but this information is not available by geographic location. Enrolments are known and so the closest proxy is to calculate an enrolment rate for 17 years olds. See page 88.

***2.2.3: Progression from school to university*—** as expressed by the percentage of 17–20 year olds commencing the first year of tertiary study for the first time. Commencements were chosen rather than completions because a geographic identifier is not included in the data set describing completion of university study (i.e. it is not possible to describe the rate of completion of university studies by students from rural and remote areas). Additionally, at the end of their studies, home address is more likely to be the location where students are studying or are working, rather than where they are 'from'. See page 89.

Employment

Employment gives people a sense of function, of integration with the community, and of self-worth as well as the financial resources to provide for necessities. Information about those participating in the labour force and those employed (including those engaged in community development employment programs) is relevant. Employment opportunities and types of job are typically more restricted in non metropolitan areas, limiting the opportunities for people to find employment in rural communities and consequently forcing them to move to less remote centres or accept less favourable employment options.

Information about the both the quantity and type of employment would be useful, particularly:

- the proportion of the population who want to be employed (and the proportion who actually are and are not); and
- the type of work available or performed (type of industry, part time/full time).

Desirable measures of employment include:

- the percentage of the adult population who want to be employed;
- the percentage of these who are not employed;
- the percentage (relative to both dot points above) who are employed under Community Development Employment Programs (CDEP); and
- the percentage of the adult population who are employed.

Desirable measures of the type of employment include:

- the type of industry in which people are engaged (farming, other business, public sector, and so on). This information is dealt with by indicator 2.2.7 ('Sources of income');
- whether work is full time, part time, or seasonal (not currently possible); and
- whether people are self-employed or employees (not currently possible).

Employment (or unemployment) rates and type of work can be estimated from the ABS Census, once every five years. Although this allows quite some time between reporting periods, it does allow comparison of rates between regions (which are unlikely to change rapidly without a radical change in the rural/remote economy relative to that of the metropolitan economy).

While it is currently possible to identify people who are registered with CDEP, it is not possible to describe the number who are working.

Suggested indicator:

2.2.4: Workforce and employment—proportions of Indigenous and non-Indigenous people aged 15–64 or 15–54 years, by sex:
a) in the labour force (participation rate);
b) unemployed as a proportion of the labour force (unemployment rate);
c) employed as a proportion of the population (employment/population ratio).

See page 90.

Income

Income from employment (or other personal income such as investments or superannuation) or via social security provides for necessities such as food, clothing, shelter, security, education, transport, and health care. It also provides people with choice and power (self-determination) within their own lives. The 'less skilled' nature of work opportunities in more remote settings and the higher level of competition for jobs, as well as lower prevalence of employment, act to keep income at lower levels. Higher levels of fertility and larger families, along with greater prevalence of Indigenous people, who tend to have larger households, may require income to be assessed more cautiously than measures based merely on average 'household income'.

Income is relative; relative to the income of others and relative to the cost of goods and services. Indicators of income need to be interpreted in the light of information about the costs of goods and services across geographic areas.

There are several aspects of income that are important:

- the relative size of family incomes adjusted for family size (i.e. are the incomes of similar sized families the same in metropolitan and rural Australia?);
- a measure of the gap between the rich and poor (as there is some evidence that health relates to this gap as well as to absolute levels of poverty);
- the percentage of each region's income derived from each type of industry (farming, other business, public sector, social security, etc.). This measure allows an understanding of the weaknesses and strengths in the economy of each area, an important determinant of the opportunity for employment and to earn income; and

- the percentage of each region's income derived from the source of that income, i.e. from wage and salary, business income (sole proprietor, partnership), investments and government benefits). These measures give an insight into the income self-reliance and earning capacity of regions (an issue expanded further on page 29).

These details of income can be derived from ABS Census data and the ABS Survey of Income and Housing Costs (SHIC). More recently, estimates derived by the ABS from the Australian Taxation Office (ATO) Individual Income Tax Return Database have become available, but while these describe income in discrete areas, they cannot yet describe income for broad geographic areas (e.g. ABS Remoteness).

The Rural and Regional Statistics National Centre (RRSNC) within the ABS has produced estimates of the number of wage and salary earners and their average wage and salary income at regional levels from 1995–96 onwards using ATO Individual Income Return data. Data is available by age, sex and occupation. The intent is to provide this data annually thus providing an inter-censal measure of income and occupation at regional levels. While wage and salary data is currently available, estimates of all sources of income and average disposable income are yet to be produced. Full details will be available in the ABS Rural and Regional Statistics National Centre Information Development Plan when released in mid 2003.

Measures of total income less tax paid also provide information on average individual disposable income. The combination of wage and salary income measures, with occupation information in particular, provides a very good measure of regional labour market activity where employment measures may not be available or meaningful.

Suggested indicators:

2.2.5: Adjusted after-tax household income—average equivalised 'after-tax' household income, adjusted for household structure. See page 91.

2.2.6: Gap between rich and poor—the ratio of the income earned by the affluent to the income earned by the poor. See page 93.

2.2.7: Sources of income—the percentage of people reliant on each industry sector for their main income and the sources of personal income in each region. See page 95.

Measures of the number of people reliant on social security and the total dollar amounts paid in each area, while not currently available, are currently being developed by ABS RRSNC.

A combined measure of education, income and employment

SEIFA (Socioeconomic Index for Areas) provides a summary measure of the socioeconomic conditions in an area.

Suggested indicator:

2.2.8: SEIFA—the indexes of disadvantage, economic resources and of education and occupation. The proportion of the population in each area who live in census collectors district areas in each SEIFA quartile. See page 97.

2.3 Community capacity

Community capacity incorporates information on characteristics of communities that can influence health, such as health literacy, quality housing, community support services, transport, community safety and social support. It also includes measures of local health services. Concepts and measures of community capacity are currently the focus of considerable research and development. Appropriate national performance indicators that relate health to community capacity will be developed.

Indicators could include:

- *health services in the locality;*
- *trust in health professionals;*
- *health literacy; and*
- *community support services.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- demographic characteristics;
- social issues and social capital;
- services (including recreational and cultural activities/venues);
- health literacy;
- individuals perception of risk;
- housing;
- transport;
- cost of living; and
- health of the business/commercial sector.

Demographic characteristics

The age and sex of the population as well as the proportion who are Indigenous are important issues, both in their own right and also for the interpretation of many of the other indicators.

Suggested indicator:

***2.3.1: Demography*—** demographic characteristics of the population, including population size, growth rate, age and sex structure, and proportion of Indigenous persons. See page 98.

It is possible that mobility (i.e. migration to another area) masks important health differentials. The opportunity for, and pressure to, change residence so as to access education, a job or health services will see people move between areas. Mobility of the population between areas may affect the interpretation of other indicators. For example, migration of older people in poorer health to less remote areas, leaving those who are in good health to continue residing in remote areas, may hide poor health outcomes in remote areas and overstate them in other areas.

Suggested indicators:

***2.3.2: Dependency ratio*—** the ratio of people aged 0–14 and 65+ to those between 15 and 64 years (working age). See page 100.

***2.3.3: Internal migration*—** of the number who were present in each area in the year prior to the Census, the proportion remaining, and the proportion who moved to each other area (disaggregated by age group). See page 101.

Teenage pregnancy and larger numbers of children per family increase personal risk and financial stress, and reduce educational and employment opportunities for women and their families.

Suggested indicator:

***2.3.4: Fertility*—** birth rates for females for each age group and all ages in each area. See page 103.

Social issues and social capital

'Social capital' refers to the institutions, relationships, and norms that shape the quality and quantity of a society's social interactions. Increasing evidence shows that social cohesion is important for societies to prosper economically and for development to be sustainable (World Bank 2002). Measuring social capital is difficult; however, a range of proxies such as measures of trust in government, voting trends, memberships in civic organisations, and hours spent volunteering has been used previously (World Bank 2002).

Social issues that would appear to be important indicators of the health of rural and remote populations include hours spent volunteering or engaged in community projects, levels of violence in the community and within the family, rates of property crime, membership of clubs, some measure of community empowerment, sole parenting, truancy rates, and so on.

Community and family harmony provide a safe and nurturing environment in which people can enjoy living. Community violence and child abuse or neglect can turn an otherwise healthy community environment into one where fear and aggression reduce the opportunities for health, education and mental wellbeing.

Suggested indicator:

***2.3.5: Community safety*—** mortality of all people generally and of children under 5 years due to interpersonal violence. Reporting to attempt to differentiate between violence in the community and at home. See page 104.

Services

Services such as post offices, banks, health services, community services (e.g. police, social workers, and so on), telephones, mobile phone coverage, Internet and emergency support services are important basic services for which there may be inequities in access across the spectrum of remote to metropolitan Australia.

These services are important for a number of reasons, either so as to provide health services, infrastructure to contribute to a safe and convenient environment, a means of enhancing communication and access to information, and emergency services in times of crisis.

During periods of crisis, people (frequently women and their children, but including homeless men of all ages and families in difficult circumstances) require emergency assistance. Assistance can be provided through a number of channels including friends, family, government agencies and non-government organisations.

In addition, recreational and cultural activities/venues are important on the basis of the beneficial effect they can have on people's life style. Apart from their impact on mental outlook and physical activity, these factors are likely to play an important part in the retention of health professionals. Activities/venues can be facilities (e.g. football fields, parks, libraries), natural features (e.g. accessible beaches and rivers) or groups of people (e.g. choral groups, churches, football clubs). There is some overlap here with social capital and also with the environmental dimension.

An indicator has not yet been developed.

Health literacy

Health literacy is the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions (US Health Department 2002).

Health literacy means more than being able to read pamphlets and successfully make appointments. It represents the cognitive and social skills that determine the motivation and ability of individuals to gain access to, understand and use information in ways that promote and maintain good health. By improving people's access to health information and their capacity to use it effectively, health literacy is critical to empowerment.

As such, knowledge and understanding of health issues, services and opportunities provide people with greater power to influence their own level of health. For example, knowledge about the effects of tobacco smoking, excessive alcohol consumption, nutritional intake, cervical screening and so on are important so that individuals can make informed choices about healthy lifestyles. Additionally, people's knowledge, understanding and attitude about accessing services, about programs aimed at improving access to services and about their rights generally are likely to have an impact on people's use of services.

Indicators could assess issues such as ability to speak and read English (correlated to ability to access services and level of education), women's health screening issues (e.g. ever had a mammogram or Pap test), understanding of health risk factors (e.g. that smoking, excessive alcohol consumption, illicit drugs, lack of exercise, poor diet, etc., is bad for you), and level of private health insurance.

A suitable indicator requires further development and an appropriate data source has not yet been identified.

Individuals' perception of risk

Are individuals' perceptions of risk to their own personal health or safety different in rural areas to those in metropolitan areas? The perception of risk relates to a range of practices and behaviours, from speeding, drink driving, smoking, sexual practices and seeking medical advice, to income and perhaps, to some extent, a measure of stoicism. Understanding whether perceptions of risk differ with geography could be an important element in altering the prevalence of risky behaviour in particular areas.

An appropriate indicator has yet to be developed; however, a possible proxy is suggested below.

Suggested indicator:

***2.3.6: Individuals' perception of risk*—** the percentage of the population who report engaging in risky behaviour (e.g. driven, worked, swum, verbally or physically abused someone, etc.) while intoxicated with alcohol or an illicit drug. See page 106.

Housing

Housing provides people with personal security and protection against the elements. Its quality relates directly or indirectly to health through the effects of crowding and state of repair on education, personal hygiene, stress, depression, injury, and so on. Valuable comparisons would include:

- the quality of housing (including state of repair and function);
- levels of home ownership as opposed to tenancy;
- levels of crowding; and
- how well the housing suits the lifestyle of households.

Of these, the second and third issues can be described. Although some information is available for the other two, the data sources do not provide national coverage.

Suggested indicators:

***2.3.7: Housing tenure*—** the proportion of households that are renting, purchasing or own their dwellings. See page 107.

***2.3.8: Crowding in households*—** the proportion of dwellings that are considered crowded. See page 108.

Transport

Information about transport should consider both access to local goods and services as well as access (when required) to health-related goods and services available only in metropolitan areas. Public transport is limited or is not available in rural and especially remote areas, so access to a car is important for accessing goods and services (including health services, education and work). Measures such as rates of car ownership are obvious, but other important issues include:

- whether a bus or train service operates locally and to major centres (including metropolitan centres);
- how frequently services run;
- the financial costs of using these services; and
- whether some form of government financial assistance for transport may be required to access health services, etc.

This level of information is not available nationally.

Suggested indicator:

***2.3.9: Transport*—** the average number of registered motor vehicles garaged per household per adult. See page 109.

Cost of living

The capacity to be able to live a healthy life not only depends on income, but also on the cost of living. Clearly, if food is more expensive, there is less to spend on access to health services (and other goods and services directly and indirectly linked with health outcomes).

There is no available overall measure of cost of living in rural and remote areas (consumer price index (CPI) is calculated only on the basis of costs in metropolitan areas). Reporting the cost of food, petrol and housing prices (weekly expenditure of mortgage or rent) is currently possible.

Suggested indicator:

***2.3.10: Cost of living*—** in lieu of an overall cost of living statistic, prices of three fundamental groups of commodities (food, housing and petrol) can be compared across areas.

Cost of housing as expressed by the weekly cost of rents and mortgages recorded at each Census can be used to describe the cost of housing to residents in each geographic area. The cost of petrol is collected regularly by Informed Sources P/L for the Australian Competition and Consumer Commission (ACCC), but the cost of food is currently collected only by 'one-off' State surveys. See page 110.

Health of businesses

The opportunity for deriving a livelihood through paid employment, with its inherent health benefits, depends on the health of the business sector and opportunities for employment in the public sector. This presupposes a buoyant regional economy. Contraction of the economy is likely to restrict employment opportunities and engender despondency; a healthy or expanding economy is likely to create job opportunities, attendant optimism and better health outcomes. Access to employment and goods and services is important for the maintenance of health and also assists in the retention of a health workforce in regional areas. Potentially valuable information could include the number or rate of business closure and openings, the types of businesses opening and closing, and the relative contribution of these to local employment (number of people employed) and income (dollars earned by people locally).

Under the New Tax System (TNTS) incorporating the introduction of the GST, the ABS is working in collaboration with the Australian Taxation Office to produce business activity statistics using the number of Australian Business Number (ABN) allocations, the number of businesses registered for GST and information provided in the Business Activity Statements. Regional statistics can be derived only from some, but not all, of these administrative processes. However, estimates have been produced on small business activity in regional Australia. Data for the number of businesses, total expenditure, total income and profit as well as the averages for expenditure, income and profit per Statistical Division have been estimated retrospectively from 1995–96 to 1999–00.

Other work has been done using the ATO Australian Business Register (see ABS 2001a). Data deal with the number of businesses registering for GST and whether these are employing, non-employing, single State or multi-State businesses. Industry breakdowns are also given. Limited regional data are available by postcode or groups of postcodes.

The ABS Rural and Regional Statistics National Centre can currently report counts of ABNs (i.e. businesses) and can report counts of regional small businesses, operating income, operating expenses, profit and the percentage change for these variables from year to year. Unfortunately, while it is possible to report these statistics for States or even for Statistical Divisions, it is not currently possible to report these (ABS 2002, ABS 2001a, ABS 2001b) for broad geographic areas such as ASGC remoteness, ARIA or RRMA.

Suggested indicator:

***2.3.11: Business activity*—**the economic health of a region measured by business growth or decline. See page 112. This indicator cannot currently be reported by ABS Remoteness structure (or similar geographic classification).

2.4 Health behaviours

Poor health is strongly associated with, or caused by, certain health behaviours. Poor diet, insufficient physical activity, excess alcohol consumption and smoking are common risk factors for many diseases and conditions including cancers, diabetes, heart disease and stroke.

Possible indicators to monitor may include:

- *tobacco use;*
- *excessive consumption of alcohol;*
- *illicit drug use;*
- *levels of physical activity; and*
- *nutritional intake.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- smoking;
- hazardous and harmful alcohol consumption;
- illicit drug use;
- physical activity/inactivity;
- nutrition;
- sexual practices; and
- driving practices.

Smoking

Smoking is the personal risk factor associated with the greatest burden of disease. It would be desirable to compare smoking rates in each area and for Indigenous and non-Indigenous people (including an assessment of the prevalence of children smoking). Comparison of individual and community attitudes to smoking as well as availability of cigarettes to young people would be more appropriately covered under the 'Community capacity' dimension.

Suggested indicator:

***2.4.1: Tobacco use*—** the percentages of persons aged 14+ within each area who are regular smokers, occasional smokers, ex-smokers and those who have never smoked. See page 113.

Hazardous and harmful alcohol consumption

Moderate alcohol consumption appears likely to provide some health benefits; however, consumption of larger amounts can have substantial harmful health and social effects. Useful information would include comparisons across areas of both rates and patterns of hazardous and harmful alcohol consumption.

Suggested indicator:

***2.4.2: Hazardous and harmful alcohol consumption*—** the prevalence of hazardous and harmful alcohol consumption. See page 115.

Illicit drug use

Illicit drug use can constitute a significant health risk and can feed property and personal crime rates (reducing opportunities for others). The rate of illicit drug use (including cannabis, injecting drugs, non-prescription use of prescribed drugs, petrol, and so on) may vary with remoteness. Relatively small sample sizes of the relevant data sources may restrict the opportunities for reporting in the more remote areas.

Suggested indicator:

***2.4.3: Illicit drug use*—** the proportion of people who had recently used an illicit drug (all illicit drugs, cannabis and all illicit drugs other than cannabis). See page 117.

Physical activity/inactivity

A certain level of physical activity is required to reduce the risk of cardiovascular diseases, the leading cause of death. Comparison of rates of physical inactivity across areas, with consideration given to the contribution of physical activity sustained both at work and during leisure time.

Suggested indicator:

***2.4.4: Levels of physical activity*—** the percentage of persons aged 18+ years doing some physical activity and the percentage doing no physical activity; the percentage engaging in sufficient levels of exercise and the percentage doing insufficient levels of exercise. Additionally, from the National Health Survey, the percentage engaging in physical activity for leisure. See page 118.

Nutrition

Food availability and price have been considered in the 'Environmental' and 'Community capacity' dimensions. Good nutrition with sufficient quantities of fruit and vegetables, appropriate quantities of dairy products and meat and lower quantities of fat, salt and refined sugars reduces the risk of a range of serious diseases and conditions. It would be useful to be able to report against all of these. From available data sources it is difficult to distinguish refined from unrefined sugars, and so sugars will not be reported.

Suggested indicator:

***2.4.5: Nutritional intake*—** estimated mean and median intake of fat, energy and fibre, and a measure of intake of fruit and vegetables. See page 120.

Sexual practices

The prevalence of sexually transmitted infections (STIs) in some communities in rural and remote communities is high. The effect on individuals, their sexual partners and their children is substantial from both a health and also a social perspective. An understanding of sexual practices, particularly the prevalence of unprotected sexual intercourse outside of a monogamous relationship, may assist in enhancing efforts to protect individuals from STIs in these areas.

Suggested indicator:

***2.4.6: Sexual practices*—** the age-standardised percentage of males and females who self-report non-safe sexual practices in each area. See page 122.

Driving practices

Motor vehicle accidents contribute substantially to the excess mortality in non-metropolitan areas. Comparison of driving practices such as speeding, drink driving and seat belt use across geographical areas may assist in targeting public health action.

A data source for this indicator has not been identified.

2.5 Person-related factors

Person-related factors include age, genetic and biomedical characteristics. These are factors outside those normally influenced by individual behaviours or by the environment. Genetic factors determine predisposition to certain conditions.

Possible indicators for this dimension could include:

- *rates of specific genetically determined diseases, e.g. Downs syndrome, muscular dystrophy, cystic fibrosis and haemophilia; and*
- *rates of specific birth defects, e.g. congenital anomalies of the heart.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- genetically determined diseases;
- specific birth defects caused by environmental factors;
- blood pressure;
- cholesterol; and
- overweight and obesity.

Genetically determined diseases

Particular anomalies at birth sometimes occur as a result of genetic inheritance from parents (e.g. Down syndrome, cystic fibrosis). The prevalence of these conditions can be reduced by a number of strategies. Higher prevalence for population groups in particular geographic zones may initiate greater efforts to further reduce the future prevalence or to assist in the care of those already affected.

Suggested indicator:

2.5.1: Genetically determined diseases—report both the number and rate of births with genetically determined diseases, including:

- Inherited Genetic Disease (cystic fibrosis, muscular dystrophy) caused by abnormal genes and inherited generation to generation;
- Somatic Genetic Disease (cancer) caused by sudden appearance of a defective gene in a part of the body. Disposition to cancer is inherited through abnormal genes.
- Chromosomal Aberrations (Down syndrome) due to deviations in chromosomal structures or numbers. They are either inherited or perhaps associated with mother's age at conception. See page 123.

Specific birth defects caused by environmental factors

Anomalies at birth (e.g. neural tube defect, including spina bifida) are influenced by environmental factors, and are not a result of genetic inheritance from parents. The prevalence of some of these conditions can be reduced (e.g. folic acid supplementation for pregnant women in order to reduce prevalence of spina bifida). Understanding of geographic variation for these conditions may help targeting of public health programs to reduce their prevalence.

Suggested indicator:

2.5.2: Specific birth defects—report both the number and rate of births with specific birth defects caused by environmental factors (e.g. pollution, radiation, drugs, sickness during pregnancy). See page 124.

Blood pressure

High blood pressure is a major risk factor for coronary heart disease, stroke, peripheral vascular disease and renal failure. The likelihood of high blood pressure can be lowered by reducing excess body weight, exercising, and limiting alcohol and salt intake, while existing high blood pressure can be lowered through the use of medication. Information about variation in the prevalence of high blood pressure across geographic zones could be of use in either targeting public health action to reduce prevalence or in encouraging the greater use of medication.

Results of blood pressure measurements are not available nationally by geographic area. The AUSDIAB study measured (among other things) blood pressure from a national perspective, but the data are not capable of being used to describe blood pressure at a finer level.

Self-reported data from the National Health Survey may be of some use, but this self-reported data suffers because people who have not been tested are (de facto) not aware that they may have blood pressure outside the normal range. The subsequent statistic can reflect either the prevalence of high (or low) blood pressure, or the likelihood of being tested. Hypertension is described using National Health Survey data under indicator 1.1.1 (The prevalence of chronic diseases).

Suggested indicator:

1.1.1: The prevalence of chronic diseases—hypertension as described on page 8.

Cholesterol

High blood cholesterol is a major risk factor for coronary heart disease and peripheral vascular disease. Lifestyle changes that prevent or reduce high blood cholesterol include a diet low in saturated fat, physical exercise and losing weight. Identification of greater prevalence of high blood cholesterol levels in some geographic zones may suggest public health action.

Results of biochemistry tests are not available nationally by geographic area. The AUSDIAB study measured (among other things) cholesterol levels from a national perspective, but the data are not capable of being used to describe cholesterol levels at a finer level. Self-reported data (e.g. from the National Health Survey) underestimates prevalence because people who have not been tested are (de facto) unaware that they may have elevated cholesterol levels.

Overweight and obesity

People who are overweight or obese have a higher risk of ill health including coronary heart disease, stroke, congestive heart failure and Type 2 diabetes. Lifestyle changes at the population level can reduce the prevalence of people who are overweight and consequently there is value in attempting to identify geographic zones with higher prevalence of overweight for intervention.

Suggested indicator:

2.5.3: Overweight and obesity — proportion of persons aged 18 years and over with a body mass index (BMI) in the overweight and obese ranges. See page 125.

Health system performance (Tier 3)

The nine dimensions of this tier are:

3.1 Effective (intervention achieves desired outcome)

3.2 Appropriate (care is relevant to the client's needs and based on established standards)

3.3 Efficient (desired results achieved cost effectively)

3.4 Responsive (service has respect for people and is client orientated)

3.5 Accessible (ability of people to obtain health care at the right place and right time irrespective of income, cultural background or physical location)

3.6 Safe (avoidance or reduction of harm associated with health care management)

3.7 Continuous (service can provide uninterrupted, coordinated care)

3.8 Capable (skilled and knowledgeable workforce)

3.9 Sustainable (capacity to provide ongoing workforce, and other infrastructure, engage in research and monitoring)

3.1 Effective

The definition proposed for effective in the framework is 'care/intervention/action achieves the desired result in an appropriate timeframe'. In framing a question related to effectiveness, it could be:

– *Is the care/intervention/action achieving the desired outcome?*

In the Fourth Report on Health Sector Performance Indicators, the term effectiveness includes the concepts of quality, appropriateness, accessibility and equity. In the new framework, the term effective will be used to evaluate whether health interventions are primarily achieving the desired results in the timeframe expected, for example, if radiotherapy is effective in reducing the size of tumours or immunisation reduces the prevalence of the disease in the community.

Indicators for effective could be drawn from:

- *immunisation rates and prevalence of disease;*
- *HIV education and the practice of safe sex;*
- *SIDS education and the prevalence of sudden death in infants; and*
- *breast screening and detection of small size cancers.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the effectiveness of each of the following was considered:

- the ambulance service in getting people with coronary and injury trauma to care where they can be stabilised in an appropriate time period;
- STI education in promoting the practice of safe sex;
- immunisation in reducing the incidence of childhood infectious diseases;
- breast cancer screening and cervical screening in reducing mortality due to breast and cervical cancer; and
- medical and surgical treatment in producing good health outcomes (or conversely rate of medical and surgical misadventure).

Retrieval for victims of trauma

Large travel distances in rural and remote areas can increase the time between the onset of trauma (heart attack, motor vehicle accident, overdose etc.) and arrival at an intensive care unit. It is important for victims of trauma to arrive at a suitable intensive care unit within an hour of the trauma occurring. Delays can occur because time is required:

- to locate the patient (i.e. time from onset of trauma to alerting and informing the retrieval team);
- for the retrieval team to travel to the location, collect the patient and then transport them to the closest medical facility; and
- to transfer the patient to an optimal care facility for that form of trauma.

It is important to know whether victims of trauma in more remote areas have to wait longer periods before they can access appropriate medical care, and whether this makes any difference to mortality for those people. It is also important to assess the contribution of each of the listed points above to the total time taken.

Development of appropriate indicators requires identification of a source of data for the following:

- time taken by the retrieval team to arrive following the event;
- retrieval and delivery times to initial hospital for trauma cases. Ambulance Service data (if available);
- the time taken to transfer the patient from the initial hospital to the most appropriate hospital;
- the status of the patient on arrival and discharge; and
- what emergency skills (e.g. craniotomy, intubation) exist at the local level in rural and remote areas.

Analysis would assess the relationship between the initial severity of trauma, the time taken to get to appropriate care and the outcome for the patient, in each geographic zone.

Currently, it is unclear whether such information is available. This important indicator requires investigation and development.

STI education in promoting the practice of safe sex

The incidence of sexually transmitted infections (STIs) is particularly high in some rural and remote populations. As such, and as a marker for the opportunity for the spread of HIV, there is value in evaluating the effectiveness of STI education on the prevalence of safe sex practices.

Important considerations are:

- for those who have received STI education in each geographic area, whether and how their understanding and sexual practice has changed;
- the incidence of STIs in each geographic zone (see indicator 1.1.5);
- the prevalence of safe as opposed to unsafe sex in each geographic zone (see indicator 2.4.6); and
- the proportion of the population that has received STI education in each geographic zone.

A suitable indicator may either:

- compare the 'efficiency', or impact, of STI education on the sexual practices of individuals who have been surveyed; or
- compare the proportion of the population who have received STI education, the prevalence of safe and unsafe sex, and the incidence of STIs across geographic areas.

A data source has not been identified and a suitable indicator requires investigation and development.

Immunisation in reducing the incidence of childhood infectious diseases

The value of immunisation lies in preventing communicable diseases such as measles and pertussis, by providing individual children with immunity and by providing those who are not immune with a measure of protection through herd immunity (the protective effect whereby immunised children prevent the spread of the disease to un-immunised children). As a result of vaccination, potentially fatal or debilitating childhood infectious diseases are now much less common than they previously were. Because of the current rarity of cases, the potential impact of these diseases can frequently be trivialised by some parents who may then leave their children unvaccinated.

Important issues are:

- immunisation rates (e.g. for pertussis); and
- the incidence of infectious diseases (e.g. for pertussis)

A suitable indicator may compare immunisation rates (or estimated numbers of un-immunised children) with rates (or numbers of cases) of notified disease across geographical areas.

Immunisation data from the ACIR provides an essentially complete picture of childhood immunisation.

Suggested indicator:

***3.1.1: Immunisation*—** proportion of children who are fully immunised against vaccine-preventable diseases according to NHMRC recommendations at the ages of 12–15 months and 24–27 months as recorded in the Australian Childhood Immunisation Register (ACIR). See page 126.

This statistic can be compared against the incidence of pertussis in each area, reported as indicator 1.1.5 under the 'Health conditions' dimension.

Breast cancer and cervical screening in reducing mortality due to cancer

Breast cancer and cervical screening provide women with an opportunity to reduce, or (in the case of cervical screening) greatly reduce, the risk from breast and cervical cancer.

Use of the change in cancer mortality rates over time to assess the effectiveness of screening programs suffers from two difficulties. The first is that changes in mortality over time may reflect other factors in addition to screening. The second is that changes in the mortality rates may not be apparent for a number of years following the commencement of a screening program. Accordingly, mortality needs to be viewed over the long-term and interpreted with caution. An alternative indicator to the mortality rate is the participation rate.

Data sources include Breast Screen Australia and the National Health Survey.

Suggested indicator:

***3.1.2: Breast cancer and cervical screening participation rate*—** the proportions of women in the target age groups who have had mammography and Pap smear tests in each area. This indicator can be compared with estimates of breast and cervical cancer mortality (indicator 1.4.5 under the 'Deaths' dimension). See page 127.

Medical and surgical treatment in producing good health outcomes

Suggested indicator:

3.6.1: Surgical and medical misadventure – as described under the 'Safe' dimension. See page 58.

3.2 Appropriate

Appropriate care is considered to be 'relevant to the client's needs and based on established standards'. The questions to be asked for this dimension could be:

- *Is the care/intervention/action provided relevant to the client's needs?*
- *Is the care/intervention/action based on established standards?*

Appropriate care is also effective care, but the treatment is considered in relation to the patient's particular needs, requests and prognosis. Treatments for similar conditions may vary according to the patient's needs and this may take into account factors such as:

- *allergies or adverse reactions;*
- *a person's preference for treatment at home or in a medical facility;*
- *a choice between aggressive treatment versus palliative care;*
- *elective versus emergency procedures;*
- *the stage of the disease process or severity of injury; and*
- *cultural influences and religious beliefs.*

Appropriate care or treatment should be based on established and accepted standards, such as evidence-based clinical guidelines.

In evaluating how appropriate an intervention is, or how well the system is delivering appropriate care, it may be possible to evaluate treatments provided for the disease and injuries associated with the greatest burden of disease. The treatments given could be compared to recommended approaches from evidence-based guidelines or accepted clinical practice and whether the treatment chosen was most appropriate for the patient's needs.

Appropriate may overlap with effective but the main differentiation is that several interventions for a health condition may be effective and available, but one of the treatments may be more relevant or appropriate to the person's needs or community objectives. Furthermore, a particular intervention may be considered to be effective but inappropriate.

An indicator to report on appropriate care could include:

- *proportion of hospitals and available beds that have Australian Council on Healthcare Standards (ACHS) accreditation status.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- whether women have adequate access to female GPs. This may involve the review of the numbers of male and female GPs in general practice or perhaps more appropriately, the number of hours male and female GPs work in general practice;
- whether rates of surgical procedure are similar in metropolitan and non-metropolitan areas;
- whether rates of service delivery by specialists are similar in all areas;
- whether the health system is providing the same level of care after surgical intervention (e.g. after cardiac surgery) that assists the patient towards the best recovery possible;
- whether the options for aged care are similar (i.e. does an aged person have the same degree of choice in their mode of care across geographic areas);
- whether the level of accreditation is similar for hospitals across geographic areas;

- whether people from the various areas have to wait similar lengths of time for surgery; and
- for what reasons people visit a general practitioner in each area.

Female GPs

Women can frequently prefer to visit a female rather than a male GP. Lack of access to a female GP may necessitate a long trip to a location where one is available.

Suggested indicator:

***3.2.1: Female GPs*—** the number of full time equivalent female GPs per 100,000 expected consultations with female patients or per 1000 standardised whole female patient equivalents, and the proportion of GPs who are female in each area. See page 128.

Surgical procedure

People who live in non-metropolitan areas will frequently have to travel a substantial distance from their home for surgery. This, and physical access to specialists for consultation, may reduce the opportunity for people to undergo a surgical procedure.

Comparison of the rate of surgical procedure for people in each area provides an indication of the relative provision of service to residents of rural and remote areas. However, without reference to the rates of disease related to the procedures, it would be unclear whether higher rates of procedure reflected greater access to services or greater need for services. Reporting of procedures for coronary artery bypass graft, angioplasty, hip replacement, lens insertion, kidney transplant and for tonsillectomy, hysterectomy and myringotomy may be useful.

Suggested indicator:

***3.2.2: Hospital procedures*—** rate of hospital admission for a number of key procedures: coronary artery bypass graft, angioplasty, hip replacement, lens insertion and the others (age-standardised). Reference where possible to rates of related disease is important in interpreting statistics for this indicator. See page 130.

Specialist consultations

While Medicare and DVA data can be used to estimate the rate of specialist consultation, it fails to include hospital procedures for public patients when they are undertaken in public hospitals. A more valid comparison of specialist services across the various areas may involve the use of Medicare and DVA data to compare rates of non-hospital consultation (i.e. in private rooms) and the use of hospital morbidity data (public and private) to compare the rates of service provided by specialists in hospitals across areas (as in indicator 3.2.2).

The indicator would seek to describe the rate of consultation for residents of each area. The consultations would be those performed by doctors working in the major specialties. Minor specialities to also be included, but treated as a group (i.e. 'others').

Suggested indicator:

***3.2.3: Specialist consultations*—** non-hospital consultations with specialists from each of the major specialties. See page 132.

Use of this indicator and indicator 3.2.2, especially with reference to indicators of prevalence and mortality due to chronic disease, would indicate areas for investigation or action.

Care after surgery

Better quality of care after surgery improves outcomes for the patient.

A data source has not been identified.

Aged care

Care and accommodation of the aged is provided in a number of ways, with the pattern of use changing with remoteness. Residential aged care services, hospitals, residential care packages and HACC programs each make their contribution to the care of the aged, with hospitals taking on a more important role in more remote areas where the provision of nursing home places is limited.

Suggested indicator:

***3.2.4: Aged care*—** the number of places provided for the care and accommodation of older people through residential aged care services and hospitals, as well as packages (e.g. EACH and CACP) and HACC provided to assist continued living within the community. See page 133.

Hospital accreditation

Accredited hospitals are likely to provide better service and outcomes.

The indicator would describe the proportion of hospitals within each area that are accredited.

Suggested indicator:

***3.8.1: Hospital accreditation*—** as described on page 60.

Waiting times for elective surgery

Suggested indicator:

***3.4.1: Waiting times for elective surgery*—** as described in the 'Responsive' dimension on page 48.

Morbidity managed in general practice

It is important to know why people visit the doctor, what is really wrong with them and whether this varies substantially with remoteness.

Data from the BEACH rolling survey of GP activity by itself cannot easily be used to generate rates of consultation, but it can be used to describe the most common problems managed by GPs. Rates can be estimated when combined with adjusted Medicare/DVA data.

In BEACH data, recording by the GP of the patient's expressed reason for encounter is believed to be considerably less reliable than the GP's coding of the problem managed. Further, the patient reason for encounter is often vague (such as 'need my scripts' and could be less informative regarding population morbidity patters.

Suggested indicator:

3.2.5: Morbidity managed in general practice—the most common problems managed by GPs (e.g. depression, anxiety, mental health problems generally, immunisation, insomnia, etc.) for people who live in each area. See page 135.

3.3 Efficient

The definition proposed for an efficient system is 'achieve desired results with most cost effective use of resources'. The question to be answered from this dimension could be:

– *What outputs and outcomes can be achieved with the available resources?*

It is important when evaluating the performance of the health system that efficiency is not considered at the expense of quality or equity. In reporting efficiency, both technical and allocative efficiency are included.

Technical efficiency is the degree to which the least cost combination of resource inputs occurs in production of a particular service. A more technically efficient system will provide more outputs for the same inputs. For example, efficiency gains may be achieved by the amalgamation of several sole practices into a central practice. Savings are gained through the reduction of fixed costs for each practice (inputs), without reduction in the number of treatments per service provider (outputs).

Allocative efficiency is the degree to which maximum benefit (or outcomes) is obtained from available resources. A system that is allocatively efficient will provide improved outcomes for the same or less cost. Achieving allocative efficiency pre-supposes that health care services are efficient in the everyday meaning of the term, i.e. that the best possible ratio of inputs to outputs have been achieved.

Efficiency of the health system has been traditionally measured by comparing inputs to outputs and has been defined as 'the rate of translation of inputs into outputs'. However, definitions can vary depending on the perspective taken and efficiency is a concept which can be applied in different contexts, i.e. in production, in the mix of products and in consumption.

In the context of this report, technical efficiency will refer to the production of an output with the least cost inputs and allocative efficiency will refer to the least cost mix of outputs that delivers a desired outcome. Cost-effectiveness of the system compares the outputs and inputs of the system to the outcomes.

Cost-effectiveness is measured by comparing the cost of inputs to outcomes. A more cost-effective outcome will require less resources to achieve the same result. For example, effective preventative approaches such as immunisation or the use of protective equipment are less costly than the treatment and rehabilitation costs for related injury or illness, with better outcomes for the people at risk.

Allocative efficiency is related to cost-effectiveness and appropriateness as it is concerned with how services are integrated and combined to deliver the most effective and appropriate care with the least cost.

Examples of efficiency indicators could include:

- *cost per casemix adjusted separation in public hospitals*
- *average cost per DRG/average benefit per DRG*
- *cost per GP visit*
- *cost per woman screened for breast cancer.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- the per-capita cost of providing GP, community health and hospital services in rural and remote areas (adjusted, e.g. hospitals casemix-adjusted);
- the per-capita cost of providing the same GP, community health and hospital services to people from rural and remote areas (adjusted, e.g. hospitals casemix-adjusted);
- how the cost of screening compares across geographic areas; and
- the ratio of expenditure to positive outcomes, For example the cost per life saved in intensive care, both for rural hospital intensive care departments and for residents of rural areas. Apart from the potential ethical questions raised, an indicator of this issue would be influenced by the effectiveness of intensive care (itself influenced by the difficulties imposed by large distances and retrieval time).

No indicators for this dimension have yet been developed.

3.4 Responsive

Responsiveness is the dimension that evaluates consumer and community experience and expectations of the health system. The World Health Report 2000 *presents a definition of responsiveness as 'a service that provides respect for persons and is client orientated'. This definition has been adopted for the framework.*

The questions for this dimension could be:

- *Do the clients of the service feel respected and that the service is orientated to their needs?*
- *Is the health system meeting expressed needs and concerns of patients and their carers/families?*

In considering responsiveness of the health system, the WHO report distinguishes between elements related to respect for human beings as persons, and more objective elements of how a system meets certain commonly expressed concerns of patients and their families as clients of health systems. The two categories were subdivided into seven distinct elements or aspects of responsiveness.

Respect for persons includes:

- *respect for the dignity of the person*
- *confidentiality, or the right to determine who has access to one's personal health information*
- *autonomy to participate in choices about one's health. This includes helping to choose what treatment to receive or not to receive.*

Client orientation includes:

- *prompt attention: immediate attention in emergencies, and reasonable waiting times for non-emergencies*
- *amenities of adequate quality, such as cleanliness, space and hospital food*
- *access to social support networks—family and friends—for people receiving care.*
- *choice of provider, or freedom to select which individual or organisation delivers one's care.*

A measure of commitment in Australia to improving the responsiveness of the system is the participation of consumers in the planning and management of health service delivery. This process to ensure the consumer voice is reflected in decision making is incorporated in several accreditation processes, is used in national mental health reporting and is being developed within some jurisdictions. Some states, like Victoria, have mandatory establishment of consumer advisory committees to metropolitan health service boards while others have voluntary establishment of mechanisms to ensure consumer participation. A performance indicator for national reporting of this process measure could be developed.

Other indicators could include:

- *the degree of reporting to consumers*
- *the handling of complaints from consumers*
- *participation of consumers in decision making and advisory processes.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- whether health services are culturally appropriate for Indigenous people and whether Indigenous people feel intimidated, suspicious, or otherwise reluctant to use these services;
- whether confidentiality regarding personal health information is maintained. In small communities, this may be particularly effective in developing the community's sense of trust in the service, itself an important factor affecting usage of the health service;
- how many GPs are locally available for people to chose from (choice of provider);
- how long public patients have to wait for elective surgery;
- the response time to emergencies in hospital emergency departments. How long non-emergency patients have to wait in emergency waiting rooms to seek attention;
- the proportion of GP consultations that are bulk billed and the proportion of GPs in a locality who bulk bill (as distinct from the proportion of GPs in each geographic zone who bulk bill);
- how long people have to wait for an appointment with allied health workers such as speech pathologists, podiatrists, physiotherapists, etc.;
- how long public and private patients have to wait for pathology, radiography results, etc.;
- the percentage of GPs at any locality who have closed books; and
- whether residents of each area are generally satisfied with the health service available to them. Additionally, whether patients of the health service are satisfied with the service they have encountered.

Acceptance of health services by Indigenous people

The indicator would seek to describe the degree to which Indigenous people feel welcome and happy to use mainstream health services in each area.

An appropriate data source has not been identified.

Confidentiality

Inadequate confidentiality, or perceptions of this, may force people to access health services further afield and would certainly taint their perception of and dealings with the service.

An appropriate data source has not yet been identified.

Waiting times by public patients for elective surgery

Currently it is not possible to describe waiting times for public patients from each area nationally (although is possible for patients of 7 hospitals in South Australia and about 30 hospitals in Queensland, but these are big and predominantly in the cities or major rural centres). This capacity may possibly be expanded in the future so that reporting of waiting times for public patients who live in each area can be described, if/when other States provide waiting-time data linked to morbidity data.

However, a close approximation is to describe waiting times for elective surgery for public patients accessing services in public hospitals located in each of the areas (i.e. reporting of waiting times for patients at hospitals in each area as opposed to waiting times for patients from each area).

Suggested indicator:

***3.4.1: Waiting times for elective surgery*—** the mean, median, 25th and 75th percentiles of the number of days public patients have to wait for elective surgery in public hospitals located in each geographic area, by type of surgery. See page 139.

Response time in emergency departments

The ability to report response times is currently being developed, at least for metropolitan areas and for larger rural hospitals, but data is not yet available.

A suitable indicator may describe the mean, median, 25th and 75th percentiles of the time spent waiting for treatment in emergency waiting rooms for each of a number of conditions (of varying severity).

Bulk billing

Bulk billing provides all people with ready access to medical services provided by general practitioners. People who live in regional and remote areas, where choice is frequently limited (e.g. to a single doctor in the town), may find it impossible to access a bulk billing GP unless they travel a considerable distance.

A number of statistics are likely to be useful. These include the proportion of:

- GP consultations that are bulk billed in each geographic area;
- GPs in each geographic area that bulk bill;
- GP consultations that are bulk billed in each locality; and
- GPs in a locality who bulk bill.

Indicators of bulk billing in each area (i.e. first two points) would simply report the proportion of consultations that were bulk billed and the total number of consultations.

Indicators of bulk billing in each locality would attempt to describe the likelihood of bulk billing being available for a person living in a community within each broad area. A suitable indicator has not yet been developed.

Suggested indicator:

***3.4.2: Bulk billing*—** percentage of GP consultations that are bulk billed in each area. See page 140.

Waiting times for allied health workers

Low supply and uneven distribution can result in very long delays for access to services provided by allied health workers in some areas.

A suitable indicator would seek to describe the mean, median, 25th and 75th percentiles of the time from request for service to provision of service, for people from each area.

An appropriate data source has not been identified.

Waiting time for results of diagnostic tests

The potential for reduced access to pathology and radiography services for people from rural and remote areas may result in delayed access to diagnostic testing and to the results of the tests.

A suitable indicator may describe the time from request for diagnostic service to provision of results.

An appropriate data source has not been identified.

Closed books

Supply of GPs in rural and remote areas can be such that GPs have to refuse access for 'new' patients for 'non-urgent' service. A suitable indicator would seek to describe the proportion of GPs for whom demand is so great (in relation to the desired or acceptable workload) that they have closed their books. This indicator would provide a measure of the pressure on GPs and of insufficient numbers of GPs in these areas.

An appropriate data source has not been identified.

Satisfaction

Irrespective of the absolute levels of service available to people, and of the imperfect ability to measure these, a potentially useful measure is the general level of satisfaction people have with the health service available to them.

An appropriate data source has not been identified.

3.5 Accessible

Accessible health care is defined by the 'ability of people to obtain health care at the right place and right time irrespective of income, cultural background or physical location'. This dimension is related to how readily people are able to access care without barriers of distance, discrimination, affordability and restriction of service. It encompasses the objective of equity. A fair health system should provide appropriate care to people without bias.

The questions for this dimension could be:

- *Is appropriate health care available for all people at locations that are within reasonable travelling distance from their home?*
- *Is there reasonable access to emergency health care if required?*
- *Is the service available at appropriate hours and provided with sufficient frequency to meet the needs of people?*
- *Is cost of travel or care a barrier for people accessing appropriate care?*
- *Is care community focused and sensitive to cultural and religious customs and beliefs?*

Distance and physical location can limit access to health services, particularly for people who live in rural and remote areas of Australia. People either travel long distances to obtain care or a service may be taken to them, for example 'fly-in, fly-out medical services'. Emergency care when needed is critical.

For acute services, several performance indicators used to date include:

- *emergency department waiting times to service delivery;*
- *elective surgery waiting times;*
- *separations per thousand target group of population; and*
- *general practitioner services per thousand population living in rural, remote and metropolitan areas.*

Indicators for equity of access could be utilisation rates by target group compared to national average, e.g. health care service use by Aboriginal and Torres Strait Islander peoples, rural populations etc.

Source: *National Health Performance Framework Report, August 2001.*

Accessibility is defined in terms of distance, discrimination, affordability and restriction of service.

Under this dimension in the framework, the following issues were considered:

- How far is it to a primary health care provider, an emergency department, chemist, hospital or nursing home?
- How common is it that people do not access a service or are denied access because of discrimination (race, social class, ages, sex, disability)?
- How common is it that people do not access a service because they cannot afford it?
- Is there a sufficient supply of health facilities and health professionals to meet the needs of the population in the general area?
- How does the rate of service usage compare across geographic areas?
- At what times during the week is access to doctors, emergency departments, chemists, hospitals not possible?

Distance

Distance to a service could be expressed in kilometres. Roads are of varying quality, however, and in wet weather and for some time afterwards, can be impassable. Additionally, 20 km of winding dirt road is likely to take longer to negotiate than 20 km of sealed highway. It would be preferable to use travel time and a measure of how frequently roads are impassable or difficult/dangerous to negotiate.

Information is not currently available on road conditions, travel time or the frequency and duration of periods when roads are impassable.

Suggested indicator:

3.5.1: Distance to medical services – the proportion of people who are within 20, 40, 60 and 80 km by road of a GP, a GP service, hospital, AMS, and a remote area nurse. Also the proportion who are within these distances of any combination of these services. See page 141.

Discrimination

Access to health services can be affected because of discrimination on the basis of race, social class, age, sex or disability. This is a potential issue especially for Indigenous people, for whom health status is a major issue.

A data source has not been identified and the indicator needs development.

Financial constraints

Even though people may not be able to afford a service, they may indeed pay for it, but then be unable to afford other essential goods or services. Perhaps a reasonable measure is one comparing the out-of-pocket cost of the service (including travel and accommodation) with a measure of ability to pay (e.g. median or mean income for the geographic zone).

In addition to the out-of-pocket cost of the service itself, other very significant costs include:

- the cost of travelling to where the service can be accessed;
- the costs associated with disruption as a result of the need for family members to accompany the sick person;
- the costs associated with accommodation for the patient or accompanying family member when undergoing treatment; and
- the costs of accessing rehabilitation services after treatment.

Some schemes are available to assist with the costs of travel and accommodation of rural and remote patients. It would be useful to know something about the availability of these and their impact on covering the incurred costs.

Median or mean income for the population is one potential measure of people's ability to pay, but people who are least likely to be able to afford access would not be well represented in such a measure. An option is to use the value for income that is the 25th percentile.

Currently it is unclear where to obtain information about the additional (and frequently intangible) costs incurred by people. However, it is possible to describe income (see the 'Socioeconomic factors' dimension). If information on costs were available, a measure of the out-of-pocket cost to a person from each area accessing treatment compared to the weekly income level of the 'average' lower income earner would be possible.

The indicator has yet to be developed.

Health facilities and health professionals

Access to health workers and facilities could be described via the numbers of these available or through the number of services that they perform. Both of these options are considered here.

The numbers of GPs, nurses, allied health workers and Indigenous health workers, and the numbers of hospitals (and acute hospital beds), aged care facilities (and nursing home or hostel places) and pharmacies clearly affect the opportunities for people to access services. Typically there tends to be an under-supply of facilities and professionals in rural and remote areas (although this may not always be the case). An under-supply can mean longer waiting time until a service is accessed.

As some workers are part time and facilities are of different sizes (and function), there may be some benefit in seeking to report the prevalence of health workers in terms of 'full time equivalents' and the prevalence of hospitals and nursing homes in terms of establishments with different levels of function, beds and places.

Additionally, the need for some workers (especially allied health workers) to travel so as to access patients in more remote locations can reduce the time that these workers can spend with their patients. Consequently allowance should be made for time spent travelling for any comparison of numbers of health workers to population.

In many cases, older populations will require higher levels of access. Direct comparison of numbers of workers with numbers of people in the population may be misleading. One possible way of allowing for different population age and sex structures is to predict the number of occasions of service that would be required if age-specific national rates of utilisation applied to the populations of each area. In this way, the observed number of workers could be compared to the number of services estimated to be necessary. The resultant ratio may indicate where there are more or fewer workers than required, but this statistic would make no allowance whatever for different levels of need as a result of different levels of health (it would only allow for differences in age and sex). A decision about whether there is an under- or over-supply would also have to include an assessment of the general level of health in the population (for example, whether death rates and other measures of health status, such as childhood infectious diseases, indicated a greater need for services).

Description of services performed is also frequently problematic. For those services for which there are central payment systems (e.g. Medicare, DVA and the Pharmaceutical Benefits Scheme), only a (large) proportion of services are recorded, with other services being performed outside the system or under other systems. Different patterns of service provision in non-metropolitan settings could make inter-regional comparison using only data from these systems misleading. For those services where data is available through population-based surveys, coverage is frequently poor in remote areas and precision blunted by the quality of recall. In some cases there is very little data available, or data is only available from multiple sources (i.e. has not been aggregated nationally).

Workers and facilities considered here include:

- numbers of a range of health workers;
- numbers of hospitals providing various levels of service and available beds;
- hospital use (separations);
- general practitioner consultation rates;
- dentist consultation rates;
- use of mental health services;
- rate of prescription as a proxy for access to pharmacist; and
- prevalence of disability services outlets.

Waiting times for elective surgery and waiting times in emergency departments are covered under the 'Responsive' dimension of this tier.

Numbers of health workers

Estimates of the numbers of health workers can be based on responses to AIHW's health labour force surveys and on the ABS Census. Because some workers work in several locations, some are part time and the length of the working week varies, health worker numbers may best be expressed as 'full time equivalents' as well as head counts (full time and part time workers).

A measure of the proportion of time health workers (particularly allied health workers) spend travelling between locations (which is likely to reduce the actual time spent with their patients) is currently not available from the labour force surveys.

Because the ratio of health workers to population is a crude measure (but easily visualised), an additional statistic of the predicted or expected number of services in each area (based on national age-specific rates of service provision) compared to the number of workers in each area would also be described.

Suggested indicator:

***3.5.2: Numbers of health workers*—** the number of major groups of health workers and their full time equivalent working in each area. See page 144.

This indicator does not describe the number of communities without access to various types of health workers, nor does it describe the combination of various types of health workers (e.g. medical practitioners, nurses, allied health workers, Indigenous health workers, etc.) in localities within each geographic area. Development of an indicator that describes the 'typical' availability of each type of health worker within communities within each area would be useful. An indicator such as this is partially catered for by indicator 3.5.1 (Distance to medical services) described earlier in this dimension.

Level of hospital service

Physical closeness to a hospital can be important for a number of reasons, including access to emergency care, intensive care, rehabilitation and general care when unwell or recuperating from surgery. Hospitals are of various sizes and types and offer different ranges of services.

A potential indicator would aim to describe the proportion of the population who had a hospital nearby that provided certain levels of service, as well as the ratio of people to hospitals offering each level of service in each area. The former may be possible (with development) using GIS methodology (e.g. used and developed by GISCA). The latter may be possible, with development of an appropriate measure of level of service that could be

used to compare between areas (for example, based on DRGs and using AIHW hospital morbidity data).

While it is possible to describe the number of hospital beds in hospitals in each area, people from remote areas requiring major operations and specialist treatment have to use hospital beds in less remote and often metropolitan hospitals, while a large proportion of rural, and especially remote area, hospital beds accommodate the aged.

An indicator has yet to be developed.

Hospital use

Admission to hospital depends on demand and on hospital admission policies (and on the availability of beds). Policy and need may vary across areas, with hospitals in remote areas more likely to admit patients. Simple comparison of admissions across areas is unlikely to be entirely valid, with the need to take into consideration nursing home type patients, admissions for dialysis and chemotherapy, other non-acute admissions, and so on. Additionally, for serious conditions, patients from remote areas will frequently be admitted to a hospital in a less remote area.

Suggested indicator:

***3.5.3: Hospital separations*—** rate of hospital separation and consumption of bed days due to acute, non-acute and all causes, for patients from each area, to hospitals in each area. See page 146.

Rate of GP consultation

The access issue is complicated by the fact that health services are provided by a range of workers and institutions. For example, primary health care is provided in some form or other by GPs, salaried medical officers working out of hospitals, and a range of staff in Aboriginal Medical Services (AMS), community health centres and clinics. There is little or no data available on AMS and community health centres and their work.

Medicare/Department of Veterans' Affairs data can be used to partially describe GP consultation. However the greater use of medical services provided from outpatients departments, use of AMS services (a proportion of which do not bill to Medicare or DVA) and lower rates of billing to Medicare/DVA in non-metropolitan areas make simple comparison difficult. Some of these issues can be taken into consideration by use of outpatients and BEACH data in addition to Medicare/DVA data. Interpretation needs to be undertaken cautiously.

Suggested indicator:

***3.5.4: Primary care medical consultations*—** the adjusted rate of consultation of medical practitioners in general practice and in hospital outpatient department settings. See page 148.

Rate of and reason for dental consultation

Dental services are likely to be less well distributed than GP services, and for those on lower incomes living in remote areas, access may be affected by their ability to pay. It is important to know whether residents of rural and remote areas consult a dentist less frequently than people from metropolitan areas.

Suggested indicator:

***3.5.5: Dental consultations*—** number of dental consultations per 100,000 population per year by reason for visit (pain, other problem, check-up, and so on). See page 150.

Access to mental health services

Mental health services are available through a range of providers including GPs, as well as psychologists, psychiatrists and other mental health workers in both the public and private sectors. The ratio of psychologists and psychiatrists to population, in addition to a measure of the number of mental health consultations with the GPs and the number of GPs providing these mental health consultations, may provide a measure of access to services.

While it is possible to count the number of services provided by psychiatrists, it is not yet possible to describe the number (and types) of services provided by community mental health workers and psychologists in private practice. It is expected, however, that data describing community mental health occasions of service will be available in the future.

However, the number of GP mental health consultations per 100,000 population can be estimated. Use of specific Medicare item numbers for mental health consultation is apparently not yet widespread, and so it is not yet valid to use this indicator. However, using Medicare and BEACH data, it is possible to estimate the number of consultations with GPs for mental health purposes.

Suggested indicator:

***3.2.5: Reasons for visiting a GP*—** as described under the 'Appropriate' dimension (see page 43).

Rate of prescription

Rate of prescription through community and hospital pharmacists can be described using Pharmaceutical Benefits Scheme (PBS) data. PBS data describes details of pharamaceuticals received by concession holders and also details of certain pharmaceuticals with greater than a certain retail price. The total number of units of pharmaceuticals received by the population could be modelled from the number received by concession holders, and usage of some of the more expensive pharmaceuticals can be described directly from PBS data.

Suggested indicator:

***3.5.6: Prescription*—** rate of prescription for all pharmaceuticals, and also for major groups of pharmaceuticals. See page 152.

Disability services

Access to disability services may be poorer in more remote areas because of the relatively low population density.

From the ABS surveys of Disability, Ageing and Carers it is possible to describe the prevalence of disability, although it may be necessary to aggregate data from the two most remote categories (see page 12).

AIHW disability services data can be used to describe the number of occasions of service (and the type of service) delivered from each office and reported for each area. This service data does not strictly describe the number of services provided to residents of each area (disability service data is available for location of service, not location of client). Information on geographic location of client's residence may be included in the disability services database in the future. It would then be possible to report the ratio of services delivered to population with a disability in each area.

Suggested indicator:

3.5.7: Access to disability services—the number of occasions of service of each major type, for residents of each area, per 1,000 population estimated to have a disability in each area. See page 154.

Continuity

Although a service may be available, it may not be available all the time. Services in smaller communities may be less likely to be accessible 24 hours a day. Clearly, if facilities are not available during part of the day, people cannot access the service. For some services, this will generate inconvenience (at least); for others (e.g. emergency departments), it may be more serious.

Data describing opening hours for health services is not currently available.

3.6 Safe

The definition proposed for the safe dimension is 'the avoidance or reduction to acceptable levels of actual or potential harm from health care management or the environment in which health care is delivered'. This aspect of performance relates to prevention or minimisation of causes of adverse events associated with the delivery of health actions.

The question for this dimension could be:

– *Are the risks associated with the delivery of health actions identified and managed?*

In reporting under this dimension, it would be necessary to report on the spectrum of health care settings and include acute and primary care settings, as well as the community and the home. Data is available on hospital-based adverse events, but it may be difficult getting information from primary care settings and home and community-based care.

Comprehensive reporting on safety would need to include information on adverse events and include aspects of risk identification and risk management.

It may be possible to collect information on whether a health facility or provider has developed a risk management plan where risks have been identified for the action/intervention, as well as for the environment. The prevalence of adverse events relevant to the health action could then be used to assess the effectiveness of the risk management plans. It would be important for the aspects of safety and risk management to be tied to accreditation.

Possible performance indicators for safety could be presented in relation to the setting, e.g. acute care, primary care etc. Also it will be important to link with other safety reporting by the Australian Council for Safety and Quality in Health Care (ACSQHC).

The existing indicators address the identification of adverse events in the system, but they do not address how well the system deals with the management of the risk and improvement in safety. Performance indicators related to the system need to be developed and should be done in consultation with the ACSQHC. Indicators for other health settings will need to be identified and possibly developed.

A relevant indicator could be:

- *number of approved products withdrawn from the market or requiring a change to conditions of approval for safety-related reasons.*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- whether the rate of medical surgical misadventure is similar in hospitals across geographic categories and similar for people from different geographic categories; and
- whether survival rates of people admitted to intensive care are similar in hospitals from different geographic zones (adjusted for seriousness of condition).

Medical/surgical misadventure

Medical/surgical misadventure refers to complications of medical care and of surgery that result in an adverse health outcome (e.g. that can result in hospital admission or death). Adverse events can occur because of infection, poor response to treatment, mishaps during surgery, and so on.

Because of the difficulty in differentiating between medical and surgical misadventure, misadventure will be considered as an aggregated group. With some development, it may be possible to differentiate between various types of misadventure.

Suggested indicator:

***3.6.1: Surgical and medical misadventure*—** the rates of death and hospital admission as a result of surgical and medical misadventure, using the number of admissions requiring a procedure (as a measure of exposure to medical and surgical intervention) as the denominator. See page 155.

Survival rates in intensive care units

The likelihood of surviving admission to an intensive care unit (ICU) depends on a number of factors, including the severity of the condition, the chances of getting to an ICU before death occurs, treatment before arriving at the ICU and the effectiveness of the ICU. The closest proxy that seems to be currently available is a measure of the discharge status for patients who are admitted for a procedure called 'mechanical ventilation in ICU'.

A valid and robust indicator has not yet been developed.

3.7 Continuous

Continuous care is defined as the 'ability to provide uninterrupted, coordinated care/ intervention/action across programs, practitioners, organisations and levels over time'. The question for this dimension could be:

- *Is the delivery of health care actions provided in a coordinated and continuous manner across the continuum of care?*

The focus of this dimension is to evaluate whether there is integration of services for the individual, with the aim of improved care resulting from improved communication between individual care providers and between facilities where care may be provided. It has been identified that communication and care planning between acute care providers/facilities, primary care providers and community health workers can be improved to provide less fragmented services.

The Commonwealth Government recently introduced Medicare Benefit Schedule (MBS) items to address this issue. Care planning and case conference items are available for older Australians and people with chronic and complex needs with the aim of improving the coordination of care. Coordinated Care Trials are also being conducted in Australia to evaluate the effect of more coordinated approaches to dealing with patients with complex health care needs, including coordination between various parts of the health system, from primary to continuing care.

At a program level, performance may be evaluated using the Coordinated Care Trials as an example. At a system level, it may be possible to evaluate the use of the new MBS items for care planning and case conferencing and patient outcomes.

A relevant indicator could be:

- *usage of Medicare Benefit Schedule item 720 for care planning.*

Source: *National Health Performance Framework Report, August 2001.*

In line with the National Health Performance Framework in describing the delivery of health in a coordinated and continuous manner across the continuum of care, the major thrust of an indicator for this dimension is to describe the degree of coordination of care across geographic areas.

Care planning and case conferencing

In late 1999, as part of the Enhanced Primary Care Package, the Government introduced a range of new Medicare services, including health assessments, multidisciplinary care plans and case conferences. The suggested indicator is to use the MBS item numbers for care planning and case conferencing to assess the level of coordinated care in each area.

Suggested indicator:

***3.7.1: Care planning and case conferencing*—**rate of care planning and case conferencing (i.e. care of a patient coordinated between health professionals) as expressed by the ratio of Medicare claims for MBS item numbers 720–730 (care planning) and 734–779 (case conferencing) to the population in each area. See page 156.

3.8 Capable

The definition proposed for capable relates to 'an individual or service's capacity to provide a health care/service/intervention based on skills and knowledge'. The questions related to this dimension could be:

- *Do the people providing the care, service or intervention have the relevant qualifications, skills and experience?*
- *Are the facilities for the provision of care appropriate?*

The primary focus for this dimension relates to the training of health professionals and other staff involved in the delivery of care. Standards for undergraduate and postgraduate education can be evaluated across the spectrum and may involve academic institutions, medical colleges and registration boards.

In regard to the capability of the facilities, this may involve the application of standards developed by organisations such as the Royal Australian College of General Practitioners, Australian Physiotherapy Association, Australian Council on Healthcare Standards and Standards Australia. Accreditation bodies have a wealth of information about the compliance with standards developed by the professions.

Performance measures for assessment of capability could relate to the skill, knowledge and education of health workers. This could include measures such as the total number of professionals registered to work in Australia, their level of education, postgraduate training etc. Performance measures could include the proportion of General Practitioners as those who have completed the RACGP training course and those practising who are not vocationally registered. This principle could also apply to medical specialists, allied health professionals and nurses.

Capability of facilities providing care could be evaluated using accreditation status through an industry recognised assessor.

Performance measures could include:

- *the proportion of accredited practices/facilities for general practice, physiotherapy and hospitals.*

Source: *National Health Performance Framework Report, August 2001.*

A range of issues describing the capability of the health system has already been described under other dimensions:

- the proportion of accredited hospitals is also covered under the 'Appropriate' dimension; and
- capability is also inferred by rates of admission for surgical/medical misadventure (covered under the 'Safe' dimension).

Ultimately, the proportion of health worker diagnoses and treatments that are appropriate (as expressed by health outcomes, adjusted for seriousness of the condition and access to appropriate care) may be the best measure of the level of competence of health workers and the adequacy of infrastructure in each area, although this is likely to be difficult. Accreditation may or may not in itself be a measure of the capacity of health workers; it may simply be a measure of the 'need' for accreditation of the health worker in each area.

Accreditation of hospitals is likely to be a reasonable measure of compliance with standards.

Suggested indicator:

3.8.1: Hospital accreditation— The percentage of hospitals and hospital beds that are accredited in each hospital peer group in each area. See page 157.

3.9 Sustainable

A health system that is sustainable will 'provide infrastructure such as workforce, facilities and equipment, be innovative and respond to emerging needs (research, monitoring)'.

Questions to be asked to assess the sustainability of the health system could include:

- *Is there sufficient funding allocated to provide an appropriately trained workforce?*
- *Is there sufficient funding allocated to the building and maintenance of facilities?*
- *Is there sufficient funding and provision of appropriate equipment for health care?*
- *Is innovation and research supported and funded adequately?*

Source: *National Health Performance Framework Report, August 2001.*

Under this dimension in the framework, the following issues were considered:

- training of the health workforce for rural areas;
- recruitment of the health workforce in rural areas; and
- retention of the health workforce in rural areas.

For many professions, there is a lack of personnel working in rural areas. This implies a need to recruit more health professionals to work in rural and remote areas and for recruited professionals to continue to work in these areas. Potential strategies have included:

- encouraging rural youth to seek a career in health in the expectation that people from rural areas are more likely to return to those areas to work;
- bonded scholarships requiring graduates to work for a (specified) period in rural areas;
- granting overseas-trained doctors the right to practise if they choose to work in rural/remote areas;
- allocating provider numbers for use in rural remote areas, requiring doctors to work in certain locations; and
- payment of grants and incentives to doctors to encourage them to move to, and work in, a rural area.

Ultimately, whether a health professional chooses to remain working in an area relies on a number of factors including remuneration, work satisfaction, professional support, opportunity for time off work, work and educational opportunities for spouse and children, recreational and cultural opportunities, and the interaction between their personal attributes and those of their community.

Training of the rural health workforce

It would be useful to describe the numbers of students from rural areas who have enrolled in or completed specific health courses.

While it is currently possible to report the numbers of students from rural areas who have commenced a health course, the number from rural areas who have completed a course is not currently available. Even if the completions data were to contain a field for geographic location of the home address, by the time students have completed a health course, it is quite possible that their home (or mailing) address would have changed to reflect where they currently live, rather than where they were from. If it were possible to link completions data to commencements data, it may be possible to report on completions and also to report on pass rates for rural versus metropolitan students.

Suggested indicator:

***3.9.1: Workforce in training*—**number of commencements of students enrolled in first year studies of selected health disciplines, by remoteness class, based on home address. See page 158.

Recruitment and retention of the rural health workforce

It would be useful to describe, for specific professions, the number required, the number working, the number who have left and arrived in the past year, and the length of time that workers remain in each area.

There are considerable difficulties in providing this issue with an indicator. Currently the best indicator of duration in rural practice is the number of general practitioners receiving rural retention payments. No data source that documents the duration at a given work location has been identified. Even for GPs, it is difficult to accurately describe commencement, duration and completion of service in rural and remote locations using Medicare data, particularly for GPs who stay only a short time in rural areas.

Suggested indicator:

***3.9.2: GP recruitment and retention*—**the number and percentage of general practitioners receiving rural retention payments. See page 160.

Hours worked and age of health workers

A potential proxy indicator likely to influence future retention is the number of hours worked and age of health workers.

If some health workers are working longer hours than others, they may also become more discontented and leave. The age of health workers may suggest future shortages.

Suggested indicator:

***3.9.3: Hours worked and age of health workers*—**hours worked and age of male and female health workers, including general practitioners, other primary care medical practitioners, selected specialist medical practitioners, enrolled and registered nurses, selected allied health workers, dentists and pharmacists working in each area. See page 161.

On-call work

Health workers, particularly GPs, in more remote locations have limited opportunities for nights and weekends off. Sharing of workload (especially out-of-hours work) is either not possible or opportunity is limited in many rural and remote locations. Constant exposure to conditions such as these may contribute to fatigue and dissatisfaction resulting in relocation to an area where the workload is more reasonable.

A source of data for an indicator describing the level of weekend and after-hours work for GPs (and other health workers) has yet to be identified. A potential indicator would preferably describe the mean and median number of weekends each year on call and the number of nights each week on call.

A potential alternative involves reporting the number of hours on call (but not working) each week as well as the number of hours worked each week. Such an alternative would provide an indication of any substantial change in workload over time and has been included in indicator 3.9.3 above.

Indicator documentation

Health status (Tier 1)

1.1 Health conditions dimension

1.1.1 Prevalence of chronic diseases

Proposed definition:	Prevalence of circulatory and respiratory diseases, cancer, diabetes and renal disease (see page 8).
Rationale:	All these diseases are serious, debilitating, distressing and can ultimately lead to death. These diseases (along with injury) are the most common causes of death. Prevalence and mortality can frequently be modified by preventive or medical/surgical action.
Desired outcome:	Low and similar prevalence of these diseases in each area, decreasing over time.
Numerator:	The number of people who report having these diseases or conditions in the National Health Survey. Reported diseases to include cerebrovascular disease and stroke, heart disease, hypertension and all diseases of the circulatory system, total neoplasms, asthma, bronchitis/emphysema and total respiratory diseases, total diabetes and kidney diseases.
Denominator:	The number of people who participate in the National Health Survey.
Calculation method:	Indirect age-standardisation using standard rates based on the prevalence of people who self-identify with these diseases nationally. Comparison between years will require standardisation to age-specific rates for a single year (e.g. 1995).
Data source:	ABS National Health Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total Indirect age-standardised prevalence for each of the diseases. Males and females. Indigenous, non-Indigenous and total population (as the data allows). Time series (for each of the years in which data is available).
Data coverage:	National and approximately 5-yearly.

Data issues:	The National Health Survey has low coverage in remote and very poor or non-existent coverage in very remote areas. Sample size is typically greater than 50,000. For many issues (particularly those which are reasonably uncommon), reporting is not possible in these areas, or is possible only when data for remote and very remote areas are aggregated. Sampling in rural and remote areas may be concentrated in larger centres where sampling is more cost effective. While this is suspected, it is not confirmed. The effect of possible biased sampling is unclear, but may reduce the size of differentials in rural and remote areas. Prevalence of conditions is self-reported and may not be entirely accurate. As with almost all surveys, the small numbers of Indigenous people surveyed make it impractical to report for Indigenous people in each area. However, regional reporting for non-Indigenous people may be possible because of their greater representation. Where reporting for Indigenous people at a regional level is not possible, reporting at the national level should be attempted.
Related indicators:	Leading causes of death (1.4.5), Specialist hospital procedures (3.2.2).
Consultation with:	Tim Carlton and Paul Atyeo (Health Section, ABS).

1.1.2 Prevalence of injuries

Proposed definition:	Prevalence of people with injuries (see page 9).
Rationale:	Injury is a leading cause of death and is likely to be more common in non-metropolitan areas.
Desired outcome:	Low and similar prevalence of these injuries in each area, decreasing over time.
Numerator:	The number of people who report having an injury in the ABS National Health Survey. Reported injuries to include fractures, dislocations, sprains and strains, open wounds, bruising and crushing, burns and scalds, complications of surgical and medical care and total injuries.
Denominator:	The number of people who participate in the National Health Survey.
Calculation method:	Indirect age-standardisation using standard rates based on the prevalence of people who self-identify with these injuries nationally. Comparison between years will require standardisation to age-specific rates for a single year (e.g. 1995).
Data source:	ABS National Health Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total Indirect age-standardised prevalence. Males and females. Indigenous, non-Indigenous and total population (as the data allows). Time series (for each of the years in which data is available). Report for each of the injuries mentioned.
Data coverage:	National and approximately 5-yearly.
Data issues:	The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63.
Related indicators:	Leading causes of death (1.4.5).
Consultation with:	Tim Carlton and Paul Atyeo (Health Section, ABS).

1.1.3 Prevalence of depressive, anxiety and substance abuse disorders

Proposed definition:	Percentage of males and females aged 18 years and over in each area who report depressive, anxiety and substance abuse disorders (see page 10).
Rationale:	Depression, anxiety and substance abuse are major mental health conditions. This indicator describes whether the prevalence of depressive disorders is different in rural and remote areas.
Desired outcome:	To reduce the prevalence of depressive, anxiety and substance abuse disorders in the population and any differentials in prevalence between areas. To promote better detection and treatment of depression.
Numerator:	The number of males and females in selected age groups (18–24, 25–44, 45–64, 65 years and over) in each area who report these disorders.
Denominator:	Total number of males and females in the survey who responded to the question.
Calculation method:	Simple proportions and indirect age-standardised proportions using the age-specific proportions from the overall population in the survey as the standard.
Data source:	1997 ABS Mental Health and Wellbeing Survey.
Presentation:	MC IR OR R/VR Total Percentage of males and females aged 18 years and over who report depressive, anxiety and substance abuse disorders. For age groups (as the data allows): • 18–24 • 25–44 • 45–64 • 65 years and over and • for all ages (age-standardised). For Indigenous, non-Indigenous and total populations (as the data allows). Time series is not possible at present.
Data coverage:	National, 1997.
Data issues:	The scope of the survey means that there is little or no representation of those in remote and very remote areas and that reporting for Indigenous people will be difficult or impossible.
Related indicators:	Happiness (1.3.3), Leading causes of death (1.4.5).
Consultation with:	Josie Barac, Tim Carlton, Lishani Gunawardena (Health Section, ABS). Professor Fiona Judd (Monash University).

1.1.4 Decayed, missing and filled teeth

Proposed definition:	The mean number of decayed, missing and filled (dmf) teeth in 6, 12 and 35–44 year olds in each area. The percentage of those 65 years and older who are edentulous (see page 10).
Rationale:	The indicator provides a measure of the population's oral health at an early age when the foundation for future oral health is being laid and in adulthood. Poor oral health in childhood predicts poor oral health in older age, dental health status in adulthood relates (with children's dental health) to potential demand for service. This indicator could be used to identify the need for further efforts to enhance children's oral health in some geographic areas and to direct services generally. Ages 6, 12 and 35–44 are WHO key age groups. Edentulism in older people is an indication of available services in the past in terms of physical and financial access.
Desired outcome:	Low levels of decayed, missing and filled teeth and edentulism in all areas.
Numerator:	The number of teeth that are decayed, missing or filled for those in the Child Dental Health Survey who were 6 years old and 12 years old at the time of participation, and for those who were 35–44 years old at the time of the National Oral Health Survey. The number of people 65 years and older, who were edentulous at the time of the National Health Survey, by 5-year age group.
Denominator:	The number of participants in the Child Dental Health Survey who were 6 and 12 years old and the number in the National Oral Health Survey who were 35–44 years old. The number of people who are in each 5-year age group and older than 65 years in the National Health Survey.
Calculation method:	Calculate the mean number of dmf teeth, the median, 25th and 75th percentiles, for each age group in each area. Percentages of edentulism for those 65 years and older age-standardised indirectly to the national age-specific proportions. Comparison between years will require standardisation to age-specific rates for a single year (e.g. 1995).
Data source:	AIHW Dental Statistics Research Unit, AIHW. Child Dental Health Survey, National Oral Health Survey. ABS National Health Survey.

Presentation:	MC IR OR R VR Total Number of dmf teeth for each individual (mean, median, 25th and 75th percentiles): • 6 year olds • 12 year olds • 35–44 year olds. Age-standardised percentage of older people who are edentulous.
Data coverage:	National and annual since 1989 for 6 and 12 year olds, 1987 for 35–44 year olds, and 1989–90, 1995 and 2001 for those older than 65 years.
Data issues:	The Oral Health Survey data does not allow differentiation of Indigenous from non-Indigenous records; consequently it is not possible to report separately for Indigenous or non-Indigenous people. Data to calculate the mean number of decayed, missing and filled teeth in 35–44 year olds is only currently available for 1987/88; there has not been another National Oral Health Survey since. Data for the survey did not appear to be well distributed across rural and remote areas. Until data is available for other years, and the coverage outside major cities is better, data for 35–44 year olds would not be presented. Data for the 6 and 12 year olds is collected through school dental clinics, and is considered to capture details of almost all children who attend school (although coverage is higher in some States than others). The need for payments by parents in some States reduces the participation and therefore the available data. At present it is not possible to report for Indigenous people. Information about Indigenous status is collected well in only a few States. Work is proceeding to improve data quality and it is hoped that reporting will be possible in the future. The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63.
Related indicators:	Dental consultations (3.5.5), Numbers of health workers (3.5.2).
Consultation with:	David Brennan and Jason Armfield (Dental Statistics and Research Unit, AIHW).

1.1.5 Communicable diseases

Proposed definition:	Rate of disease notifications for a number of notifiable diseases: all arboviral disease (e.g. Ross River, Barmah Forest); pertussis; foodborne disease (e.g. campylobacterosis and salmonellosis); sexually transmitted infections (e.g. chlamydia, syphilis). See page 11.
Rationale:	Incidence of communicable diseases can be moderated by public health action. Elevated rates of communicable disease in some areas may suggest policy or public health action.
Desired outcome:	Low and similar rates of notifications in each area, decreasing over time.
Numerator:	The number of cases of each disease notified in each year for which data is available. If numbers are too small, report for aggregated periods as appropriate.
Denominator:	The population in each area for that period.
Calculation method:	Indirect age-standardised rates, using national age-specific rates as the standard. Comparison between years requires standardisation to a single reference year (e.g. 1997).
Data source:	National Notifiable Diseases Surveillance System (NNDSS) collection. AIHW population databases.
Presentation:	MC IR OR R VR Total Notification rate for persons (age-standardised): • arboviral disease; • pertussis; • foodborne disease; • sexually transmitted infections.
Data coverage:	Yearly and national.
Data issues:	Only a proportion of cases of disease are notified, increases in rate of notification may be as a result of better surveillance, increased testing for the disease or an increase in the rate of disease. Comparison across areas assumes uniform likelihood of testing for and reporting of cases. There would be no reporting by sex or for Indigenous people, both for reasons of statistical power, possible concerns about accurate identification of Indigenous status and for issues of sensitivity.
Related indicators:	Immunisation rates (3.1.1).
Consultation with:	Jenean Spencer, Peter Lindenmayer (Communicable Diseases & Environmental Health Branch, Commonwealth Department of Health and Ageing (DoHA)). Reporting requires consultation with the Communicable Diseases Network, Australia (CDNA).

1.1.6 Birth outcomes

Proposed definition:	Mean birth weight and percentage of birth weights in each of a number of ranges (<1,500g, 1,500–2,499g, 2,500–4,199g, 4,200+g) by Indigenous status of mother (see page 11).
Rationale:	Indicator of health status of babies and of the community in general. Being a healthy baby is a good foundation for adult health.
Desired outcome:	Similar and low incidence of out of range birth weight babies in all areas, decreasing with time.
Numerator:	Birth weight of babies.
Denominator:	The number of babies born (live and still).
Calculation method:	Means, medians and percentages to be calculated for individual age groups or age-standardised (using the national means, medians and percentages for each 5-year age group of maternal age). In comparing between years, means and medians are standardised to a single year (e.g. 1997).
Data source:	National Perinatal Statistics Unit (NPSU) National Perinatal database.
Presentation:	MC IR OR R VR Total Mean, median, 25th and 75th percentiles of birth weight. Percentage of births in each range: <1,500g, 1,500–2,499g, 2,500–4,199g, 4,200+g. Indigenous, non-Indigenous and total population. Time series (currently 1992–1999 available).
Data coverage:	National and yearly.
Data issues:	There is some relationship between birth weight and maternal age, therefore age standardisation is necessary. Time series for Indigenous and non-Indigenous should be done cautiously and in close consultation with NPSU and Indigenous stakeholders (e.g. NCATSIS and OATSIH).
Related indicators:	Perinatal mortality (1.4.2), Fertility (2.3.4).
Consultation with:	Elizabeth Sullivan (National Perinatal Statistics Unit (NPSU).

1.2 Human function dimension

1.2.1 Prevalence of disability

Proposed definition:	The age-standardised prevalence rate in the population younger than 65 years with any disability and the age-standardised percentage of the same population with a profound/severe activity limitation. Also, the estimated number of people with disabilities in these two groups (see page 12).
Rationale:	Disability (physical, intellectual, psychological and acquired brain injury) has significant impacts on the lives of affected people, who constitute a significant proportion of the Australian population. Understanding of geographic variation may inform policy. Standardisation protects against the impact of different age structures. The number of people with disability (within both categories) in each area provides an indicator of burden.
Desired outcome:	Rates of disability and profound/severe activity limitation low and similar in all areas, becoming lower over time.
Numerator:	The number of individuals younger than 65 years identified in the survey as having a disability. And the number younger than 65 years identified as having a severe or profound disability.
Denominator:	The number of individuals younger than 65 years identified in the survey.
Calculation method:	Indirect age-standardisation to the national age-specific rates calculated from the same survey.
Data source:	ABS Survey of Disability, Ageing and Carers.
Presentation:	MC IR OR R/VR Total Age-standardised prevalence rates (0–64 year olds): all disability; and profound or severe disability.
Data coverage:	Data available 5-yearly, national.
Data issues:	These data are available from a survey, which provides small numbers in the most remote areas; consequently confidence in the point estimates for these areas is reduced. There is no Indigenous identifier. People with a severe/profound disability may move to a less remote area in order to access care; consequently, interpretation of the data will require consideration of the prevalence of 'all disabilities'. It is likely that low levels of sampling will prevent reporting for people from remote and very remote areas.
Related indicators:	Access to disability services (3.5.7).

Consultation with:	Xingyan Wen and Phil Anderson, Ros Madden (Disability Services Unit, AIHW). Ken Black, Margaret Sherley (Disability, Aging and Carers Section, ABS).

1.2.2 Reduced activity because of illness

Proposed definition:	The estimated number of days of reduced activity as a result of illness for males and females living in each geographic area (see page 12).
Rationale:	Days of reduced activity—the age-standardised mean of the number of days of reduced activity as a result of illness from the National Health Survey.
Desired outcome:	Low and similar numbers of days of reduced activity as a result of illness, decreasing over time.
Numerator:	The number of days of reduced activity for each respondent in the previous two weeks (as recorded in the National Health Survey.
Denominator:	The number of respondents to the question in the survey.
Calculation method:	Indirectly age-standardised to the national age-specific rates. For comparison over time, standardisation should be to national rates in one of the years (e.g. 1995). Comparison between years will require standardisation to age-specific rates for a single year (e.g. 1995).
Data source:	ABS National Health Survey.
Presentation:	MC IR OR R/VR Total The mean number of days of reduced activity per fortnight for adult males and females in each area (age-standardised). For all ages and also for those younger than 65 years. For Indigenous, non-Indigenous and total population (as the data allows).
Data coverage:	National and 5-yearly.
Data issues:	The mean only will be reported. Reporting of medians, 25th and 75th percentiles may be misleading, as it is possible for people to have had more than the two weeks with reduced activity. Also, if people have been unwell for some time, 'usual activity' may be similar to 'reduced activity' for an otherwise fairly healthy person. There may be some difficulty in reporting for the remote areas due to restricted sampling in those areas. The indicator may need to be restricted to population younger than 65 years. Reporting for Indigenous people is unlikely to be possible because of small numbers. Reporting days away from usual activity may be a better measure than days off work, because employed and unemployed people are included (rather than just employed people). Differences in rates of employment across areas could otherwise add bias. The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional

	level, and may be biased in the more remote areas. See comments on page 63.
Related indicators:	Self-assessed health status (1.3.2).
Consultation with:	Tim Carlton, Paul Atyeo (Health Section, ABS).

1.3 Life expectancy and wellbeing dimension

1.3.1 Life expectancy

Proposed definition:	Life expectancy at birth for males and females within each area, as well as the probability of living to age 55 and to age 65 years (see page 13).
Rationale:	Reports on an internationally accepted marker of overall health and standard of living. Provides an alternative perspective on overall mortality.
Desired outcome:	Similar life expectancy in all areas, for all groups, increasing over time.
Numerator:	Number of deaths.
Denominator:	Number in the population.
Calculation method:	Calculation methods as in Pollard, Yusuf & Pollard (1975). Calculation of life expectancy and probability of survival based on development of abridged life tables from mortality data.
Data source:	AIHW Mortality and Population Databases.
Presentation:	MC IR OR R VR Total For males and females: life expectancy; probability of living to: • 55 years; and • 65 years. Indigenous, non-Indigenous and total population (as the data allows).
Data coverage:	National and 3-yearly.
Data issues:	It is possible that migration of older sicker people from remote to less remote areas affects the calculated value of life expectancy. Calculation of probability of living to age 55 or 65 provides an additional perspective. The smaller population and relatively small number of deaths in the more remote areas could cause instability in estimates of age-specific death rates. It is not currently possible to report these figures for the Indigenous population because of poorer identification of Indigenous deaths and likelihood of better identification in more remote areas.
Related indicators:	Overall mortality (1.4.1).
Consultation with:	John Goss (Summary Measures Unit, AIHW).

1.3.2 Self-assessed health status

Proposed definition:	Percentage of respondent's health status assessed as excellent, very good, good, fair, poor by area (see page 14).
Rationale:	Reflects the gravity and persistence of illness and its consequent impact on the ability of people to function normally.
Desired outcome:	High and similar proportions of people self-reporting excellent health status in all areas.
Numerator:	Number of people in each self-assessed health status category and in each area.
Denominator:	Population of survey respondents from each area.
Calculation method:	Indirect age-standardised to the national age-specific rates calculated from this survey. Comparison between years will require standardisation to national rates in one of the years only.
Data source:	ABS National Health Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total The age-standardised and crude percentages of males and females who rate their health as excellent, very good, good, fair or poor. For Indigenous, non-Indigenous and the total population (as the data allows). Time trend.
Data coverage:	Every 5 years after the National Health Survey.
Data issues:	Responses are self-assessed. Standardisation is necessary to ensure that comparison between areas is valid (as the age-sex structure of the population of respondents from each area may well vary). Comparison over time relies on methodology and survey questions remaining constant. The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63.
Related indicators:	Happiness (1.3.3).
Consultation with:	Tim Carlton, Paul Atyeo (Health Section, ABS).

1.3.3 Happiness

Proposed definition:	How people feel about their lives in general (delightful through to terrible). See page 14.
Rationale:	Happiness is a major life goal, and a measure of mental health. How people feel about their lives is likely to reflect their general circumstances and their degree of happiness about being alive.
Desired outcome:	A high and similar proportion of people happy with their lives.
Numerator:	The number of respondents to the ABS National Health Survey who rated their lives as delightful through to terrible.
Denominator:	Number of responding males and females in each appropriate age group surveyed in each area.
Calculation method:	Indirectly age-standardise the percentage of the population who rate their lives as delightful through to terrible, using the national age-specific rates. Comparison between years requires the use of standard rates from one year only as the standard.
Data source:	ABS National Health Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total The age-standardised percentage of people in each category of 'how they feel about life as a whole'. For Indigenous, non-Indigenous and the total population (as the data allows).
Data coverage:	National, every 5 years.
Data issues:	The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63. Mental health score was considered as a measure of happiness, but how people felt about their lives was considered to be a clearer measure.
Related indicators:	Workforce and employment (2.2.4), Self-assessed health status (1.3.2).
Consultation with:	Tracy Dixon (Cardiovascular Disease, Diabetes and Risk Factor Monitoring Unit, AIHW). Tim Carlton (Health Section, ABS).

1.4 Deaths dimension

1.4.1 Overall mortality

Proposed definition:	Indirectly age-standardised 'all cause' death rate, trend over time and heterogeneity within broad geographic areas (see page 15).
Rationale:	Overall mortality is perhaps the most significant and ultimate indicator of population health.
Desired outcome:	Low death rate, similar in all areas and diminishing over time.
Numerator:	The number of deaths in the three most recent years for which data is available.
Denominator:	The population in each area in the three most recent years for which mortality data is available.
Calculation method:	Indirect age standardisation using national age-specific rates for a specified period (e.g. 1997–1999). Comparison between years requires standardisation to one single reference period (e.g. 1997–1999).
Data source:	AIHW Mortality and Population Databases.
Presentation:	MC IR OR R VR Total For males and females: • number of deaths; and • indirect age-standardised death rate. For Indigenous, non-Indigenous, total population (as the data allows). Trend over time. Comparison of rates for SLAs within broad geographic areas.
Data coverage:	Data is available nationally and yearly.
Data issues:	Older rural/remote non-Indigenous people tend to exhibit lower mortality than their metropolitan counterparts (although for younger age groups the tendency is reversed), suggesting that individuals with poorer health tend to move away from remote areas towards less remote centres (presumably to access services). This indicator may underestimate mortality for people in more remote areas. There is significant potential for Indigenous mortality to affect overall mortality and so rates for Indigenous, non-Indigenous and the total population should each be described where possible. ABS estimates that Indigenous deaths are underestimated in all States and particularly badly in some States (currently Victoria, New South Wales, Tasmania and the Australian Capital Territory). Identification may be more accurate in remote areas, which will tend to bias any comparison of Indigenous mortality by area. Until this problem is rectified or the size of any effect

	understood, reporting of mortality will omit analysis for Indigenous, while reporting of non-Indigenous rates will carry a small quantifiable bias. Indigenous population data by area is available only for 1996 at present. It is likely that population estimates for Indigenous will continue to be available for Census years only. Calculation of rates for non-Indigenous populations will therefore likely be slightly biased in more remote areas. Rates need to be based on deaths over several years because of the small populations and numbers of deaths in the more remote areas.
Related indicators:	Age-specific mortality (1.4.3), Life expectancy (1.3.1).
Consultation with:	Nil.

1.4.2 Perinatal mortality

Proposed definition:	Perinatal mortality (fetal, neonatal and overall perinatal death rate) per 1,000 births for Indigenous, non-Indigenous and total persons (see page 15).
Rationale:	Perinatal mortality is an indicator of population health and birth outcomes.
Desired outcome:	Low and similar rates of perinatal mortality in all areas, decreasing over time.
Numerator:	a) Number of stillborn infants weighing at least 400g or born after at least 20 weeks gestation in each area. b) Number of neonatal deaths (deaths of babies within 28 days of birth) in each area. c) Overall perinatal deaths in each area—that is, a + b.
Denominator:	Total births (live births and stillbirths) to women from each area.
Calculation method:	Indirect age-standardisation, using national maternal age-specific death rates as the standard.
Data source:	ABS Perinatal Deaths data, ABS Births data.
Presentation:	MC IR OR R VR Total Average annual number of still births and neonatal deaths. Stillbirth rate. Neonatal death rate. Perinatal death rate. Indigenous, non-Indigenous and total population (as the data allows). Time trend (for the total (i.e. Indigenous plus non-Indigenous) population).
Data coverage:	National, annual.
Data issues:	It is likely that poor identification of Indigenous mortality will prevent meaningful use of statistics for Indigenous (and perhaps also for non-Indigenous populations).
Related indicators:	SEIFA (2.2.8), Birth outcomes (1.1.6).
Consultation with:	Dr Elizabeth Sullivan (NPSU).

1.4.3 Age-specific mortality

Proposed definition:	Age-specific death rates for males and females from each area. See page 16.
Rationale:	Age-specific death rates give finer detail required for policy development by identifying life stages at which rates are particularly elevated. Age-specific death rates also provide a more direct (but cumbersome) comparison of mortality across the areas.
Desired outcome:	Age-specific death rates similar in all areas.
Numerator:	Numbers of deaths in each age group.
Denominator:	Population in each age group.
Calculation method:	Divide the number of deaths by the population.
Data source:	AIHW Mortality and Population Databases.
Presentation:	MC IR OR R VR Total Number of deaths. Rate per 100,000 population. For age groups 0–4, 5–14, 15–24, 25–44, 45–64, 65–74, 75+. For males and females. Indigenous, non-Indigenous and total population (as the data allows).
Data coverage:	National and annual.
Data issues:	As for overall mortality. Reporting of Indigenous mortality is likely to be rendered impractical by poor identification.
Related indicators:	Other mortality indicators (1.4.1–1.4.5), Demography (2.3.1).
Consultation with:	Nil.

1.4.4 Premature mortality

Proposed definition:	Indirectly age-standardised 'all cause' death rate for people younger than 65 years, by sex in each area. Years of life lost and average years of life lost per death for those who fail to reach 70 years of age (see page 16).
Rationale:	Overall mortality can be misleading. Mortality for older residents (particularly non-Indigenous) living in more remote areas is lower than for counterparts from metropolitan areas. This is possibly a result of migration by older people with health problems from rural and remote areas to more populous areas with better health services. Standardised death rates for younger people (i.e. younger than 65 years) provide a check. The number of years of life lost provides a single measure of untimely death, where deaths of infants, children and young adults have a large impact on the reported statistic.
Desired outcome:	Low and similar rates of premature death in each area.
Numerator:	The number of deaths of 0–64 year olds in a certain time period. The age at death and the difference between this and 70 years for each individual who dies in this period.
Denominator:	The population of 0–64 year olds in each area in the years for which mortality data is available. The total number of deaths in these years.
Calculation method:	Indirect age standardisation using national age-specific rates for those aged 0–64 years (e.g. for 1997–1999). Years of life lost is the sum, for those who fail to live to 70 years, of the shortfall. This number divided by the total number of deaths (of any age), is a measure of the average shortfall at death in each population.
Data source:	AIHW Mortality and Population Databases.
Presentation:	MC IR OR R VR Total Indirect age-standardised death rate (0–64 years). Years of life lost. Average years of life lost per death. For males and females. Indigenous, non-Indigenous, total population (as the data allows).
Data coverage:	Three-yearly and national.

Data issues:	Issues are similar to those outlined for overall mortality above. Mortality of Indigenous people would not be reported until after issues surrounding poor identification were resolved. Presentation of results for the total population and particularly the non-Indigenous population would be particularly useful here. Selection of 70 as the age before which death is premature has been on the basis that, at ages older than this, migration to less remote centres (so as to access services) is likely to invalidate comparisons between areas. In all probability a figure of 80 or 85 years may be a better measure of the age to which people could aspire to live. Consequently, this measure is likely to underestimate a more appropriate value of years of life lost.
Related indicators:	Overall mortality (1.4.1), Life expectancy (1.3.1).
Consultation with:	Chris Stevenson (Health Registers and Cancer Monitoring Unit, AIHW).

1.4.5 Leading causes of death and excess deaths

Proposed definition:	Mortality and excess deaths due to cardiovascular disease, cancer, respiratory disease, diabetes, renal disease and injury (all ages and 0–64 year olds), in the three years for which data are most recent (see page 16).
Rationale:	Cardiovascular disease, cancer, respiratory disease and injury are the most common general causes of death. Diabetes is a common contributor to death, and is especially prevalent in the Indigenous community and is a national health priority area. Death due to renal disease is much more common in remote areas, likely as a result of the larger numbers of Indigenous people who live there. Risk factors for renal disease (diabetes and urinary tract infection) are potentially preventable. The prevalence of renal disease may be increasing rapidly in more remote areas. For some of these conditions there appear to be higher rates in remote areas.
Desired outcome:	Low and similar rates of death as a result of each cause, in each area.
Numerator:	For the three most recent years for which there is data: • the number of deaths due to cardiovascular disease (ICD9 390–459; ICD10 I00–I99); • the number of deaths due to cancer (ICD9 140–208, 210–239; ICD10 C00–C97, D00–D48); • the number of deaths due to respiratory disease (ICD9 470–478, 490–519; ICD10 J30–J98); • the number of deaths whose principal cause was diabetes and also the number for which diabetes was mentioned as a contributor (ICD9 250; ICD10 E10–E14); • the number of deaths due to renal disease (ICD9 580–589; ICD10 N00–N19); and • the number of deaths due to injury (ICD9 800–999; ICD10 V01–Y89).
Denominator:	The population in each area in the three most recent years for which mortality data is available.
Calculation method:	Indirect age standardisation using national age-specific rates for each cause of death (e.g. for 1997–1999). Excess deaths described as the number of deaths in excess of those expected if major city rates applied to each 5-year age group in each area.
Data source:	AIHW Mortality and Population databases.

Presentation:	MC IR OR R VR Total Indirect age-standardised death rate. Number of deaths in excess of those expected if major city rates applied. For males and females: • Indigenous, non-Indigenous and total population (as the data allows); • repeat for non-Indigenous 0–64 years. For each disease group (above) and for each of the following more specific disease groups: • ischaemic heart disease and cerebrovascular disease; • lung, breast, colorectal and cervical cancer; • chronic obstructive pulmonary disease and asthma; and • motor vehicle accidents, suicide and interpersonal violence.
Data coverage:	Three-yearly and national.
Data issues:	Issues are similar to those outlined for the indicator of overall mortality. Reporting for asthma also for 5–34 year olds, because in older age the diagnosis for asthma can be confused with chronic obstructive pulmonary disease.
Related indicators:	Overall mortality (1.4.1), Prevalence of chronic diseases and injury (1.1.1–1.1.2).
Consultation with:	Nil.

Determinants of health (Tier 2)

2.1 Environmental factors dimension

2.1.1 Fluoridated water

Proposed definition:	The percentage of 'local areas' in which reticulated water supplies have a fluoride concentration within the NHMRC guidelines (see page 18).
Rationale:	Fluoride augmentation of domestic water supplies reduces the risk of dental caries in children and in their later life. Opportunity for public health gain exists in any area where less than 100% of reticulated water supplies contain adequate fluoride.
Desired outcome:	All reticulated water supplies to contain adequate fluoride.
Numerator:	The number of areas (defined by postcode) which have reticulated water supplies with adequate fluoride concentration.
Denominator:	The number of postcodes.
Calculation method:	Simple percentage of postcode areas with adequate fluoride concentration.
Data source:	Dental Statistics and Research Unit (DSRU), AIHW.
Presentation:	MC IR OR R VR Total Percentage of postcodes where reticulated water supplies have adequate fluoride concentration.
Data coverage:	This data set is national, with data for the various areas updated from time to time. Some data within this data set may be up to a decade old.
Data issues:	This indicator describes only the concentration of reticulated water supplies; it reports nothing about private water supplies. Some water (e.g. some bore water) is naturally fluoridated, while tank (collected rain) water contains very little fluoride. This data set does not provide information about the percentage of water supplies that have adequate fluoride, it simply provides information about whether the fluoride in reticulated water supplies in any particular postcode is equal to or greater than the NHMRC target.
Related indicators:	Decayed, missing and filled teeth (1.1.4), Dental consultations (3.5.5).
Consultation with:	David Brennan, Jason Armfield (Dental Statistics and Research Unit, AIHW).

2.2 Socioeconomic factors dimension

2.2.1 Educational status of the adult population

Proposed definition:	The percentage of persons aged 20–39, 40–59 and 60+ who completed primary school, Year 10, high school (i.e. to matriculation) or have tertiary qualifications (see page 20).
Rationale:	The indicator of adult educational status compares educational background of the adult population currently living in each area.
Desired outcome:	High level of education in each area.
Numerator:	The number of persons 20–39, 40–59 and 60+ years who left school when younger than 12, 17 or aged 17 years and older, and the number who have completed some tertiary qualification (including level/type of qualification (TAFE certificate, bachelor degree or better, other (e.g. diploma)).
Denominator:	The number of people aged 20–39, 40–59 and 60+ years in each area.
Calculation method:	Simple percentage for each age group.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total For age groups: 20–39, 40–59, 60+ years. Percentage adults left school: • before age 12 years; • before age 17 years; or • after turning 17 years. Percentage of adults who completed some tertiary qualification. Indigenous, non-Indigenous and total population.
Data coverage:	5-yearly, national.
Data issues:	In 1991 and 1996, data about the level of schooling achieved is not available; consequently, age left school can be used instead. However, in 2001, the Census collected information on level of schooling achieved, not age left school, and consequently there will be a break in the continuous reporting of this indicator.
Related indicators:	Progression from school to university (2.2.3), High school retention rates (2.2.2).
Consultation with:	Gill McPadden, Kathie Whiting (Client Services, ABS).

2.2.2 High school retention rates

Proposed definition:	The percentage of 17 year olds enrolled in secondary school (see page 20).
Rationale:	The number of people enrolled in secondary schools is an indicator for measuring the potential for future employment and potential for health. This is also a measure of the opportunity afforded to children in each area.
Desired outcome:	High and similar proportion of people at school when 17 years old in each area.
Numerator:	The number of 17 year old males and females from each area enrolled in secondary school, by Indigenous status.
Denominator:	Population of Indigenous and non-Indigenous males and females aged 10–14 years in each area (four years previously) divided by five. This population group of younger people four years previously has been selected to account for the fact that the population of 17 years olds in remote areas will have dwindled as people seek employment in less remote areas).
Calculation method:	The reported statistic is a simple percentage.
Data source:	ABS Census, AIHW Population Database.
Presentation:	MC IR OR R VR Total Number enrolled. Percentage enrolled. For males and females. For Indigenous, non-Indigenous and total.
Data coverage:	5-yearly, national.
Data issues:	ABS Census data is available only for census years, but it is possible to obtain this information by postcode of the child's home address. DEST data for completions for secondary schools is not available so it is not possible to gain an accurate picture of persons who completed secondary school. Data for government and non-government schools is only available from 1998; prior to 1998, data is available for non-government schools only. DEST data is the count of the number of children at any age enrolled by postcode of the school. It is not possible to provide this data by postcode of the child's home address.
Related indicators:	Progression from school to university (2.2.3), Educational status of the adult population (2.2.1).
Consultation with:	Gill McPadden (Client Services, ABS).

2.2.3 Progression from school to university

Proposed definition:	The proportion of 17–20 year old persons who have commenced first year of university, for the first time (see page 20).
Rationale:	The number of people enrolled in tertiary education is an indicator for measuring the potential for future employment, higher socioeconomic status, and the greater potential for better health. This is also a measure of the opportunity afforded to children in each area.
Desired outcome:	Similar percentage of each cohort going on to commence at university in each area.
Numerator:	Number of male and female students aged 17–20 from each area enrolled in first year of university.
Denominator:	Population of males and females aged 10–14 years (divided by five) in each area 5 years previously. This age group is chosen to ensure the population estimate for youth in rural and remote areas is not underestimated. A proportion of young adults often leave rural and remote areas to seek employment or education in larger centres and therefore rural and remote population of 17–20 year olds is deflated.
Calculation method:	The reported statistic is a simple percentage.
Data source:	DEST university commencements, AIHW Population database.
Presentation:	MC IR OR R VR Total Percentage commenced university. Males and females. Indigenous, non-Indigenous and total population. Time trend.
Data coverage:	National, annual.
Data issues:	Rural/remote students may have already moved to the city prior to enrolling at university therefore limiting the capture of rural/remote students. This indicator assumes that if an individual enrols at university, they will do so once before they reach 21 years of age. Data pertaining to university completions are not available for geographic areas. Data pertaining to enrolments at TAFE may be available from the National Centre for Vocational Education Research.
Related indicators:	High school retention rates (2.2.2).
Consultation with:	Geoff Izzard (Statistics Unit, DEST).

2.2.4 Workforce and employment

Proposed definition:	Proportions of males and females aged 15–64 and 15–54 years: a) in the labour force (labour force participation rate); b) unemployed as a proportion of the labour force (unemployment rate); c) employed as a proportion of the population (employment/population ratio). See page 21.
Rationale:	Unemployment reflects the level of social disadvantage experienced which is a risk factor for health. An improvement in employment level may translate into improvements in health.
Desired outcome:	Low and similar levels of unemployment in each area, diminishing over time.
Numerator:	For each age group (15–64 or 15–54 years) and for each area: a) number of people in the labour force; b) number of unemployed people (i.e. without a job but in the labour force); c) number of employed people.
Denominator:	Estimated resident population of people aged (15–64 or 15–54 years) in each area in the same census year.
Calculation method:	Indirectly age-standardised using national employment age-specific rates for the same period. Comparison between years requires standardisation to rates in a single year.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total For males and females: • labour force participation rate; • unemployment rate; • employment/population ratio. Indigenous, non-Indigenous and total population. Time trend.
Data coverage:	National, 5-yearly after the Census.
Data issues:	CDEP has not been included because of concerns of data validity and quality (CDEP data available from ABS describes the number registered with/for CDEP and not the number who are actually engaged working). This indicator does not describe whether employment is full time or part time.
Related indicators:	Indicators of income (2.2.5–2.2.7) and mortality (1.4.1–1.4.5).
Consultation with:	Kathie Whiting (Client Services, ABS). Brendan Brady (Labour Force and Rural Health Unit, AIHW).

2.2.5 Household income

Proposed definition:	Equivalised 'after-tax' household income (adjusted for the number and age of those in the household). The gross household income and the number in each household (see page 22).
Rationale:	Income provides people with opportunities, control, access to housing, goods and services as well as mobility. Reporting average (adult) income and household income does not consider the larger number of children in more remote households. This indicator attempts to provide a measure of the after-tax income with which to support each individual in a household. The household is used as the unit of income because individuals in households generally share resources. Also while some households have large incomes, many will have small incomes and also many children.
Desired outcome:	High and similar levels of income in each area.
Numerator:	Household 'after-tax' income (from the ABS Survey of Income and Housing Costs (SIHC)). Gross household income (from Census). Number of adults (15+) and children (0–14) usually resident in each household (from Census).
Denominator:	Household age and sex structure and the number in the household (from SIHC). The number of households (from Census).
Calculation method:	The basis of the summary statistic is the after-tax income weighted by the number and age of individuals in the household. The new OECD summary measure (replacing the old OECD measure and the Henderson scales) is essentially the after-tax household income divided by the weighted number of people in the household (the first adult = 1, subsequent adults = 0.5, children = 0.3 each). Reported statistics would include the mean, median, 25th and 75th percentiles of the weighted after-tax household income. From the ABS Census, the mean, median, 25th and 75th percentile of: • the gross household income; and • the number of adults and children in each household.
Data source:	ABS Survey of Income and Housing Costs and ABS Census.

Presentation:	From SIHC: MC IR OR • equivalised after-tax household income, expressed as the mean, median, 25th percentile and 75th percentile. From ABS Census: MC IR OR R VR Total • Gross household income • number usually resident in each household adults children total. Reporting against Indigenous and non-Indigenous is not possible from the ABS Survey of Income and Housing Costs, but is possible using Census data.
Data coverage:	National and 2–3-yearly after each ABS Survey of Income and Housing Costs or 5-yearly for the Census.
Data issues:	Data for the ABS Survey of Income and Housing Costs only exists from 1994–95 onwards; the sample size is approximately 10,000. The SIHC does not collect information in most of the remote areas. There would be very little information that could be provided with any accuracy for the remote areas, since they only account for a small part of the population, therefore any analysis would be largely confined to 'major city', 'inner regional' and 'other' areas. Reliable estimates of change over time could not be provided because of the relatively brief period over which data has been collected. Data from the Census describes only gross household income (i.e. it is not possible to describe equivalised after-tax household income), but coverage is good in all areas.
Related indicators:	Gap between rich and poor (2.2.6).
Consultation with:	Jenny Harber, Leon Pietsch (Living Conditions Section, ABS). Gill McPadden (Client Services, ABS).

2.2.6 Gap between rich and poor

Proposed definition:	The ratio of the income earned by high income earners to the income earned by low income earners (see page 22).
Rationale:	Income inequality as well as income per se have been suggested as determinants of poor health. This indicator attempts to provide insight into the disparity in income between households in each area.
Desired outcome:	Small differences only between the incomes of the rich and those of the poor in all areas.
Numerator:	Not applicable.
Denominator:	Not applicable.
Calculation method:	Sort households in each area by equivalised 'after-tax' household income (see indicator 2.2.5, Household income). Weight for the number of people in each household. Determine the dollar value of equivalised after tax income for each decile. Divide the amount earned by the person at one decile by the amount earned by the person at another. The ratios describe how much more one group earns than the other group. P10 for example is the income earned by individuals who earn less than 90% of the individuals in the area, but are more affluent than 10% of individuals in the area. These deciles can also be expressed as a percentage of the Australian median after-tax household income.
Data source:	ABS Survey of Income and Housing Costs (SIHC).
Presentation:	MC IR OR & Total Ratios: • P90:P10 • P80:P20 • P80:P50 • P20:P50 P90 and P10 also to be compared to the Australian median. Time series (currently 1996 and 1999–2000).
Data coverage:	National, every 2 or 3 years.

Data issues:	Data for the ABS Survey of Income and Housing Costs only available from 1994–95 onwards. The SIHC does not collect information in most of the remote areas. There would be very little information that could be provided with any accuracy for the remote areas, since they only account for a small part of the population, therefore any analysis would be largely confined to 'major city', 'inner regional' and 'other' areas. Reliable estimates of change over time can only be provided since 1996 (i.e. limited time series). Reporting against Indigenous and non-Indigenous is not possible from the SIHC.
Related indicators:	Household income (2.2.5).
Consultation with:	Jenny Harber, Leon Pietsch (Living Conditions Section, ABS).

2.2.7 Sources of income

Proposed definition:	The percentage of people reliant on each sector for their main source of income (see page 22).
Rationale:	From this indicator it is possible to gauge the importance of a number of different sectors to the livelihoods of people in rural, regional and remote areas.
Desired outcome:	Less reliance on social security and greater reliance on public and private sector employment and on small business.
Numerator:	The number of adults whose main source of income is in each sector in each area.
Denominator:	The number of adults in each area.
Calculation method:	The statistic is expressed as a simple proportion.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total The percentage and number of the adult population (15+) whose main source of income is in each of the following economic sectors: • agriculture, forestry and fishing; • mining; • manufacturing; • electricity, gas and water supply; • construction; • wholesale trade; • retail trade; • accommodation, cafes and restaurants; • transport and storage; • communication services; • finance and insurance; • property and business services; • government administration and defence; • education; • health and community services; • cultural and recreational services; • personal and other services; • non-classifiable economic units; • unemployed; • not in the labour force. Time series (currently 1991, 1996 and 2001 available).
Data coverage:	National and 5-yearly.

Data issues:	ABS Survey of Income and Housing Costs does not collect the wages, salaries and business income classified by industry (rather by salaries and wages, own incorporated business, investment returns and government benefits). SIHC data does not allow reporting for remote areas, and at this stage only over a limited time period. Also, it is not possible to derive after-tax income for two or more industries from that of a whole income (i.e. where an individual is reliant for income on more than one industry, it is not possible state what amount was derived from each). Census data does not permit reporting of after-tax income, nor is it capable of allocating a dollar amount to income earned from each industry in which an individual works. It does, however, allow reporting over all geographic areas and over time. The financial contribution of each sector can only be described using de-identified ATO Individual Income Tax Return data from the ABS when it is possible to differentiate between areas of different remoteness.
Related indicators:	Business activity (2.3.11).
Consultation with:	Claire Conroy (Rural and Regional Statistics National Centre, ABS). Gill McPadden (Client Services, ABS).

2.2.8 SEIFA

Proposed definition:	This indicator describes for each area, the percentage of the population who live in census collectors districts (CDs) which have a SEIFA quartile (i.e. lowest to highest quartiles). The mean SEIFA score for CDs in each area is inappropriate and will not be reported. The SEIFA index of disadvantage, of economic resources and of education and occupation, would be reported (see page 23).
Rationale:	SEIFA indexes are summary measures of socioeconomic wellbeing, which has strong links with health status.
Desired outcome:	Similar percentages of the population in each SEIFA quartile in each area.
Numerator:	Not applicable.
Denominator:	Not applicable.
Calculation method:	Rank CDs in each area by SEIFA score. Report the percentage of the population of each area that live in CDs for which the SEIFA score is in the lowest, 2nd, 3rd and highest national quartile.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total Percentage of the population who live in CDs with SEIFA scores in the lowest, 2nd, 3rd and highest quartile. For the index of: • disadvantage; • economic resources and of education; and • occupation.
Data coverage:	National and 5-yearly after each Census.
Data issues:	1991 SEIFA is not reported because of concerns regarding comparability with SEIFA in 1996 and 2001.
Related indicators:	All socioeconomic indicators (2.2.1–2.2.7).
Consultation with:	Brendan Brady (Labour Force and Rural Health Unit, AIHW). Tenniel Guyer (Statistical Consulting, ABS).

2.3 Community capacity dimension

2.3.1 Demography

Proposed definition:	Demographic characteristics of the population, including population size, growth rate, age and sex structure and proportion of the population who are Indigenous (see page 24).
Rationale:	It is important for policy development to be able to visualise the population in the rural/remote setting. Issues like population growth, ageing, changes in sex ratios and in the proportion who are Indigenous have implications for health status, policy and allocation of resources.
Desired outcome:	There is no desired outcome. This indicator is important for the interpretation of the others.
Numerator:	The population of males and females, population of people in each life-stage (0–14 years, 15–24 years, 25–44 years, 45–64 years, 65+ years), population and proportion of Indigenous persons for the most recent year of estimated resident population data for each area.
Denominator:	The number of years being compared (i.e. 5).
Calculation method:	For population growth: subtract the 1991 population from the 1996 population (for males and females in each area), divide by the 1991 population and then divide by 5. For other components of this indicator (relative sizes of populations, numbers in each life stage age group, percentage male and female, percentage Indigenous), presented statistics to be counts or simple percentages.
Data source:	AIHW population databases.
Presentation:	MC IR OR R VR Total Population. Percentage of the Australian population. Number of Indigenous persons. Indigenous persons as percentage of the population in each area. Indigenous persons in each area as percentage of the Australian Indigenous population. Males 0–14 15–24 25–44 45–64 65 + Females 0–14 15–24 25–44 45–64 65 + Population growth (number and percentage change).

Data coverage:	5-yearly and national.
Data issues:	Substantial differences in the number of people identifying as Indigenous prevents description of the change in the Indigenous and non-Indigenous populations. Description of changes in the population living in remote and very remote areas may be unreliable because of assumptions made in the allocation of remoteness category to population data.
Related indicators:	Dependency ratio (2.3.2).
Consultation with:	Phil Trickett (Health Registers and Cancer Monitoring Unit, AIHW). Frank Blanchfield (Geography Section, ABS).

2.3.2 Dependency ratio

Proposed definition:	The ratio of people older than 65 years and of people 14 years or younger to people of working age (15–64 years). See page 24.
Rationale:	High levels of dependence require higher levels of support.
Desired outcome:	Similar and low levels of apparent dependence in each area.
Numerator:	The number of people 0–14 and 65+ in each area.
Denominator:	The number of people 15–64 in each area.
Calculation method:	Divide the numerator by the denominator.
Data source:	AIHW population databases.
Presentation:	MC IR OR R VR Total The ratio.
Data coverage:	5-yearly and national.
Data issues:	The dependency ratio is synthetic. There is no guarantee that the people of working age are working; however, they are a source of support and care for people of dependent age.
Related indicators:	Demography (2.3.1).
Consultation with:	Joy Eshpeter (National Population Health Planning Branch, DoHA).

2.3.3 Internal migration

Proposed definition:	The number and proportion of the population in each age group migrating, and the direction of that migration expressed as the proportion of those responding to the Census lived in a different geographic area 12 months previously. The area in which they live now, and for those who had moved, the area in which they lived 12 months previously (see page 24).
Rationale:	It is unconfirmed, but appears likely that older people or people with poor health tend to move from more remote areas to less remote areas, probably to access health or other facilities. An understanding of the migration of people living in these areas is essential for a valid interpretation of other indicators.
Desired outcome:	There is no preferred outcome. The indicator has value in assisting interpretation of other indicators.
Numerator:	The number who moved in the year prior to the Census.
Denominator:	The number living in each area at the Census.
Calculation method:	Generate a five by five table, showing the numbers of people resident in each area, where they lived 12 months previously and where they lived at the time of the census. From the table, calculate the proportion from each area who subsequently move to another area in the year. Repeat for each age group (15–24, 25–44, 45–64, 65–74 and 75+). Indigenous, non-Indigenous and the total population.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total For each area, by age group: • the percentage of the population in an area, who move to or from more remote areas; • the percentage of the population in an area, who move to or from less remote areas; and • the net change in the population in each area as a result of internal migration. Indigenous, non-Indigenous and total population.
Data coverage:	National, 5-yearly after the Census.
Data issues:	An issue which this indicator does not address is the work-related seasonal movement of people (e.g. the movement of seasonal farm workers, opal miners, holiday makers, etc.) to rural and remote areas. An influx of people into these areas can put pressure on health systems designed to cater for fewer people locally. Comparison of location of residence one year previously has been used, rather than at last year's Census, because of the lower opportunity for deaths to invalidate the comparison.

Related indicators:	Demography (2.3.1).
Consultation with:	Michael Roden (Demography Section, ABS).

2.3.4 Fertility

Proposed definition:	Birth rates for females overall and in each age group (see page 24).
Rationale:	Fertility impacts on health services and on poverty. Teenage fertility can impact adversely on life opportunities, while risks surrounding birth are greater for very young and old mothers. An understanding of how remoteness affects fertility for both Indigenous and non-Indigenous women and for different age groups would be useful.
Desired outcome:	Low rates of teenage fertility and of births to older women.
Numerator:	The number of births in a calendar year for females in each age group and for all ages in each area.
Denominator:	The number of females in each 5-year age group.
Calculation method:	Divide numerator by denominator and multiply by 1,000 for each age group. Rates for all women indirectly age-standardised using national age-specific birthrates for women nationally. Teenage fertility rate is the number of live births to mothers aged less than 20 years in a given year per 1,000 females aged 15–19 years.
Data source:	ABS Birth Registration data, AIHW population databases.
Presentation:	MC IR OR R VR Total Number of babies. Birthrate (births per 1000 women per year): • less than 20 years; • 20–29 years; • 30–39 years; and • 40 years and over. Overall fertility (age-standardised). Indigenous, non-Indigenous and total population (as the data allows). Time trend for the total population.
Data coverage:	Annual, national.
Data issues:	Quality of the Indigenous identifier is poor. Changes in the likelihood of identifying as Indigenous over time prevent valid reporting of time trends for both Indigenous and non-Indigenous people.
Related indicators:	Demography (2.3.1), Birth outcomes (1.1.6), Perinatal mortality (1.4.2).
Consultation with:	Elizabeth Sullivan (National Perinatal Statistics Unit (NPSU).

2.3.5 Community safety

Proposed definition:	Mortality due to interpersonal violence and mortality of children under 5 years due to interpersonal violence (see page 25).
Rationale:	Homicide, including the death of young children is an extreme indicator of community safety and function. As well as mortality, higher levels of violence also generate fear and reduce opportunities for social interaction, significantly reducing the quality of life.
Desired outcome:	Low and similar levels of homicide in each area, diminishing over time.
Numerator:	Number of deaths of people and, as a subset, of 0–4 year old children in each area classified as non-accidental injury and neglect (ICD9 codes E960–E969; ICD10 T74 (maltreatment codes). This excludes late effects.
Denominator:	The number of people by 5-year age group and number of children aged 0–4 in each area.
Calculation method:	Indirect age standardisation using national age-specific homicide death rates. Comparison across time requires standardisation to a single period (e.g. for the period 1997–1999). Deaths of children expressed as crude rates.
Data source:	AIHW Mortality and Population Databases.
Presentation:	MC IR OR R VR Total Number of deaths. Deaths per 100,000 population. Male and female adults. Children. Time trend for total population of males and females. Indigenous, non-Indigenous and total population (as the data allows).
Data coverage:	National and yearly.
Data issues:	This indicator is a measure of an extreme outcome that is likely to be correlated to overall levels of violence and abuse within each community. Where violence, child abuse or neglect does not end in death, alternative data sources could include courts or police data. National Child Protection data (which might otherwise provide a good overview of child physical abuse) suffers from a number of problems. These include different case definitions in each State, the geographic identifier is not available in the national data set, notification to the system has a different probability in more remote areas and the identification of Indigenous children is affected by a range of issues which are likely to invalidate comparison. Small numbers of deaths may make comparison between some

	areas difficult. Rate of hospital separation due to neglect and injury due to interpersonal violence has been considered as an alternative or supporting indicator. Different admission policies may, however, affect the validity of this (hospital) indicator. Use of 'place of occurrence' field could allow reporting for interpersonal violence at home and interpersonal violence in the community. However, information on place of occurrence is available only for a proportion of records.
Related indicators:	Alcohol (2.4.2), Illicit drugs (2.4.3).
Consultation with:	Helen Moyle, Helen Johnston, Fadwa Al Yaman (Children Youth and Families Unit, AIHW).

2.3.6 Perception of risk

Proposed definition:	The percentage of the population who self-report engaging in risky behaviour while intoxicated with alcohol or an illicit drug (see page 26).
Rationale:	The perception of risk influences behaviour, which can influence the risk of accident or of chronic disease. Understanding of differences in the perception of risk (or the tendency to take risks) could be useful in addressing rates of accident or chronic disease in non-metropolitan areas.
Desired outcome:	Similar and low levels of risk taking behaviour in all areas.
Numerator:	While intoxicated with alcohol or an illicit drug, the number who self-reported working, swimming, boating, driving or operating hazardous machinery (personally risky), and the number who self-reported creating a public disturbance, damaging property, stealing or verbally or physically abusing someone (socially risky) in the past 12 months.
Denominator:	All respondents to the AIHW National Drug Household Survey.
Calculation method:	Indirect age-standardised percentage using national age-specific rates as the standard.
Data source:	AIHW National Drug Strategy Household Survey.
Presentation:	MC IR OR R/VR Total For males and females. Percentage reporting behaviour that was: • personally risky; and • socially risky.
Data coverage:	National, every 3 years.
Data issues:	This survey has a relatively small sample size (10,030 in 1998, but 26,744 in 2001). CATI methodology in 2001 may reduce the opportunity for poorer people in more remote areas to respond. Prior to 2001, methodology significantly reduced the opportunity for many remote populations to participate. There may be a need to aggregate responses from the two most remote areas due to small sample sizes. The sample will not support separate Indigenous analysis.
Related indicators:	Prevalence of chronic disease and injury (1.1.1 and 1.1.2).
Consultation with:	Mark Cooper-Stanbury (Population Health Data and Information Services Unit, AIHW).

2.3.7 Housing tenure

Proposed definition:	The proportion of households that are: a) rented; b) being purchased; or c) owned (see page 27).
Rationale:	Home ownership provides families with a greater sense of control over their own lives and a greater sense of permanency. Renting can be a practical and economic alternative to purchasing.
Desired outcome:	Similar percentage of households renting in each area.
Numerator:	Number of households in each tenure category (those still purchasing, those who own outright and those who rent) in each area.
Denominator:	The total number of households in each area.
Calculation method:	Percentage-standardised by the age of the reference person in each dwelling using national age-specific percentages as the standard. Crude percentage to also be calculated. The standardised percentage seeks to describe the probability of renting, owning, etc. The crude percentage describes the actual percentage who are renting, owning, etc.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total Crude and age-standardised proportion of: • households renting; • households purchasing dwelling; and • households that own dwelling. Time trend using data from each Census. Indigenous, non-Indigenous and total population. Graph: Data would be presented in a stacked column chart for each area.
Data coverage:	National and every 5 years after the ABS Census.
Data issues:	Age standardisation is necessary to compare the probability of renting between areas because the age structures of the populations are different and younger people are more likely to rent and less likely to own their dwelling.
Related indicators:	Overcrowding in households (2.3.8).
Consultation with:	Anne Marie Waters (Cardiovascular Disease, Diabetes and Risk Factor Monitoring Unit, AIHW). Leon Pietsch (Living Conditions Section, ABS). Gill McPadden (Client Services, ABS). Tenniel Guyer (Statistical Consulting, ABS).

2.3.8 Overcrowding in households

Proposed definition:	The percentage of households that are overcrowded (Canadian National Occupancy Standard), based on number of bedrooms, household size and composition (see page 27).
Rationale:	There is evidence to suggest that overcrowded dwellings are associated with a greater risk of communicable diseases, accidents and poorer mental health. It is expected that overcrowding may occur in more remote areas due to larger families and cultural practices of Indigenous people.
Desired outcome:	A low and similar level of crowding in each area.
Numerator:	The total number of bedrooms in the dwelling.
Denominator:	The number of bedrooms required (using the Canadian National Occupancy Standard).
Calculation method:	The number of bedrooms required = ceiling of ((1*single adults) + (1*adult couples) + (children under 5/2) + (boys 5–17/2) + (girls 5–17/2)). If the number of bedrooms is less than the number required, then the dwelling is crowded.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total The percentage of households crowded, just right and under utilised. Indigenous, non-Indigenous and total population. Time trend.
Data coverage:	National, every 5 years after the Census.
Data issues:	A complex relationship which may be influenced by time actually spent in the home, cultural differences and the condition of housing. While data is presented using one single model across Australia, it can be argued that some groups may have different requirements or may use dwellings differently.
Related indicators:	Housing tenure (2.3.7), Household income (2.2.5).
Consultation with:	Anne Marie Waters (Cardiovascular Disease, Diabetes and Risk Factor Monitoring Unit, AIHW). Anne Jenkins (Ageing and Aged Care Unit, AIHW).

2.3.9 Transport

Proposed definition:	The average number of registered motor vehicles per adult in each household (see page 28).
Rationale:	Large distances to services and little or no public transport make access to car transport important for accessing services, day-to-day living and for empowerment. People living in rural and remote areas who do not have access to a car are particularly disadvantaged. People without access to a car in metropolitan areas are likely to be far less disadvantaged.
Desired outcome:	High and similar ratios of cars to adults in each household, in each area.
Numerator:	The number of registered motor vehicles garaged at each household, in each area.
Denominator:	The number of adults aged 20 years and over who live in each household, in each area.
Calculation method:	Divide the numerator by the denominator. The indicator statistic is the mean, median, 25th and 75th percentile of the quotient.
Data source:	ABS Census.
Presentation:	MC IR OR R VR Total Number of cars per household. Household car to adult (20+ years) ratio. Mean, median, 25th and 75th percentiles of the ratio reported. For Indigenous, non-Indigenous and total households.
Data coverage:	National and 5-yearly after the ABS Census.
Data issues:	People living in metropolitan areas may have less need for cars, as these areas are better serviced by public transport. This indicator does not address road quality or the number of kilometres travelled each year by residents of each area.
Related indicators:	Workforce and employment (2.2.4), Distance to medical services (3.5.1).
Consultation with:	Gill McPadden, Dean Turner (Client Services, ABS). Brendan Brady (Labour Force and Rural Health Unit, AIHW).

2.3.10 Cost of living

Proposed definition:	In lieu of an overall cost of living statistic, prices of three fundamental groups of commodities are compared across areas: housing, food and petrol (see page 28).
Rationale:	It is not possible to report on consumer price index (CPI) or similar but appropriate summary measures comparing cost of living between areas. Comparison of the cost of food, petrol and housing provides some indication of the day-to-day cost of living experienced by rural populations. This indicator is recommended because poverty or affluence is at least as influenced by cost of living as by income.
Desired outcome:	Low and similar costs for these three commodities in each area.
Numerator:	Not applicable.
Denominator:	Not applicable.
Calculation method:	The price of petrol and index of food prices to be reported as they are. Mean cost of rent and mortgage to be standardised on the basis of the number of bedrooms in the dwelling.
Data source:	Mortgages and rental: ABS Census. Food prices: ABS Indexes of relative retail prices of food, Australian cities and towns 1984–1990 (discontinued survey), as well as specific 'one-off' State surveys. Petrol prices: Informed Sources P/L.
Presentation:	MC IR OR R VR Total Report the mean, median, 25th and 75th percentiles of mortgages and rents. Where details of price are not available for all locations (food and petrol), cost to be (scatter) plotted against continuous ARIA score for SLAs.
Data coverage:	Costs of housing are available nationally and every five years. Cost of petrol is available nationally and several times yearly. Cost of food is available for some States only, and irregularly.
Data issues:	Data availability is restricted. Petrol prices are available for each location for the previous month or over the past years. Housing prices and rents are available for all areas. Food prices (or rather indices) are available for 1984–1990, and also periodically for some States. Housing costs, and food and petrol prices reflect a proportion of the cost of living. There is no national ability to compare cost of living in metropolitan and other parts of Australia. Region-specific factors influencing people's demands for these items (e.g. the need to drive greater distances and consume more petrol) need to be considered in interpreting this indicator. Comparison with the indicator of income in this framework (which has been equivalised) is valid.

Related indicators:	Household income (2.2.5).
Consultation with:	Petrol: Informed Sources P/L; Alan Price. Housing: Leon Pietsch (Living Conditions Section, ABS). Food: Steve Whennan (Consumer Price Index Section, ABS).

2.3.11 Business activity

Proposed definition:	The economic health of a region measured by business growth or decline (see page 29).
Rationale:	The opportunity for deriving a livelihood through paid employment, with its inherent health benefits, depends on the health of the business sector and opportunities for employment in the public sector. A buoyant economy is likely to encourage a healthy population.
Desired outcome:	Similar or increasing numbers of businesses (as expressed by counts of ABNs) in each area from year to year. Similar or increasing counts of small regional businesses, operating income and profit in each area from year to year.
Numerator:	Counts of single location ABNs registered for GST. Counts of regional small businesses, operating income, operating expenses, and profit.
Denominator:	Counts of regional small businesses.
Calculation method:	The statistic reports counts, simple means and medians, and the change in these from year to year.
Data source:	ABS ATO Australian Business Register (ABR). ABS ATO Business Income data (BID).
Presentation:	MC IR OR R VR Total Number of ABNs registered for GST. Number of regional small businesses. Mean and median: • operating income; • operating expense; and • profit. For each year data exists.
Data coverage:	National, annual. ABR since October 2000, BID since 1995/1996.
Data issues:	Confidentiality and development issues currently prevent reporting by geographic areas smaller than State (for ABR), while for BID, Statistical Division is the smallest area against which it is possible to report. Small business is defined as those businesses whose total income or expenses were between $10,000 and $5m in a financial year. These data do not describe large or multi-locational businesses.
Related indicators:	Workforce and employment (2.2.4), Sources of income (2.2.7).
Consultation with:	Claire Conroy (Rural and Regional Statistics National Centre, ABS).

2.4 Health behaviours dimension

2.4.1 Tobacco

Proposed definition:	The percentage of persons living in each area who are regular smokers, light regular smokers, occasional smokers, ex-smokers and who have never smoked (see page 30).
Rationale:	Estimates the prevalence of smoking in adults. Smoking is a major risk factor for several important causes of morbidity, notably circulatory diseases, cancers and respiratory diseases.
Desired outcome:	Prevalence of smoking low and similar in all areas, decreasing over time.
Numerator:	From the National Drug Strategy Household Survey; the number of males and females in each area, in each age group (14 years and older) who: • Are regular smokers (at least one cigarette, cigar or pipe per day); • are regular smokers (at least once weekly); • are occasional smokers (less often than weekly); • are ex-smokers having smoked 100 or more cigarettes in life; • have never smoked (including smoked less than 100). From the ABS National Health Survey; the number of males and females in each area, in each age group (18 years and older) who: • are regular smokers; • are occasional smokers; • are ex-smokers (100 or more in life); • have never smoked.
Denominator:	Number of males and females in each age group in each area 14 years and older in the National Drug Strategy Household Survey, and 18 years and older in the National Health Survey.
Calculation method:	Calculate age-standardised proportions for males and females who are regular smokers, occasional smokers, ex-smokers having smoked 100 or more cigarettes in life, never smoked. Comparison across time will require proportions to be standardised to those from a single year (e.g. 1995 NHS).
Data source:	National Drug Strategy Household Survey (currently 1998, 2001 available). Small sample size in 1995 prevents reporting by remoteness. The ABS National Health Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total For the National Drug Strategy Household Survey, the age-standardised percentage of males and females who: • are regular smokers (at least daily); • are regular smokers (at least once weekly);

- are occasional smokers (less often than weekly);
- are ex-smokers; and
- never smoked (including smoked less than 100).

Or crude percentage for each age group 14–24, 25–44, 45–64, 65+.

There may be a need to aggregate some categories where sensible.

For the ABS National Health Survey, the

age-standardised percentage of males and females 18+ who:

- are regular smokers;
- are occasional smokers;
- are ex-smokers (100 or more in life); and
- never smoked.

Or crude percentage for each age group 18–24, 25–44, 45–64, 65+.

For Indigenous, non-Indigenous and total population (as the data allows).

Data coverage: Every 3 years (NDSHS) or 5 years (NHS), national.

Data issues: The National Drug Strategy Household Survey has a relatively small sample size (10,030 in 1998, but 26,744 in 2001). CATI methodology in 2001 may reduce the opportunity for poorer people in more remote areas to respond. Prior to 2001, methodology significantly reduced the opportunity for many remote populations to participate. There may be a need to aggregate the remote areas due to small sample sizes.

The NDSHS will not support separate Indigenous statistics.

Other issues include those previously mentioned for indicators from national surveys.

The ABS National Health Survey has a larger sample size, greater history (thereby time series is possible). The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63. Results from the two surveys will not be identical, but should show similar trends.

Information about smoking rates of children which can be described by geographic area are not available nationally.

Related indicators: Chronic diseases (1.1.1), Leading causes of death and excess deaths (1.4.5), SEIFA (2.2.8).

Consultation with: Mark Cooper-Stanbury (Population Health Data and Information Services Unit, AIHW).
Tim Carlton and Paul Atyeo (Health Section, ABS).

2.4.2 Alcohol

Proposed definition:	The prevalence of alcohol consumption capable of resulting in harm in the short and long-term as defined by the NHMRC Australian alcohol guidelines 2001. These supersede the previous guidelines (more than 4 glasses for males and 2 glasses for females per day being hazardous, greater quantities daily classified as harmful). See page 30.
Rationale:	Moderate alcohol intake is not harmful and may be associated with some health benefits. Higher levels of intake (hazardous and harmful alcohol consumption) is a risk factor for a number of diseases/conditions, both for the individual and for others.
Desired outcome:	Low and similar levels of short- and long-term hazardous or harmful alcohol consumption in each area.
Numerator:	Number of males and females in each area, in each age group who have: • alcohol consumption with potential for short- or long-term harm (new NHMRC definition); and • hazardous or harmful alcohol consumption (old NHMRC definition).
Denominator:	The total number of male and female respondents in the survey from each area and age group.
Calculation method:	Proportions for age groups are simple proportions. Proportion of the total population is age-standardised, using national proportions for each age group as the standard. Comparison between years will require standardisation to national age-specific proportions for one year only (e.g. 1995).
Data source:	AIHW National Drug Strategy Household Survey (currently 1998 and 2001 available). Small sample size in 1995 prevents reporting by remoteness. ABS National Health Survey (currently 1989–90, 1995 and 2001 available).

Presentation:	MC IR OR R/VR Total From the AIHW National Drug Strategy Household Survey: Age-standardised percentage of males and females who drink alcohol in such a way as to risk: • harm in the short term; and • harm in the long term. The crude percentage who risk harm in the short and long term for the following age groups: • 14–19 years • 20–29 years • 30–39 years • 40+years. From the ABS National Health Survey: Age-standardised percentage of males and females who have: hazardous or harmful alcohol consumption; the crude percentage of those who have hazardous or harmful alcohol consumption in the following age groups: • 18–29 yrs • 30–39 yrs • 40+ yrs. For Indigenous, non-Indigenous and total population (as the data allows). Time series (currently 1989–90, 1995 and 2001 available).
Data coverage:	National and 3-yearly.
Data issues:	Issues are the same as for the Tobacco indicator (2.4.1). Definition of hazardous and harmful alcohol consumption has been modified recently. Definition of harmful and hazardous alcohol consumption will follow the recent NHMRC Australian alcohol guidelines 2001 instead of the previous definition. This is possible only for the AIHW data. The NHS data can only be defined in terms of the older definition (and will be reported as such).
Related indicators:	Illicit drug use (2.4.3), and Tobacco consumption (2.4.1).
Consultation with:	Mark Cooper-Stanbury (Population Health Data and Information Services Unit, AIHW). Tim Carlton (Health Section, ABS).

2.4.3 Illicit drugs

Proposed definition:	The proportion of people who had recently used an illicit drug (all illicit drugs, cannabis and all illicit drugs other than cannabis). See page 31.
Rationale:	Illicit drug use can constitute a significant health risk and can feed property and personal crime rates (reducing opportunities for others). Statistics for all three groups of drugs will be presented because some people use both cannabis and other illicit drugs.
Desired outcome:	Low and similar levels of illicit drug use in each area.
Numerator:	The number of respondents who had recently used an illicit drug (including cannabis) and the number who had recently used cannabis.
Denominator:	The total number of respondents in the survey.
Calculation method:	Indirect age-standardised proportions using national age-specific proportions as the standard.
Data source:	AIHW National Drug Household Survey, 1998 and 2001. Small sample size in 1995 prevents reporting by remoteness.
Presentation:	MC IR OR R/VR Total Age-standardised percentage of males and females who had recently used: • cannabis; • another illicit drug; • any illicit drug (including cannabis).
Data coverage:	National and 3-yearly.
Data issues:	Issues are the same as for indicator 2.4.1 (re the NDSHS). Details of illicit drug use are not collected in the National Health Survey. Self-reporting may result in under-reporting of rates.
Related indicators:	Alcohol (2.4.2), and Tobacco (2.4.1).
Consultation with:	Mark Cooper-Stanbury (Population Health Data and Information Services Unit, AIHW).

2.4.4 Physical activity and inactivity

Proposed definition:	The percentage of persons aged 18+ years doing some physical activity and the percentage doing no physical activity. The percentage of persons aged 18+ years doing sufficient levels of exercise and the percentage not doing sufficient levels of exercise. See page 31.
Rationale:	Physical inactivity is the second largest contributor to burden of disease in Australia (AIHW: Mathers et al. 1999).
Desired outcome:	Low and similar levels of physical inactivity in all areas, decreasing over time.
Numerator:	From the AIHW Physical Activity Survey: the number of people in each area aged 18 years and over who have done some physical activity and the number who have been sedentary in the previous week; and the number of people in each area aged 18 years and over who have done 'sufficient levels of physical activity' and the number that have done insufficient levels of exercise in the previous week. From the ABS National Health Survey: the number who have done sufficient leisure time physical activity in the previous fortnight. Sufficient activity is defined as at least 30 minutes of moderate-intensity physical activity on most, preferably all, days.
Denominator:	Number of people in each area who responded to each survey.
Calculation method:	Indirect age-standardised proportion using national age-specific proportions as the standard.
Data source:	AIHW Physical Activity Survey 1998 and the ABS National Health Survey (1989–90, 1995 and 2001 currently available).
Presentation:	MC IR OR R/VR Total From the Physical Activity Survey, the percentage of people 18 years and over: • doing some physical activity and doing no physical activity; and • doing sufficient levels of exercise and not doing sufficient levels of exercise. From the National Health Survey, the percentage of people 18 years and over doing sufficient leisure time physical activity, in each year for which data is available. For Indigenous, non-Indigenous and total population (as the data allows).
Data coverage:	National; 5-yearly for the National Health Survey, one-off for the Physical Activity Survey.

Data issues:	The 'physical activity' definition used in the 1998 Physical Activity Survey is more recent and appropriate than the definition used in the 1995 National Health Survey. However, the Physical Activity Survey was conducted by phone and has limited representation of rural and remote areas. The ideal data source would be the NHS with redevelopment of the physical activity question. The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63.
Related indicators:	The prevalence of chronic disease (1.1.1), Leading causes of death (1.4.5), Community safety (2.3.5).
Consultation with:	Tim Armstrong (Cardiovascular Disease, Diabetes and Risk Factor Monitoring Unit, AIHW). Tim Carlton (Health Section, ABS).

2.4.5 Nutrition

Proposed definition:	Estimated dietary energy intake, and intake of saturated fat, fresh fruit and vegetables, and dietary fibre (see page 31).
Rationale:	Energy is provided from particular food groups and aids in growth, movement, metabolism and physical activity. Intake of too little or too much energy has adverse health consequences. A high intake of saturated fats can contribute to high serum cholesterol levels, obesity and increased risk of cardiovascular disease. A high intake of fresh fruit and vegetables provides a wide range of general dietary needs. Fresh fruit and vegetable consumption can reduce risks to cardiovascular disease and cancer and is essential to general health and wellbeing. Some components of fibre assist in lowering blood cholesterol, maintaining blood glucose levels and providing protection against intestinal problems.
Desired outcome:	Energy intake similar in all areas. Similar levels of low saturated fat and high dietary fibre intake in each area. High and similar percentages of people eating sufficient quantities of fresh fruit and vegetables. All aspects of diet improving over time.
Numerator:	Energy, saturated fat, and dietary fibre intake for males and females in each age group in each area. The number of males and females in each age group with different levels of fresh fruit and vegetable intake in each area.
Denominator:	Number of males and females in each age group in each area in the 1989–90, 1995 and 2001 National Nutrition Survey.
Calculation method:	Indirect age-standardised means, median and proportions using national age-specific values as the standard. Comparison between years requires standardisation to a single year (e.g. 1995).
Data source:	ABS National Nutrition Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total The mean, median, 25th and 75th percentiles of: • dietary energy intake; • saturated fat intake; and • dietary fibre intake. The percentage of males and females with fresh fruit and vegetable intake in each of five categories (little to lots). For males and females.
Data coverage:	National and 5-yearly.

Data issues:	This survey has a relatively small sample size (13,858 of which 8,339 are in capital cities). In the Northern Territory only one remote area was sampled. Data for remote and very remote areas will likely need to be aggregated because of small numbers. The sample will not support separate Indigenous or non-Indigenous statistics. It is common to most dietary surveys that due to their '24 hour recall' methodology, on average people under-report their consumption of food and beverages. Other issues include those previously mentioned for indicators from national surveys. Refined sugar intake would be useful, but it is not possible to differentiate between refined and unrefined sugars. If differences between males and females are not substantial, reporting for 'people' could increase power in the smaller areas.
Related indicators:	Prevalence of chronic diseases (1.1.1), Leading causes of death (1.4.5), Cost of living (2.3.10), Overweight/obesity (2.5.3), SEIFA (2.2.8).
Consultation with:	Bonnie Field (Cardiovascular Disease, Diabetes and Risk Factor Monitoring Unit, AIHW). Tim Carlton, Paul Atyeo (Health Section, ABS).

2.4.6 Sexual practices

Proposed definition:	The age-standardised percentage of males and females who self-report non-safe sexual practices in each area (see page 32).
Rationale:	Notification of sexually transmitted infections can be high in some rural/remote communities, the health and social impact can be substantial and there is the opportunity for public health action based on understanding to improve the situation.
Desired outcome:	Low and similar rates of non-safe sexual practice in all areas, decreasing over time.
Numerator:	Numbers of individuals self-reporting non-safe sexual practices in the Australian Study of Health and Relationships.
Denominator:	The number of responses to the Australian Study of Health and Relationships.
Calculation method:	Indirect age-standardised proportion.
Data source:	Australian Study of Health and Relationships, La Trobe University, 2002.
Presentation:	MC IR OR R/VR Total Percentage of males and females who self-report non-safe sexual practices (age-standardised). There is an option to report for Indigenous and non-Indigenous populations.
Data coverage:	Data is national, but is likely to be a one-off study.
Data issues:	The survey is CATI; consequently coverage of poorer people especially in more remote areas may be low. Sample size is 19,307, with an augmented rural/remote sample.
Related indicators:	Communicable diseases (1.1.5).
Consultation with:	Dr Richard de Visser (Australian Research Centre in Sex, Health & Society, La Trobe University).

2.5 Person-related factors dimension

2.5.1 Genetically determined diseases

Proposed definition:	The number and rate of births with genetically determined diseases (including inherited genetic disease, somatic genetic disease (cancer), chromosomal aberrations (including specifically Down syndrome). See page 33.
Rationale:	Antenatal testing provides parents with information that can be used to reduce the prevalence of genetically determined disease in the population. Knowledge of higher rates in some areas may initiate action to improve availability of antenatal testing, options or attitudes to termination of pregnancy or other actions to reduce incidence.
Desired outcome:	Rates to be low and similar in each area, decreasing over time.
Numerator:	The number of live and stillbirths with genetically determined diseases as specified.
Denominator:	The total number of live and stillbirths.
Calculation method:	Rates age-standardised to national rates by maternal age.
Data source:	ABS births data and NPSU perinatal data
Presentation:	MC IR OR R/VR Total Number and rate of babies born with genetically determined diseases (age-standardised by maternal age): • inherited genetic diseases; • somatic genetic diseases; • chromosomal aberrations; • Down syndrome; and • all genetically determined diseases. Also time series (either individual years or rolling averages).
Data coverage:	National and annual (although reporting may require the aggregation of several years' data).
Data issues:	Numbers are likely to be too small to report also for Indigenous and non-Indigenous by area. Reporting for time series may require the use of rolling averages because of small numbers.
Related indicators:	Specific birth defects (2.5.2).
Consultation with:	Dr Elizabeth Sullivan, Dr Siva Sivarajasingam (National Perinatal Statistics Unit (NPSU)).

2.5.2 Specific birth defects

Proposed definition:	The number and rate of births with specific birth defects caused by environmental factors (all and also neural tube defect). See page 34.
Rationale:	High rates can be preventable (for example, folic acid supplementation to reduce risk of spina bifida). Knowledge of higher rates in some areas may initiate action to reduce incidence.
Desired outcome:	Rates to be low and similar in all areas, decreasing over time.
Numerator:	The number of live and stillbirths with specific birth defects.
Denominator:	The total number of live and stillbirths.
Calculation method:	Numbers and rates, age-standardised to national rates by maternal age.
Data source:	ABS births data and NPSU Perinatal data.
Presentation:	MC IR OR R/VR Total Rate of babies born with specific birth defects caused by environmental factors (age-standardised by maternal age). • All specific birth defects. • Neural tube defect. Also time series (either individual years or rolling averages).
Data coverage:	National and annual (although reporting may require the aggregation of several years data).
Data issues:	Numbers are likely to be too small to report also for Indigenous and non-Indigenous by area. Reporting for time series may require the use of rolling averages.
Related indicators:	Genetically determined diseases (2.5.1).
Consultation with:	Dr Elizabeth Sullivan, Dr Siva Sivarajasingam (National Perinatal Statistics Unit (NPSU)).

2.5.3 Overweight/obesity

Proposed definition:	Proportion of persons aged 18 years and over with a body mass index (BMI) in the overweight and obese ranges (see page 35).
Rationale:	The indicator estimates the prevalence of overweight and obesity in adults and reflects the risk of premature mortality, diabetes, and circulatory disease.
Desired outcome:	Low and similar rates of overweight and obesity in each area, decreasing over time.
Numerator:	The number of males and females in the NNS who are: overweight (BMI 25 to 29 kg/m^2); and obese (BMI 30 kg/m^2 or greater).
Denominator:	Total number of males and females surveyed in the NNS for males and females in each area.
Calculation method:	Indirect age-standardised using national age-specific proportions. Comparison between years requires standardisation to a single year (e.g. 1995). BMI = weight (kg)/height (metres)^2 and then categorise as: • not overweight or obese (BMI less than 25); • overweight (BMI 25 to 29); or • obese (BMI 30 or greater).
Data source:	ABS National Nutrition Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total The percentage of males and females in each area who are: • not overweight or obese; • overweight; • obese. For Indigenous, non-Indigenous and total population (as the data allows).
Data coverage:	National and 5-yearly.
Data issues:	The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63.
Related indicators:	Nutrition (2.4.5), Physical activity and inactivity (2.4.4), Prevalence of chronic diseases (1.1.1).
Consultation with:	Tim Carlton, Paul Atyeo (Health Section, ABS).

Health system performance (Tier 3)

3.1 Effective dimension

3.1.1 Immunisation rates

Proposed definition:	Proportion of children who are fully immunised against vaccine preventable diseases according to NHMRC recommendations at the ages of 12–15 and 24–27 months as recorded in the Australian Childhood Immunisation Register (ACIR). See page 39.
Rationale:	Reflects the prevalence of full age-appropriate immunisation of children. Reflects access to and utilisation of immunisation services.
Desired outcome:	Similar high and increasing proportion fully immunised in all areas.
Numerator:	Number of children aged 12–15 and 24–27 months in each area who have received all the immunisations at the designated milestone times as per the Australian Childhood Immunisation Schedule.
Denominator:	Total number of children aged 12–15 and 24–27 months on the ACIR in each area.
Calculation method:	For each of the age groups, divide the numerator by the appropriate denominator then multiply by 100 for expression as a percentage.
Data source:	Australian Childhood Immunisation Register.
Presentation:	MC IR OR R VR Total Percentage fully immunised at: • 12–15 months • 24–27 months.
Data coverage:	Annual, national.
Data issues:	The Indigenous indicator field is not compulsory for immunisers to complete and is likely to be unreliable. Consequently, reporting for Indigenous and non-Indigenous groups is not possible.
Related indicators:	Communicable diseases (pertussis (1.1.5)). Comparison with this indicator could be used to identify problems either with immunisation coverage or with management of the cold chain.
Consultation with:	Jennifer Mayhew-Larsen (Health Information Section, HIC).

3.1.2 Breast cancer and cervical screening participation rate

Proposed definition:	The percentage of women screened for breast cancer and by Pap smear in the past 2 years for the target age groups 50–69 years (breast cancer screening) and 20–69 years (pap smear). See page 39.
Rationale:	Breast cancer and cervical screening has the potential to provide early detection of breast cancers and cervical cellular change, with better health outcomes for affected women. Changes to policy have the opportunity to address lower participation rates where substantial differentials are apparent from area to area.
Desired outcome:	High participation rates for women in these age groups in all areas, decreasing over time.
Numerator:	The number of individual 50–69 and 20–69 year old women screened for breast cancer and by Pap smear in the past 2 years.
Denominator:	The number of women in the 50–69 and 20–69 year age group in each area.
Calculation method:	The summary statistic is calculated as the number of women screened divided by the population of women, expressed as a percentage.
Data source:	ABS National Health Survey and AIHW Population Databases.
Presentation:	MC IR OR R/VR Total Percentage of: • 50–69 year old women screened for breast cancer; and • 20–69 year old women having Pap smear.
Data coverage:	5-yearly and national.
Data issues:	The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63.
Related indicators:	Leading causes of death (1.4.5) (breast and cervical cancer mortality).
Consultation with:	Mieke van Doeland (National Data Development Unit, AIHW).

3.2 Appropriate dimension

3.2.1 Female GPs

Proposed definition:	The number of full time equivalent (FTE) female GPs per 100,000 expected unreferred GP consultations with females or per 1,000 standardised whole female patient equivalents (SWPEs), and the proportion of GPs who are female in each area (see page 41).
Rationale:	Women can frequently prefer to visit a female rather than a male GP. Lack of access to a female GP can necessitate a long trip to a location where one is available.
Desired outcome:	High and similar ratios of FTE female GPs to expected consultations with female patients in each area.
Numerator:	The number of FTE female GPs who practise in each area. The number of FTE female salaried primary care medical practitioners in each area.
Denominator:	Expected number of unreferred GP consultations with female patients who live in each area or the number of standardised whole female patient equivalents who live in each area. The number of FTE GPs who practice in each area. The number of salaried primary care medical practitioners who practise in each area.
Calculation method:	The expected number of consultations is calculated by applying the national age-specific Medicare/DVA rates of consultation to the population of females in each age group, in each area. The total number of SWPEs in each area is calculated as the number of females in each age group in each area multiplied by the SWPE weighting factor for females in each age group. The reported statistics are otherwise simple ratios.
Data source:	AIHW health labour force databases. Medicare/DVA data, AIHW population data.

Presentation:	MC IR OR R VR Total Number of • female GPs and FTE female GPs; • female salaried primary care medical practitioners and their FTE; • GPs and FTE GPs; and • salaried primary care medical practitioners and their FTE. Percentage of • GPs and FTE GPs who are female; and • of salaried primary care medical practitioners and their FTE, who are female. The • expected number of consultations for female patients resident in each area; and • number of female SWPEs resident in each area. The ratio of • FTE female GPs to expected female consultations or to SWPEs resident in each area; and • FTE female GP and salaried primary care medical practitioners to expected female consultations or to SWPEs resident in each area.
Data coverage:	National, annual.
Data issues:	Interpretation of this indicator should allow for the fact that differences in need across areas (as a result of differences in health status) have not been taken into consideration. All other things being equal, people in areas with poorer health status are likely to require greater medical attention, even though the cause of the poorer health is unlikely to be linked to resources, but rather to other (e.g. environmental) factors such as employment, empowerment, education, opportunity, and so on.
Related indicators:	Prevalence of chronic diseases (1.1.1), Self-assessed health status (1.3.2).
Consultation with:	Glenice Taylor, Warwick Conn (Labour Force and Rural Health Unit, AIHW). Ross Saunders (Financing & Analysis Branch, DoHA). Gordon Calcino, Jonathon Wraith (General Practice Branch, DoHA).

3.2.2 Specialist hospital procedures

Proposed definition:	Rate of hospital admission for a number of specific procedures (see page 41).
Rationale:	Remoteness of major hospitals and specialists from the rural population may influence access to specialist procedures. Does the pattern presented for procedures reflect the pattern for deaths, or alternatively are rates of procedure similar across all areas?
Desired outcome:	The pattern presented for procedures should reflect the pattern for deaths or other outcomes, or alternatively rates of procedure should be similar across areas.
Numerator:	The number of separations for each procedure.
Denominator:	The population in each area.
Calculation method:	Rates to be indirectly age-standardised using national age-specific rates as the standard.
Data source:	National Hospital Morbidity database. AIHW population database (based on ABS Census).
Presentation:	MC IR OR R VR Total Hospital separations/1,000 population for: • coronary artery bypass graft; • angioplasty; • hip replacement; • lens insertion; • tonsillectomy; • hysterectomy; and • myringotomy. For males and females. For Indigenous, non-Indigenous and the total population (as the data allows).
Data coverage:	Updates can be reported annually. Data coverage is Australia wide.
Data issues:	A separation is not a count of the number of people who have been to hospital. Some separations are of the same person making several visits. Some people, if requiring to live close to a metropolitan hospital during treatment, may have their address recorded as other than their usual rural/remote home address. Indigenous people are under-identified in the hospital morbidity data set, with identification better in more remote areas (ABS & AIHW 1999). Reporting for Indigenous people is likely to underestimate rates in all areas, but especially in metropolitan areas. For this reason reporting for Indigenous people in each area should not be attempted and reporting for non-Indigenous should be done cautiously.
Related indicators:	Specialist consultations (3.2.3).

Consultation with:	Jenny Hargreaves, Narelle Grayson (Hospitals and Mental Health Services Unit, AIHW).

3.2.3 Specialist consultations

Proposed definition:	Non-hospital consultations with specialists (see page 42).
Rationale:	Access to specialists is important for dealing with serious medical conditions and for surgical procedures. Specialist consultations may be inequitably distributed geographically. National Hospital Morbidity data has been used to quantify in-hospital services such as procedures (see indicator 3.2.2) because Medicare data describes procedures for hospital private patients (not hospital public patients). Non-hospital consultations with specialists can be quantified using Medicare and DVA data (i.e. these consultations will attract a Medicare or DVA benefit).
Desired outcome:	Equitable distribution of 'out of hospital' specialist consultations across geographic areas.
Numerator:	For people who live in each area, the number of 'out of hospital' referred specialist attendances.
Denominator:	The number of people resident in each area.
Calculation method:	Indirectly age-standardised using national age-specific rates of non-hospital Medicare/DVA consultation for each speciality.
Data source:	Medicare and DVA data. AIHW population database (based on ABS Census).
Presentation:	MC IR OR R VR Total Number of people in the population 'Out of Hospital' specialist attendances 'Out of Hospital' specialist attendances/1,000 population (age-standardised) For: • paediatrics; • obstetrics; • orthopaedics; • pathology; • diagnostic imaging; • optometry; • other specialities; • all specialities; and • all referred attendances.
Data coverage:	Updates can be reported annually. Data coverage is Australia wide.
Data issues:	The indicator does not inform whether rates of illness or disease differ between areas, simply whether non-hospital specialist consultation rates differ.
Related indicators:	Specialist hospital procedures (3.2.2).
Consultation with:	Gordon Calcino (General Practice Branch, DoHA). Ross Saunders (Financing & Analysis Branch, DoHA).

3.2.4 Aged care

Proposed definition:	The number of places provided for the care and accommodation of older people in residential aged care services and hospitals, as well as packages (e.g. EACH and CACP) and HACC provided to assist continued living within the community (see page 42).
Rationale:	Housing and care of the aged is an important issue. The pattern of provision of services and care is likely to be different outside metropolitan areas, and people in some areas may be disadvantaged. All means of providing for older people should be considered so that a valid comparison across areas can be made.
Desired outcome:	Equitable distribution of aged care in each area. Care in a residential aged care service or through an aged care package is seen as preferable to care in a hospital setting. Care close to the individual's family and friends is preferable to care further away.
Numerator:	Places (in residential aged care services), bed years (for separations approximating nursing home type patients (NHTPs) in hospitals) and numbers of aged care packages and HACC services provided in each area (i.e. where they are used). NHTPs are approximated as non-acute patients staying more than 35 days if older than 70 years (or more than 50 years if Indigenous). However, this group may also include some others.
Denominator:	Population of people 70 years and older who live in each area. In describing rates for Indigenous people, the Indigenous population older than 50 years could be used as a suitable denominator.
Calculation method:	Divide each numerator by the denominator, then multiply by 1,000. Average age of older people calculated as the mean of the ages of those older than 70 may not be possible (with available data). As an alternative, the percentage of the population older than 70 years who are also older than 85 years.
Data source:	AIHW National Hospital Morbidity database, AIHW Population databases, ACCMIS warehouse files supplied by DoHA annually, HACC minimum data set, Community Aged Care Package Census, Extended Aged Care At Home Census, Day Therapy Centre Census.

Presentation:	MC IR OR R VR Total • Number of people 70+. • Average age of those aged 70+ (or per cent aged 85+). • Places in residential aged care services/1,000 (70+). • Bed years provided by hospitals/1,000 (70+). • Aged care packages/1,000 (70+). • HACC services /1,000 (70+). Rates for these four modes of care would be presented separately for each area.
Data coverage:	Updates can be reported annually. Data coverage is Australia wide.
Data issues:	Each of the services or types of accommodation is not equivalent, therefore it is not possible to sum them to provide an overall picture. Some services such as places provided by multipurpose services and places provided through the ATSI Aged Care Strategy (which are more likely to be provided in more remote areas) are not able to be broken down by area and so are not reported. It may be more appropriate to use the number of people aged 65+ who have a physical disability as the denominator; however, it is not possible to accurately assess the size of this population within each area. If older people are cared for by relatives or friends without accessing government assistance, they will not be represented in this statistic.
Related indicators:	Internal migration (2.3.3), Dependency ratio (2.3.2).
Consultation with:	Dr Diane Gibson, Dr Anne Jenkins (Ageing and Aged Care Unit, AIHW).

3.2.5 Morbidity managed in general practice

Proposed definition:	The most common problems managed by GPs (e.g. depression, anxiety, mental health problems generally, immunisation, insomnia, etc.) for people who live in each area. See page 43.
Rationale:	This indicator describes, for the population in each area, the rate at which specific problems are managed by GPs (i.e. what the doctor treats). This indicator is important because little is known of how morbidity managed in general practice changes with remoteness of the patient.
Desired outcome:	Rates of consultation are similar, or reflect levels of chronic disease and injury.
Numerator:	Proportions of GP consultations involving the management of each problem type to be based on the latest 4 years unweighted data (June release).
Denominator:	Not applicable.
Calculation method:	BEACH data describes rates of encounter for specific problems managed per 100 GP encounters. BEACH data can also be used to describe the proportion of consultations billed to Medicare/DVA in each area. Medicare/DVA data can describe the number of consultations that are charged to Medicare/DVA on behalf of patients from each area (and indeed by GPs from each area). Using these data sources, the rate of consultation for each problem can be compared between areas. Comparison involves the calculation of the adjusted number of consultations in each area and the number expected if national rates and patterns applied. The number of expected consultations for each specific morbidity can be calculated for patients from each area as the sum of the expected number of consultations in all of the age groups. The expected number of consultations (Ei) in each age group can be calculated as: Ei = Rn X Ql Where Rn = the individual national age-specific rates of consultation for that reason; and Ql = the number of individuals in that age group in each local population. Rn can be calculated as: Rn = [Nn X Pn X (1/Bn)]/Qn Nn = the national number of consultations for that age group.

Pn = the national age-specific proportion of consultations managed for each reason.

Bn = for the reason, the proportion of consultations charged to Medicare/DVA, nationally for each age group.

Qn = the number of individuals in that age group in the national population.

The estimated number of actual consultations in each area is the sum of the estimated number of age-specific consultations (Oi) in each area.

Oi can be calculated as:

Oi = [Nl X Pl X (1/Bl)]

Nl = the local number of consultations for that age group.

Pl = the local age-specific proportion of consultations managed for each reason.

Bl = for the reason, the proportion of consultations charged to Medicare /DVA, locally for each age group.

O = the sum of calculated age-specific consultations (Oi)

E = the sum of expected age-specific consultations (Ei)

O/E = the ratio of observed to expected GP consultations (excludes consultations with other primary care medical practitioners)

O–E = the number of consultations in excess of what is expected (or for negative numbers, the shortfall).

The indirect age-standardised rate = (O/E) X C

Where C = the crude national rate of consultation for that reason.

It is likely that use of specific values for Bn and especially for Bl will be on the basis of small numbers and their use may be impractical. Age-specific 'all cause' values for these variables in each area, or even single 'all cause' values for each area may suffice.

Data source: BEACH data, Medicare/DVA data, AIHW population database.

Presentation: MC IR OR R/VR

Rate per 100 GP encounters.

Observed GP encounters.

Expected GP encounters.

O/E.

O–E.

Indirect age-standardised rate of GP encounter.

For the range of broad problems managed by GPs.

For residents of each area.

Data coverage:	BEACH survey, random sample of about 1,000 GPs per year who each supply information about 100 encounters with patients. Survey is annual, national, rolling.
Data issues:	Consultations with primary care medical practitioners who are not GPs are not included. These other medical practitioners can provide a substantial volume of service in rural and remote areas. In this national sample of GPs, remote areas are not well represented (data for remote and very remote areas may need to be aggregated), and even so numbers may be too small to be meaningful. In BEACH data, recording by the GP of the patient's expressed reason for encounter is believed to be considerably less reliable than the GP's coding of the problem managed. Further, the patient reason for encounter is often vague (such as 'need my scripts' and could be less informative regarding population morbidity patters. Consequently, problem managed will be reported here.
Related indicators:	GP consultation (3.5.5), Prevalence of chronic diseases (1.1.1), Self-assessed health status (1.3.2).
Consultation with:	Ruth Penm (Hospitals and Mental Health Services Unit, AIHW). Helena Britt, Stephanie Knox (General Practice Statistics and Classification Unit, AIHW).

3.3 Efficient dimension

No indicators

3.4 Responsive dimension

3.4.1 Waiting times for elective surgery

Proposed definition:	The mean, median, 25th and 75th percentiles of the number of days public patients have to wait for elective surgery in public hospitals which are in each geographic area, by type of procedure (see page 48).
Rationale:	Private patients have effectively little waiting time for elective surgery. Public patients can sometimes be subjected to substantial waits, during which time they may endure additional pain and/or discomfort. Waiting times may be substantially different in regional or remote areas.
Desired outcome:	Waiting times are low and similar in each area.
Numerator:	The number of days between the patient being added to the waiting list and admission for elective surgery for hospitals that are in each area.
Denominator:	The number of separations, for elective surgery, of public patients in public hospitals that are in each area.
Calculation method:	Waiting times for elective surgery for public patients accessing services in public hospitals that are in each area. Medians and 90th percentiles of waiting times for public patients admitted to hospitals in each area.
Data source:	AIHW Elective Surgery Waiting Times data collection.
Presentation:	MC IR OR R VR Total Waiting times for public patients by indicator procedure. Median for hospitals in each area. 90th percentile for hospitals that are in each area.
Data coverage:	National and annual.
Data issues:	Currently it is not possible to describe waiting times for public patients from each area nationally (although is possible for patients to seven hospitals in SA and about thirty hospitals in Qld, but these are big and predominantly in the cities or major rural centres). This capacity may possibly be expanded in the future so that reporting of waiting times for public patients who live in each area can be described, if/when other States provide waiting time data linked to morbidity data. The statistic reported here is the waiting time for patients at hospitals in each area.
Related indicators:	Specialist hospital procedures (3.2.2), Specialist consultations (3.2.3), Numbers of health workers (3.5.2).
Consultation with:	Narelle Grayson (Hospitals and Mental Health Services Unit, AIHW).

3.4.2 GP Bulk billing

Proposed definition:	Percentage of GP consultations that are bulk billed in each area (see page 48).
Rationale:	Reduced access to and competition between GPs may result in reduced access to bulk billing for the population. This may be an impediment for rural people (a larger proportion of whom are poorer) to access GP services.
Desired outcome:	High and similar rates of bulk billing in each area.
Numerator:	The number of unreferred GP consultations that were bulk billed for people who live in each area. The number of unreferred GP consultations that were bulk billed by GPs from each area.
Denominator:	The total number of unreferred GP consultations for people from each area and for GPs from each area.
Calculation method:	Simple percentage and indirect age-standardised percentage of unreferred GP consultations that are bulk billed. Percentages to be standardised to national age-specific rates of bulk billing.
Data source:	Medicare data.
Presentation:	MC IR OR R VR Total Number of consultations by GPs from each area. Number of GP consultations for people from each area. Number of consultations bulk billed by GPs from each area. Number of GP consultations bulk billed for people from each area. Crude percentage bulk billed by GPs from each area. Crude percentage bulk billed for people from each area. Age-standardised percentage of consultations bulk billed for people who live in each area.
Data coverage:	Annual and national.
Data issues:	This indicator does not describe State-funded consultations by primary care medical practitioners working as salaried medical officers out of public hospital A&E departments. The need for age standardisation assumes that the probability of bulk billing is age-related.
Related indicators:	Household income (2.2.5), GP retention (3.9.2), Prevalence of chronic diseases (1.1.1), Morbidity managed in general practice (3.2.5).
Consultation with:	Ross Saunders (Financing & Analysis Branch, DoHA).

3.5 Accessible dimension

3.5.1 Distance to medical services

Proposed definition:

The proportion of people who are within 20, 40, 60 and 80 km by road[2] of a GP, a GP service,[3] hospital, AMS, and a remote area nurse.

In addition to reporting for these five groups separately, reporting would also include the proportion who are:

- within 20 km from a hospital or full time GP ($250,000 worth of Medicare billing) or full time AMS or remote area nurse base which the nurse never leaves (i.e. non-travelling nurse). This indicates access to emergency care with staff who have some level of medical/nursing skill who are permanently present at that location;
- within 20 km (or other distance(s)) of the above plus locations where there is a GP working at least 1 day a week (see definition below). This indicates access to medical/nursing workforce and to regular but non-continuous medical services (e.g. immunisation, updating scripts, check-ups etc.); and
- as above, but also including locations which are within 100 km by road of a remote area nurse base (where the nurse is a travelling nurse). This indicates access to at least intermittent medical services at the more basic end of the scale. Communities which have regular, but non-continuous, access to a remote area nurse are presumably more advantaged than those who do not have such access, but more disadvantaged than those who have access to a GP.

Currently, GISCA has the ability to report on the proportion of the population who are proximate to GPs, hospitals and AMSs. The capacity to report for remote area nurses is currently being developed.

Clearly it is not possible to equate the services provided by a remote area nurse (RAN) with that provided by a hospital (or GP) providing services from one centre. The former provides intermittent health services to small communities over a large area and under difficult conditions, while the former provides more complex help on a continuous basis at a fixed point. Presentation of these data tries to recognise these issues.

---

[2] Distance to be negotiated. Those nominated are nominal only.

[3] A location which has a GP service has been defined here as one where annual GP Medicare claims for all GPs working at that location total at least $50,000. This equates to a GP service being available at that location for approximately 1 day per week (52 weeks per year).

	Because of the importance of the issue of Indigenous health and the large proportions of the remote area population who are Indigenous, it would also be desirable to report for Indigenous people. This would further complicate the presentation of the indicator. Against this must be balanced the possibility that for Indigenous people in more remote areas, the provision of services may be through other means or workers for which data does not exist. See page 51.
Rationale:	This indicator has been proposed because of the importance of proximity to services for people living in the remote parts of Australia. Simply reporting ratio of certain services per head of population ignores the fact that people who live in towns where services exist have good physical access to services, while people who live in other areas may have very poor access. An additional feature of using GIS technology in this way is to identify areas where people do not have access to any of these services.
Desired outcome:	A high proportion of people who are close to each service in each area.
Numerator:	Not applicable.
Denominator:	Not applicable.
Calculation method:	Per GISCA.
Data source:	Per GISCA.
Presentation:	Data would be presented as a graph, table and map. The graph would compare the proportion of the population with access to each service and also to each combination of services in each area. The table would provide numeric information for the graph, along with total number of people affected. The map would identify specific geographic areas with lower levels of access and the identity and size of the population at each affected centre.
Data coverage:	National and yearly.

Data issues:	Using road distance as a measure of access presupposes that all roads are of equal quality and that all people have equal access to transport (i.e. cars). For those people without access to a car, and with lower levels of or non-existent public transport in rural and especially remote areas, being 20 km from services presents a much greater barrier to accessing those services than does such a distance in less remote areas. This issue assumes even greater significance when it is considered that the people who are less likely to have transport are also the people who are likely to have poorer health and are more likely to need to access health services (e.g. the poor and Indigenous people). Data for remote area nurses are not yet available. Locations where services provided by GPs amount to less than $50,000 per year are excluded. GPs based in one area, who also provide services in another, can have two provider numbers: one for the main location and the other for the second location. Details of work performed at each location are based on these provider numbers. However, not all GPs who also work in another location use a second provider number, and so description of services provided in remote areas is likely to be understated using this indicator.
Related indicators:	Specialist hospital procedures (3.2.2), Primary care medical consultations (3.5.4).
Consultation with:	Errol Bamford (GISCA).

3.5.2 Numbers of health workers

Proposed definition:	The number of major groups of health workers and their full time equivalent working in each area (see page 53).
Rationale:	Access to services is at least partially affected by the number of available workers in an area from each profession per unit of population. Differences in these ratios or in the ratio of expected numbers of services to actual numbers of available health workers may signal the need for changes in the number of workers in each area.
Desired outcome:	Ratios to be similar in each area, or to become higher in areas with poorer health outcomes. For professions requiring travel (e.g. allied health workers), ratios should be higher in more remote areas.
Numerator:	The number (and full time equivalent) of general practitioners, other primary care medical practitioners, selected specialist medical practitioners, enrolled and registered nurses, selected allied health workers, dentists and pharmacists working in each area.
Denominator:	The number of people living in each area. The predicted number of services required for people who live in each area.
Calculation method:	Divide the number of health workers or FTEs by the population resident in each area. The predicted number of services is the number of services that would be performed if national age-specific service provision rates were applied to the population in each area. The ratio of predicted services to FTE is the number of predicted services divided by the number of FTEs for that profession in that area. National age-specific service provision rates (or proxy) for most age groups and for several professions can be estimated from the National Health Survey, BEACH, Medicare and National Hospital Morbidity data.
Data source:	AIHW health labour force databases. AIHW population database (based on ABS Census). Medicare/DVA data. ABS National Health Survey. AIHW National Hospital Morbidity Database. BEACH data.

Presentation:	MC IR OR R VR Total Number of health workers. FTE of health workers. Ratio of health workers to population. Ratio of FTE to population. Ratio of 'predicted' services to FTE (where possible). For: • GPs; • other primary care medical practitioners; • selected specialists (paediatricians, obstetricians, anaesthetists, orthopaedic surgeons, general surgeons); • registered nurses; • enrolled nurses; • allied health (selected physiotherapists, OTs, etc.); • dentists; and • pharmacists.
Data coverage:	National, some annual, some up to 3-yearly.
Data issues:	Some populations are older, some sicker, some poorer. Simply dividing the number of health workers by population and comparing the ratio, without taking need into consideration, may not make a valid comparison. An assessment of equity needs to be made on the basis of other indicators also, for example demographics (hence the ratio of predicted services to FTE) and health (which may be estimable from health status indicators). Estimates of values for FTE are based on the worker's estimate of where their main, second and third job is located. There is some concern that a proportion of workers may not identify their second and third job, and so the ratio may possibly be understated in more remote areas. Some workers in rural and remote areas need to travel to outlying communities. The time taken to travel is at the expense of time spent with patients, therefore a greater number of workers may be required for the same output. This effect has not been taken into consideration but needs to be considered during interpretation. The AIHW labour force databases are compiled as a by-product of annual or biannual professional registration. Professions that do not require registration are not represented.
Related indicators:	Prevalence of chronic diseases and injury (1.1.1–1.1.2), Workforce in training (3.9.1), Leading causes of death (1.4.5).
Consultation with:	Glenice Taylor (Labour Force and Rural Health Unit, AIHW).

3.5.3 Hospital separations and bed days

Proposed definition:	Rate of hospital separation and consumption of bed days due to acute, non-acute and all causes: • dialysis and chemotherapy; • non-acute staying more than 35 days and older than 70 years if non-Indigenous or older than 50 years if Indigenous*; • other non acute; • injury and poisoning; • all other acute; • all acute; and • all causes. *Approximates nursing home type patients (NHTPs). See page 54.
Rationale:	Hospital admission (separation) rates are frequently used to demonstrate the differences in health status or access to health services for people who live in non-metropolitan areas. This indicator compares rates of admission and bed days consumed for several classes of admission and to indicate where people from each area are admitted (e.g. are they admitted to metropolitan or local hospitals).
Desired outcome:	Rates similar for acute admissions, or higher where rates of chronic diseases and injury are higher. Bed days for 'NHTPs' low and similar in each area; admissions for dialysis and chemotherapy in line with prevalence of chronic disease and rates of chronic disease mortality.
Numerator:	Hospital separations of, and bed days consumed by, residents of each area, in hospitals in each area.
Denominator:	The population of each area.
Calculation method:	Rates to be indirectly age-standardised using national age-specific rates of separation and consumption of bed days as the standard.
Data source:	AIHW National Hospital Morbidity Database. AIHW population database.

Presentation:	MC IR OR R VR Total Hospital separations/1,000 population and Bed days /1,000 population for: • Dialysis and chemotherapy; • 'NHTPs'; • other non-acute; • injury and poisoning; • all other acute; • all acute; and • all separations. For both sexes, for the total population, Indigenous and non-Indigenous. Comparison of rates of admission and consumption of bed days to be presented as ratios of observed to expected in a table. The percentage of admissions and bed days due to each cause in each area to be described using a stacked bar chart. The indirect age-standardised rate of admission and bed days consumed as a result of acute admissions to be presented in a stacked bar chart, with each segment proportional to the rate of admission or bed days consumed in hospitals in each area.
Data coverage:	Updates can be reported annually. Data coverage is Australia wide.
Data issues:	Separation from hospital is both an indicator of health and also an indicator of access (although frequently it is unclear which of these has the greatest impact on rate of admission). Admission to hospital will also be affected by admission policies that will necessarily differ between metropolitan and rural areas. Indigenous people are under-identified in the Hospital Morbidity data set, with identification better in more remote areas (ABS & AIHW 1999). Reporting for Indigenous people is likely to underestimate rates in all areas, but especially in metropolitan areas. For this reason reporting for Indigenous people should not be attempted and reporting for non-Indigenous should be done cautiously.
Related indicators:	Prevalence of chronic diseases (1.1.1), Specialist hospital procedures (3.2.2), Aged care (3.2.4), Waiting times for elective surgery (3.4.1).
Consultation with:	Jenny Hargreaves, Narelle Grayson (Hospital Morbidity and Mental Health Services Unit, AIHW).

3.5.4 Primary care medical consultations

Proposed definition:	The adjusted rate of consultation of medical practitioners in general practice setting and in outpatient departments (see page 54).
Rationale:	Access to primary care medical practitioners is a major rural health issue. Primary medical care can be accessed through medical practitioners working in private practice or hospital outpatients departments. Adjusted Medicare/DVA data can provide information about private practice encounters, while information about encounters in hospital outpatients departments is available from the National Hospital Morbidity data set. The patterns of use for both of these types of service differ with remoteness.
Desired outcome:	Similar rates of consultation across areas.
Numerator:	Number of GP type Medicare and DVA consultations for residents of each area, adjusted for encounters not billed to Medicare or DVA (using BEACH data). Number of public hospital outpatient occasions of service.
Denominator:	Population in each area in the same year
Calculation method:	The statistic involves comparing the adjusted number of primary medical care consultations with the expected number in each area. National age-specific rates of consultation for Medicare and DVA are adjusted using BEACH derived national age-specific adjustment factors (AMWAC 2000). These national rates are applied to local populations to generate an expected number of consultations. The expected number of consultations is compared with the sum of the local (age-specific) numbers of consultations, adjusted by local age-specific BEACH adjustment factors. The reported statistic would be the ratio of the adjusted observed number over the adjusted expected number of consultations. The statistic for describing the rate of attendance at outpatient departments would be calculated in the same way, but without the need for adjustment. BEACH adjustment factors are a measure of the proportion of GP attendances that are charged to Medicare/DVA nationally and in each area (a proportion of GP attendances are not changed to Medicare or DVA). There needs to be some form of age standardisation because of the sensitivity of consultation rates to age and sex of the patient, coupled with the differences in the age and sex structure of the populations in the various areas.

	Rates need to be adjusted using BEACH data because attendances in more remote areas are less likely to be charged to Medicare or DVA.
Data source:	Medicare and DVA patient data, BEACH data, AIHW National Hospital Establishments Database, AIHW population database.
Presentation:	MC IR OR R VR Total Adjusted number of patient encounters per 100,000 population: • in private practice; • as outpatients in public hospital; • total. The ratio of observed to expected attendances: • in private practice; • as outpatients in public hospital; • total.
Data coverage:	Data is available yearly. Coverage is national.
Data issues:	This indicator may omit some proportion of contacts with primary medical care at AMS. Hospital outpatients primary care type services may not be identical to private practice services. The indicator does not take into consideration the fact that some populations may have poorer health and greater need. Interpretation needs to bear these issues in mind independently. The indicator also does not take into consideration any differences in the length of consultation (i.e. all consultations are assumed to be of equal average duration). Outpatient occasions of service described in the Hospital Establishments Database is by area of the hospital, not area of the patient. Also, it is not possible to describe the number of these occasions of service for each age group.
Related indicators:	Rate of specialist consultation (3.2.2–3.2.3), Prevalence of chronic diseases and injury (1.1.1–1.1.2), Leading causes of death (1.4.5), Health behaviour indicators (2.4.1–2.4.6).
Consultation with:	Gordon Calcino (General Practice Branch, DoHA). Ross Saunders (Financing & Analysis Branch, DoHA). John Harding (Health Registers and Cancer Monitoring Unit, AIHW). Narelle Grayson (Hospital Morbidity and Mental Health Services Unit, AIHW).

3.5.5 Dental consultations

Proposed definition:	Rate of and reason for dental consultations. Reasons for visit include pain, other problem, check-up, and so on (see page 54).
Rationale:	Access to dentists is important for dealing with dental conditions that impact on pain, wellbeing and self-perception. Dental consultations may be inequitably distributed geographically.
Desired outcome:	Similar rate of consultation in each area.
Numerator:	Number of dental consultations, by broad reason for visit.
Denominator:	Number of respondents to the National Health Survey.
Calculation method:	Indirect age-standardised using national age-specific rates at the time of the survey. For comparisons over time, age standardise to the national age-specific rates in one of the years (e.g. 1995). Also report for broad age groups (0–19, 20–39, 40–59, 65+ years) if the data supports this level of analysis. Although rates for females are higher than for males, the difference is not great. Reporting for persons rather than by sex will help with power in the analysis.
Data source:	ABS National Health Survey (currently 1989–90, 1995 and 2001 available).
Presentation:	MC IR OR R/VR Total Age-standardised mean number of consultations per year (per patient) and for each major age group (if possible). For all reasons and by reason for visit. Indigenous, non-Indigenous, all people (although small numbers will make analysis difficult or impossible in most cases). Age-standardised median number of consultations (and 25th and 75th percentiles). Time trend (each year for which data is available).
Data coverage:	NHS data available nationally and every 5 years.

Data issues:	The National Health Survey data has poor coverage in remote areas, difficulty reporting for Indigenous people at regional level, and may be biased in the more remote areas. See comments on page 63. Another source of data is the National Dental Telephone Interview Survey; however, small sample size reduces its usefulness (particularly in non-metropolitan areas). Also, telephone coverage in some regional areas and most remote and very remote areas may be substantially less than 100%. This may bias the survey results in these areas to wealthier people, who are likely to have better access and better health outcomes than poorer people. This survey was conducted in 1994–96, 1999, and will be again in 2002 and 2005. Sample sizes were 7,987 in 1994; 5,101 in 1995; 8,292 in 1996; and 7,829 in 1999. The changes in availability of free/subsidised dental health care for lower income earners may result in changes in consultation rates over time. It is possible that review of the data within cohorts may ultimately be appropriate.
Related indicators:	Decayed, missing and filled teeth (1.1.4), Numbers of health workers (3.5.2).
Consultation with:	David Brennan (Dental Statistics Research Unit, AIHW).

3.5.6 Prescription

Proposed definition:	Rate of prescription for all pharmaceuticals, and also for major groups of pharmaceuticals (see page 55).
Rationale:	Distance from a community pharmacist or a hospital pharmacist may reduce the opportunity for people to access this service and fill prescriptions. This indicator attempts to compare the rate of prescription for all and several major groups of pharmaceuticals for people who live in each area.
Desired outcome:	Rate of prescription similar in all areas, or higher in areas with poorer health outcomes.
Numerator:	Total number of prescriptions for all pharmaceuticals and for major groups of pharmaceuticals. The total number of prescriptions will need to be modelled from the number collected by concession holders under the Pharmaceutical Benefits Scheme. Generic (Anatomical Therapeutical Chemical (ATC) level 5) drugs costing more than the threshold amount, aggregated up to ATC level 2. Those categories for which inter-regional comparison is considered valid to be included in analysis. Comparison of prescription rates for preventive and disease management pharmaceuticals may also be possible.
Denominator:	The number of people resident in each area.
Calculation method:	Indirect age-standardised rate of prescription, using national age-specific rates as the standard. Comparison between years requires standardisation to a single year (e.g. 1999).
Data source:	DoHA PBS data. AIHW population database (based on ABS Census).
Presentation:	MC IR OR R VR Total For males and females. Rate of prescription per 100,000 population. All pharmaceuticals. Major (level 2 ATC) groups of pharmaceuticals.
Data coverage:	Annual and national.

Data issues:	Details of pharmaceutical use are collected for concession holders and for those pharmaceuticals that are expensive enough to attract a benefit under the PBS. Valid comparison between total rates in each area depends on the ability to adjust data for concession holders. Adjustment accounts for pharmaceuticals purchased by non-concession holders, without the aid of the PBS (details of which are not recorded on the PBS). This ability has been developed by the Pharmaceutical Access and Quality Branch (DoHA). Reporting for groups of pharmaceuticals without the use of adjustment is possible, but would need to apply only to drugs costing more than the threshold amount. Data on postcode has only lately become available and so reporting by area is only possible from 2002.
Related indicators:	Numbers of health workers (3.5.2), Prevalence of chronic diseases (1.1.1), Leading causes of death (1.4.5).
Consultation with:	Bruce Griffin, Peter Marlton (Pharmaceutical Access and Quality Branch, DoHA). Maxine Robinson (Pharmaceutical Evaluation/Pharmaceutical Benefits Branch)

3.5.7 Access to disability services

Proposed definition:	The rate of use of disability services (see page 56).
Rationale:	Different rates of service provision may indicate different levels of access to services for people with disabilities.
Desired outcome:	Similar rates of service provision in each area.
Numerator:	The number of people from each area accessing disability services on the snapshot day.
Denominator:	The number of people estimated to have a profound/severe disability in each area.
Calculation method:	Divide the number accessing the service on the snapshot day by the number of people estimated to have a profound/severe disability. The summary statistic is a ratio.
Data source:	CSDA Minimum Data Set (snapshot day data).
Presentation:	MC IR OR R VR Total Ratio of the number of people accessing disability services to the number with a profound/severe disability in each area.
Data coverage:	Data available nationally and annually.
Data issues:	Use of this statistic is not currently possible as data on the provision of service is only currently available for location of service, not location of client. This data is, however, likely to be available in the future. Additionally, this indicator describes only one of several programs that assist people with disabilities. This indicator ignores the contribution from programs such as HACC. One person can use more than one service on any one snapshot day. The summary statistic is not a true rate and is based on a survey generated estimate of the number who have a disability and an indicative measure of the number of people accessing a service on a snapshot day. This indicator should be interpreted with caution because people with disabilities, unable to obtain services where they live, may move to less remote areas so as to obtain services.
Related indicators:	Prevalence of disability (1.2.1).
Consultation with:	Xingyan Wen and Phil Anderson, Ros Madden (Functioning and Disability Unit, AIHW).

3.6 Safe dimension

3.6.1 Surgical and medical misadventure

Proposed definition:	The rates of death and hospital admission as a result of surgical and medical misadventure (see page 58).
Rationale:	Are the chances of successful medical and surgical care similar for people from all areas? Are outcomes for residents of remote areas as good as for people from less remote areas?
Desired outcome:	Rates of misadventure to be low and similar across all areas, decreasing over time.
Numerator:	The number of admissions and deaths as a result of surgical and medical misadventure (ICD10 Y40–Y84) for residents of each area.
Denominator:	The number of admissions requiring a procedure (as a measure of exposure to medical and surgical intervention) for residents of each area.
Calculation method:	Indirect age-standardised rates, using the national rate for misadventure as the standard. Comparison across time requires standardisation to a single year (e.g. 1999).
Data source:	AIHW National Hospital Morbidity Database. AIHW Mortality Database.
Presentation:	MC IR OR R VR Total Number of deaths. Number of admissions. Deaths per 1,000 admissions requiring procedure. Admissions per 1,000 admissions requiring procedure.
Data coverage:	Annual and national.
Data issues:	It is not possible to determine from the data where the misadventure took place. The denominator describes only admissions to hospital requiring procedure. Other interventions (e.g. private medical consultations) are not considered.
Related indicators:	Specialist hospital procedures (3.2.2), GP consultations (3.5.4).
Consultation with:	Narelle Grayson (Hospitals and Mental Health Services Unit, AIHW).

3.7 Continuous dimension

3.7.1 Care planning and case conferencing

Proposed definition:	The rate of care planning and case conferencing (see page 59).
Rationale:	Care planning and case conferencing aims to promote coordination of the care of a patient with at least one chronic medical condition and complex multidisciplinary care needs. This involves a GP planning or meeting with at least two other health professionals. Better coordination is likely to improve the quality of care for patients.
Desired outcome:	Rates of care planning and case conferencing similar in each area. It is unclear what level of service is most appropriate.
Numerator:	The number of Medicare claims for item numbers 720–730 (care planning) and 734–779 (case conferencing).
Denominator:	The population in each area and the number of people who are admitted to hospital for a procedure.
Calculation method:	Indirect age-standardised rate of case planning and care conferencing, using national age-specific rates as the standard.
Data source:	Medicare data, AIHW population database (based on ABS Census), AIHW National Hospital Morbidity Database.
Presentation:	MC IR OR R VR Total Rate of care planning per 100,000 population. Rate of case conferencing per 100,000 population. The indirect age-standardised rate of hospital admission requiring procedure (as a proxy measure of ill health); for comparison.
Data coverage:	National and annual.
Data issues:	These data items are relatively new. It is anticipated that use of these Medicare item numbers will improve over time. The comparison will be between the number of occasions of service and both the number of people in the population and the number of people who are admitted to hospital for a procedure (as a measure of ill health requiring care). The statistics should be treated as indicative ratios rather than as true rates.
Related indicators:	Prevalence of chronic diseases (1.1.1).
Consultation with:	Kim Boyer (NHMRC). Ross Saunders (Financing & Analysis Branch, DoHA).

3.8 Capable dimension

3.8.1 Hospital accreditation

Proposed definition:	The percentage of public hospitals and hospital beds that are accredited in each hospital peer group, in each area (see page 60).
Rationale:	Accreditation is a measure of compliance with recommended standards. A high proportion of hospitals complying with the standard indicates a higher level of capability.
Desired outcome:	All public hospitals accredited in each area.
Numerator:	The number of accredited hospitals and hospital beds in each area that are in each hospital peer group.
Denominator:	The number of hospitals and hospital beds in each area that are in each hospital peer group.
Calculation method:	The statistic to be reported as a simple proportion.
Data source:	AIHW National Hospital Establishments Database.
Presentation:	MC IR OR R VR Total The number of accredited hospitals and hospital beds in each peer group. The number of hospitals and hospital beds in each peer group. The proportion of hospitals in each peer group that are accredited. The proportion of hospital beds in each hospital peer group that are accredited.
Data coverage:	National and annual.
Data issues:	Private hospitals are not included. There are some concerns about the quality of data. Accreditation can be by a range of accrediting bodies and for a range of issues, not all of which are comparable.
Related indicators:	Surgical and Medical misadventure (3.6.1).
Consultation with:	Narelle Grayson (Hospitals and Mental Health Services Unit, AIHW).

3.9 Sustainable dimension

3.9.1 Workforce in training

Proposed definition:	Number of commencements of students from each area enrolled in first year studies of selected health disciplines (see page 61).
Rationale:	It is believed that health sector students from rural areas are more likely to return to rural areas to practise. This indicator describes enrolment of rural students in tertiary health sector courses. Increasing proportion of enrolments from rural and remote areas is desirable.
Desired outcome:	Strong and growing representation of students from rural and remote areas training in the health sector.
Numerator:	The number of students from each area commencing health courses. Data is available from 1989 for trend analysis. Disciplines proposed for reporting include: • medicine (ASCO 07.05.02) • occupational therapy (ASCO 07.06.02) • physiotherapy (ASCO 07.06.03) • speech pathology (ASCO 07.06.04) • dentistry (excludes therapists) (ASCO 07.02.01) • health surveying and environmental health (ASCO 07.03.04) • nursing (basic) (ASCO 07.04.02) • medical radiography (ASCO 07.04.04) • medical technology (ASCO 07.04.05) • nutrition and dietetics (ASCO 07.04.06) • optometry (ASCO 07.04.07) • pharmacy (ASCO 07.04.08) • podiatry (ASCO 07.04.09)
Denominator:	Numbers of existing workers in each area and an estimate of the size of a 1-year cohort from each area.
Calculation method:	Report raw numbers for each year. Also divide numerator by denominator to provide a ratio of the number of students commencing training compared to the number of workers already practising and a proxy for the percentage of their cohort enrolling from each area.
Data source:	DEST Higher Education data holdings (commencements), AIHW labour force data, AIHW population databases.

Presentation:	MC IR OR R VR Total For the following courses: • medicine; • occupational therapy; • physiotherapy; • speech pathology; • dentistry (excludes therapists); • health surveying and environmental health; • nursing (basic); • medical radiography; • medical technology; • nutrition and dietetics; • optometry; • pharmacy; and • podiatry. Number of students. Number of existing workers. Number of FTEs (existing workers). Population in 'cohort'. Ratio of students to workers. Students per 1,000 in the 'cohort'. Time trend.
Data coverage:	Annual, national.
Data issues:	The postcode listed on commencements file may not, in a small number of cases, reflect all students who have commenced study who are from a rural or remote area. It is possible that students may record their 'semester/term residence' address as their 'permanent home residence'. This is more likely to be a problem if seeking information about course completions (when a student's ties with the parental home are likely to be weaker). Also, there are difficulties in expressing commencements of health-related courses as a rate per head of population or as a ratio due to the difficulty in selecting the appropriate source population. Using 15–19 or 15–24 year olds as the denominator would lead to a higher rate of commencements in rural and remote areas because of the smaller population of that cohort remaining in these areas after a substantial proportion move so as to seek employment or study. The population of 10–14 year olds is an imperfect but practical estimate of a suitable denominator.
Related indicators:	Numbers of health workers (3.5.2), High school retention rates (2.2.2).
Consultation with:	Odette Vogt (Labour Force and Rural Health Unit, AIHW).

3.9.2 GP retention

Proposed definition:	The number and percentage of general practitioners receiving rural retention payments (see page 62).
Rationale:	Rural retention payments are both a measure of the duration GPs work in non-metropolitan areas and a reward for fulfilling a community need. Monitoring of the total amount paid in rural retention payments in each area would indicate changes in retention.
Desired outcome:	The percentage of GPs who receive rural retention payments to increase over time.
Numerator:	The number of GPs receiving rural retention payments.
Denominator:	The number of GPs working in each area.
Calculation method:	Divide the numerator by the denominator.
Data source:	HIC data. AIHW Medical Labour Force database.
Presentation:	MC IR OR R VR Total Number of GPs receiving retention payments. Number of GPs in each area. Percentage of GPs receiving retention payments. Percentage of GPs qualifying for retention payment categories A to E.
Data coverage:	National and annual.
Data issues:	Primary care medical practitioners working under other systems (e.g. State salaried medical officers) are also included when they work in areas covered by retention payment categories C, D and E. Categories A, B, C, D and E are determined on the basis of remoteness (E being most remote); qualifying periods in more remote areas are shorter and payments are higher.
Related indicators:	Numbers of health workers (3.5.2).
Consultation with:	Gordon Calcino (General Practice Branch, DoHA). Ross Saunders (Financing & Analysis Branch, DoHA).

3.9.3 Hours worked and age of health workers

Proposed definition:	Hours worked, age and sex of health workers, including general practitioners, other primary care medical practitioners, selected specialist medical practitioners, enrolled and registered nurses, selected allied health workers, dentists and pharmacists working in each area (see page 62).
Rationale:	Rural health workers can be older, work longer hours and be less likely to be female. These features have important effects on the appropriateness and sustainability of the provision of service.
Desired outcome:	Similar characteristics in all areas.
Numerator:	Hours worked, age and sex of health workers.
Denominator:	Number of health workers.
Calculation method:	Simple percentages, median, 25th and 75th percentiles.
Data source:	AIHW health labour force databases.
Presentation:	MC IR OR R VR Total For males and females, mean, median, 25th and 75th percentiles: • hours worked in each area; • hours on call not worked (for medical practitioners); and age. For: • GPs; • other primary care medical practitioners; • selected specialists (paediatricians, obstetricians, anaesthetists, orthopaedic surgeons, general surgeons); • registered nurses; • enrolled nurses; • allied health (selected physiotherapists, OTs, etc.); • dentists; and • pharmacists.
Data coverage:	Some can be updated annually (e.g. medical), while others can be updated 2-yearly (nursing), 3-yearly (allied health) or less frequently (dentistry, pharmacy). Coverage is for all of Australia.

Data issues:	Total hours worked on call by medical practitioners is not available, but rather is included among the total hours worked reported here. It is not possible from the data to determine the number of nights or weekends off duty for medical practitioners in each area. Because health workers can work in several locations, hours worked have been proportionally allocated to the various locations where the worker said they worked. The use of full time workload equivalent (FWE) was considered. FWE (based on receipts from Medicare for each GP) could be used as an estimate of workload, with those earning more from Medicare than a standard amount (e.g. $185,000) considered to be overworked. A potential complication is that rural and remote GPs may need to travel more (therefore reducing the opportunity to earn), and it is possible that, for some GPs, Medicare may be only one source of income. The suggested indicator is based on hours worked (not income earned) and may consequently be a better measure.
Related indicators:	GP retention (3.9.2).
Consultation with:	Glenice Taylor, Warwick Conn (Labour Force and Rural Health Unit, AIHW).

Data gaps

Data gaps are discussed here

- in broad and generic terms;
- by describing the issues for which data sources have not yet been identified; and
- by describing the limitations of existing data that frustrate more complete reporting.

A number of recommendations follow from the discussions.

Before discussing the gaps, it is important to recognise that there has been substantial progress made in collecting the right kind of data and improving its quality. Currently, available data allows reporting against most of the suggested framework, with only some issues not presently able to be described.

Generic issues

There are a number of limitations with data used to describe health issues in rural, regional and remote areas, but perhaps the two most serious relate to Indigenous identification and the lack of information available for remote and very remote areas from surveys.

Accurate identification of Indigenous people in data collections is important because it allows:

- description of health issues for Indigenous and non-Indigenous people separately; and
- disentanglement of Indigenous from remote health issues.

Information from surveys such as the National Health Survey is available for rural and regional areas; however, the number of people surveyed in remote areas is frequently insufficient to draw meaningful conclusions.

Indigenous identification

Reporting particularly for Indigenous (but also for non-Indigenous) people is substantially affected by the accuracy of identification of Indigenous people in data collections.

In many data sets there is under-identification of Indigenous people, which results in reporting of rates that are lower than is likely to be the case in reality. More seriously, there is a strong likelihood that identification in remote areas is more accurate than in major cities. The consequence of systematic regional differences in the accuracy of Indigenous identification is that higher rates reported in more remote areas may in fact be an artefact of more accurate identification in those areas. For example, better identification of Indigenous people who are admitted to hospital in remote areas may suggest higher rates of admission than for Indigenous people from major cities. The magnitude of this effect has been measured for hospital morbidity data (ABS & AIHW 1999) but details are unclear for many data sources (including national mortality data).

Additionally, there have been changes over time in the tendency for people to identify as Indigenous, with people more likely to identify now than in the past. Consequently, comparison of Indigenous rates for two time periods may show higher rates in the latter

period than would have been the case if the likelihood of identifying as Indigenous had remained constant.

In some cases, it is not possible to report for Indigenous and non-Indigenous people because no information about Indigenous status has been collected or the identification is not considered adequate.

In other cases (for example, in many surveys including the ABS National Health Survey), the number of Indigenous people from whom data was collected in each area is so small that meaningful reporting is not possible, especially in the more remote areas and particularly for rarer conditions.

Not only is poor identification of Indigenous status a constraint for the reporting of regional Indigenous health issues, but it also constrains the reporting of non-Indigenous statistics. At the national level this is not a substantial problem because the proportion who are Indigenous is small. However, in regional and especially remote areas, where Indigenous people are more strongly represented, there is the potential for the number of non-Indigenous people in data collections to be over stated. However, if identification of Indigenous people is indeed better in more remote areas (as is likely to be the case), then any error in calculated non-Indigenous rates associated with inaccurate identification of Indigenous status will be moderated. This moderation is largely a consequence of the rarity of Indigenous people in less remote areas and their substantial presence in more remote areas.

Surveys

While several sources of data capture every event or individual (e.g. ABS Census data, National Mortality data, National Hospital Morbidity data), some data sources are samples of the population. A characteristic of samples is that the number of events or individuals recorded is limited, and that consequently it can be difficult to draw firm conclusions from the data. This problem is exacerbated when describing rates for sub-populations, for example people who live in regional and especially remote areas. Because of the expense of collecting data, and to maintain the representativeness of the sample, surveys that are designed to describe national rates will usually have only a small number of responses from remote areas, and consequently it may not be possible to describe rates in those more remote areas (e.g. ABS National Health Survey, National Mental Health Survey, National Survey of Income and Housing Costs, and ABS Survey of Disability, Ageing and Carers).

Additionally, some surveys may sample in the more densely settled parts of remote areas, which may result in people from outlying areas being under-represented, potentially biasing results in the more remote areas. It is currently unclear to what extent, if any, this issue biases the results from surveys such as the National Health Survey in remote areas, and perhaps even in rural/regional areas.

Some surveys (for example, the AusDiab study) employ cluster sampling to provide meaningful and cost effective national data. The AusDiab study measures a number of biomedical factors (e.g. blood pressure and cholesterol) across Australia. As only a few of the clusters are in non-metropolitan areas, it is not possible to generate meaningful and representative results for regional and remote areas.

CATI surveys are those that are conducted by telephone interview and rely on the respondent having a telephone. Telephone ownership rates are likely to be lower in rural and especially remote areas, particularly among poorer people and Indigenous people. It is possible that sampling in these areas may be biased, with under-representation of people

from lower socioeconomic groups and may consequently underestimate rates of poor health outcome in those areas. The size of this effect has not yet been determined.

Geographic classification

There are currently several geographic classifications in existence, three commonly used being RRMA, ARIA and ASGC Remoteness Structure. These classifications are not equivalent and it is not possible to make direct comparisons between them. As each new classification is developed, it is adopted by various organisations with different levels of alacrity. Indeed, for reporting against some data sets, some classifications may never be appropriate or adopted. As reporting against the range of indicators requires the sourcing of data from a wide range of organisations, the data can frequently not be available and not be organised by the preferred geographic classification. Consequently considerable development work may be required in many cases before all the data is available by a single geographic classification.

The use of a single classification, or several complementary geographic classifications, or the use of some form of geocoding would allow less troublesome reporting from disparate data sources.

Irrespective of the geographic classification used, allocation of a geographic category on the basis of the postcode or SLA has some deficiencies. One limitation stems from the fact that the smallest geographic area identified in many data sets is the postcode or the SLA. The boundaries for small areas such as these can change from time to time which can complicate the allocation of broad geographic category. Another limitation is that the boundaries of geographic classifications (e.g. ASGC remoteness) can cut across SLA or postcode boundaries, which means that it is frequently not clear whether a person or event recorded in a data set should be allocated to one remoteness category or another. In these cases they have to be allocated a category on the basis of probability. While it is unlikely that this adds any appreciable degree of systematic bias, it is likely that the ability to distinguish differences in rates between areas is diminished.

Some data collections that originally contained a data field identifying postcode or SLA have lost this when aggregated to the national level. Examples of State data aggregated nationally and losing a geographic identifier in the process include workers' compensation data and cervical screening data.

While it is useful to be able to comment on associations between remoteness and health issues, other aspects of geography have been ignored. Although measures of remoteness (e.g. ARIA and ASGC remoteness structure) are partially affected by the size of the local centre, the effect is small. The size of the local town is of great importance in providing services, employment, education and the opportunity for social interaction, all of which impact on health issues. Additionally, there are fundamental differences between coastal and inland areas that are not taken into consideration by the standard geographic classifications; for example, coastal areas can frequently be retirement areas while inland areas are less likely to be. Infrastructure and the natural environment in coastal areas may provide people with a greater opportunity to lead a healthy life. These differences are of fundamental importance and should be considered in future work.

The methods of describing non-metropolitan health outlined in this framework rely on presentation of 'average' findings for broad geographic areas. Such methods allow simple description of complex issues, however, it is clear that substantial differences exist within areas; some communities exhibit good health while others have poor health (e.g. some have

high death rates, others lower death rates). An ability (or the opportunity) to describe the differences between communities within broad areas is important in understanding the fundamental reasons behind this.

Other issues

- Data may be collected in some locations but not others.

  For example, data about food prices and availability is collected by some States from time to time, but not others. Consequently it is not possible to report differences in food prices and availability from area to area.

- Services may be provided by several different organisations or in several different ways.

  For example, primary medical care is provided by GPs through Medicare or DVA funding and contributions from patients, through State-funded salaried medical officers, some salaried AMS doctors, and perhaps by other means as well. So as to develop a valid appreciation of a population's access to primary medical care, data from each of these sources needs to be considered (however, the services provided by each group may not be equivalent). Additionally, health services are also provided by State and privately employed allied health workers, State-funded community health centres and services, public health units, and so on. A single repository of data for provision of medical, nursing and allied health services would be, from a reporting perspective, very desirable.

- Frequently it may be difficult to compare rates between areas because of different models of care employed in each of the areas.

  For example, GPs are less likely to charge Medicare or DVA in remote areas; non-metropolitan hospitals are more likely to admit patients; and people from rural and remote areas are more likely to attend hospital accident and emergency (A&E) departments for primary care medical consultations than people from major cities. Comparison between areas in such an environment using disparate data sources may, without a great deal of care, result in invalid comparisons between areas.

- Data may be collected differently in different areas and cannot be aggregated.

  For example, the definition of what constitutes 'child abuse' differs substantially from State to State; consequently it is not possible to provide from National Child Protection data a regional comparison of the rate of child abuse.

- In a number of cases several data sources (which may not be capable of aggregation) may need to be considered (e.g. data from Medicare, DVA, hospital A&E departments describing primary medical care).

- In many cases the data simply may not have been collected, or a suitable data source may not yet have been identified.

  For example, there is no current national monitoring system that can be used to compare the prices and availability of (healthy) food across the country; consequently comparisons may have to rely on the price of three individual commodities (food, petrol and housing).

- In some cases, trends data are not available.

  Where some data sources have provided data periodically and regularly, it is possible to describe trends for indicators over time. For a number of issues, data has been

collected on only one occasion, and so it is not possible to describe changes over time (e.g. food prices).

In some situations, even though data has been collected on more than one occasion, a change in either the way the data was collected or aggregated, or indeed a change in the question asked, has made it impossible to compare across time. In other situations, a change over time in the likelihood of an event (e.g. the likelihood of identifying as Indigenous or the likelihood of a person being correctly identified as Indigenous) can make comparison across time invalid.

Changes in coding from one period to the next can make comparisons over time difficult or impossible. For example, changes to the coding of mortality and hospital morbidity (from ICD9 to ICD10) can frequently result in sudden changes to rates, which can be addressed by adjusting the data (a practical but less than desirable solution). Comparison of the percentage of houses rented, owned and being purchased is adversely affected by a change in coding in the ABS Census between 1991 and 1996; consequently it is only possible to present data for 1996 and 2001.

- While it is possible to describe a number of statistics for each broad geographic area, such statistics do not describe what it is actually like to live and work in a rural or remote community. Case studies would provide more of an understanding of the real problems faced and advantages enjoyed by people who live outside major cities.

Issues for which it is not possible to report and why (by each dimension of the framework)

1.1 All identified issues can be addressed.

1.2 The effect of migration on the regional prevalence of disability is unclear. A research project may be able to assess the magnitude of an effect.

1.3 Calculation of disability-adjusted life years and disability-adjusted life expectancy requires regional age-specific data on the prevalence of disability. This information currently exists only for Australia as a whole and for Victoria; not for 'rural', 'regional' and 'remote' areas.

1.4 While it is possible to describe whether regional death rates are higher or lower, it is not currently possible to describe to what extent these are influenced by any regional differences in the effectiveness of medical or surgical interventions, emergency response to trauma and post-operative care.

2.1 There are many gaps in the ability to report for environmental health issues in regional and remote Australia. Sources of data that would allow national regional reporting of water quality, sewerage, food quality and availability, housing quality and function, recreational and cultural facilities, workplace safety and conditions and pollutants (including agricultural chemicals) have yet to be identified or developed. Details of food availability are periodically assessed by some States, while the ability to report on regional differences in workplace safety could be developed using identified data sources in consultation with the States and Territories.

2.2 Most identified issues can be addressed, but it is not currently possible to report on whether work is full time or part time, on the seasonality of work, or on the numbers who work on Community Development Employment Programs. Reporting of the numbers who are self-employed and who are employees may be possible with development of data from ABS RRSNC.

2.3 Issues for which data sources have not been identified include social issues and measures of social capital, the availability of social and commercial services, the suitability of housing, the availability of public transport and measures of health literacy. There is no available overall measure of the cost of living in rural and remote areas. An overall summary of business activity may be possible with further development of identified data sources. These issues are particularly important as they describe a substantial part of the social environment in which the health of the population develops.

2.4 It is possible to report against most identified issues, however a source of information regarding driving practices has not yet been identified.

2.5 Data describing blood cholesterol concentrations is available from the National Health Survey, but relies on people having been tested, frequently in the absence of symptoms. Reporting of blood cholesterol levels from this source may be misleading; results from a random survey may be more valid.

3.1 It is unclear where details of the time taken to get victims of trauma to appropriate care is available. It is possible that data from ambulance services may be an appropriate source, but considerable development work is likely to be required in order to generate a national data set. In addition, it is not currently clear where data describing exposure to STI education and its effect on sexual practice can be obtained.

3.2 Appropriate care and support after medical or surgical intervention can substantially improve post-operative outcomes and reduce the likelihood of adverse health events. Currently it is not clear where information describing regional differences in the quality of rehabilitation or post-operative care is available.

3.3 The source and means of reporting the per-capita cost of health services, the cost of screening and the ratio of expenditure to positive health outcomes in each area is currently unclear.

3.4 A range of issues under the responsive dimension are currently unable to be described by geographic area. These issues include the cultural appropriateness of services for Indigenous people, the confidentiality of health services, choice of provider, Emergency Department response and waiting times, the lengths of time people have to wait for appointments with allied health workers or dentists and for pathology and imaging results, the percentage of GPs with closed books and people's general level of satisfaction with available health services. In addition, even though it is possible to describe average bulk billing rates in areas, it is not possible to describe the number of people for whom bulk billing is inaccessible (i.e. the number of people living in communities where bulk billing is not available).

3.5 Means of describing reduced access due to discrimination, cost (specifically the additional costs borne by non-metropolitan residents in accessing services), or due to services being periodically closed (e.g. overnight or on weekends) have not been developed. While it is possible to describe the average ratio of health workers to population across broad areas, it is not currently possible to describe this statistic for communities within each broad area (which may be perhaps a better description of access for residents). It is unclear how to describe the level and volume of hospital services available to local residents; this capacity has yet to be developed and appropriate data sources identified. It is currently not possible to describe the number of services provided by community mental health workers and by psychologists.

3.6 It is currently not possible to describe survival rates in Intensive Care Units, either for people from each geographic area or for hospitals in each geographic area.

3.7 All identified issues can be addressed.

3.8 All identified issues can be addressed.

3.9 It is not currently possible to report the number of students originally from each area who complete tertiary health courses. While it is possible to describe aspects of retention for general practitioners, it is not yet possible to describe retention of non-medical (e.g. allied) health workers. Additionally it is not possible to clearly describe the demands of on-call work (e.g. the number of weekends each year or nights each week GPs spend on call).

Data sources used in reporting against the indicators and their constraints

ABS National Health Survey

- Remote areas are poorly represented.
- It is not possible to report for Indigenous populations because of the small sample size.
- Health conditions are self-reported and may not be entirely accurate.
- Data in rural and remote areas may be biased because of tendency to sample in population centres.

ABS Mental Health and Wellbeing Survey

- Remote areas are poorly represented.
- It is not possible to report for Indigenous populations because of the small sample size.
- Conditions are self-reported and may not be entirely accurate.
- Data in rural and remote areas may be biased because of tendency to sample in population centres.
- Time series is not possible.

DSRU Child Dental Health Survey

- Indigenous status is not recorded or is recorded well in only a few States.
- Participation is restricted in some States because of the need for payment from patients.

DSRU National Oral Health Survey

- Data is available only for 1987–88.

National Notifiable Diseases Surveillance System

- Not all cases are notified.

NPSU national perinatal database

- No substantial limitations yet identified.

ABS Survey of Disability, Ageing and Carers

- Remote areas are poorly represented.
- It is not possible to report for Indigenous populations because there is no Indigenous identifier.
- People with a severe disability may move to less remote areas to access services, therefore rates derived from the data may be misleading.
- Although data is representative of the national population, it is unclear whether sampling is truly representative of the population living in each area (especially rural and remote areas).

AIHW national mortality data

- It is not possible to report for Indigenous populations because only an estimated 60% of Indigenous deaths are identified as such. It is probable that this figure is lower in cities and higher outside cities, invalidating comparisons between areas. Indigenous identification is more accurate in some States (e.g. SA, WA & NT) than others, but can change over time.
- Changes in the accuracy of identification of Indigenous people over time invalidates time trend analysis for Indigenous and non-Indigenous people.
- It is probable that older people move to less remote areas so as to access services. Older people who do not require services (and who are therefore healthier or more robust), may be less likely to move.

AIHW population databases

- No substantial limitations yet identified.

ABS perinatal deaths data

- Similar issues to those for national mortality data.

ABS births data

- Quality of the Indigenous identifier is poor.

ABS Census

- Only available every five years.

DEST university commencements/DEST higher education data holdings

- There is no guarantee that those commencing will complete studies.
- Although the home address of commencing students is likely to be their parents' home address and therefore where they are 'from', there is no guarantee that this is the case.

ABS Survey of Income and Housing Costs

- Remote areas are not represented.
- It is not possible to report for Indigenous populations because of the small sample size.
- Ability to report time trends is limited, with data collected only in 1996 and 1999–2000.
- Although data is representative of the national population, it is unclear whether sampling is truly representative of the population living in each area (especially rural and remote areas).

AIHW National Drug Strategy Household Survey

- Remote areas are poorly represented.
- It is not possible to report for Indigenous populations because of the small sample size.
- Ability to report time trends is currently limited.
- CATI methodology (which requires access to a telephone in the home) may reduce the opportunity for poorer people to participate.
- Although data is representative of the national population, it is unclear whether sampling is truly representative of the population living in each area (especially rural and remote areas).

Informed Sources P/L petrol prices

- No substantial limitations yet identified.

ABS indexes of relative retail prices of food

- The survey was discontinued in 1990.

ABS ATO Australian Business Register

- Data is not yet available by ASGC Remoteness, RRMA or ARIA.

ABS ATO business income data

- Data is not yet available by ASGC Remoteness, RRMA or ARIA.

ABS National Nutrition Survey

- The sample is relatively small, with poor coverage in remote areas.
- It is not possible to report for Indigenous populations because of the small sample size.
- Although data is representative of the national population, it is unclear whether sampling is truly representative of the population living in each area (especially rural and remote areas).

Australian Study of Health and Relationships (La Trobe)

- The survey has been conducted only once and may not be repeated.

Australian Childhood Immunisation Register

- It is not possible to report for Indigenous children because the Indigenous indicator is unreliable.

AIHW labour force data sets

- There is some reliance that survey participants will list all the places where they work. It is likely that a proportion list only the main location of their work; consequently labour force in more remote areas may be underenumerated.
- There is no information about the time spent travelling on the job rather than working with patients. Greater need for work-related travel in non-metropolitan areas may affect comparability between areas.
- There is no data for professions that do not require registration.
- It is not possible to describe details of weekends and nights spent on call or working on call.

Medicare/DVA data

- Medicare DVA consultations represent a large proportion of provided medical services, but not all of them.

National Hospital Morbidity data

- The rate of hospital admission can be affected by both the need for care and also the hospital's admission policies (which is likely to be affected by remoteness). Consequently it is unclear whether higher rates of admission reflect higher rates of need or greater likelihood of admission.
- Indigenous people are under-identified, but particularly in metropolitan areas. Consequently comparison between areas of admission rates for Indigenous people is likely to be invalid.

HACC minimum data set

- No substantial limitations yet identified.

ACCMIS warehouse files

- No substantial limitations yet identified.

BEACH data

- BEACH data is poorly represented in remote areas.
- Reporting of reasons for encounter is less reliable than for problem managed.

AIHW Elective Surgery Waiting Times Data Collection

- It is not possible to report the waiting times for people who live in each area, although it is possible to report the waiting times experienced by people at hospitals in each area.

AIHW National Hospital Establishments Database

- Counts of outpatient occasions of service relate to the area of the hospital (not the home address of the patients), and it is not possible to describe the characteristics (i.e. age, sex and Indigenous status) of the patients.

Pharmaceutical Benefits Scheme (PBS) data

- Data is not available to describe the overall rate of prescription except as an adjusted statistic. Only details of pharmaceuticals that are collected for concession holders or that are expensive are available; total numbers of prescriptions are adjusted up on the basis of the ratio of concession to non-concession holders.
- Time trend is not possible.

CSDA minimum data set

- Data is available only for the location from which the service was provided, not the home address of the client.

Strategies to overcome data constraints

This framework is a living document. There is an expectation that the framework and reporting can be improved with further development of data sources and statistical capacity, perhaps along the lines of the strategies outlined below.

This framework should be reviewed and updated by June 2005 in the light of comments and new or improved data sources.

Improvement or validation of existing data sources

1. Consider augmenting the ABS National Health Survey (and other national surveys) so as to give better coverage in remote areas.
2. Assess the magnitude and direction of any bias in the National Health Survey and other similar surveys that may result from a tendency to sample in areas with higher population densities.
3. Assess the amount of bias introduced by sampling in CATI surveys. Are respondents from rural and remote areas more likely to have higher incomes, belong to higher socioeconomic groups and be healthier than non-respondents from these areas?
4. For each region (i.e. by remoteness category), assess the accuracy of identification of Indigenous people in each data collection (particularly the mortality data collection).
5. Further encourage the more accurate identification of Indigenous people in data collections, with the aim to make identification as close to perfect as possible.
6. Assess the extent to which the distribution of people with disabilities is affected by a need for people to migrate to larger centres where they can better access services.
7. Assess the extent to which older people who are in poor health move to less remote areas so as to access services. This report speculates that people who are in poor health, particularly those in older age groups, are likely to move to less remote areas where they can access health services. This goes some way to explaining the lower death rates of older people who live in remote areas, but there is little information available to confirm such a hypothesis.
8. Add questions for Health Labour Force Surveys seeking description of time spent travelling, doing administrative tasks and time spent with patients.

Research projects

9. Identify the factors that attract GPs and other health workers to some rural and remote areas and not to others.
10. Identify the reasons for and protective factors against higher suicide rates in non-metropolitan areas. Although rates of suicide are higher for working age males outside major metropolitan centres, the reasons for this are unclear. Understanding may enable a constructive approach to reducing the differential between suicide death rates in metropolitan and non-metropolitan areas.
11. Conduct a number of case studies describing health issues (access, determinants, resources, constraints etc.) in a number of rural and remote communities so as to provide depth to existing rural health information.
12. Develop a clear understanding of the differences in models of care employed in each area (e.g. differences in the provision of primary care medical services, in the provision

of hospital care and so on). This work could be included as part of the development of community case studies.

13. Identify the risk factors for poor rural health, possibly by developing a model predicting health outcomes for small areas (e.g. SLAs) using available data about determinants of health and health system performance as the explanatory variables.
14. For each area where substantial regional differences in health status exist, investigate the causal factors so as to identify practical cross-sectoral policy initiatives (e.g. for higher MVA and IHD death rates).
15. Develop the capacity to describe the contribution of health status, environmental/occupational issues, effectiveness of response to trauma, surgical intervention and follow up care to overall higher death rates in non-metropolitan areas.
16. Develop a rural health research program, identify priority research issues and develop a coordinated approach to progressing the work on a national level.

Development of national data from currently available sources

17. With the National Occupational Health and Safety Commission, develop workers' compensation data to provide a national data set capable of reporting for a range of remoteness categories.
18. Develop ABS Rural and Regional Statistics National Centre (RRSNC) data so reporting of income and business data is possible by region (e.g. ASGC Remoteness).

Development of the ability to report where data are currently unavailable

19. There are a number of areas where the ability to report is restricted because of either a lack of identified data sources or the need for considerable development of a meaningful indicator. Focus should be given to the ability to report on:
    - national environmental health issues (e.g. water quality, sewerage, recreational and cultural resources, etc.);
    - regional cost of living;
    - regional availability of healthy food;
    - measures of social capital (e.g. truancy rates, volunteering etc.);
    - services (telephone ownership, banks, access to shops, internet etc.);
    - measures of health literacy;
    - mobility (ease or difficulty of getting to places such as work, services and venues);
    - retrieval times and other details for victims of trauma;
    - quality and effectiveness of follow up care after major medical or surgical intervention;
    - cultural appropriateness of health services for Indigenous people;
    - confidentiality of health data locally;
    - choice of provider;
    - emergency department waiting times;
    - waiting times to consult doctors and allied health workers;
    - waiting times for pathology and imaging results;
    - prevalence of GPs with 'closed books';

- people's satisfaction with available health services;
- levels of discrimination against Indigenous people in health services;
- additional costs borne by residents of non-metropolitan areas in accessing health services;
- temporarily inaccessible services due to periodic (e.g. weekend or nightly) closure;
- mental health services provided by community mental health workers and psychologists;
- survival rates in intensive care units;
- retention of non-medical health workers (e.g. nurses and allied health workers); and
- the demands of on-call work for GPs.

Capacity building

20. Develop the ability to report on the effects of coastal versus inland location, town size, and SEIFA on health issues.
21. Develop the capacity to report on the efficiency (including cost efficiency) of health services.
22. Develop geocoding of health and population data as a priority, and also develop a capacity to ascribe aspects of geography (e.g. remoteness, population density, coastal/non-coastal status) on the basis of this specific geographic location. Current organisation of health and population data allows only crude allocation of a remoteness category or other aspect of geography; this limits the ability to describe aspects of health in rural and remote areas.

References

ABS (Australian Bureau of Statistics) 1990. Indexes of relative retail prices of food, Australian cities and towns. ABS Cat. No. 6404.0. Canberra: ABS.

ABS (Australian Bureau of Statistics) 2002. Experimental estimates, regional small business statistics, Australia. ABS Cat. No. 5675.0. Canberra: ABS.

ABS (Australian Bureau of Statistics) 2001a. Occasional paper: Australian business register—a snapshot. ABS Cat. No. 1369.0. Canberra: ABS.

ABS (Australian Bureau of Statistics) 2001b. Australian business register counts of single business locations, ANZIC Industry Division by postcode. ABS Cat. No. 8136.0.55.001. Canberra: ABS.

ABS (Australian Bureau of Statistics) & AIHW (Australian Institute of Health and Welfare) 1999. Assessing the quality of identification of Aboriginal and Torres Strait Islander people in hospital data. Canberra: Aboriginal and Torres Strait Islander Health and Welfare Information Unit, Australian Health Ministers' Advisory Council, Australian Institute of Health and Welfare & Australian Bureau of Statistics.

AIHW (Australian Institute of Health and Welfare): Mathers C, Vos T & Stevenson C 1999. The burden of disease and injury in Australia. AIHW Cat. No. PHE 17. Canberra: AIHW.

AMWAC (Australian Medical Workforce Advisory Council) 2000. The general practice workforce in Australia: supply and requirements 1999–2010, AMWAC report 2000.2, Sydney: AMWAC.

US Health Department 2002. Healthy people 2010 volume 1 (2nd edition), chapter 11, Health Communication. Office of Disease Prevention and Health Promotion US Health Department [cited 30 August 2002]. Available from Internet: http://www.health.gov/healthypeople/Document/Word/Volume1/11HealthCom.doc

McMichael A 1993. Planetary overload. Cambridge: Cambridge University Press.

NHPC (National Health Performance Committee) 2001. National health performance framework report. Brisbane: Queensland Health.

Pollard AH, Farhat Yusuf, Pollard GN 1975. Demographic Techniques. Pergamon: Rushcutters Bay.

Public Health Services 2001. The 2000 healthy food access basket (HFAB) survey: full report. Queensland: Queensland Health.

The World Bank social capital homepage [online]. August 2002 [cited 30 August 2002]. Available from Internet: http://www.worldbank.org/poverty/scapital/index.htm

Appendix 1

Table A1: The National Health Performance Framework

<table>
<tr><th colspan="5">Health status and outcomes
How healthy are Australians? Is it the same for everyone?
Where is the most opportunity for improvement?</th></tr>
<tr><th>Health conditions</th><th>Human function</th><th colspan="2">Life expectancy
and wellbeing</th><th>Deaths</th></tr>
<tr><td>Prevalence of disease, disorder, injury or trauma or other health-related states.</td><td>Alterations to body, structure or function (impairment), activities (activity limitation) and participation (restrictions in participation).</td><td colspan="2">Broad measures of physical, mental, and social wellbeing of individuals and other derived indicators such as disability adjusted life expectancy (DALE).</td><td>Age and/or condition-specific mortality rates.</td></tr>
<tr><th colspan="5">Determinants of health
Are the factors determining health changing for the better? Is it the same for everyone?
Where and for whom are they changing?</th></tr>
<tr><th>Environmental factors</th><th>Socioeconomic factors</th><th>Community capacity</th><th>Health behaviours</th><th>Person-related factors</th></tr>
<tr><td>Physical, chemical and biological factors such as air, water, food and soil quality resulting from chemical pollution and waste disposal.</td><td>Socioeconomic factors such as education, employment, per-capita expenditure on health, and average weekly earnings.</td><td>Characteristics of communities and families such as population density, age distribution, health literacy, housing, community support services and transport.</td><td>Attitudes, beliefs knowledge and behaviours, e.g. patterns of eating, physical activity, excess alcohol consumption and smoking.</td><td>Genetic related susceptibility to disease and other factors such as blood pressure, cholesterol levels and body weight.</td></tr>
<tr><th colspan="5">Health system performance
How well is the health system performing in delivering quality health actions to improve the health of all Australians? Is it the same for everyone?</th></tr>
<tr><th colspan="2">Effective</th><th colspan="2">Appropriate</th><th>Efficient</th></tr>
<tr><td colspan="2">Care, intervention or action achieves desired outcome.</td><td colspan="2">Care/intervention/action provided is relevant to the client's needs and based on established standards.</td><td>Achieving desired results with most cost– effective use of resources.</td></tr>
<tr><th colspan="2">Responsive</th><th colspan="2">Accessible</th><th>Safe</th></tr>
<tr><td colspan="2">Service provides respect for persons and is client orientated and includes respect for dignity, confidentiality, participation in choices, promptness, quality of amenities, access to social support networks, and choice of provider.</td><td colspan="2">Ability of people to obtain health care at the right place and right time irrespective of income, physical location and cultural background.</td><td>The avoidance or reduction to acceptable limits of actual or potential harm from health care management or the environment in which health care is delivered.</td></tr>
<tr><th colspan="2">Continuous</th><th colspan="2">Capable</th><th>Sustainable</th></tr>
<tr><td colspan="2">Ability to provide uninterrupted, coordinated care or service across programs, practitioners, organisations and levels over time.</td><td colspan="2">An individual's or service's capacity to provide a health service based on skills and knowledge.</td><td>System or organisation's capacity to provide infrastructure such as workforce, facilities and equipment, and be innovative and respond to emerging needs (research, monitoring).</td></tr>
</table>

Appendix 2

Table A2: Development status of first tier indicators

Dimension	Issue	Indicator developed
1.1	Chronic diseases	1.1.1
	Injury	1.1.2
	Mental health	1.1.3
	Oral health	1.1.4
	Communicable diseases	1.1.5
	Birth outcomes	1.1.6
1.2	Severity and type of disability	1.2.1
	Effect of migration on regional prevalence of disability	
	Days off work or away from usual activity because of illness	1.2.2
1.3	Disability-adjusted life expectancy	
	Life expectancy	1.3.1
	Disability-adjusted life years	
	Years of life lost	1.4.4
	Self-assessed health	1.3.2
	Self-assessed happiness	1.3.3
1.4	Overall death rates	1.4.1
	Perinatal mortality	1.4.2
	Age-specific mortality	1.4.3
	Premature mortality	1.4.4
	Leading causes of death and excess deaths	1.4.5

Table A3: Development status of second tier indicators

Dimension	Issue	Indicator developed
2.1	Water quality	
	Reticulated water with adequate fluoride	2.1.1
	Sewerage	
	Food	
	Housing tenure and crowding	2.3.7–8
	Housing quality and function	
	Recreational and cultural facilities	
	Workplace	
	Pollutants	
2.2	Education of adult population	2.2.1
	School retention & progression to university	2.2.2 & 2.2.3
	Employment	2.2.4
	Household income	2.2.5
	Gap between rich and poor	2.2.6
	Sources of income	2.2.7
	SEIFA	2.2.8
2.3	Demography	2.3.1
	Dependency ratio	2.3.2
	Internal migration	2.3.3
	Fertility	2.3.4
	Community safety (homicide rate)	2.3.5
	Other social issues and social capital	
	Social and commercial services	
	Health literacy	
	Individuals perception of risk	2.3.6
	Housing tenure	2.3.7
	Crowding in households	2.3.8
	Other aspects of suitability of housing	
	Car ownership	2.3.9
	Availability of other transport	
	Cost of living	2.3.10
	Health of the business sector	2.3.11
2.4	Smoking rates	2.4.1
	Harmful consumption of alcohol	2.4.2
	Illicit drug use	2.4.3
	Physical activity	2.4.4

Table A3 (continued): Development status of second tier indicators

	Nutrition	2.4.5
	Sexual practices	2.4.6
	Driving practices	
2.5	Rate of genetically determined diseases	2.5.1
	Rate of other birth defects	2.5.2
	High blood pressure	1.1.1
	High cholesterol	
	Overweight and obesity	2.5.3

Table A4: Development status of third tier indicators

Dimension	Issue	Indicator developed
3.1	Retrieval time for victims of trauma	
	STI education in promoting safe	
	Immunisation in reducing incidence of infectious disease	3.1.1
	Screening in reducing mortality due to breast and cervical cancer	3.1.2
	Medical and surgical misadventure	3.6.1
3.2	Prevalence of female GPs	3.2.1
	Rate of hospital specialist procedure	3.2.2
	Rate of non-hospital specialist consultation	3.2.3
	Quality of care after surgery	
	Options for aged care	3.2.4
	Accreditation of hospitals	3.8.1
	Waiting times for elective surgery	3.4.1
	Rates of GP consultation for a range of reasons	3.2.5
3.3	Per-capita cost of GP, community health and hospital services in each area	
	Per-capita cost of GP, community health and hospital services for people from each area	
	Cost of screening	
	Ratio of expenditure to positive health outcome	
3.4	Whether services are culturally appropriate for Indigenous people	
	Whether services are confidential	
	Choice of provider	
	Waiting times for elective surgery (see 3.2)	3.4.1
	ED response and waiting times	
	Bulk billing	3.4.2
	Waiting time for access to allied health workers	
	Waiting time for imaging and pathology results	
	Percentage of GPs with closed books	
	Satisfaction of residents with health services generally	
3.5	Road distance to primary health care, ED, chemist, hospital and aged care service	3.5.1
	Reduced access to service because of discrimination	
	Reduced access to service because of cost	
	Supply of health workers	3.5.2
	Level of hospital service available	
	Rate of hospital admission	3.5.3
	Rate of GP and primary medical care consultation	3.5.4
	Rate of dental consultation by reason	3.5.5

Table A4 (continued): Development status of third tier indicators

	Rate of GP consultation for mental health reasons	3.2.5
	Rate of prescription	3.5.6
	Access to disability services	3.5.7
	Continuity of service (24 hour availability)	
3.6	Rate of surgical and medical misadventure (see 3.1 & 3.8)	3.6.1
	Survival in intensive care units	
3.7	Rate of care planning and case conferencing	3.7.1
3.8	Accreditation of hospitals	3.8.1
	Rate of surgical and medical misadventure	3.6.1
3.9	Numbers of student health workers from rural areas	3.9.1
	Retention of GPs	3.9.2
	Retention of other health workers	
	Hours worked by health workers	3.9.3
	Age of health workers	3.9.3
	Demands of on call work	