

## Appendix



## Explanatory notes on data sources and methods used

### Victorian Population Health Survey (VPHS) 2006

The VPHS 2006 was administered by computer assisted telephone interview (CATI) to a representative sample (n=7,500) of persons aged 18 years or over residing in private dwellings in Victoria. Department of Human Services staff supervised the fieldwork, which was outsourced to a market research agency. All data were self-reported and stored directly in the CATI system. Random digit dialling was used to generate the sample of telephone numbers, and all residential households with landlines were considered in scope for the survey. The survey sample was stratified by department region. This type of survey delivery excludes various population groups, such as the homeless or itinerant, those persons in hospitals or institutions, the frail and aged and persons with disabilities which preclude them from participating in an interview.

Letters were mailed to all households where the randomly selected telephone number matched a listing in an electronic directory of Victorian household telephone numbers. Approximately 13,200 primary approach letters were mailed, an approach known to contribute to an increase in response rates. The letter informed the households that the department was conducting the Victorian Population Health Survey to collect information about health, lifestyle and wellbeing in the community, and outlined the importance of the survey. Interviews were conducted in six languages other than English, and a participation rate of 62 per cent was achieved. Survey data were weighted to reflect the probability of selection of the respondent in each household and the age, sex and geographic distribution of the population.

### Burden of disease

#### Disability-adjusted life years (DALY)

The Victorian burden of disease study is based largely on the methods developed for the global burden of disease (GBD) study (Murray and Lopez, 1996). The method allows the quantification of all states of ill-health into a universal indicator, the disability adjusted life year (DALY). The DALY is a health gap measure that combines both time lost due to premature mortality and non-fatal conditions. The DALY extends the concept of potential years of life lost due to premature death (PYLL) to include equivalent years of 'healthy' life lost by virtue of being in states other than good health. DALYs for a disease or health condition are calculated as the sum of the years of life lost due to premature mortality (YLL) in the population, and the equivalent 'healthy' years lost due to disability (YLD) for incident cases of the health condition.

$$\text{DALY} = \text{YLL} + \text{YLD}$$

#### Years of life lost (YLL)

YLLs are the mortality component of DALYs. To define the standard, the highest life expectancy observed for any nation (that is, the 82.5 years life expectancy of women in Japan) was chosen. The standard expectations are, therefore, based on a model life table: the Coale and Demeny model life table, which is broken down into four regional models: north, south, east and west. West level 26 was chosen, which has a life expectancy at birth for females of 82.5 years. The male–female 'biological' difference in survival potential was chosen as 2.5 years. There is no male schedule with a life expectancy of 80 years, therefore the standard life expectancy at birth for males of 80 years was based on the female schedule for Coale and Demeny model life table West level 25 (Mathers et al., 2001). This life table differs from the Australian cohort life expectancy (which takes into account declining mortality trends) created by Mathers and colleagues for the Australian National Burden of Disease Study (Mathers et al, 1999) and the 1996 Victorian Burden of Disease Study (DHS, 1999a, b).

The interpolated life expectancy for each age category and sex was estimated from the observed mean age at death, in the age interval and the life expectancy figures at the exact ages defining the age interval. The mean life expectancy in each age interval was then discounted at three per cent using the formula:

$$\text{YLL} = \frac{1}{0.03} (1 - e^{-0.03L})$$

where L is the life expectancy. YLL conversion figures were calculated for each age group and sex, and then multiplied by the observed deaths to derive the YLLs by cause, age and sex.

### Years lost due to disability (YLD)

Years lost due to disability are the disability component of DALYs. The basic formula for calculating YLD is:

$$YLD = I \times DW \times L$$

where I is the number of incident cases in the reference period, DW is the disability weight (in the range zero to one) and L is the average duration of disability (measured in years). With discounting at a rate of three per cent, the formula becomes:

$$YLD = \frac{I \times DW \times (1 - e^{-0.03L})}{0.03}$$

Consistent and meaningful YLD estimates depend on a clear definition of the condition under consideration, in terms of case or episode and severity level or disease stage. It is then necessary to ensure that the disability weight and the population incidence or prevalence data relate to the same case definition. The most difficult step in estimating YLD for most diseases is matching existing population data to the disease stage or severity categories for which weights of different severity are available. Errors in this matching can result in a substantial error in the YLD estimate.

### Life expectancy at birth for Victorian local government areas, 2001–2005

To determine life expectancy at birth for local government areas (LGAs), registered Australian Bureau of Statistics (ABS) mortality and mid-year estimated resident population (ERP) data 2001–05 were used. Deaths of persons with place of usual residence in Victoria were included, and deaths with unidentified place of usual residence or missing age were excluded from the analysis.

Life tables combine mortality rates of a population at different ages into a single model, and project life expectancy assuming that current death rates will continue into the future. The UK Office of National Statistics abridged life table (Toson & Baker, 2003; Eayres & Williams, 2004) was used to calculate life expectancy at birth for each LGA for the period 2001–2005 by sex. Age at death was grouped into age groups of 0, 1–4 and 5–9 years, and continued in five-year intervals to age 85 years and over. The life tables were computed in MS Excel spreadsheets.

### Ambulatory care sensitive conditions (ACSCs)

Hospital separation data were obtained from the Victorian Admitted Episodes Dataset (VAED). The VAED is a minimum dataset containing data on all admitted patient activity (submitted by all public and private acute hospitals) including acute facilities in rehabilitation, extended care institutions and day procedure centres. Clinical data are stored as International Classification of Disease Version 10, Australian Modification (ICD-10-AM) codes in diagnosis and procedure fields in the VAED. The VAED records were selected on the basis of diagnosis fields, with some exclusions based on procedure fields. Ambulatory care sensitive conditions (ACSCs) identified using ICD-10-AM codes in the diagnosis fields of the VAED are indicated in Table 1.

Population figures by gender and five-year age groups were obtained using the ERP figures produced by the ABS. The population data were used for calculating admission rates and 95 per cent confidence intervals (CI).

To analyse individual ACSCs admissions to hospital, admission rates for defined geographic areas must be calculated. The boundaries of the geographic areas in Victoria (which make up local government areas under the Australian Standard Geographical Classification) have changed significantly over the past decade. There are currently 200 statistical local areas, which make up 79 local government areas. These boundaries were collapsed into 32 primary care partnership (PCP) catchment areas, with the population in 2003 ranging from a minimum of 31,025 (Grampians Pyrenees PCP) to a maximum of 421,486 (Outer East PCP). Information from the VAED at the hospital admission level was used to assign each patient's place of usual residence to one of the 32 PCPs. Comparisons across the PCPs were made for the period 1999–2000 and 2003–04, while comparisons across the eleven years from 1993–94 to 2003–04 were made at the department region level.

Admission rates were age and sex standardised (direct method) using the 2001 Victorian population as the reference. The 95 per cent CI for the standardised rates were based on the Poisson distribution.

## Health outcomes

### National health priority conditions

The National Health Priority Areas (NHPA) initiative is a collaborative effort endorsed by the Australian and all state and territory governments. The NHPA initiative seeks to focus the attention of the health sector on diseases or conditions that have a major impact on the health of Australians, and offer potential for significant health gain. The NHPA initiative spans the continuum of care, from prevention and early detection, through to treatment, rehabilitation and continuing care, palliative care and research. There are seven national health priority areas:

1. Cardiovascular health and stroke
2. Diabetes Mellitus
3. Asthma
4. Arthritis and musculoskeletal conditions
5. Cancer control
6. Mental health (with a focus on depression)
7. Injury prevention and control

In addition, the initiative focuses on common health risk factors and health inequalities as reflected by NHPA diseases and conditions.

The ICD-9-CM and ICD-10-AM codes used to define these national health priority areas for extracting public and private hospital data from the VAED are summarised in table 2.

### Victorian cancer registry data

Incident cases of all cancers and the leading five cancers (bowel, breast, prostate, lung and melanoma) were obtained from the Victorian Cancer Registry, Cancer Epidemiology Centre at The Cancer Council Victoria. The Victorian Cancer Registry has been a population-based registry since 1982. The registry was enabled by the *Cancer Act 1982*, which made it mandatory for all hospitals and pathology laboratories to notify the cancer registry of the presence of cancer in patients or human tissues.

All malignant neoplasms are registered, as are in situ carcinoma of breast, and cervix and melanoma. Basal and squamous cell carcinomas of the skin are not registered, except for those occurring in genital and perianal skin, and the vermilion border of lip.

Non-melanocytic skin cancers are not registered by the Victorian Cancer Registry (or most other registries), because many are treated in doctors' surgeries using destructive techniques that preclude histological confirmation. Further, they vastly outnumber all other forms of cancer.

Incidence rates were calculated using the estimated resident population for Victoria for 2001, and expressed as diagnoses or per 100,000 persons per year. The crude rate is defined as the number of new cases (or deaths) divided by the whole population at risk in the specified time period, and is expressed as an annual rate per 100,000 persons. Rates are adjusted to enable comparisons between populations having different age structures. The Victorian age standardised rates (ASR) in this publication were based on the 2001 Victorian population. These rates are calculated using the direct method by summation of the weighted age-specific rates.

Details of the ICD-10-AM diagnosis codes were used in the analyses are provided in table 1.

## Injury and poisoning

Injury is defined as 'tissue damage resulting from either the acute transfer to individuals of the five forms of physical energy (kinetic or mechanical, thermal, chemical, electrical or radiation) or from the sudden interruption of normal energy patterns to maintain life patterns' (Waller, 1985).

An injury indicator is defined as a summary measure which denotes or reflects, directly or indirectly, variations in trends in injuries, or injury related or injury control-related phenomena (Cryer 2003).

In selecting injury indicators the definitions and validation tool developed by the International Collaborative Effort on Injury Statistics Indicators Group (Cryer et al., 2005) and the Injury Prevention Research Unit, University of Otago, New Zealand (Cryer et al., 2004) were utilised, with some adjustments. The extensive technical review of the injury indicators included in the Injury Prevention and Control National Health Priority Areas (NHPA) Program also informed the approach (Harrison and Steenkamp, 2002).

The operational definition of an injury death is a case where the underlying cause of death is an External Cause in the specified range in Chapter XX of the International Classification of Diseases (ICD). The operational definition of serious injury is described in terms of the pathologies in the 'Injury and Poisoning' chapter (Chapter XIX) of the ICD-Australian Modifications, except for those coded under 'sequelae' (that is, late effects).

The New Zealand group excluded medical injuries (complications of surgical and medical care) from the operational definition of serious injury, along with pathologies resulting from chronic exposure over time and the consequences of injury; that is, the injury event is counted, but not subsequent episodes of treatment and care (Cryer et al., 2004). We included medical injuries in the figures showing all-injury trends in frequency and rates for injury deaths and hospital admissions, but excluded medical injury cases from all further analyses as this cause of injury is widely considered to be outside the domain of traditional injury prevention and control. Only first admissions were included and, because we focused on measuring serious injury incidence, we excluded episodes of inpatient care related to the late consequences (sequelae) of injury.

## Source data

### Deaths

The source of indicators based on mortality data is the Death Unit Record File (DURF) provided to the Victorian Injury Surveillance Unit (VISU) by the Australian Bureau of Statistics (ABS). The ABS codes the data provided by the Victorian Registrar of Births, Deaths and Marriages utilising information on the cause of death supplied by medical practitioners certifying a death, or coroners to whom a death is reported (Harrison and Steenkamp, 2002). From 1979 to the end of 1996, deaths were coded according to the ninth revision of the International Classification of Diseases (ICD-9). From 1 January 1997, death registrations were coded according to ICD-10. Deaths are analysed by year of death.

### Hospital admissions

The source of indicators based on morbidity data is the Victorian hospital admissions data extracted from the Victorian Admitted Episodes Dataset (VAED) compiled by the Department of Human Services. We identified cases of injury as those that had a primary diagnosis of injury or poisoning, and then in terms of the presence of the relevant external cause codes. Only first admissions were included, and deaths and transfers (subsequent to first admission) within and between hospitals were excluded to avoid double counting. Episodes of inpatient care related to the late effects (sequelae) of injury were also excluded.

The VAED has contained near-complete records for admissions from public and private acute hospitals from 1994–05, and is assessed from that year to be sufficiently complete and valid to support monitoring of trends (Harrison and Steenkamp, 2002). Up to the end of June 1998, hospital data were coded to a clinical modification of ICD-9 (ICD-9-CM). From 1 July 1998 Victoria coded data according to ICD-10-AM (Australian modifications), and then to upgraded versions in 2000, 2002 and 2004. The shift from ICD-9 to ICD-10 created some problems with monitoring trends for some causes of injury, because the range of codes in ICD-10 is not necessarily equivalent to the range in ICD-9. Table 3 provides a summary of the ICD-9 and ICD-10-AM codes used to define the injury indicators reported.

## Indicator validation tool

The tool is a work in progress and currently consists of six validation criteria. The comments included in this section detail the extent to which the indicators included in this chapter satisfy each criterion.

*i) Case definition– the indicator should reflect the occurrence of injury satisfying some case definition of anatomical or physical damage, based on diagnosis, defect or pathology rather than use of services.*

The case definition we used for an injury death was not based on anatomical or physical damage (because ICD diagnosis data items are only available in ABS DURF from January 1997), but is specified solely in terms of the presence of one of the range of ICD external causes of injury codes as the underlying cause of death. By contrast, the case definition we used for an injury hospital admission was based on ICD diagnosis data items.

*ii) Serious injury– the indicator should be based on events that are associated with significant risk of impairment, functional limitation, disability or death, decreased quality of life, or increased cost (that is, serious injury).*

We used duration of stay in hospital as the indicator of case severity and defined serious injury in terms of hospital admission, as admitted cases are at least moderately severe. In general, 'same-day' admissions—those discharged on the day of admission other than those ending in transfer to another hospital—were omitted because this group of admissions is particularly subject to variation over time and between hospitals. If case selection was based on a specific injury diagnosis (for example, forearm and wrist fracture), rather than an external cause, then 'same-day' admissions were included.

By contrast, the New Zealand research group (Cryer et al.) used a threat-to-life severity scale when defining a serious injury and only included hospitalisations with an International Classification of Diseases-based Injury Severity Score (ICISS) of less than or equal to 0.941 (that is, a probability of death at admission of at least 5.9 per cent). This represented around 15 per cent of New Zealand injury hospital discharges.

While recognising that the NZ approach produces very stable and reliable indicators of serious injury, we assessed that it was too restrictive. The threshold we adopted represents around 70 per cent of Victorian injury hospital admissions.

*iii) Case ascertainment– the probability of a case being ascertained should be independent of social, economic, and demographic factors as well as service supply and access factors (that is, measure, with minimal bias, the occurrence of injury rather than the use of services).*

The ABS-DURF supposedly includes all registered deaths, although the completeness of death registration in Victoria and the completeness of the ABS mortality file have not been evaluated (Harrison and Steenkamp, 2002). Serious injury normally results in hospital admission in Victoria, so that the Victorian Admitted Episodes Dataset (VAED) offers potential to measure the incidence of serious injury. Ascertainment of overall hospital admissions for Victorian private and public hospitals is very high on the VAED from 1994–05 onwards, although ascertainment of injury cases on the VAED was not studied separately (Harrison and Steenkamp, 2002).

In their review of the NHPA injury indicators and data sources, Harrison and Steenkamp (2002) identify the potential for biased ascertainment of cases relevant to an indicator from both death and hospital data sources. This was due mainly to underlying variations in data collection, coding and processing. Wherever possible we followed the technically revised specifications—designed to improve the performance of indicators sourced from mortality and hospital data for the purpose of monitoring injury rates—recommended by these authors.

*iv) Representativeness– the indicator should be derived from data that are inclusive or representative of the target population that the indicator aims to reflect (that is, measure the occurrence of events relating to all subpopulations equally well).*

There are no systematic exclusions of sub-populations from either of the data sources used. Alternative data sources for motor vehicle traffic injury and injury due to assault indicators rely on police reports that may not represent injury incidence in all sub-populations equally well due to reporting biases.

*v) Data availability– data should be derived from existing systems wherever possible, or it should be practical to develop new systems.*

Data were derived from well-established injury surveillance data systems, which allow monitoring of trends.

*vi) Indicator specification– the indicator should be fully specific to allow calculation to be consistent at any place and at any time.*

The specification for reporting on each indicator is summarised in the relevant section of this chapter under the figures. Full specifications are available from the Victorian Injury Surveillance Unit (VISU).

## Data analysis methods

Age-adjusted rates were calculated using the direct standardisation method and the Victorian population at 30 June 2001 as the standard.

Trends were determined using a log-linear regression model of the rate data assuming a Poisson distribution of injuries. The statistics relating to the trend curves, slope and intercept, estimated annual percentage change, estimated overall change, 95 per cent confidence intervals around these estimated changes and the p-value, were calculated using the regression model in SAS 9.1.3. A trend was considered to be statistically significant if the p-value of the slope of the regression model was less than 0.05.

## Communicable diseases

Surveillance for communicable diseases occurs under the authority of the Health (Infectious Diseases) Regulations 2001. These regulations require medical practitioners and pathology laboratories to notify the Department of Human Services when they diagnose certain communicable diseases.

Notifiable diseases are classified in the regulations under four categories: Groups A, B, C and D. Group A diseases require an immediate public health response, and all notifications are followed up to confirm the diagnosis, identify risk factors and sources of infection and to prevent the further transmission of disease. Responses to Group B diseases are defined by disease-specific protocols. Some diseases have enhanced surveillance procedures, while responses to others may only occur if a cluster, outbreak or other unusual event is detected. Information may be collected from the patient, the notifying doctor or both. Enhanced surveillance systems implemented in Victoria are reported in the relevant sections.

Group C diseases are sexually transmissible infections (excluding HIV/AIDS). Because complete identifiers are not required for these diseases, further information regarding the notification is obtained only from the notifying doctor. Group D diseases are HIV and AIDS, for which contact tracers follow up all notifications.

Analyses in this report were based on notification date, that is, the date on which the notification was received at the Communicable Diseases Section of the Department of Human Services. For some analyses of seasonal trends, notifications were reported by month of onset. Onset date may, however, not be the actual onset date of illness, because this may be uncertain or not recorded for many diseases. In those circumstances, onset date was calculated using the earliest date entered into the system. Population notification rates were calculated using the 2001 mid-year estimated resident population (ERP) obtained from the ABS.

Notifications were counted in the Victorian dataset if the postcode of residence of the diagnosing doctor was in Victoria. Given that postcodes of residence of the case and doctor do not necessarily reflect the place of acquisition of infection, regional rates should be interpreted with caution. This is particularly important in small areas where the actual numbers reported may be too small for rates to be meaningful.

The department had nine health regions in Victoria in the reporting period, four in metropolitan Melbourne and five in regional areas. Each region comprises LGAs, and notifications are geocoded to LGAs by postcode and then allocated to a region. The denominators for regional rates were the 2001 mid-year ERP population from the ABS for the combined LGAs.

Changes occurred in the number of notifications reported in previous annual reports for some diseases, due to the ongoing maintenance and update of notification datasets as new information became available, or as errors were detected through data cleaning processes. In addition, the Communicable Diseases Network Australia, in collaboration with states and territories, revised the surveillance case definitions for nationally notifiable diseases in Australia, therefore, some changes in total notifications may reflect a more sensitive or specific case definition.

## Avoidable mortality

The analysis is based on mortality and population data for 1997–2003 supplied by the ABS for Victoria using ICD-10 coding. Mortality rates in LGAs in Victoria between 1997 and 2003 were age-standardised using the direct method, with Victoria's 2001 population as the reference. The statistical software package Stata (Version 9, College Station, Texas, USA) was used for all analyses.

The list of causes of avoidable mortality (AM) is presented in Table 4. Tobias and Jackson initially compiled this list and defined it using only ICD-9 codes (Tobias and Jackson, 2001). The appropriate groupings of ICD-10 codes were subsequently developed by the New South Wales Department of Health in *The health of the people of New South Wales, 2002*. We reviewed these codes to ensure that the codes in each category of disease and injury are mutually exclusive. All other causes of mortality under 75 years were assumed to be 'unavoidable mortality' (UM) for the purposes of this analysis.

Comparisons of total AM rates were made between the sexes over time (1997–2003) for Victoria as a whole. For the period between 1997 and 2003 comparisons of total AM and UM by sex were made between metropolitan and rural LGAs, between LGAs grouped into quintiles based on their Index of Relative Socio-economic Disadvantage (IRSED) score, and between LGAs grouped by categories of remoteness, based on their Accessibility/Remoteness Index of Australia (ARIA) score.

## References

- Cryer, C, Langley, JD, Jarvis, SN, et al, 2005, 'Injury outcomes indicators: the development of a validation tool', in *Injury Prevention*, Volume 11, pp. 53–7.
- Cryer, C, Langley, J, Stephenson, S, 2004, *Developing valid injury outcome indicators: a report for the New Zealand injury prevention strategy*, Injury Prevention Research Unit, Dunedin.
- DHS, 1999a, '*Victorian Burden of Disease Study: Morbidity*', Melbourne: Epidemiology Section, Department of Human Services.
- DHS, 1999b, '*Victorian Burden of Disease Study: Mortality*', Melbourne: Epidemiology Section, Department of Human Services.
- Eayres, D, Williams ES, 2004, 'Evaluation of methodologies for small area life expectancy estimation', in *Journal of Epidemiology and Community Health*, Volume 58, pp. 243-9.
- Harrison, JE, Steenkamp, M, 2002, 'Technical review and documentation of current NHPA injury indicators and data source', in *Injury Research and Statistics Series*, no 14, : AIHW catalogue no INJCAT 47, Adelaide.
- Mathers, C, Vos, T, Stevenson, C, 1999, '*The burden of disease and injury in Australia*'. Cat no PHE 17, Canberra Australian Institute of Health and Welfare.
- Mathers, CD, Vos, T, Lopez, AD, Salomon, J, Ezzati, M, 2001, '*National burden of disease studies: A practical guide. Edition 2.0. Global Program on Evidence for Health Policy*', Geneva: World Health Organization.
- Murray, CJM, Lopez, AD, 1996, *The global burden of disease: a comprehensive assessment of mortality and disability from diseases, injuries and risk factors in 1990 and projected to 2016*, Cambridge: Harvard University Press.
- Report of the NSW Chief Health Officer, 2002, *The health of the people of New South Wales*, Public Health Division, NSW Health Department.
- Tobias, M, Jackson, G, 2001, 'Avoidable mortality in New Zealand, 1981–97', in *Australian and New Zealand Journal of Public Health*, Volume 25, no 1, pp. 12–20.
- Toson, B, Baker A, 2003, *Life expectancy at birth: methodological options for small populations*. National Statistics Methodological Series No.33, Norwich: Office for National Statistics, UK.

**Table 1: Ambulatory care sensitive conditions and International Classification of Disease version 10–Australian Modification (ICD-10-AM) codes used**

Category	ICD-10 codes	Notes (ICD-10)
Influenza and pneumonia	J10 J11 J13 J14 J153 J154 J157 J159 J168 J181 J188	In any diagnosis field, excludes cases with secondary diagnosis of D57, and people under two months
Other vaccine preventable	A35 A36 A37 A80 B05 B06 B161 B169 B180 B181 B26 G000 M014	In any diagnosis field
Asthma	J45 J46	Principal diagnosis only
Congestive heart failure	I50 I110 J81	Principal diagnosis only, exclude cases with procedure codes according to attached list
Diabetes complications	E101 E102 E103 E104 E105 E106 E107 E108 E110 E111 E112 E113 E114 E115 E116 E117 E118 E130 E131 E132 E133 E134 E135 E136 E137 E138 E140 E141 E142 E143 E144 E145 E146 E147 E148	In any diagnosis field
Chronic obstructive pulmonary disease	J20 J41 J42 J43 J44 J47	Principal diagnosis only, J20 only with diag2 of J41 J42 J43 J47 J44
Angina	I20 I240 I248 I249	Principal diagnosis only, exclude cases with procedure codes in block 1 to 1819
Iron deficiency anaemia	D501 D508 D509	Principal diagnosis only
Hypertension	I10 I119	Principal diagnosis only, exclude cases with procedure codes according to attached list
Nutritional deficiencies	E40 E41 E42 E43 E550 E643	Principal diagnosis only
Dehydration and gastroenteritis	E86 K522 K528 K529	Principal diagnosis only
Pyelonephritis	N390 N10 N12 N11 N136	Principal diagnosis only
Perforated/bleeding ulcer	K250 K251 K252 K254 K255 K256 K260 K261 K262 K264 K265 K266 K270 K271 K272 K274 K275 K276 K280 K281 K282 K284 K285 K286	Principal diagnosis only
Cellulitis	L03 L04 L08 L980 L88 L983	Principal diagnosis only, exclude cases with procedure codes in block 1 to 1819, OR if procedure is 30216-02 30676-00 30223-02 30064-00 34527-01 34527-00 90661-00 and this is the only listed procedure
Pelvic inflammatory disease	N70 N73 N74	Principal diagnosis only
Ear, nose and throat infections	H66 H67 J02 J03 J06 J312	Principal diagnosis only
Dental conditions	K02 K03 K04 K05 K06 K08 K098 K099 K12 K13	Principal diagnosis only
Convulsions and epilepsy	O15 G40 G41 R56	Principal diagnosis only
Gangrene	R02	In any diagnosis field

**Procedure codes to use for exclusions for congestive heart failure and hypertension:**

33172-00	35304-00	35305-00	35310-02	35310-00	38281-11
38281-07	38278-01	38278-00	38281-02	38281-01	38281-00
38256-00	38278-03	38284-00	38284-02	38521-09	38270-01
38456-19	38456-15	38456-12	38456-11	38456-10	38456-07
38456-01	38470-00	38475-00	38480-02	38480-01	38480-00
38488-06	38488-04	38489-04	38488-02	38489-03	38487-00
38489-02	38488-00	38489-00	38490-00	38493-00	38497-04
38497-03	38497-02	38497-01	38497-00	38500-00	38503-00
38505-00	38521-04	38606-00	38612-00	38615-00	38653-00
38700-02	38700-00	38739-00	38742-02	38742-00	38745-00
38751-02	38751-00	38757-02	38757-01	38757-00	90204-00
90205-00	90219-00	90224-00			

**Table 2: National Health Priority Areas Conditions and International Classification of Diseases (ICD) codes used**

<b>National health priority areas</b>	<b>ICD-9 codes (1993–94 to 2000–01)</b>	<b>ICD-10-AM codes (2001–02 to 2005–06)</b>
Heart, stroke and vascular health	Diagnosis codes 390.0–459.9 <ul style="list-style-type: none"> <li>• Ischaemic heart disease 410.0–414.9</li> <li>• Stroke 430.0–438.9</li> <li>• Peripheral vascular disease 441.0–444.9</li> </ul>	Diagnosis codes G45, G46, I00–I99 <ul style="list-style-type: none"> <li>• Ischaemic heart disease I20–I25</li> <li>• Stroke G45, G46 and I60–I69</li> <li>• Peripheral vascular disease I71–I74</li> </ul>
Diabetes mellitus	Diagnosis codes 250.0–250.9	Diagnosis codes E09–E14
Asthma	Diagnosis codes 493.0–493.9	Diagnosis codes J45–J46
Arthritis and musculoskeletal conditions	Diagnosis codes <ul style="list-style-type: none"> <li>• Osteoarthritis 715.0–715.9</li> <li>• Rheumatoid arthritis 714.0–714.2, 714.31–714.33, 714.4–714.9</li> <li>• Osteoporosis 733.0</li> </ul>	Diagnosis codes <ul style="list-style-type: none"> <li>• Osteoarthritis M15–M19</li> <li>• Rheumatoid arthritis M05–M06</li> <li>• Osteoporosis M80–M82</li> </ul>
Cancer	NA	Diagnosis codes C00–D48
Injuries and poisoning <sup>1</sup>	NA	Diagnosis codes S00–T98
Mental health	NA	Diagnosis codes F00–F99

1. See table 3 for a separate summary of the ICD codes used for the individual injury indicators reported.

**Table 3: Summary of Injury Indicators and International Classification of Diseases (ICD) codes used**

Injury Indicator	ICD-9 / ICD-10 codes	Notes
Injury and poisoning (all causes <sup>2</sup> ): deaths	An ICD-9 cause of death code in the range 800-928, 930-958, 960-968, 970-978 or 990-998, or an ICD-10 cause of death code in the range V00-Y84.	Excludes deaths, transfers and records without injury as a primary diagnosis. Deaths resulting from medical causes (adverse events and medical misadventure) were then excluded (an ICD-9 external cause code in the range 870-879 or an ICD-10 code in the range Y40-Y84).
Injury and poisoning (all causes <sup>1</sup> ): hospital admissions	An ICD-9 primary injury or poisoning diagnosis codes in the range 800-904, 910-999 or an ICD-10 primary injury or poisoning diagnosis code in the range S00-T89.	Deaths and transfers within and between hospitals were excluded. Admissions resulting from medical causes (an ICD-9 cause code in the range 870-879 or an ICD-10 cause code in the range Y40-Y84) and same-day records were excluded.
Unintentional injury and poisoning (all causes <sup>1</sup> ): deaths	Deaths with an ICD-9 cause of death code in the range 800-928, 930-950 or an ICD-10 code in the range V00-X59.	
Unintentional injury and poisoning (all causes <sup>1</sup> ): hospital admissions	An ICD-9 injury or poisoning diagnosis code in the range 800-904, 910-999 or an ICD-10 diagnosis code in the range S00-T89 where the cause of injury was unintentional.	Deaths and transfers within and between hospitals were excluded. Same-day records were excluded.
Intentional self-harm: deaths	Deaths with an ICD-9 cause of death code in the range 950-959 or an ICD-10 cause of death code in the range X60-X84	
Intentional self-harm: hospital admissions	An ICD-9 injury or poisoning diagnosis code in the range 800-904, 910-999 or an ICD-10 diagnosis code in the range S00-T89 if the cause of injury was intentional self-harm.	Excludes deaths, transfers and records without injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded. Same-day records were excluded.
Assaultive injury: deaths	Deaths with an ICD-9 cause of death code in the range 960-969 or an ICD-10 code in the range X85-Y09	
Assaultive injury: hospital admissions	An ICD-9 injury or poisoning diagnosis code in the range 800-904, 910-999 or an ICD-10 diagnosis code in the range S00-T89 if the cause of injury was assaultive.	Excludes deaths, transfers and records without injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded. Same-day records were excluded.
Unintentional motor vehicle traffic injury: deaths	An ICD-9 cause of death code in the range 810-819 (.0-.3, .7) or an ICD-10 cause of death code in the range V02-V04 (.1-.9), V09.2, V20-V28 (.3-.9), or V29 (.4-.9), V40-V49 (.4-.9).	All motor vehicle traffic includes car occupants, motorcyclists and pedestrians injured in motor vehicle incidents. Codes include only motor vehicle traffic deaths of car occupants, motorcyclists and pedestrians.
Unintentional motor vehicle traffic injury: hospital admissions	An ICD-9 first external cause code in the range 810-819 (.0-.3,.7) or an ICD-10 first external cause code in the range V02-V04 (.1,.9), V09.2, V20-V28 (.3-.9), or V29 (.4-.9), V40-V49 (.4-.9).	All motor vehicle traffic includes car occupants, motorcyclists and pedestrians injured in motor vehicle incidents. Codes include only motor vehicle traffic deaths of car occupants, motorcyclists and pedestrians. Deaths and transfers within and between hospitals were excluded. Same-day records were also excluded.

2. All causes excludes deaths, transfers and records without injury as a primary diagnosis.

**Table 3: Summary of Injury Indicators and International Classification of Diseases (ICD) codes used (continued)**

Injury Indicator	ICD-9 / ICD-10 codes	Notes
Poisoning (all intents)	An ICD-9 first external cause diagnosis code in the range 850–858, 950–959, 962–962.9, 980–982.9 or an ICD-10 first external cause code in the range X40–X49, X60–X69, X85–X90, Y10–Y19.	All intents poisoning excludes deaths, transfers and records missing injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded. Same-day records were also excluded.
Poisoning in 0–4 year olds	An ICD-9 first external cause diagnosis code in the range 850–858, 950–959, 962–962.9, 980–982.9 or an ICD-10 first external diagnosis cause code in the range X40–X49, X60–X69, X85–X90, Y10–Y19 if the person was aged between 0–4 years.	All intents poisoning excludes deaths, transfers and records missing injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded. Same-day records were also excluded.
Unintentional injury-related forearm and wrist fracture	An ICD-9 injury diagnosis code in the range 813–814 or an ICD-10 diagnosis code in the range S52.0–S52.9, S62.0–S62.1 if the injury was unintentional.	All forearm and wrist fractures excludes deaths, transfers and records missing injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded.
Unintentional hip fracture among persons aged 65–74 years	An ICD-9 injury diagnosis code in the range 820–820.9 or an ICD-10 injury diagnosis code in the range S72.0–S72.2 if the cause of injury was unintentional and the person was aged between 65–74 years.	All hip fractures excludes deaths, transfers and records missing injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded.
Unintentional hip fracture in persons aged 75 years and over	An ICD-9 injury diagnosis code in the range 820–820.9 or an ICD-10 injury diagnosis code in the range S72.0–S72.2 if the cause of injury was unintentional and the person aged 75 years and over.	All hip fractures excludes deaths, transfers and records missing injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded.
Unintentional glass cutting and piercing injury	An ICD-10 first external-cause diagnosis code of W25. There is no equivalent code in ICD-9.	Glass related injuries excludes deaths, transfers and records missing injury as a primary diagnosis. Deaths and transfers within and between hospitals were excluded. Same-day records were excluded.

**Table 4: Avoidable mortality conditions and International Classification of Diseases version 10–Australian Modification (ICD-10-AM) codes used**

Potentially avoidable condition	ICD-10 codes	Conditions involved
Enteritis and other diarrhoeal diseases	A00–A09	Diarrhoeal diseases
Tuberculosis	A15–A19, B90	Tuberculosis
Immunisation-preventable diseases	A33, A35–A37, A80, B05–B06, P35.0, A49.2, G00.0	Diphtheria, whooping cough, tetanus, polio, Hib, measles, rubella
HIV/AIDS	B20–B24	HIV/AIDS
Hepatitis and liver cancer	B15–B19, C22.0, C22.1, C22.9	Hepatitis A, B, C, D, E, primary liver cancer
Sexually transmitted diseases (STDs)	A50–A64, N34.1, N70.0, N70.9, N71.0, N71.1, N72, N73.0–N73.5, N73.8, N75.0, N75.1, N76.0, N76.2, N76.4, N76.6, N76.8, N77.0, N77.1, N77.8, O00, R59.1	Syphilis, gonorrhoea and other STDs, ectopic pregnancy
Skin cancers	C00, C43–C44	Lip, melanoma, other skin cancer
Colorectal cancer	C18–C21	Colorectal cancer
Oral cancers	C02–C06, C09–C10, C12–C14, C32	Malignant neoplasm mouth, pharynx, larynx
Lung cancers	C33–C34	Malignant neoplasm, trachea, bronchus, lung
Breast cancer	C50	Breast cancer
Nutrition	D50–53, E40–E46, E50–E56, E63–E64	Nutritional deficits including anaemia
Alcohol related conditions	F10, I42.6, K29.2, K70	Psychosis, alcoholism, cardiac, gastric or liver damage due to alcohol
Chronic obstructive respiratory diseases	J40–J44	Chronic bronchitis and emphysema
Ischaemic heart disease	I20–I22, I24, I25.1–I25.9	Ischaemic heart disease
Stroke	I61, I62.0, I63.0–I63.5, I63.8–I63.9, I64–I66, I67.8	Intracerebral haemorrhage or occlusion
Neural tube defects	Q00–Q07	Congenital anomalies of brain and spinal cord
Low birth weight babies	P05–P07, P22, P27	Prematurity, low birth weight, respiratory disease from prematurity
Sudden infant death syndrome (SIDS)	R95	SIDS

**Table 4: Avoidable mortality conditions and International Classification of Disease version 10–Australian Modification (ICD-10-AM) codes used (continued)**

Potentially avoidable condition	ICD-10 codes	Conditions involved
Road traffic injury	V01.1, V02.1, V03.1, V04.1, V05.1, V06.1, V09.2, V09.3, V10.4, V10.5, V10.9, V11.4, V11.5, V11.9, V12.4, V12.5, V12.9, V13.4, V13.5, V13.9, V14.4, V14.5, V14.9, V15.4, V15.5, V15.9, V16.4, V16.5, V16.9, V17.4, V17.5, V17.9, V18.4, V18.5, V18.9, V19.4, V19.5, V19.6, V19.9, V20.4, V20.5, V20.9, V21.4, V21.5, V21.9, V22.4, V22.5, V22.9, V23.4, V23.5, V23.9, V24.4, V24.5, V24.9, V25.4, V25.5, V25.9, V26.4, V26.5, V26.9, V27.4, V27.5, V27.9, V28.4, V28.5, V28.9, V29.4, V29.5, V29.6, V29.9, V30.5, V30.6, V30.7, V30.9, V31.5, V31.6, V31.7, V31.9, V32.5, V32.6, V32.7, V32.9, V33.5, V33.6, V33.7, V33.9, V34.5, V34.6, V34.7, V34.9, V35.5, V35.6, V35.7, V35.9, V36.5, V36.6, V36.7, V36.9, V37.5, V37.6, V37.7, V37.9, V38.5, V38.6, V38.7, V38.9, V39.4, V39.5, V39.6, V39.9, V40.5, V40.6, V40.7, V40.9, V41.5, V41.6, V41.7, V41.9, V42.5, V42.6, V42.7, V42.9, V43.5, V43.6, V43.7, V43.9, V44.5, V44.6, V44.7, V44.9, V45.5, V45.6, V45.7, V45.9, V46.5, V46.6, V46.7, V46.9, V47.5, V47.6, V47.7, V47.9, V48.5, V48.6, V48.7, V48.9, V49.4, V49.5, V49.6, V49.9, V50.5, V50.6, V50.7, V50.9, V51.5, V51.6, V51.7, V51.9, V52.5, V52.6, V52.7, V52.9, V53.5, V53.6, V53.7, V53.9, V54.5, V54.6, V54.7, V54.9, V55.5, V55.6, V55.7, V55.9, V56.5, V56.6, V56.7, V56.9, V57.5, V57.6, V57.7, V57.9, V58.5, V58.6, V58.7, V58.9, V59.4, V59.5, V59.6, V59.9, V60.5, V60.6, V60.7, V60.9, V61.5, V61.6, V61.7, V61.9, V62.5, V62.6, V62.7, V62.9, V63.5, V63.6, V63.7, V63.9, V64.5, V64.6, V64.7, V64.9, V65.5, V65.6, V65.7, V65.9, V66.5, V66.6, V66.7, V66.9, V67.5, V67.6, V67.7, V67.9, V68.5, V68.6, V68.7, V68.9, V69.4, V69.5, V69.6, V69.9, V70.5, V70.6, V70.7, V70.9, V71.5, V71.6, V71.7, V71.9, V72.5, V72.6, V72.7, V72.9, V73.5, V73.6, V73.7, V73.9, V74.5, V74.6, V74.7, V74.9, V75.5, V75.6, V75.7, V75.9, V76.5, V76.6, V76.7, V76.9, V77.5, V77.6, V77.7, V77.9, V78.5, V78.6, V78.7, V78.9, V79.4, V79.5, V79.6, V79.9, V80.0, V80.1, V80.2, V80.3, V80.4, V80.5, V80.6, V80.7, V80.8, V80.9, V81.1, V82.1, V82.9, V83.0, V83.1, V83.2, V83.3, V84.0, V84.1, V84.2, V84.3, V85.0, V85.1, V85.2, V85.3, V86.0, V86.1, V86.2, V86.3, V87.0, V87.1, V87.2, V87.3, V87.4, V87.5, V87.6, V87.7, V87.8, V87.9, V89.2, V89.3	Road traffic injury
Poisoning	X40–X49	Poisoning
Swimming pool injury	W16, W67, W68	Swimming pool falls and drowning
Sport injury	W01.30, W02, W03.30, W09, W21, X50	Falls from playground equipment, sport injury
Fire	X00–X09	Burns and scalds
Drowning	W65, W69, W70, W73, W74, Y21	Drowning
Suicide	X60–X84, Y87.0, Y10–Y34	Suicide

**Table 4: Avoidable mortality conditions and International Classification of Disease version 10–Australian Modification (ICD-10-AM) codes used (continued)**

Potentially avoidable condition	ICD-10 codes	Conditions involved
Other infections	A23–A26, A28.0, A28.2–A28.9, A30, A31, A32.9, A38, A39, A46, B50–B54, G00, G01, J02.0, P23, P35.1–P35.9, P36–P39	Brucellosis plus other zoonoses, streptococcus, malaria, meningitis, congenital
Cervical cancer	C53	Cervical cancer
Thyroid disease	E03.2, E03.8, E03.9, E04–E05, E89.0	Goitre, thyrotoxicosis, hypothyroidism
Newborn screening conditions	E03.1, E25, E70.0, E70.1, E74.2	Congenital hypothyroidism, CAH, PKU, galactosaemia
Diabetes	E10–E14	Diabetes
Epilepsy	G40–G41	Epilepsy
Ear infections	H65–H70	Otitis media and mastoiditis
Rheumatic fever/heart disease	I00–I09	Acute rheumatic fever, heart disease
Hypertensive disease	I10–I15, I67.4	Hypertensive disease
Respiratory infections	J00, J01.1–J01.2, J01.8–J01.9, J02–J06, J10, J11.0, J12–J15, J16.8, J17.0–J17.2, J17.8, J18.0, J18.8, J20–J22	Respiratory infections including pneumonia and influenza
Asthma	J45–J46	Asthma
Peptic ulcer	K25–K28	Gastric and duodenal ulcers
Pregnancy complications	O01–O08, O10–O99	Complications of pregnancy
Musculoskeletal infections	L01–L08, L98.0, M00, M01.1–M01.3, M01.5–M01.8, M02.1, M02.3, M03.2, M35.2, M46.2, M86, M87.1–M87.9, M89.6, M90.0–M90.2	Skin, bone and joint infections
Stomach cancer	C16	Stomach cancer
Cancer of uterus	C54, C55	Cancer of uterus
Cancer of testis	C62	Cancer of testis
Eye cancer	C69	Eye cancer
Thyroid cancer	C73	Thyroid cancer
Hodgkin's disease	C81	Hodgkin's disease
Leukaemia	C91.0–C91.3, C91.7, C91.9	Lymphoid leukaemias
Benign cancers	D10–D36	Benign and in situ cancers
Appendicitis	K35–K38	Appendicitis
Intestinal obstruction and hernia	K40–K46, K56	Intestinal obstruction and hernia
Gallbladder disease	K80–K83, K91.5	Gallbladder disease
Acute renal failure	N17	Acute renal failure
Congenital anomalies	Q10–Q23.3, Q23.8–Q23.9, Q24–Q28, Q35–Q84	Congenital cardiac, digestive, genito-urinary, musculoskeletal anomalies
Birth trauma and asphyxia	P10–P15, P20–P21, P50, P51, P95	Birth trauma and asphyxia
Other perinatal conditions	P08, P22, P22.1, P25, P26, P28, P52–P96	Respiratory disease, haemolytic disease, jaundice, etc
Iatrogenic conditions	Y60–Y84	Complications of treatment

