

Burden of disease in Western Australia: An Overview

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Introduction Disability Adjusted Life Years (DALYs) methodology was developed by the World Health Organisation to measure population burden of disease.¹ It consists of two additive components – mortality (Years of Life Lost, YLL) and disability (Years Lost due to Disability, YLD). This report provides DALY estimates for WA for the first time. Although the mortality component has been previously reported,² the quantification of the disability component has not. The disability component is a population-based measure that provides a more holistic account of non-fatal outcomes than other measures such as hospital data. Derived from epidemiological data, the disability component is free from the bias such as accessibility, availability or variations in admission practices found with hospital data.

The estimated burden of disease and injury in WA for the year 2000 was 117,048 DALYs among males and 105,703 among women. The crude rate of disease burden for WA in 2000 was 118 DALYs per 1,000 population. Standardised to allow comparison with Australian data, the disease burden in WA in 2000 is lower than that reported for Australia (122 DALYs per 1,000 population compared to 137 DALYs per 1,000 population) for 1996³.

Disease and injury burden for major disease groups

Cancers, cardiovascular disease and mental disorders accounted for more than half of the burden in both genders in 2000. Among males, injuries contributed 13% of the burden in comparison to 6% among females. Neurological conditions contributed 13% of the burden among females and only 9% among males. Musculoskeletal disorders accounted for 5% of the female burden, but only 3% of the male burden (Figure 1).

Figure 1: Burden by major disease groups and gender

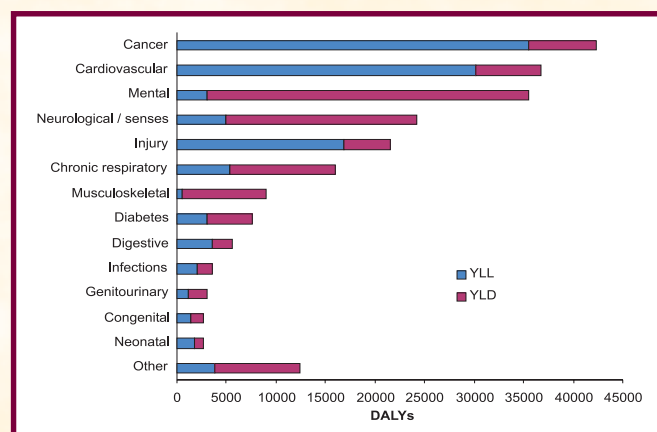
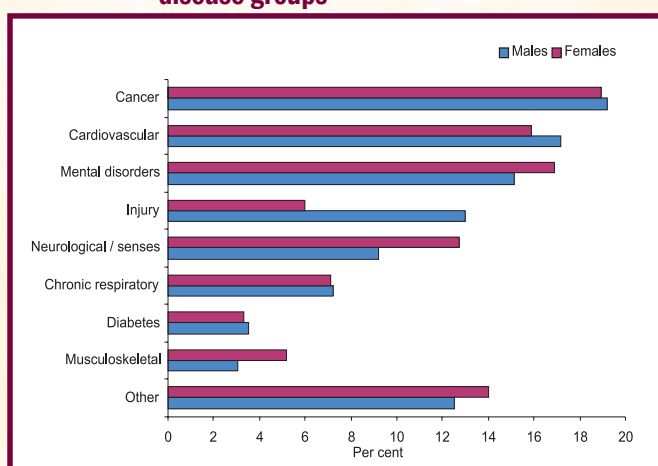


Figure 2: Mortality and disability burden by major disease groups



Mortality and disability burden for major disease groups

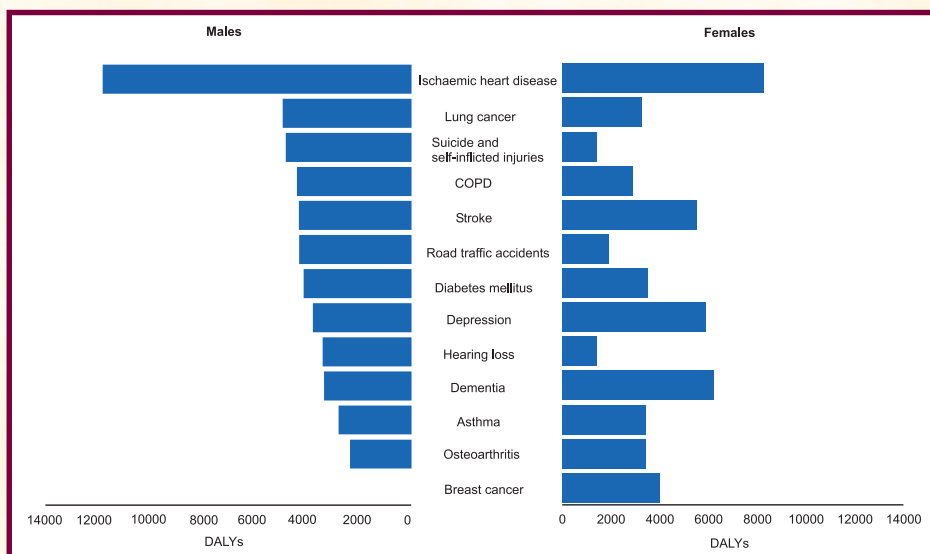
Ranking the total disease burden (DALYs) by major disease groups produces a different picture to disease ranking based on mortality burden (YLL) alone.² Cancer and cardiovascular disease are still the leading causes of total burden, with the majority of the burden being accounted for by mortality. Mental disorders and nervous system disorders are ranked next, but with the majority of the burden due to disability. Injuries, with a high proportion of burden attributed to mortality, ranked below nervous system disorders. The high ranking of mental and nervous system disorders in terms of DALYs demonstrates the importance of including disability in summary health measures (Figure 2).

Key findings

- Cancer and cardiovascular disease are the largest contributors to disease burden in the WA population.
- The contribution of the disability burden of mental health disorders, neurological and sense organ disorders, chronic respiratory disease and musculoskeletal disorders to the overall burden stress the importance of deriving summary health measures which include non-fatal outcomes.



Figure 3: Leading specific causes of disease burden (DALYs) by gender



Apart from ischaemic heart disease, which was the leading cause of burden among both genders in Western Australia in 2000, the leading causes of burden differed between the genders. Among males, smoking-related diseases (lung cancer and chronic obstructive pulmonary disease (COPD)) and injuries (suicide and self-inflicted

injury, road traffic accidents) were major contributors to burden. Mental disorders (dementias and depressions) as well as breast cancer accounted for a major proportion of the burden among females. Stroke and diabetes ranked highly among both genders (Figure 3). The results of gender analysis are reported elsewhere.

Table 1: Ten leading causes

Western Australia 2000	% DALYs	Australia 1996 ³	% DALYs
Ischaemic heart disease	9.0	Ischaemic heart disease	12.4
Stroke	4.4	Stroke	5.4
Depression	4.3	Chronic obstructive pulmonary disease	3.7
Dementia	4.3	Depression	3.7
Lung cancer	3.7	Lung cancer	3.6
Diabetes mellitus	3.4	Dementia	3.5
Chronic obstructive pulmonary disease	3.3	Diabetes mellitus	3.0
Suicide and self-inflicted injuries	2.8	Colorectal cancer	3.7
Road traffic accidents	2.8	Asthma	2.6
Asthma	2.8	Osteoarthritis	2.2

The leading causes of disease burden in the WA population during 2000 were similar to those of Australia in 1996.³ Although ischaemic heart disease and stroke were the two leading causes in both WA and Australia, the proportion of burden attributed to both conditions in WA in 2000 was lower than for Australia in 1996. Decreasing death rates during this period for cardiovascular disease and the changes to cause of death coding after 1997 may explain this difference. A higher proportion of total burden was attributed to dementia,

particularly among females, in WA in 2000 than Australia in 1996. The burden for depression in WA was derived from population change alone and the younger age-structure of the WA population may have caused a higher proportion of the total burden to be attributed to this condition than for Australia in general. The younger age-structure of the WA population may also explain ranking of suicide and road traffic accidents in the leading 10 causes in WA, but not in Australia, and the prominence of colorectal cancer for Australia in general (Table 1).

Key findings

- Ischaemic heart disease was the leading specific cause of disease burden in WA for 2000 for both sexes.
- The leading causes of burden among males reflected life-style-related diseases, whilst the leading causes among females included mental disorders and breast cancer in addition to life-style-related diseases.

The development of a broad measure of disease burden for the Western Australian population is a valuable tool for health promotion advocates, strategic planners and health service managers within the Western Australian health system. Not only does burden of disease information assist in assessing cost-effectiveness of public health interventions, but also has implications for decision-making in resource allocation and priority setting. Priorities should be assessed on the basis of burden of disease in conjunction with knowledge of current health services and public health interventions rather than in isolation.

Further bulletins in this series report on the disaggregation of disability-adjusted life years into specific diseases,⁴ age groups,⁵ attribution of burden to modifiable risk factors,^{6,7} and projected burden.⁸ The quantification of the burden attributable to major risk factors helps to identify the potential for health gains achievable through planned interventions. Modelling the likely impact on the health care system of changes in risk-factor prevalence by applying different risk-factor profile scenarios to burden of disease data will assist in the identification of target populations and the assessment of interventions for the best return on investment. With these qualities, burden of disease data is a valuable tool in supporting policy formulation and setting priorities in purchasing health services.

While this current series of bulletins utilises estimates of disability largely derived from Australian estimates,⁹ future work will draw on data from the WA Health Surveillance System and the WA Data Linkage System to improve local estimates. Other studies will also extend the description of disease burden to Aboriginal people and regional WA.

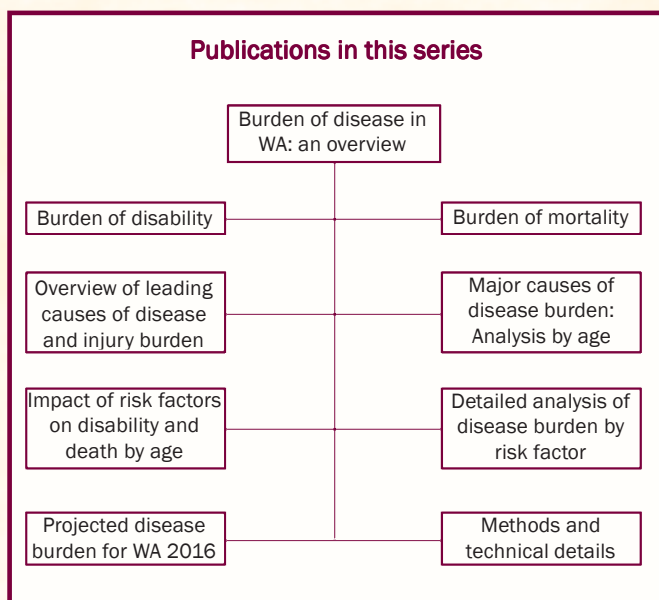
Implications

- Strategies and programs should reflect disability and mortality components of the disease burden when establishing relative priorities for resource allocation.
- Improved quality of life could be achieved through enhanced primary, secondary and tertiary interventions for conditions such as mental, neurological and musculoskeletal disorders that have a high disability burden.
- Currently, the Burden of Disease model does not address equity issues other than gender. Potential for inequity due to other factors such as Aboriginality, ethnicity and socioeconomic status should be considered when formulating policies that address differences in disease burden.
- The strong link between physical and mental illness indicates broad opportunities for general health gain through promoting mental health.¹¹

SYNOPSIS OF GENERAL METHOD TO ESTIMATE BURDEN OF DISEASE AND INJURY

- Total burden of disease (disability-adjusted life years or DALY) is the summation of the burden from mortality (years of life lost or YLL) and the burden from disability (years lost to disability or YLD), thus: -

$$DALY = YLL + YLD$$
- For both YLL and YLD, ICD disease codes have been divided into some 184 specific disease groupings (e.g. Ischaemic heart disease), which can be aggregated into more general disease groupings (e.g. Cardiovascular disease).
- YLL are calculated directly from mortality data, by disease group, 5-year age-group and gender.²
- YLD are calculated from a range of diverse data, by disease group, 5-year age-group and gender. In this analysis, YLD data for WA were extrapolated from Australian data.¹⁰
- For further details of the method used to estimate DALYs for Western Australia in 2000, refer to the supplementary technical report.⁹



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