



Contribution of risk factors to disease burden in Western Australia, 2011

Introduction and overview

This fact sheet is the fourth in a series that expands upon Western Australian findings from the *Australian Burden of Disease Study (ABDS) 2011* presented in the Australian Institute of Health and Welfare (AIHW) report, *Impact and Causes of Illness and Deaths in Australia, 2011*.¹ It draws primarily on unpublished Western Australian data from the ABDS 2011 supplied by the AIHW, and should be read in conjunction with the *Overview of Burden of Disease in Western Australia 2011*,² *Specific Disease Burden in Western Australia, 2011*,³ and *Burden of Disease by Age Group in Western Australia, 2011*.⁴

This fact sheet presents the leading risk factors contributing to WA's disease burden in 2011. A risk factor is any determinant that causes or increases the likelihood of one or more diseases or injuries.

A total of 29 risk factors were examined in the 2011 analysis (Figure 1).¹ Combined they were estimated to be responsible for 31.0% of the total burden of disease and injury in WA in 2011. The dietary risk factors combined were estimated to be responsible for 6.9% of the total WA burden.⁵ In Australia, the risk factors combined were estimated at 31.5% of the total burden and the combined dietary risk factors accounted for around 7.2% of the disease burden.⁶ See the text box on the following pages on 'Why risk factor estimates cannot be added together'.

Suggested citation

Epidemiology Branch, Public and Aboriginal Health Division, Western Australia Department of Health 2017. Contribution of risk factors to disease burden in Western Australia, 2011. Perth: Department of Health.

Data source

Australian Burden of Disease Study 2011: unpublished data supplied by the Australian Institute of Health and Welfare.

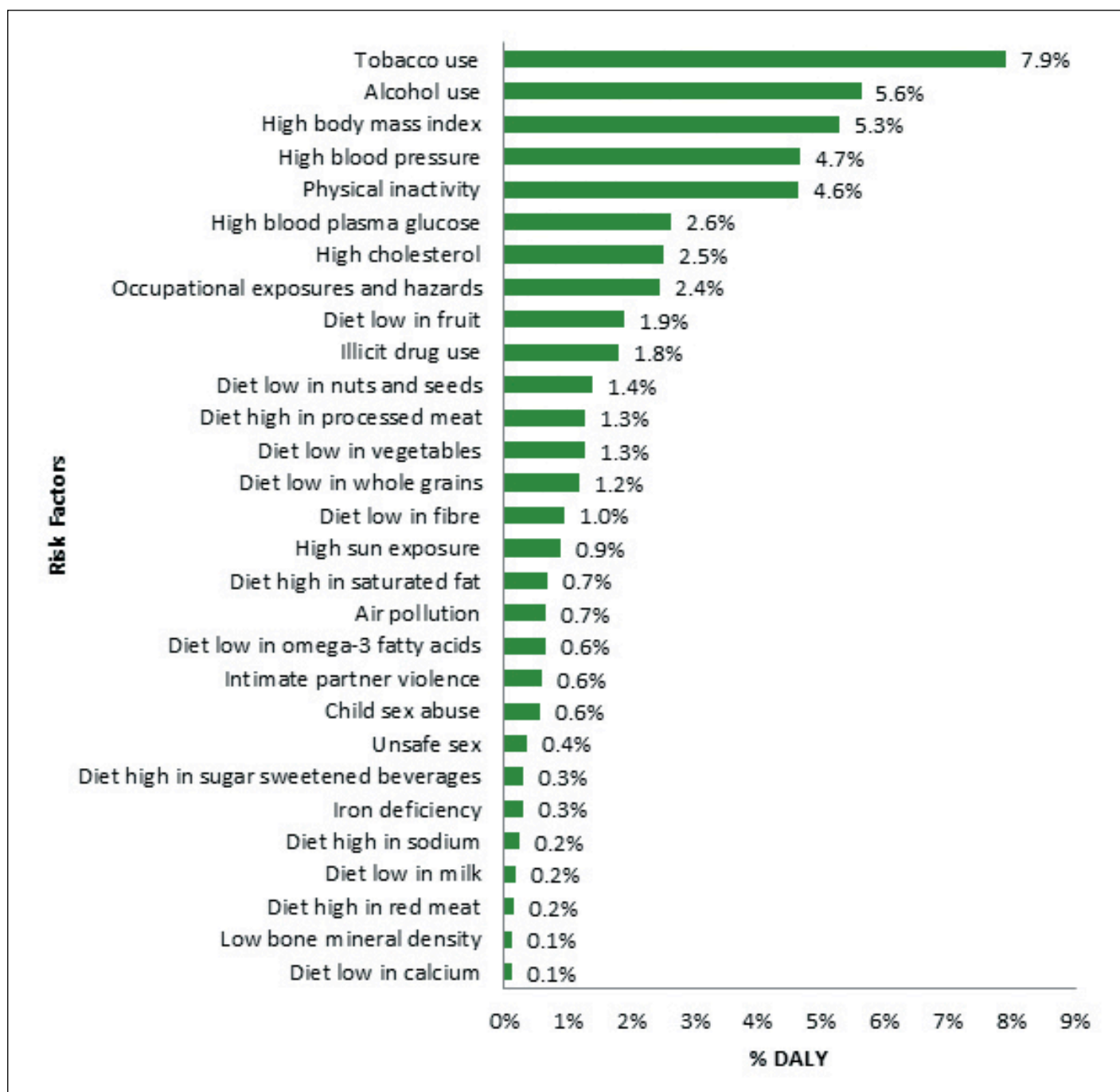
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ww2.health.wa.gov.au/Articles/N_R/Population-health-statistics

Contact us

At epi@health.wa.gov.au for any enquiries, feedback, or similar information on other risk factors, diseases and injuries.

Figure 1: Proportion (%) of total Disability Adjusted Life Years (DALY) in WA in 2011 attributable to the 29 risk factors



The five leading individual risk factors in WA in 2011 were tobacco use (7.9%), alcohol use (5.6%), high body mass index (5.3%), high blood pressure (4.7%), and physical inactivity (4.6%).

Whilst these leading risk factors in WA and Australia were the same, their order and contribution varied slightly. Australia-wide the leading individual risk factors were tobacco use (9.0%), high body mass index (5.5%), alcohol use (5.1%), physical inactivity (5.0%) and high blood pressure (4.9%).

Though tobacco use was also the leading risk factor in Australia as a whole, it accounted for a larger proportion of the total burden in Australia (9.0%) compared to in WA (7.9%). The second leading risk factor in Australia was high body mass index (5.5%) whereas in WA, it was alcohol use (5.6%), which was ranked third in Australia.¹

Why risk factor estimates cannot be added together

As risk factors are analysed individually, we cannot add their estimates together due to the complex pathways and interactions between them.

For example, if the burden of diabetes attributed to both a diet high in sweetened beverages and high body mass were added together, the burden would exceed the total diabetes burden occurring in WA. This is because these risk factors are along the same causal pathway: high intake of sweetened beverages increases the risk of a high body mass index, which then in turn increases the risk of diabetes.¹

Key uses of risk factor analysis

A proportion of disease burden attributable to the risk factors in this fact sheet are potentially avoidable or modifiable, demonstrating the potential gain in health from public health interventions that aim to reduce risk factor prevalence.¹

This assists in making evidence-based decisions about where to specifically direct efforts to reduce risks.

Linked disease: The disease or injury for which there is evidence that the probability of its occurrence is increased from risk factor exposure at harmful levels.

Total DALY: The total DALY contributed by the linked disease.

Attributable DALY Number: Number of the linked disease DALY that are a result of risk factor exposure at harmful levels.

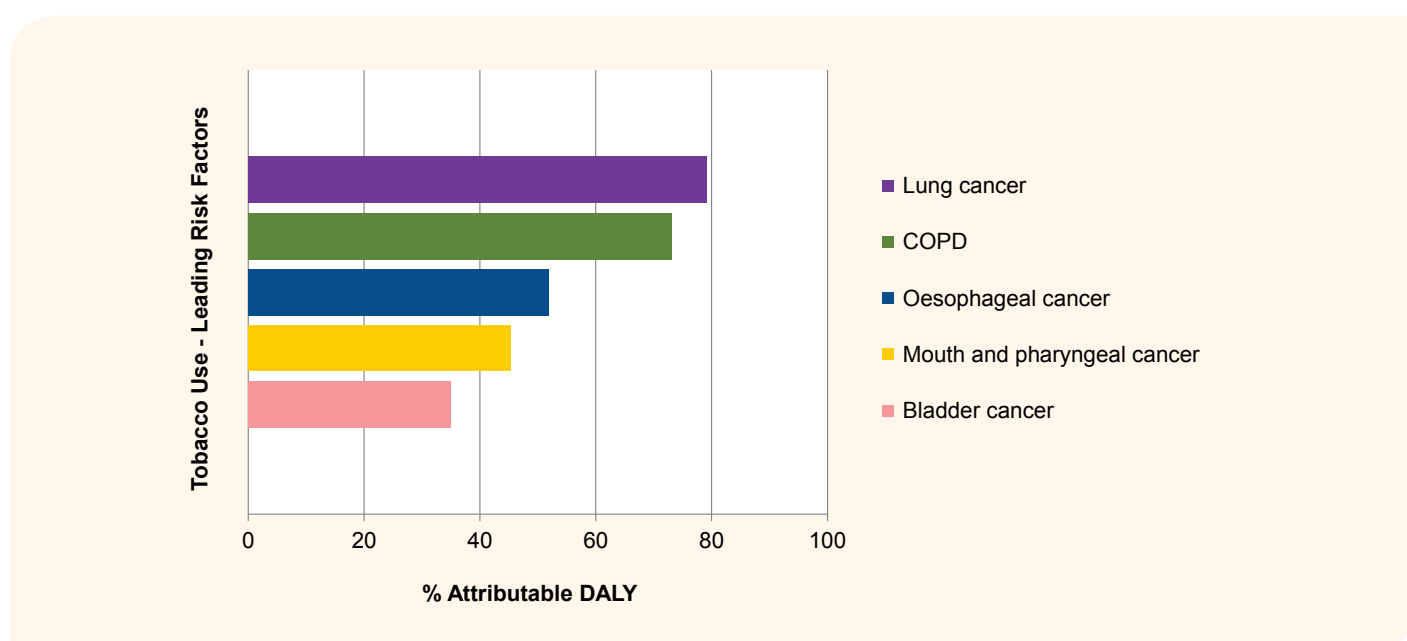
Attributable DALY Per Cent: Attributable DALY as a proportion of the total DALY for each linked disease.

Tobacco use

Table 1: Top five tobacco-linked diseases by attributable DALY in WA in 2011

Linked Disease	Total DALY	Attributable DALY	
	Number	Number	Per cent
Lung cancer	14152	11204	79.2
Chronic Obstructive Pulmonary Disease	13254	9688	73.1
Oesophageal cancer	2214	1146	51.8
Mouth and pharyngeal cancer	1947	883	45.3
Bladder cancer	1510	529	35.0

Figure 2: Top five tobacco-linked diseases by attributable DALY in WA in 2011



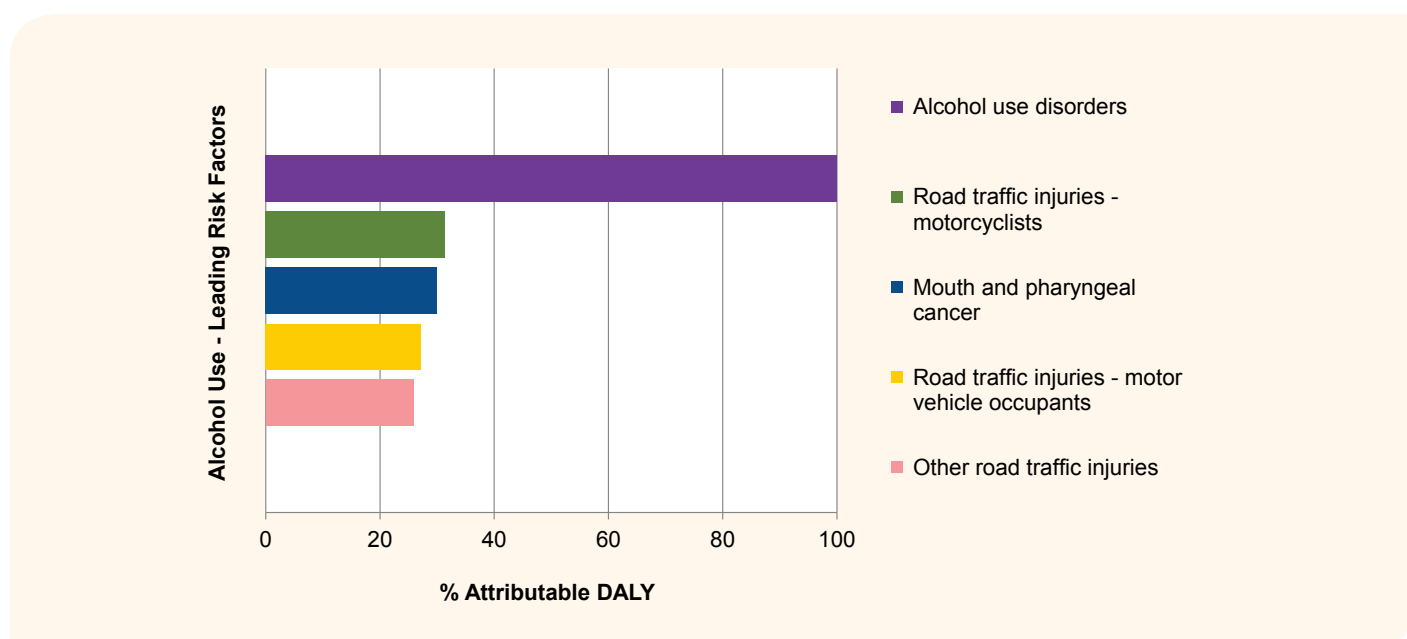
- Tobacco use was associated with 27 linked diseases.
- In 2011, tobacco use was responsible for 7.9% (34,437) of total DALY in WA.
- Tobacco was the largest quantifiable risk factor, contributing 2.3% more burden to the total than the next leading risk factor (alcohol).
- The burden attributable to tobacco included that from current smoking, past smoking, and exposure to second-hand smoke in the home.
- Tobacco use accounted for the majority of DALY attributed to several diseases such as lung cancer (79.2%), chronic obstructive pulmonary disease (73.1%), and oesophageal cancer (51.8%).

Alcohol use

Table 2: Top five alcohol-linked diseases by attributable DALY in WA in 2011

Linked Disease or Injury	Total DALY	Attributable DALY	
	Number	Number	Per cent
Alcohol use disorders	7859	7859	100.0
Road Traffic Injuries – motorcyclists	1588	498	31.4
Mouth and pharyngeal cancer	1947	585	30.0
Road Traffic Injuries – motor vehicle occupants	6489	1763	27.2
Other road traffic injuries	1384	358	25.9

Figure 3: Top five alcohol-linked diseases by attributable DALY in WA in 2011



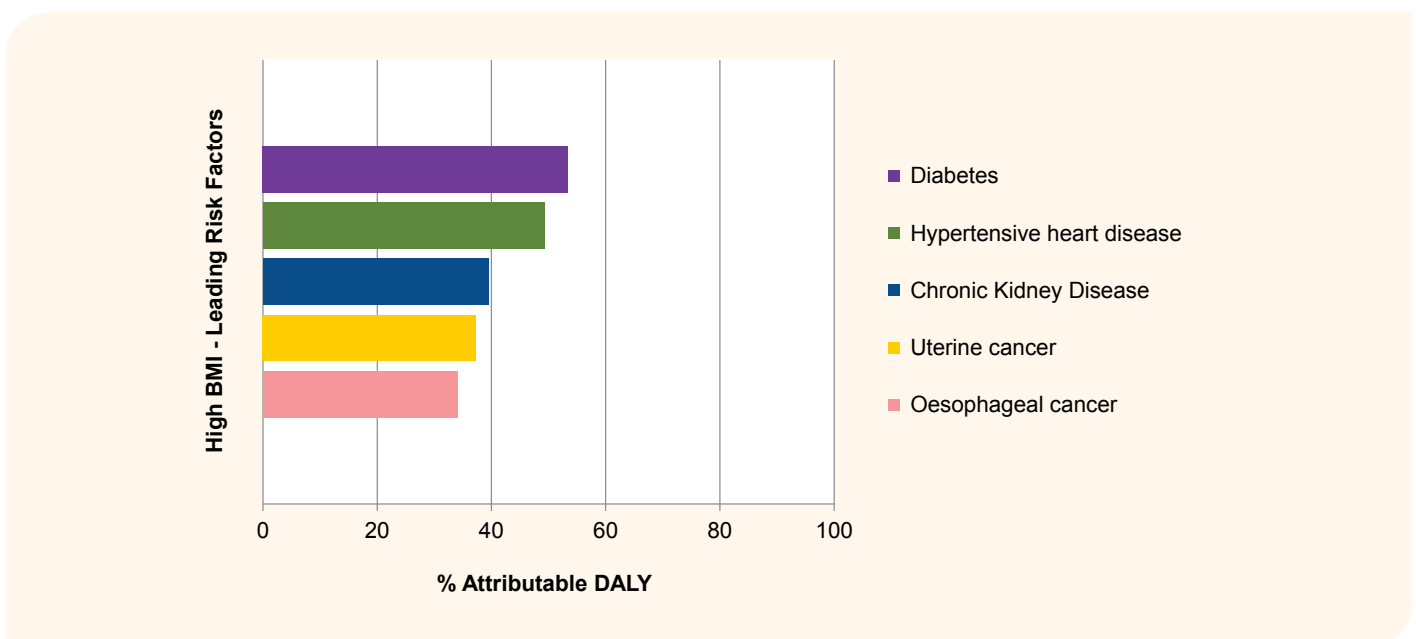
- The burden attributable to alcohol was estimated in people 15 years and over; and only alcohol-related harm is reported (not alcohol benefits).
- Alcohol use was associated with 27 linked diseases or injury causes.
- In 2011, alcohol use was responsible for 5.6% (24,465) of total DALY in WA.
- Attributable burden was both from single-occasion risk or binge drinking leading to injury; and an average daily consumption leading to mental health and chronic disease outcomes.
- Alcohol use contributed considerably to the individual DALY for a number of injuries including: road traffic injuries (motorcyclists) (31.4%), road traffic injuries (motor vehicle occupants) (27.2%), other road traffic injuries (25.9%), and other land transport injuries (24.7%).
- Alcohol use contributed totally to the burden of alcohol use disorders and approximately a quarter of the total burden for individual liver conditions, including chronic liver disease (24.0%) and liver cancer (23.2%).

High body mass index (BMI)

Table 3: Top five high BMI-linked diseases by attributable DALY in WA in 2011

Linked Disease	Total DALY	Attributable DALY	
	Number	Number	Per cent
Diabetes	10072	5375	53.4
Hypertensive heart disease	563	278	49.3
Chronic kidney disease	3743	1474	39.4
Uterine cancer	739	276	37.3
Oesophageal cancer	2214	755	34.1

Figure 4: Top five high BMI-linked diseases by attributable DALY in WA in 2011



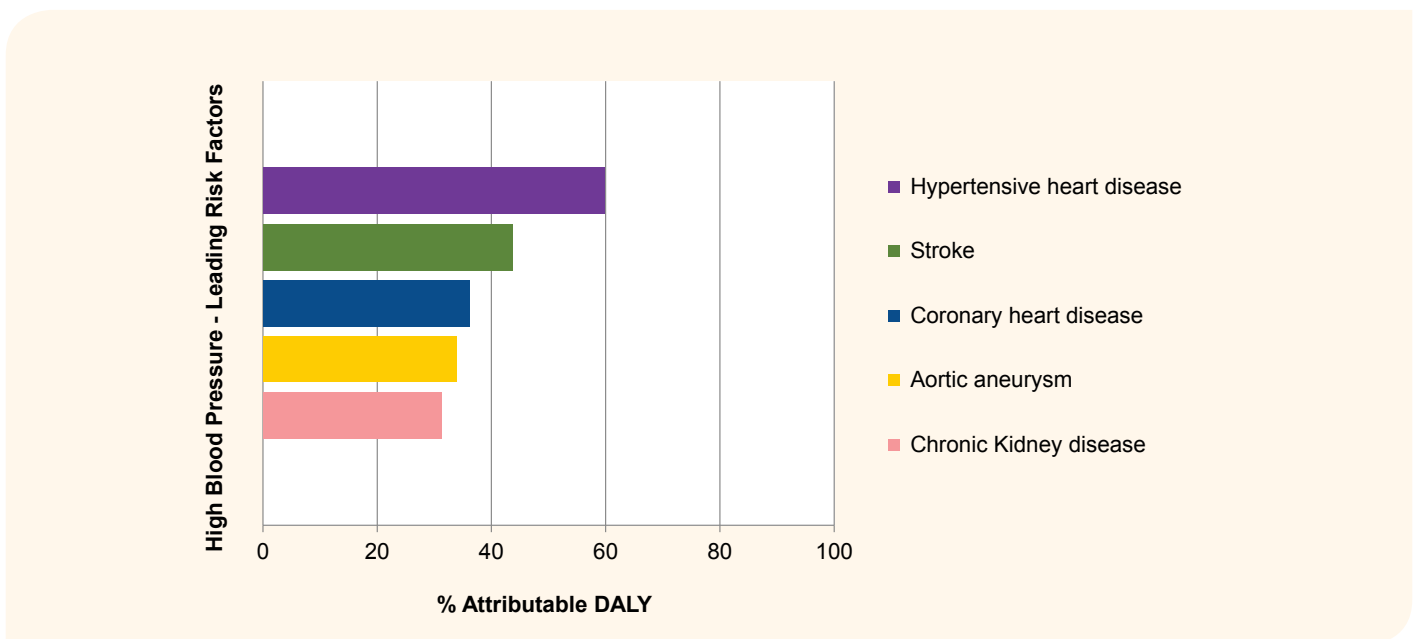
- Burden attributed to high BMI was only estimated in adults 25 years of age and over due to data limitations for younger age groups.
- High BMI was associated with 19 linked diseases.
- In 2011, high BMI was responsible for 5.3% (22,998) of total DALY in WA.
- Over half (53.4%) of the total DALY for diabetes and just under half (49.3%) of the total DALY for hypertensive heart disease were attributable to high BMI.
- High BMI also contributed considerably to the burden of chronic kidney disease (39.4%) and a number of cancers, including uterine (37.3%) and oesophageal cancer (34.1%).

High blood pressure

Table 4: Top five high blood pressure-linked diseases by attributable DALY in WA in 2011

Linked Disease	Total DALY	Attributable DALY	
	Number	Number	Per cent
Hypertensive heart disease	563	337	59.8
Stroke	10396	4528	43.6
Coronary heart disease	31282	11288	36.1
Aortic aneurysm	1202	407	33.9
Chronic kidney disease	3743	1169	31.2

Figure 5: Top five high blood pressure-linked diseases by attributable DALY in WA in 2011



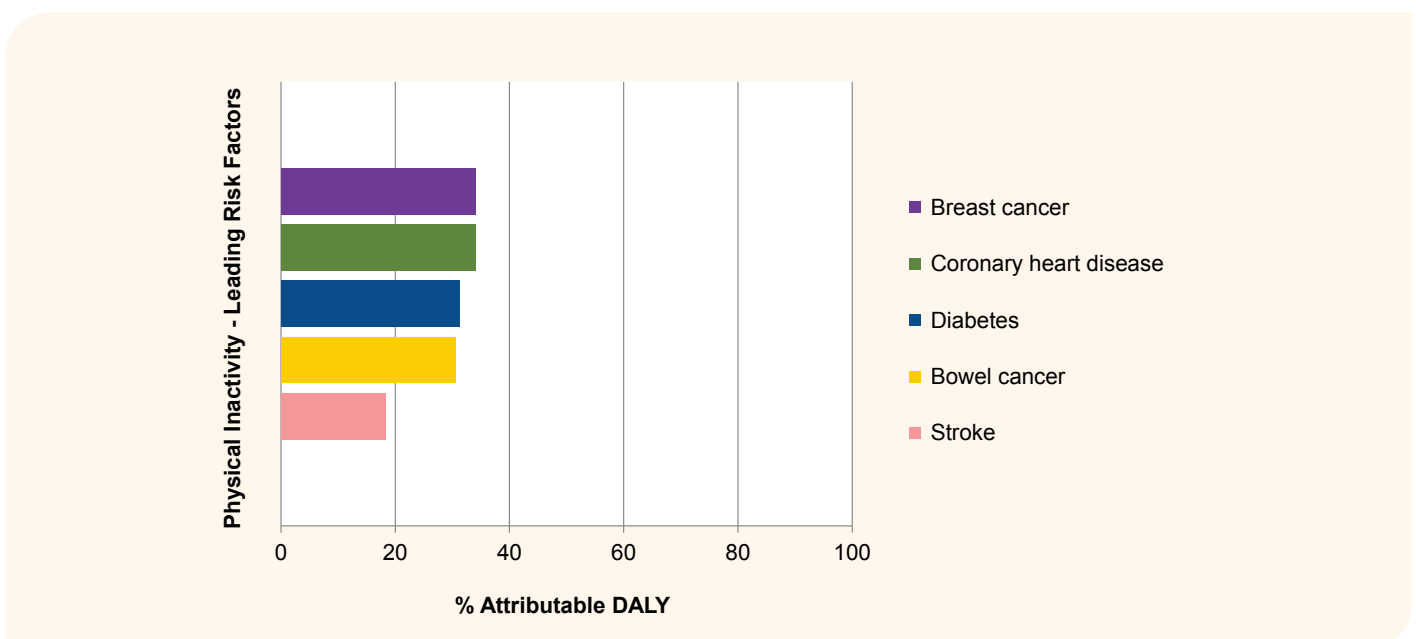
- High blood pressure was associated with 11 linked diseases.
- In WA in 2011, high blood pressure was responsible for 4.7% (20,325) of total DALY.
- Of all diseases linked to high blood pressure, 10 of the 11 fall under the cardiovascular disease group.
- High blood pressure contributed considerably to these linked cardiovascular diseases, accounting for between 4.2% and 59.8% of the total DALY for each individual disease. For example, it accounted for 59.8% of hypertensive heart disease, 43.6% of stroke, and 36.1% of coronary heart disease.

Physical inactivity

Table 5: Top five physical inactivity-linked diseases by attributable DALY in WA in 2011

Linked Disease	Total DALY	Attributable DALY	
	Number	Number	Per cent
Breast cancer	6258	2125	34.0
Coronary heart disease	31282	10621	34.0
Diabetes	10072	3138	31.2
Bowel cancer	7676	2344	30.5
Stroke	10396	1903	18.3

Figure 6: Top five physical inactivity-linked diseases by attributable DALY in WA in 2011



- Physical inactivity was associated with five linked diseases.
- In 2011, physical inactivity was responsible for 4.6% (20,130) of total DALY in WA.
- Physical inactivity contributed approximately to a third of DALY for both breast cancer (34.0%) and coronary heart disease (34.0%).
- Physical inactivity was also responsible for just under a third of diabetes and of bowel cancer burden, and 18.3% of stroke burden.

Implications and points of consideration

- The large burden attributable to tobacco use continues to make tobacco control strategies a priority.
- Exposure to tobacco in the past influenced attributable burden in 2011. Though smoking rates are declining, the lag time between tobacco exposure and the development of lung cancer means past tobacco exposure was presenting as a current high attributable burden.
- For risk factors that are increasing in prevalence (such as high BMI), a higher attributable burden can be expected in the future.
- While this fact sheet examines risk factors individually, they often occur simultaneously, even if they are not along the same causal pathway – for example use of tobacco and use of alcohol.
- This fact sheet does not include all risk factors – for example the social determinants of health. This is because such factors are not currently standard for burden of disease studies; and there was insufficient time to develop an appropriate methodology for the 2011 study. It is hoped these will be included in future studies.¹

Methods

This fact sheet discusses risk factors in relation to attributable burden, measured using DALY. DALY are the number of years lost due to ill-health, disability, or early death; and attributable DALY are simply the proportion of the total disease burden that are a result of exposure to each individual risk factor.

The burden attributable to selected risk factors is estimated using population attributable fractions (PAFs), which are applied to the total disease burden estimated.⁷

PAFs represent the proportional reduction in population disease or mortality potentially avoided if the population had never been exposed to a risk factor, or exposed to a theoretical minimum (for example, it is only possible to minimise risk factors such as sun exposure, or saturated fat in the diet). These were calculated using relative risks from the *Global Burden of Disease Study 2010* (except where they were inappropriate or not available) and exposure data by age and sex from a variety of data sources (predominantly empirical survey data). Relative risks measure the strength of the causal association between risk factors and the linked disease outcomes.¹

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