



# Western Australian Burden of Disease Study 2015: Contribution of risk factors to burden in Aboriginal Western Australians

## Introduction

Burden of disease studies provide an assessment of the impact of diseases, injuries and risk factors on a population. This impact is measured as 'disability-adjusted life years' (DALY); that is, the sum of 'years of life lost prematurely' (YLL) and 'years lived with disability' (YLD) (Prüss-Üstün, Mathers et al. 2003). The Western Australian Burden of Diseases Study (WABoDS) 2015 provides estimates of burden attributable to risk factors<sup>1</sup> that have been calculated for the Aboriginal population in WA. The data can be used to assist with policy development and planning to improve Aboriginal health.

## Methods

The WABoDS methodology is based on the Australian Burden of Disease Study (ABDS) 2011 and 2015; with minor updates. The study calculated Population Attributable Fractions (PAFs), which is the proportion of all cases of a disease that can be attributed to a specific risk factor (Mansournia and Altman 2018). PAFs were derived from the relative risk<sup>2</sup> and prevalence<sup>3</sup> of exposure to risk factors and multiplied by DALY for the relevant disease to calculate attributable burden (that is, the number of DALY attributable to a specific risk factor for that disease)<sup>4</sup>.

## Results

### Contribution of risk factors to fatal and non-fatal burden in Aboriginal Western Australians

- Risk factors contributing the most to total burden (DALY) were alcohol use (15.3% of total DALY), tobacco use (12.5%), and overweight and obesity (12.5%) and all dietary risks (11.7%).
- Risk factors contributing the most to fatal burden (YLL) were tobacco use (16.7% of total YLL), all dietary risk (16.3%), alcohol use (15.5%), and overweight and obesity (15.3% - Table 1).
- Risk factors contributing the most to non-fatal burden (YLD) were alcohol use (14.9% of total YLD), overweight and obesity (8.2%), tobacco use (6.2%), high blood plasma glucose (5.8%) and illicit drug use (5.2%).

---

<sup>1</sup> Risk factor: Any factor that causes or increases the likelihood of a health disorder or other unwanted condition or event.

<sup>2</sup> Relative risk: The risk of an event relative to exposure, calculated as the ratio of the probability of the event occurring in the exposed group to the probability of it occurring in the non-exposed group.

<sup>3</sup> Prevalence: the number of cases existing at a point in time (point prevalence) or over a specified time period (period prevalence) (Australian Institute of Health and Welfare 2019)

<sup>4</sup> Note that, as risk factors are analysed individually, the estimated attributable DALY cannot be added together due to the complex pathways and interactions between them (Australian Institute of Health and Welfare 2019).

Table 1: Burden attributable to each risk factor among Aboriginal persons in WA in 2015<sup>4</sup>

Risk factor	YLL		YLD		DALY	
	Number	% total YLL	Number	% total YLD	Number	% total DALY
<b>Behavioural</b>						
Alcohol use	3135	15.5%	2005	14.9%	5141	15.3%
Tobacco use	3372	16.7%	827	6.2%	4199	12.5%
All dietary risks	3290	16.3%	626	4.7%	3916	11.7%
Illicit drug use	2172	10.8%	698	5.2%	2870	8.5%
Physical inactivity	1142	5.7%	252	1.9%	1394	4.1%
Child abuse & neglect	674	3.3%	483	3.6%	1157	3.4%
Intimate partner violence	251	1.2%	397	3.0%	648	1.9%
Unsafe sex	209	1.0%	<50	-	218	0.6%
<b>Metabolic</b>						
Overweight & obesity	3091	15.3%	1103	8.2%	4194	12.5%
High blood plasma glucose	1867	9.3%	786	5.8%	2653	7.9%
High blood pressure	2067	10.2%	267	2.0%	2334	6.9%
High cholesterol	1793	8.9%	155	1.2%	1948	5.8%
Impaired kidney function	1266	6.3%	234	1.7%	1501	4.5%
Iron deficiency	0	0.0%	62	0.5%	62	0.2%
Low bone mineral density	<50	-	<50	-	57	0.2%
<b>Environmental</b>						
Air pollution	344	1.7%	47	0.3%	391	1.2%
Occupational exposures & hazards	174	0.9%	184	1.4%	358	1.1%
High sun exposure	<50	-	<50	-	<50	-

### Gap in burden between Aboriginal and non-Aboriginal Western Australians

- Risk factors with the highest age-standardised DALY rates (ASR<sup>5</sup>) among Aboriginal Western Australians were overweight and obesity (82.1 DALY per 1000 population) and tobacco use (80.2 DALY per 1000 population) – Table 2.
- Among Aboriginal Western Australians, the risk factor impaired kidney function had an ASR of nearly 16 times more than non-Aboriginal persons. This was followed by unsafe sex (9.3 times more) and alcohol use (8.6 times more).
- The largest gap between the impact of risk factors among Aboriginal and non-Aboriginal persons was for the risk factors overweight and obesity (rate difference of 68.7 per 1000 population), tobacco use (65.5) and all dietary risks (58.8).

<sup>5</sup> The age-standardised rate (ASR) is a rate that accounts for the age structure of the population (Australian Institute of Health and Welfare 2019). Therefore, a risk factor such as alcohol use may have the highest number of DALY but a lower ASR than overweight and obesity, and tobacco use.

**Table 2: Age-standardised DALY rates (ASR per 1000 population) attributed to selected risk factors, rate ratios and rate differences, among Aboriginal and non-Aboriginal persons in WA in 2015**

<b>Risk factor</b>	<b>Aboriginal ASR</b>	<b>Non-Aboriginal ASR</b>	<b>Rate ratio</b>	<b>Rate difference</b>
Overweight & obesity	82.1	13.4	6.1	68.7
Tobacco use	80.2	14.7	5.4	65.5
All dietary risks	70.1	11.3	6.2	58.8
Alcohol use	63.5	7.4	8.6	56.1
High blood plasma glucose	58.1	7.5	7.8	50.6
High blood pressure	46.8	8.1	5.8	38.7
High cholesterol	32.6	4.8	6.8	27.8
Impaired kidney function	32.1	2.0	15.8	30.0
Illicit drug use	31.8	6.7	4.8	25.2
Physical inactivity	26.9	4.2	6.5	22.7
Child abuse & neglect	12.7	4.4	2.9	8.4
Intimate partner violence	8.8	1.4	6.5	7.4
Air pollution	7.7	1.7	4.7	6.0
Occupational exposures & hazards	6.1	3.5	1.7	2.6
Unsafe sex	3.0	0.3	9.3	2.6
Low bone mineral density	1.5	1.3	1.2	0.2
Iron deficiency	0.8	0.8	1.0	0.0
High sun exposure	0.7	1.4	0.5	-0.8

<sup>1</sup>Rate ratio: ASR of Aboriginal persons divided by ASR of non-Aboriginal persons

<sup>2</sup>Rate difference: ASR of non-Aboriginal persons subtracted from ASR of Aboriginal persons

## Top risk factors with associated diseases

- The six risk factors with the highest number of attributable DALY were (in descending order): alcohol use, tobacco use, overweight and obesity, all dietary risks, illicit drug use and high blood plasma glucose (Table 1). The top four risk factors are discussed in more detail below:

### Alcohol:

- A total of 5141 DALY was attributable to alcohol use among Aboriginal Western Australians.
- The highest number of attributable DALY were associated with alcohol use disorders (1930, 37.5% of all DALY attributable to alcohol use – Figure 1) and suicide and self-inflicted injuries (1347, 26.2%).

### Tobacco use:

- The impact of tobacco on the burden of disease and injury is measured through current and past tobacco smoking, and through exposure to second-hand smoke.
- A total of 4199 DALY was attributable to tobacco use among Aboriginal Western Australians.
- The highest number of attributable DALY were associated with coronary heart disease (1443, 34.4% - Figure 1) and chronic obstructive pulmonary disease (COPD – 819, 19.5%).

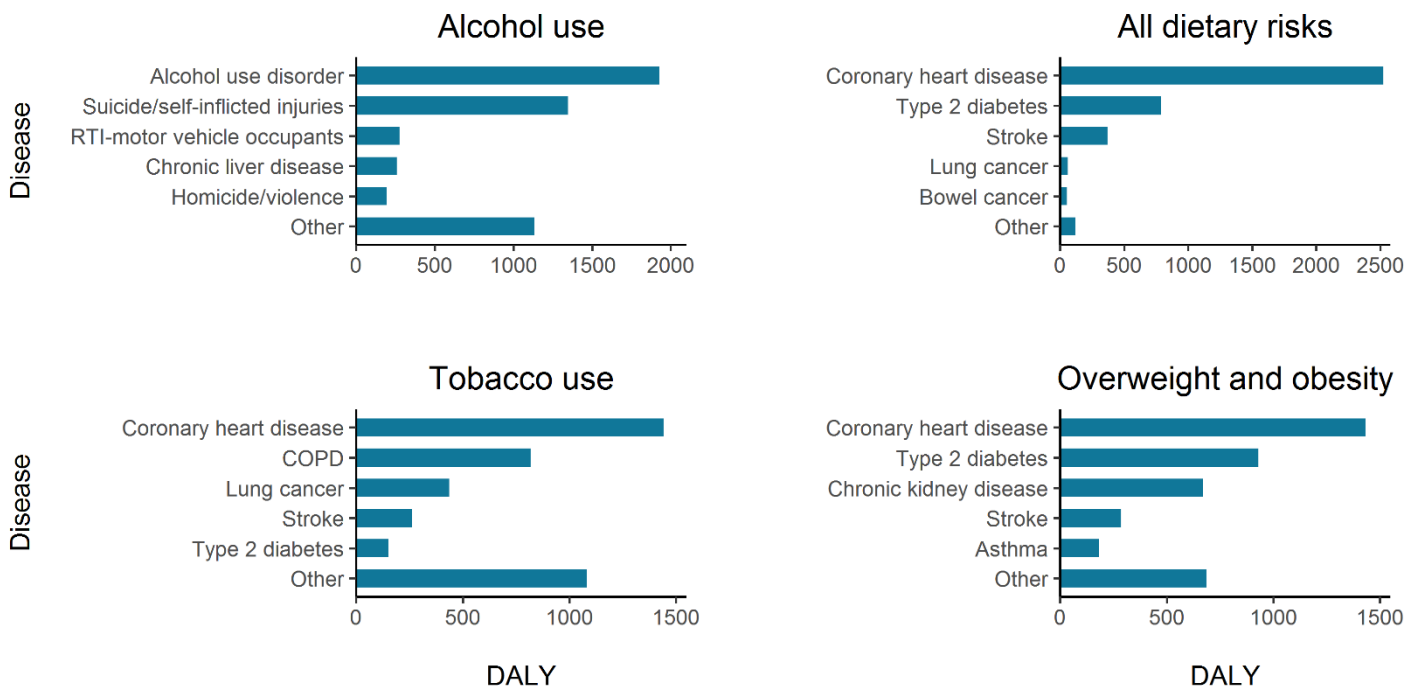
## Overweight and obesity:

- A total of 4194 DALY was attributable to overweight and obesity among Aboriginal Western Australians.
- The highest number of attributable DALY were associated with coronary heart disease (1435, 34.2% - Figure 1) and type 2 diabetes (931, 22.2%).

## All dietary risks:

- All dietary risks include a diet low in wholegrains and high fibre cereal, diet low in fruit, diet low in nuts and seeds, a diet high in processed meat and a diet high in sodium. A full list can be obtained in Table 6.1 of the ABDS 2015 report (Australian Institute of Health and Welfare 2019).
- A total of 3916 DALY was attributable to all dietary risks among Aboriginal Western Australians.
- The highest number of attributable DALY were associated with coronary heart disease (2524, 64.5% - Figure 1) and type 2 diabetes (789, 20.1%).

**Figure 1: Top risk factors contributing to attributable DALY with associated disease among Aboriginal persons in WA in 2015**



Note: RTI: road traffic injury. COPD: Chronic Obstructive Pulmonary Disease

## Risk factors by age-group

- The three risk factors contributing the highest attributable DALY in those under 15 years were: child abuse and neglect (1.0% of total DALY in this age-group), alcohol use (0.3%) and iron deficiency (0.2%)<sup>6</sup>. These results suggest that the proportion of burden of disease in under 15-year-olds that can be attributable to the risk factors analysed in this study is small.

<sup>6</sup> The DALY are not presented here as they are less than 50 for each risk factor in this age-group.

- The risk factors contributing the highest attributable DALY in those aged 15 to 24 years were: alcohol use (DALY=1110, 28.8%), illicit drug use (692, 18.0%) and child abuse and neglect (378, 9.8%).
- Among those aged 25-44 years, the three risk factors contributing the highest attributable DALY were: alcohol use (DALY=2564, 23.5%), illicit drug use (1781, 16.3%) and all dietary risks (1074, 9.8%).
- The three risk factors contributing the highest attributable DALY in those aged 45-64 years were: tobacco use (2571, 22.6%), overweight & obesity (2447, 21.5%) and all dietary risks (2355, 20.7%).
- Among those Aboriginal Western Australians aged 65 years and older, the three risk factors contributing the highest attributable DALY were: overweight and obesity (740, 20.9%), tobacco use (700, 19.8%) and high blood plasma glucose (634, 17.9%).

## The way forward

This bulletin quantifies the attributable burden of 18 risk factors. The risk factors leading to the greatest harm among Aboriginal Western Australians include use of alcohol, tobacco, dietary risks, illicit drugs, and overweight and obesity.

A strength of this analysis was the use of WA-specific Aboriginal data using primarily the Australian Aboriginal and Torres Strait Islander Health Survey 2011/12 to measure the exposure of the population to risk factors to calculate PAF and attributable burden. Limitations of the study included the small sample sizes and lower frequency of Aboriginal health surveys, and gaps in risk factor data for some conditions. The use of survey data resulted in some cases on the reliance on self-reports rather than measured exposure to risk factors, that could result in underestimates (Australian Institute of Health and Welfare 2016). There were methodological changes to risk factor analysis compared to results for Aboriginal and Torres Strait Islander people in the Australian Burden of Disease Study 2011 (Australian Institute of Health and Welfare 2016) so the results for some risk factors, such as obesity and alcohol, are not directly comparable. Finally, social determinants of health as risk factors were not included in WABoDS. Further details on methods and data quality can be found in the two recently published short reports on other WABoDS results (Department of Health Western Australia 2020, Department of Health Western Australia 2020).

Strategies to reduce these factors include: culturally appropriate health promotion activities that address risk factors, incorporating caring for country and participation in cultural activities into the health promotion programs, a focus on better nutrition and improving access to good food and empowering Aboriginal people to maintain or reclaim knowledge of, and access to, traditional foods (Aboriginal Health Policy Directorate 2020).

## References

Aboriginal Health Policy Directorate (2020). Aboriginal Health and Wellbeing: online learning course. Perth, WA, Department of Health WA.

Australian Institute of Health and Welfare (2016). Australian Burden of Disease Study: impact and causes of illness and death in Aboriginal and Torres Strait Islander people, 2011. Australian Burden of Disease series no. 6. Cat. no. BOD 7. Canberra, AIHW.

Australian Institute of Health and Welfare (2019). Australian Burden of Disease Study: impact and causes of illness and death in Australia 2015. Australian Burden of Disease series no. 19. Cat no. BOD 22. Canberra, AIHW.

Department of Health Western Australia (2020). Western Australian Burden of Disease Study 2015 - Contribution of risk factors to burden. Perth, Department of Health WA.

Department of Health Western Australia (2020). Western Australian Burden of Diseases Study 2015 - Aboriginal Report. Perth, Department of Health WA.

Mansournia, M. A. and D. G. Altman (2018). "Population attributable fraction." BMJ **360**: k757.

Prüss-Üstün, A., C. Mathers, C. Corvalán and A. Woodward (2003). Introduction and methods: assessing the environmental burden of disease at national and local levels. Geneva, World Health Organisation.