



Government of **Western Australia**
Department of **Health**

Western Australian Burden of Disease Study 2015

Summary report

Western Australian Burden of Disease Study 2015 – Summary report

Epidemiology Branch
Public and Aboriginal Health Division
Department of Health, Western Australia

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Contact us

At epi@health.wa.gov.au for any enquiries or further details on the WABoDS.

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Contents

Introduction	1
Global	1
National	1
State	1
Methods	2
Results	4
Total fatal and non-fatal burden across the life course	4
Burden by disease group	5
Fatal and non-fatal burden by disease group	7
Total burden by sex	7
Disease groups and diseases across the life course	8
Ages under 5:	8
Ages 5 to 14:	8
Ages 15 to 24:	8
Ages 25 to 44:	8
Ages 45 to 64:	8
Ages 65+	8
Fatal burden	10
Non-fatal burden	11
Selected highly ranked disease groups and diseases	12
Cancer	12
Mental and substance use disorders	13
Cardiovascular disease	14
Musculoskeletal conditions	15
Summary	16
Glossary	17
References	18

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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, Corvalán, & Woodward, 2003). YLL represents the number of deaths by sex and age multiplied by an 'ideal life span' (according to a reference life table) (Australian Institute of Health and Welfare, 2019). YLD is a measure of years lived with ill-health or disability, which accounts for the person-time with the condition multiplied by a weight representing the severity of the condition (Australian Institute of Health and Welfare, 2019).

Global

The first global burden of disease (GBD) study was GBD 1990. Studies have continued every few years, with the most recent published study being GBD 2017 (Institute for Health Metrics and Evaluation, 2019). By quantifying health loss, policies can be formulated to improve health systems, allocate resources appropriately and eliminate disparities in health between different countries and sub-populations (Institute for Health Metrics and Evaluation, 2019).

National

To supplement GBD studies, national burden of disease studies provide country-specific estimates to monitor population health, and guide national policy and health service planning (AIHW, 2019). The Australian Institute of Health and Welfare (AIHW) has conducted national studies for the reference years 1996, 2003 (in partnership with the University of Queensland), 2011 and 2015, with burden of disease estimates calculated for the Indigenous population in the 2003 and 2011 studies. These studies adapt the global methods to use the best available Australian data, resulting in estimates that are better aligned to the Australian health policy context. The Australian Burden of

Disease Study (ABDS) also includes burden estimates for sub-national population groups, including for the states and territories (AIHW, 2019).

State

The Western Australian Burden of Disease Study (WABoDS) 2015, is a collaboration between the AIHW and the Epidemiology Branch of the WA Department of Health. The study aimed to provide disease group and disease-level data for the whole state, health regions and the Aboriginal population. National studies do not produce data for sub-state regions or disease-level estimates for state Aboriginal populations. The WABoDS findings can be used to identify potential areas of prevention which could have the biggest impact on health and health expenditure and to identify health disparities by age and sub-population group (Box 1). The study used certain datasets that are available in WA but not for other states when estimating YLD in the national study.

Box 1: Use of burden of disease data

- Monitoring population health
- Guiding resource allocation and prioritising services
- Measuring the progress of health programs
- Estimating potential health gains from investment
- Recognising services provided by non-hospital-based health care, for example, community health and general practice.

Detailed burden of disease analysis was last published in WA in 2010 but was based on 2006 data, using an outdated methodology. The WABoDS 2015 used an improved methodology with updated data sources. This report provides an overview of the results of the study at WA state-level¹.

¹ Further details of results for Aboriginal Western Australians and the WA Health regions, as well as risk factors for disease and injury, can be found in other reports on WABoDS 2015.

Methods

The WABoDS methodology is based on the AIHW burden of disease studies for ABDS 2011 and 2015, with minor updates specific to WA's population. Additional data sources specific to WA have also been used to enhance WABoDS. AIHW provided technical advice to the WABoDS and the ABDS system infrastructure was used to calculate YLL, YLD and Population Attributable Fractions derived from WA-provided input data.

Calculation of YLD is based on the prevalence of 216 diseases and injuries (grouped into 17 disease groups)² in the WA population by age group, sex, health region and Aboriginality, and the relative severity of each disease or condition for the reference year 2015.

For each disease, there are a number of potential sequelae and associated health states; see Box 2 for more information. Sequelae map to one

or more health states. Each health state has an associated disability or severity weight reflecting the health loss experienced by a person while in that health state. Disability weights express the health loss on a scale from 0 (no health loss) to 1 (total health loss). Prevalence estimates were calculated for all sequelae and health states resulting in 675 sequelae/ health state combinations, including the different severity levels (mild, moderate and severe).

Estimation of YLL requires data on each death in WA during the reference year of 2015. The cause of death, age, sex, Aboriginality and health region are all utilised when investigating fatal burden. The mortality data used in this study are sourced from the Registry of Births, Deaths and Marriages WA.

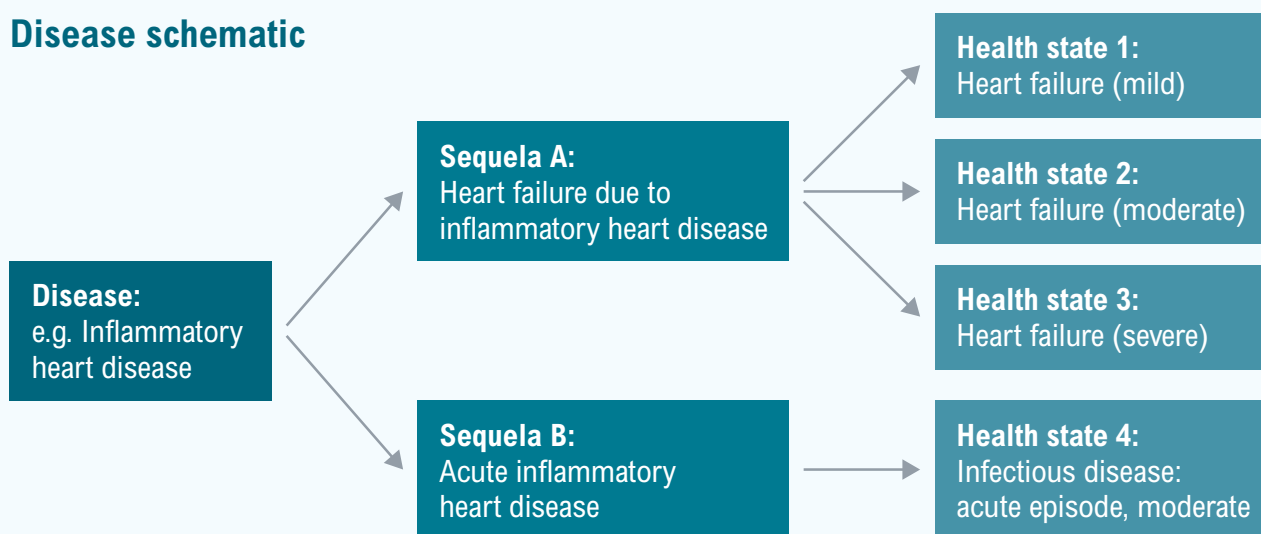
Box 2: Sequelae and health states for a disease or disorder

Sequela: Consequences of diseases; often used in the plural, sequelae.

Health state: Consequences of disease and conditions reflecting key difference in symptoms and functioning.

Disability weight: A factor that reflects the severity of health loss from a particular health state on a scale from 0 (perfect health) to 1 (equivalent to death).

Disease schematic



² The disease groups and diseases used in this study are listed in Appendix D (Australian Institute of Health and Welfare, 2019).

Data collections specific to WA were utilised where possible; a selection of key data sets and surveys are listed below in Box 3. This study has ethics approval from the Department of Health WA Human Research Ethics Committee (DOHWA HREC) and the WA Aboriginal Health Ethics Committee (WAAHEC).

Box 3: Key data sources used in WABoDS

WA Linked Data

- Hospital Morbidity Data Collection
- Death Registrations
- Cancer Registry
- Mental Health Information System
- Emergency Department Data Collection

Surveys

- WA Health Wellbeing Surveillance Survey
- WA Wounds West Survey
- Aboriginal and Torres Strait Islands Health Survey (ATSIHS), 2012-13
- National Health Survey (NHS), 2014-15

Unpublished WA data from national studies

- Australian Cystic Fibrosis Data Registry
- National Blood Authority

Epidemiological Studies

- Busselton Health Study
- Fremantle Diabetes Study

Although 2015 was used as the reference year of the study, in some instances the most recent survey may have taken place earlier than 2015. In such cases, modelling was required to estimate prevalence in 2015.

Due to differences in methodology, direct comparisons between the 2006 WABoDS study and the most recent 2015 study cannot be made. Additionally, direct comparisons between WABoDS 2015 and ABDS cannot be made due to differences in methodology between the studies.

The role of WABoDS is to provide the best basis for understanding Western Australia's burden of disease and that of the sub-state populations (i.e. health regions) of WA. Alternatively, the ABDS provide the best basis for understanding Australia's burden of disease as well as differences across the states and territories. Global comparisons are best made using the GBD study (see Box 4).

Box 4: Which burden of disease study should I use?

GBD – is used when comparing burden for Australia and other countries.

ABDS – is used when comparing WA burden to burden in other states and territories within Australia.

WABoDS – is used for a detailed examination of burden within WA, and by health region and Aboriginality.

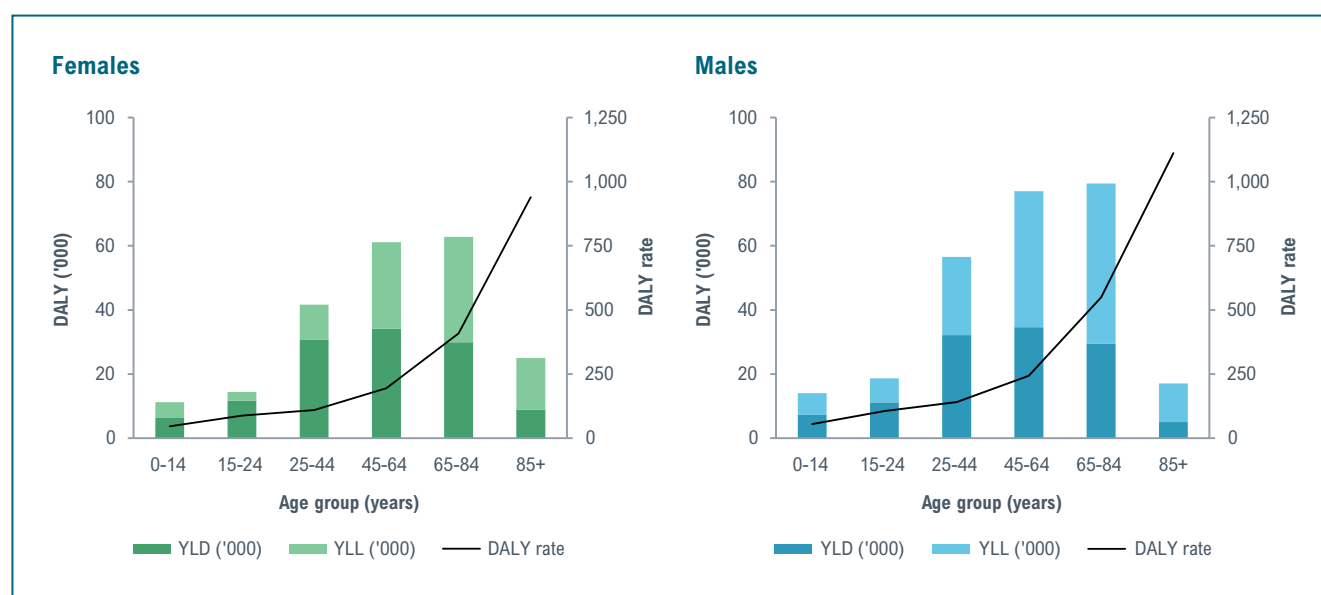
Results

Total fatal and non-fatal burden across the life course

- In 2015, there were 185 years of healthy life lost per 1000 people in Western Australia (WA) due to living with or dying prematurely from disease, injury or other health-related conditions. This amounts to approximately 478,820 DALY (disability-adjusted life years) for the WA State population.
- The total burden of disease (measured as DALY) was low in younger West Australians, increasing from age 25 years and older, then dropping from age 65 years and older due to smaller population size in the older age groups (Figure 1).
- The DALY rate (DALY divided by population) increases steeply from age group 45 to 64 years to peak in the age group 85+ years, as the population size decreases.

- Just over half the burden experienced by children aged less than 15 years is from living with illness or injury (measured as years of life lived with disability – YLD) also known as ‘non-fatal burden’, with the remainder from dying prematurely (years of life lost – YLL) also known as ‘fatal burden’. In those aged 15 to 44, ill health accounted for three-quarters of burden of disease in females and more than half of the burden of disease in males. The proportion of burden of disease accounted for by fatal burden increased with increasing age: approximately 71% in the 85+ years age group.
- Males accounted for a higher burden of disease (DALY) than females, across all age groups except 85+ -year-olds where females had a higher burden compared to males. This is primarily due to higher fatal burden among males (YLL = 143,058 in males, YLL = 94,411 in females); non-fatal burden was similar in males and females (YLD = 119,728 in males, YLD = 121,623 in females).

Figure 1: Non-fatal (YLD) and fatal (YLL) composition of the total burden (DALY), and DALY rates (per 1000 population), by sex and age group, in Western Australia in 2015



Burden by disease group

- The disease groups contributing the most to total burden (DALY) in 2015 were cancer (17% of the total burden), mental and substance use disorders (13%), and cardiovascular diseases (13%). Musculoskeletal conditions and injury contributed 12% and 11% to the total burden respectively (Figures 2 and 3).
- Both males and females experienced the highest proportion of disease burden from cancer (18% and 17% respectively). However, cardiovascular diseases and injury accounted for the next highest proportion of the total burden in males (14% each). Musculoskeletal conditions and mental and substance use disorders accounted for the next highest proportion of the burden in females (15% and 14% respectively).
- At the disease level, the five leading causes of total burden (Table 1) were coronary heart disease (6.8%), chronic obstructive pulmonary disease (COPD – 4.6%), back pain and problems (4.3%), suicide and self-inflicted injuries (3.9%) and depressive disorders (3.4%).

Figure 2: Percentage (%) of total burden (DALY), by disease group and sex, in Western Australia in 2015

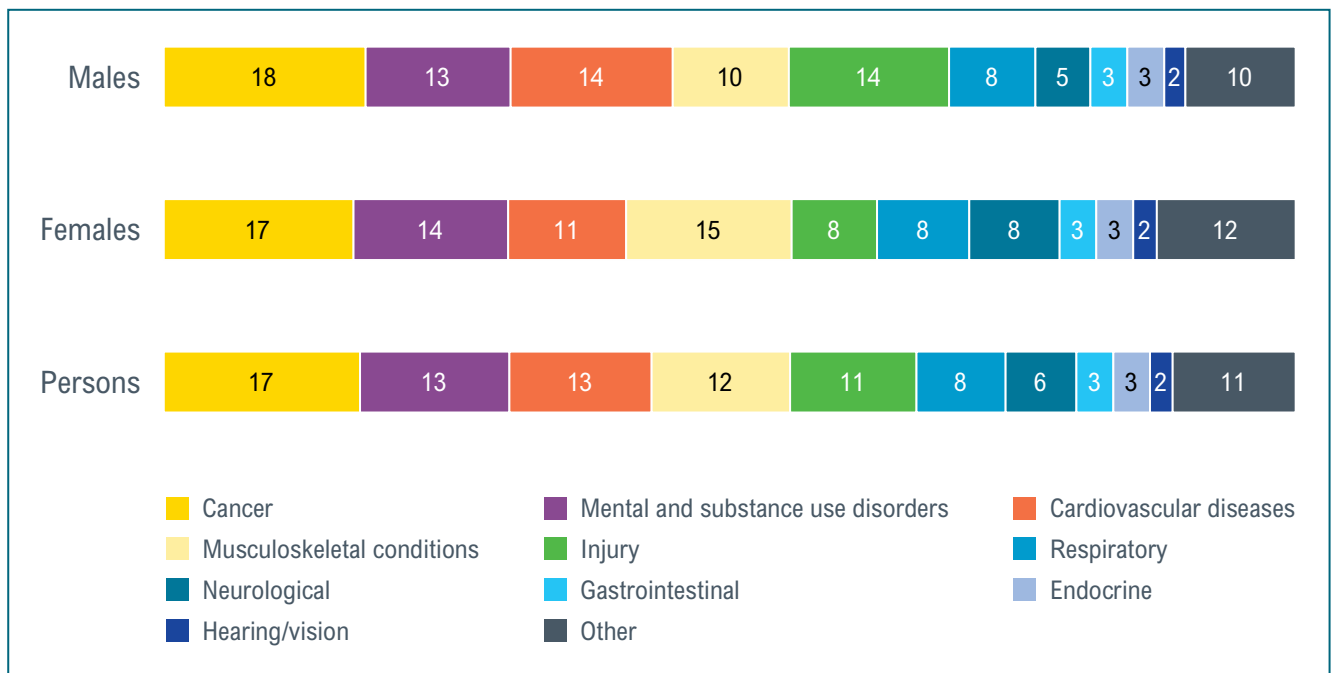


Table 1: Top 15 diseasesⁱ by proportion of DALY and Age Standardised rates (ASR), by sex, in Western Australia in 2015

DALY	Males			Females			Persons		
	Disease	n (%)	ASR (per 1000)	Disease	n (%)	ASR (per 1000)	Disease	n (%)	ASR (per 1000)
1	Coronary heart disease	21,784 (8.3)	17.0	Back pain	10,571 (4.9)	8.1	Coronary heart disease	32,301 (6.8)	11.9
2	Suicide/self-inflicted injuries	13,592 (5.2)	10.2	Coronary heart disease	10,517 (4.9)	7.1	COPD ⁱⁱ	21,920 (4.6)	8.1
3	COPD ⁱⁱ	12,490 (4.8)	9.6	COPD ⁱⁱ	9,431 (4.4)	6.7	Back pain and problems	20,295 (4.3)	7.7
4	Back pain and problems	9,724 (3.7)	7.3	Dementia	9,242 (4.3)	5.8	Suicide/self-inflicted injuries	18,439 (3.9)	7.1
5	Lung cancer	8,972 (3.4)	6.8	Depressive disorders	9,217 (4.3)	7.2	Depressive disorders	16,335 (3.4)	6.3
6	Depressive disorders	7,118 (2.7)	5.4	Anxiety disorders	8,839 (4.1)	7.1	Lung cancer	15,617 (3.3)	5.7
7	Alcohol use disorders	6,434 (2.5)	4.9	Osteoarthritis	6,911 (3.2)	5.0	Anxiety disorders	14,817 (3.1)	5.7
8	Type 2 diabetes	6,337 (2.4)	4.8	Breast cancer	6,800 (3.2)	4.9	Dementia	14,755 (3.1)	5.4
9	Anxiety disorders	5,978 (2.3)	4.6	Lung cancer	6,645 (3.1)	4.7	Osteoarthritis	11,492 (2.4)	4.2
10	Stroke	5,705 (2.2)	4.6	Asthma	5,937 (2.8)	4.6	Stroke	10,824 (2.3)	4.0
11	Poisoning	5,652 (2.2)	4.3	Rheumatoid arthritis	5,653 (2.6)	4.1	Type 2 diabetes	10,748 (2.2)	4.0
12	Dementia	5,513 (2.2)	4.8	Stroke	5,119 (2.3)	3.4	Asthma	10,669 (2.2)	4.1
13	Prostate cancer	4,854 (2.0)	3.9	Suicide/self-inflicted injuries	4,846 (2.2)	3.9	Rheumatoid arthritis	9,562 (2.0)	3.5
14	Asthma	4,733 (1.7)	3.6	Type 2 diabetes	4,411 (2.0)	3.1	Alcohol use disorders	8,492 (1.7)	3.3
15	Osteoarthritis	4,581 (1.7)	3.4	Bowel cancer	3,700 (1.7)	2.6	Poisoning	8,354 (1.7)	3.3

ⁱ 'Other' conditions, for example, other musculoskeletal conditions, have been excluded from the ranking.

ⁱⁱ COPD: Chronic Obstructive Pulmonary Disease.

Fatal and non-fatal burden by disease group

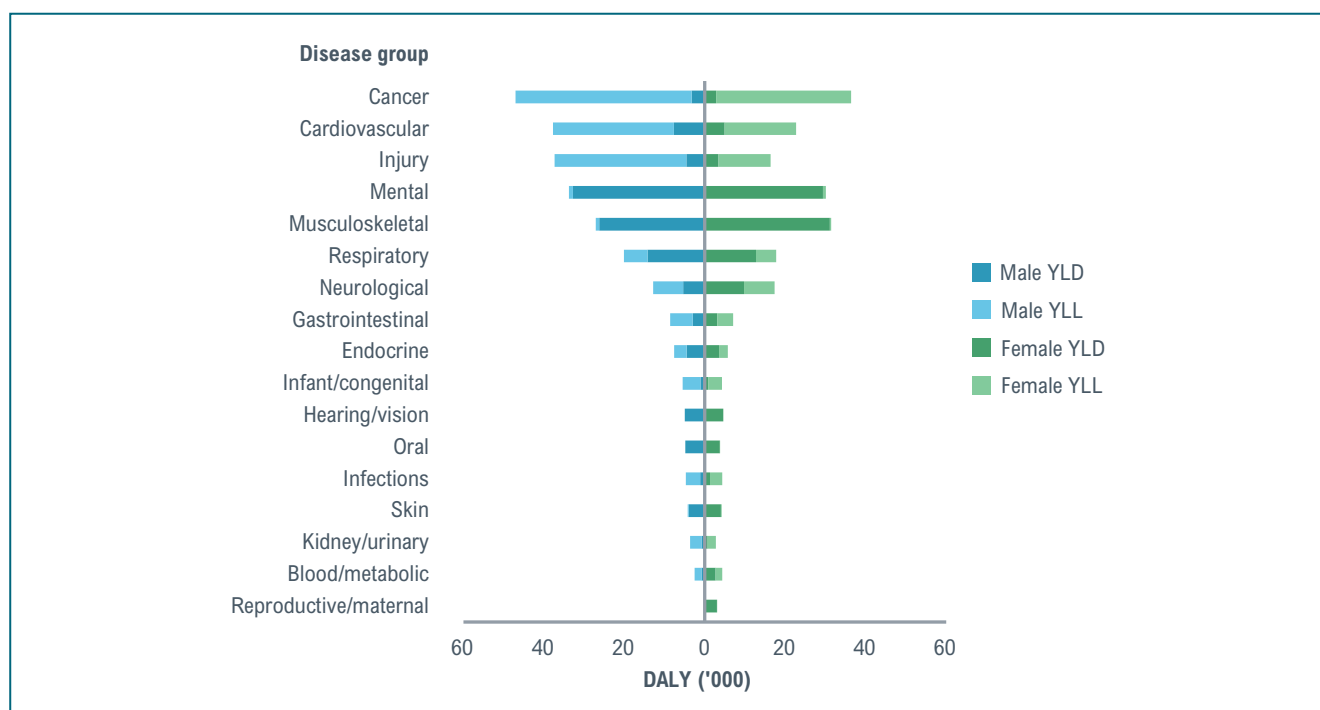
- Among the five disease groups causing the highest proportion of total burden (Figure 3):
 - cancer, cardiovascular diseases and injuries³ caused mainly fatal burden (YLL)
 - mental and substance use disorders, and musculoskeletal conditions caused primarily non-fatal burden (YLD).
- Among the remaining disease groups:
 - the burden from kidney and urinary diseases, infectious diseases, infant and congenital conditions, and gastrointestinal disorders were primarily fatal burden,
 - the burden from reproductive and maternal disorders, blood and metabolic disorders, skin disorders, oral disorders, hearing and vision disorders, endocrine disorders and respiratory diseases were largely non-fatal burden, and
 - the burden from neurological disorders was approximately equally split between fatal and non-fatal burden.

Total burden by sex

Overall, males contributed 55% of the total fatal and non-fatal burden (DALY) in WA and females contributed the remaining 45% of DALY. Some disease groups were over-represented by males and others by females:

- Males contributed a greater proportion of the total burden for: injuries (69%), cardiovascular diseases (63%); endocrine disorders (57%); kidney and urinary disorders (57%); infant and congenital conditions (57%); oral disorders (56%); and cancer and other neoplasms (56%).
- Females contributed a greater proportion of the total burden for: reproductive and maternal conditions (95%); blood and metabolic disorders (63%); neurological conditions (58%); and musculoskeletal conditions (54%).

Figure 3: Non-fatal (YLD) and fatal (YLL) burden, by disease group and sex, in Western Australia in 2015



³ Note that suicide and self-inflicted injuries are part of the injury disease group, not the mental and substance disorders group.

Disease groups and diseases across the life course

The pattern of disease group and individual disease burden across the life course is described below. Figure 4 illustrates the leading five diseases by sex and age group.

- Infant and congenital conditions made up 50% of the total burden for those aged less than 5 years.
- Mental and substance use disorders were responsible for more than a third (36%) of the total burden in 5 to 14-year-olds.
- In Western Australians aged 15 to 44 years, mental and substance use disorders and injury contributed the most to the total burden (30% and 23% respectively).
- Cancer contributed a high proportion of the burden in West Australians aged 45 years and older (23% in 45 to 64-year-olds and 24% in 65+ year olds).
- Cardiovascular disease contributed the second highest proportion of DALY in those aged over 65 years (21%).
- Musculoskeletal conditions contributed substantially to the burden across all age groups, particularly in adults.

Ages under 5:

- The leading causes of total burden in the youngest age group were pre-term and low birth weight, birth trauma and asphyxia, sudden infant death syndrome, asthma and cardiovascular defects.

Ages 5 to 14:

- Asthma, anxiety disorders, depressive disorders, conduct disorder and dental caries were the leading causes of total burden in 5 to 14-year-olds.
- Acne was ranked fifth among females in this age group, while autism spectrum disorders was ranked fifth in males.

Ages 15 to 24:

- Suicide and self-inflicted injuries, depressive disorders, road traffic injury (RTI), anxiety disorders, and back pain and problems were the leading causes of total burden in those aged 15 to 24 years.
- Among males in this age group, alcohol use disorders contributed substantially to the total burden, ranking second. Among females, asthma ranked fifth. Suicide and self-inflicted injuries ranked first among males but fourth among females. RTI ranked third among males but not in the top five among females.

Ages 25 to 44:

- Suicide and self-inflicted injuries, depressive disorders, back pain and problems, anxiety disorders and poisoning were the leading contributors to total burden in 25 to 44-year-olds.
- Among men in this age group, alcohol use disorders ranked third, after suicide and self-inflicted injuries, and poisoning. However, among females, anxiety disorders and asthma ranked third and fourth respectively. Back pain and problems ranked first for females but fifth for males.

Ages 45 to 64:

- The five leading causes of total burden in 45 to 64-year-olds were coronary heart disease, COPD, back pain and problems, lung cancer and osteoarthritis.
- Among females of this age group, breast cancer ranked second, while among males, suicide and self-inflicted injuries ranked third. Coronary heart disease ranked top for males but is not in the top five for females.

Ages 65+

- The five leading causes of total burden were coronary heart disease, dementia, COPD, lung cancer and stroke in Western Australians of 65+ years.
- Among females of this age, stroke was the fourth highest contributor to total burden, while among males, prostate cancer ranked fifth.

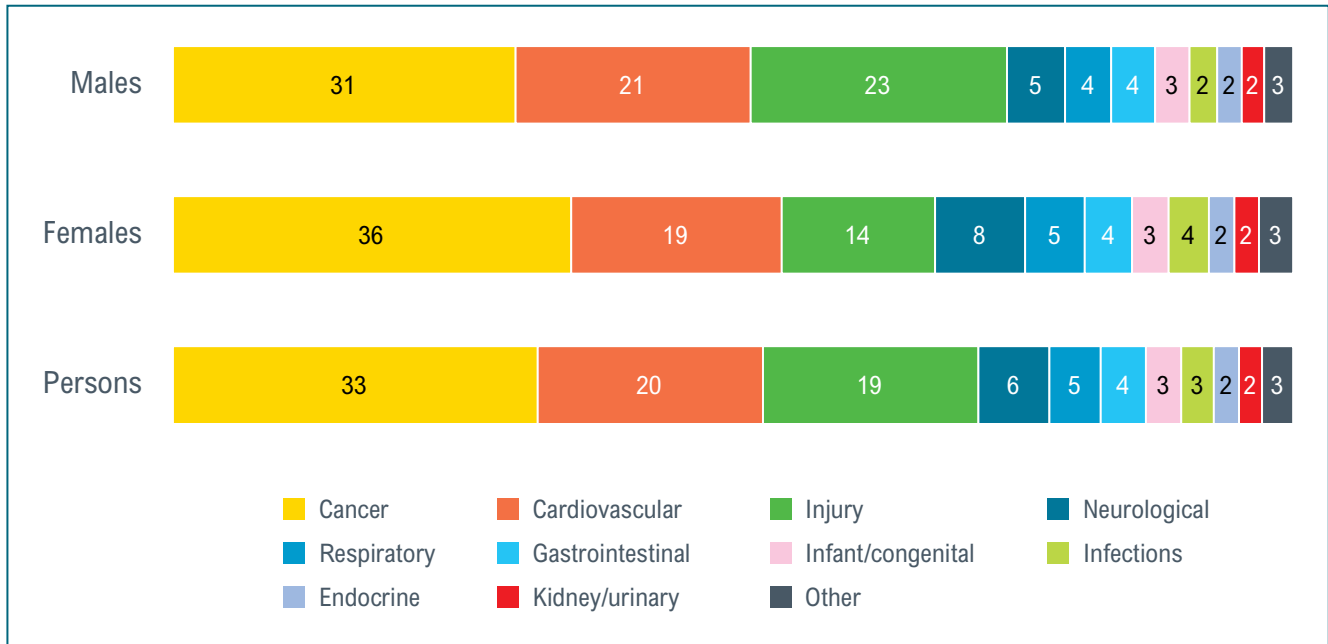
Figure 4: Leading causes of total burden (DALY; %), by sex and age group, in Western Australia in 2015

		Age group (years)					
		Under 5	5-14	15-24	25-44	45-64	65+
Male	1st	Pre-term birth/lbw complications (1082; 16.0%)	Asthma (809; 11.1%)	Suicide/self-inflicted injuries (2831; 15.1%)	Suicide and self-inflicted injuries (6560; 11.6%)	Coronary heart disease (7795; 10.1%)	Coronary heart disease (12267; 12.7%)
	2nd	Sudden infant death syndrome (539; 8.0%)	Anxiety disorders (695; 9.6%)	Alcohol use disorders (1369; 7.3%)	Poisoning (3742; ; 6.6%)	COPD (4156; 5.4%)	COPD (7834; 8.1%)
	3rd	Birth trauma and asphyxia (468; 6.9%)	Conduct disorder (500; 6.9%)	RTI - motor vehicle occupants (1350; 7.2%)	Alcohol use disorders (3581; 6.3%)	Suicide and self-inflicted injuries (3392; 4.4%)	Lung cancer (5259; 5.5%)
	4th	Cardiovascular defects (289; 4.3%)	Depressive disorders (491; 6.8%)	Back pain/problems (990; 5.3%)	Depressive disorders (3308; 5.9%)	Lung cancer (3246; 4.2%)	Dementia (5135; 5.3%)
	5th	Asthma (283; 4.2%)	Autism spectrum disorders (338; 4.7%)	Depressive disorders (986; 5.3%)	Back pain/problems (3023; 5.3%)	Back pain/problems (3202; 4.2%)	Prostate cancer (3954; 4.1%)
Female	1st	Birth trauma/asphyxia (960; 17.3%)	Anxiety disorders (603; 10.7%)	Anxiety disorders (1388; 9.6%)	Back pain/problems (3744; 9.0%)	Back pain/problems (3632; 4.1%)	Dementia (8776; 10.0%)
	2nd	Pre-term birth/lbw complications (366; 6.6%)	Asthma (574; 10.1%)	Depressive disorders (1317; 9.2%)	Depressive disorders (3679; 8.8%)	Breast cancer (3478; 4.0%)	Coronary heart disease (7696; 8.8%)
	3rd	Asthma (238; 4.3%)	Depressive disorders (560; 9.9%)	Back pain/problems (1064; 7.4%)	Anxiety disorders (3665; 8.8%)	Lung cancer (3053; 3.5%)	COPD (5770; 6.6%)
	4th	RTI – motor vehicle occupants (176; 3.2%)	Conduct disorder (303; 5.4%)	Suicide/self-inflicted injuries (1061; 7.4%)	Asthma (1853; 4.5%)	COPD (2945; 3.4%)	Stroke (4021; 4.6%)
	5th	Drowning (171; 3.1%)	Acne (280; 5.0%)	Asthma (883; 6.1%)	Suicide and self-inflicted injuries (1764; 4.2%)	Osteoarthritis (2945; 3.4%)	Lung cancer (3361; 3.8%)

Fatal burden

- The leading cause of fatal burden is cancer, which contributed one-third of years of life lost (YLL – Figure 5).
- The second and third leading causes of years of life lost were cardiovascular diseases (20%) and injury (19%).
- The years of life lost by males made up 60% (143,058) of the total years of life lost by all Western Australians.
- Notably, the years of life lost due to injury was ranked second in males (23% of total YLL by males), but third in females (14% of female YLL).
- Neurological conditions ranked fourth for both males and females in terms of YLL, but the proportion of total YLL was higher for females (8%) than males (5%).
- The top three diseases causing fatal burden overall and among males were coronary heart disease, suicide and self-inflicted injuries, and lung cancer.
- The third leading disease for females was breast cancer.
- Other conditions which ranked highly for both males and females were stroke, dementia, bowel cancer, COPD and RTI. Poisoning was ranked high for males but not females.

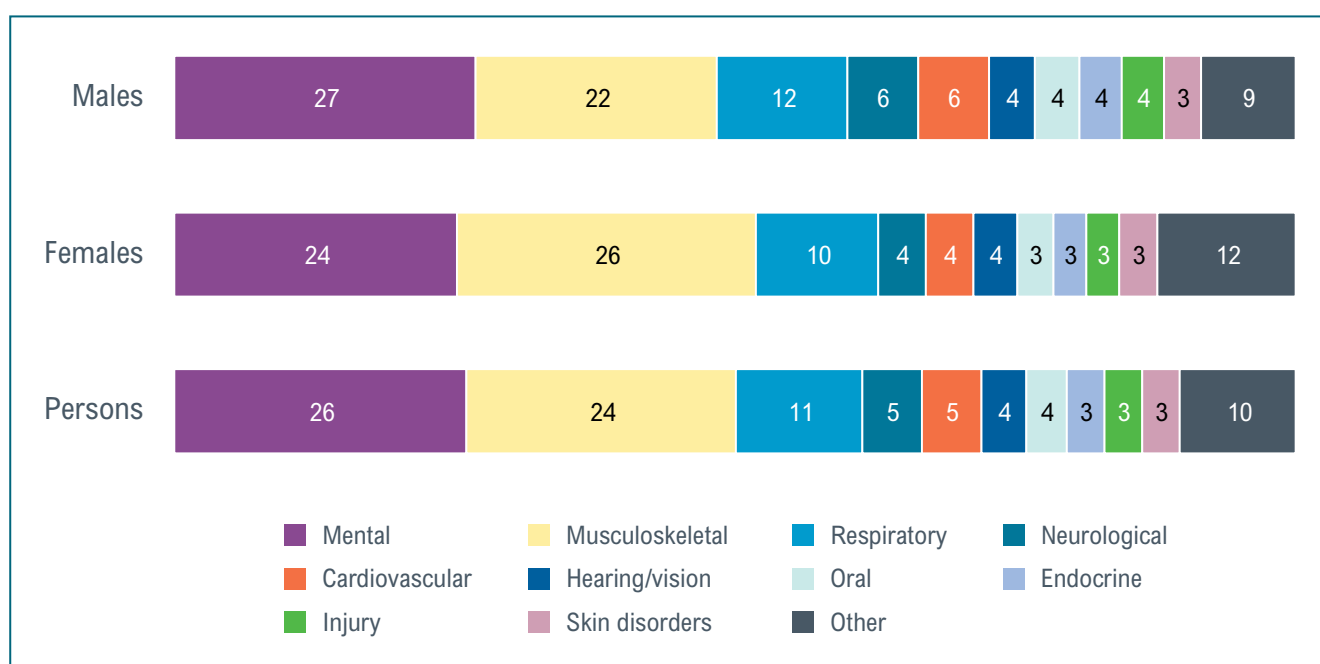
Figure 5: Percentage (%) of fatal burden (YLL), by disease group and sex, in Western Australia in 2015



Non-fatal burden

- In contrast to fatal burden, non-fatal burden was slightly higher among females (YLD = 121,623; 50.4%) than males (119,728; 49.6%).
- The overall leading disease group causing years of healthy life lost due to disease and injury (YLD) was mental and substance use disorders (26% – Figure 6). The proportion was highest in males (27%) while it ranked second in females (24%).
- Musculoskeletal conditions ranked second overall (24%) and among males (22%) but was the top ranked disease group for non-fatal burden among females (26%).
- Respiratory conditions also contributed substantially to the burden of non-fatal disease, ranking third for both males (12%) and females (10%).
- The leading three diseases causing non-fatal burden were back pain and problems, depressive disorders and anxiety disorders both overall and for females.
- For males, COPD was the second highest ranked disease. COPD ranked fourth overall and among females.

Figure 6: Percentage (%) of non-fatal burden (YLD), by disease group and sex, in Western Australia in 2015

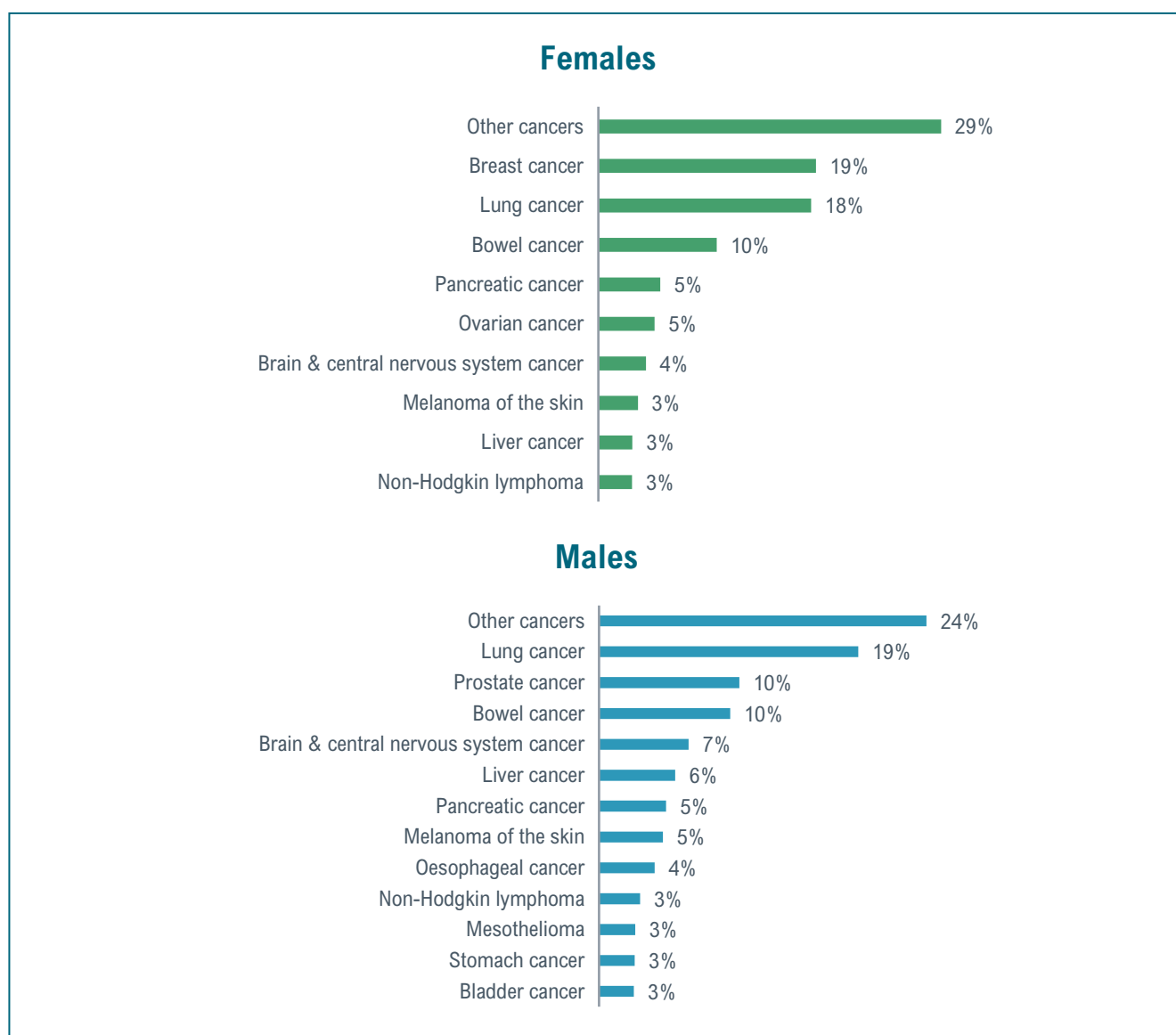


Selected highly ranked disease groups and diseases

Cancer⁴

- Cancer was the disease group which contributed the most (17%) to the total burden of disease and injury.
- Overall, YLL contributed 92% of female cancer burden and 93% of male cancer burden, with the remainder contributed by YLD.
- Most of the cancer burden occurred in those aged 65 years and older (48% of total female burden and 55% of male burden).
- In both males and females, each of the youngest age groups (under 5, 5 to 14 and 15 to 24 years) contributed 1% or less to the total burden of cancer.
- The three cancers in females which contributed the most to cancer burden were breast cancer (19% of cancer burden in females), lung cancer (18%) and bowel cancer (10% – Figure 7).
- The top three cancers in males were lung cancer (19% of cancer burden in males), prostate cancer (10%) and bowel cancer (10%).

Figure 7: Proportion of total cancer burden (DALY) by disease and sex, in Western Australia in 2015

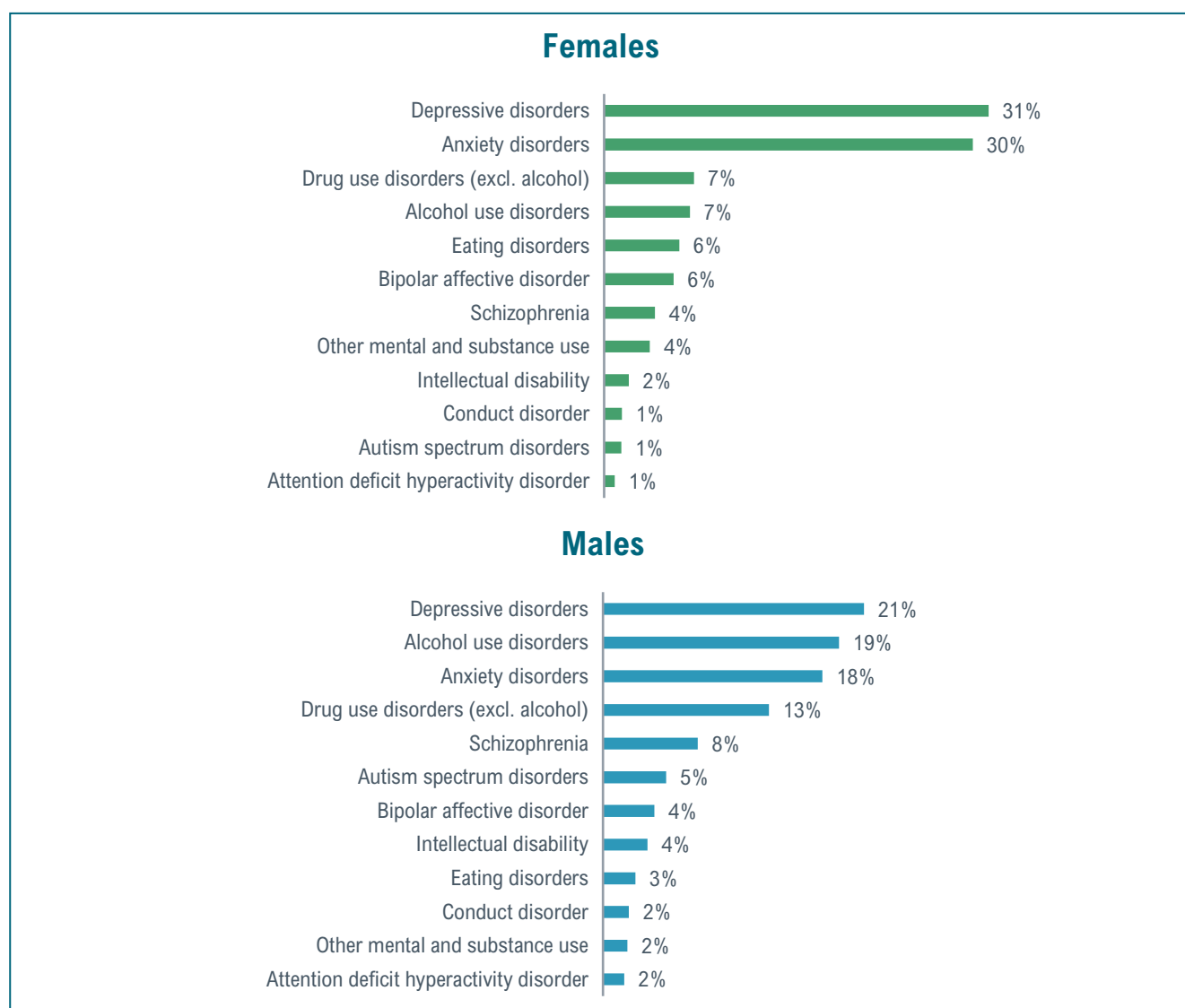


⁴ Cancers which contributed less than 2% of the cancer burden or where the primary was unknown were included in the 'other cancers' category

Mental and substance use disorders

- Mental and substance use disorders was the disease group which made the second highest contribution to the total burden of disease and injury (13%).
- Overall, years of healthy life lost to disability (YLD) contributed 99% of female mental and substance use disorder burden and 97% of the male burden, with the remainder contributed by years of life lost (YLL). [Note that suicide and self-inflicted injuries are part of the injury group and so not included here.]
- Most of the burden of mental and substance use disorders occurred in those aged 25 to 44 years (42% of total female burden and 45% of male burden). Those aged 15 to 24, and 45 to 64 years contributed 17% and 24% of the burden of mental and substance use disorders respectively.
- In both males and females, the youngest age group (under 5 years) contributed 1% to the total burden of mental health and substance use disorders.
- The top two mental and substance use disorders in females were depressive disorders (31%) and anxiety disorders (30%). Drug use disorders and alcohol use disorders each contributed 7% of the burden in this disease group.
- The top three mental and substance use disorders in males were depressive disorders (21%), alcohol use disorders (19%) and anxiety disorders (18%). Drug use disorders contributed 13% of the burden in this disease group.

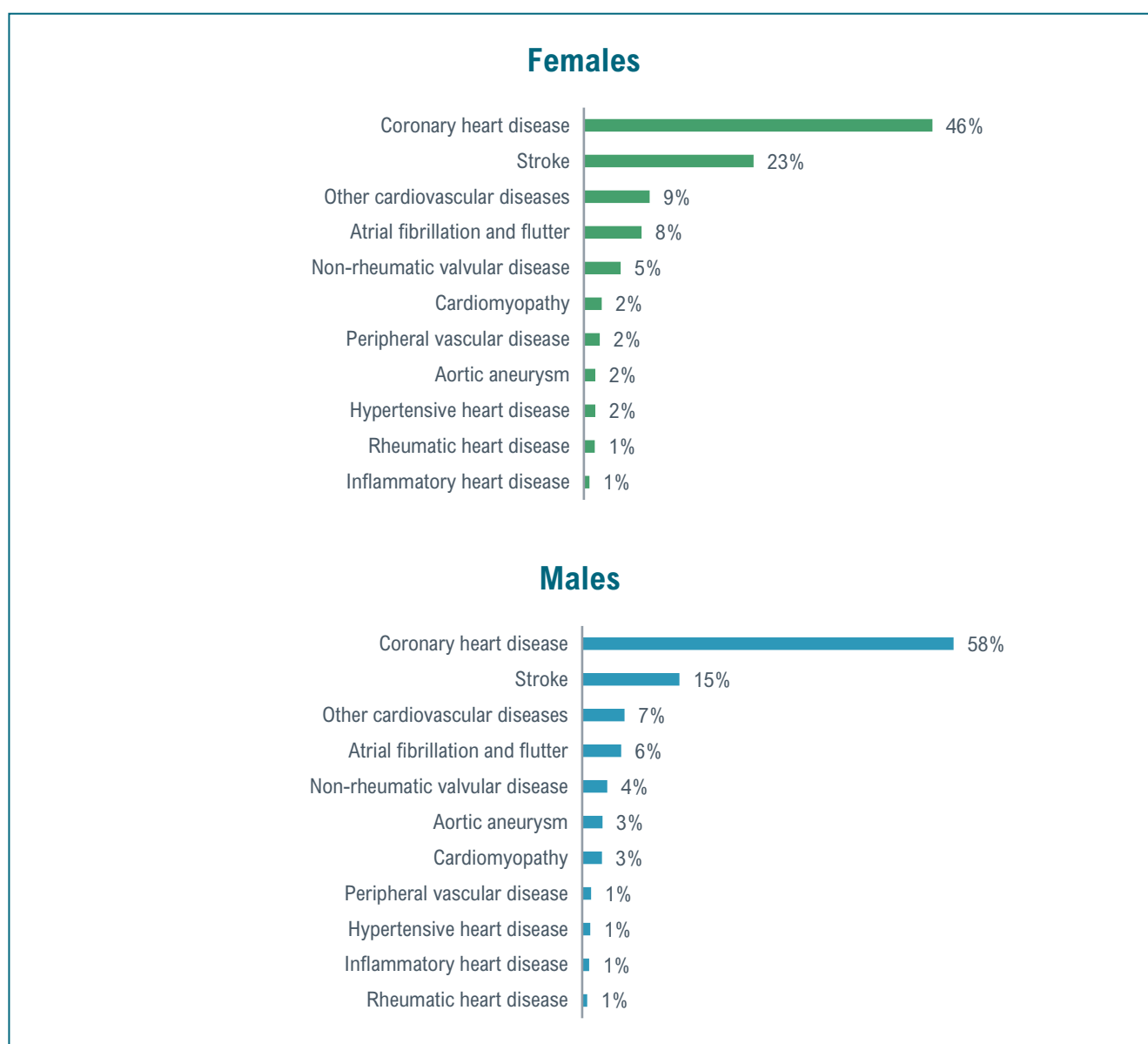
Figure 8: Proportion of total mental and substance use disorders burden (DALY) by disease and gender, in Western Australia in 2015



Cardiovascular disease

- The cardiovascular disease group was the third highest contributing disease group to total burden.
- Overall, fatal burden contributed 78% of female cardiovascular burden and 80% of the male burden, with the remainder contributed by non-fatal burden.
- Most of the burden of cardiovascular diseases occurred in males and females aged 65+ years (57% of male burden and 72% of female burden). Those aged under 25 years contributed less than 2% of the burden due to cardiovascular diseases.
- The leading causes of cardiovascular disease burden in females was coronary heart disease (46%) and stroke (23%) – Figure 9.
- Similarly, the leading cause of cardiovascular disease burden in males was coronary heart disease (58%) and stroke (15%).

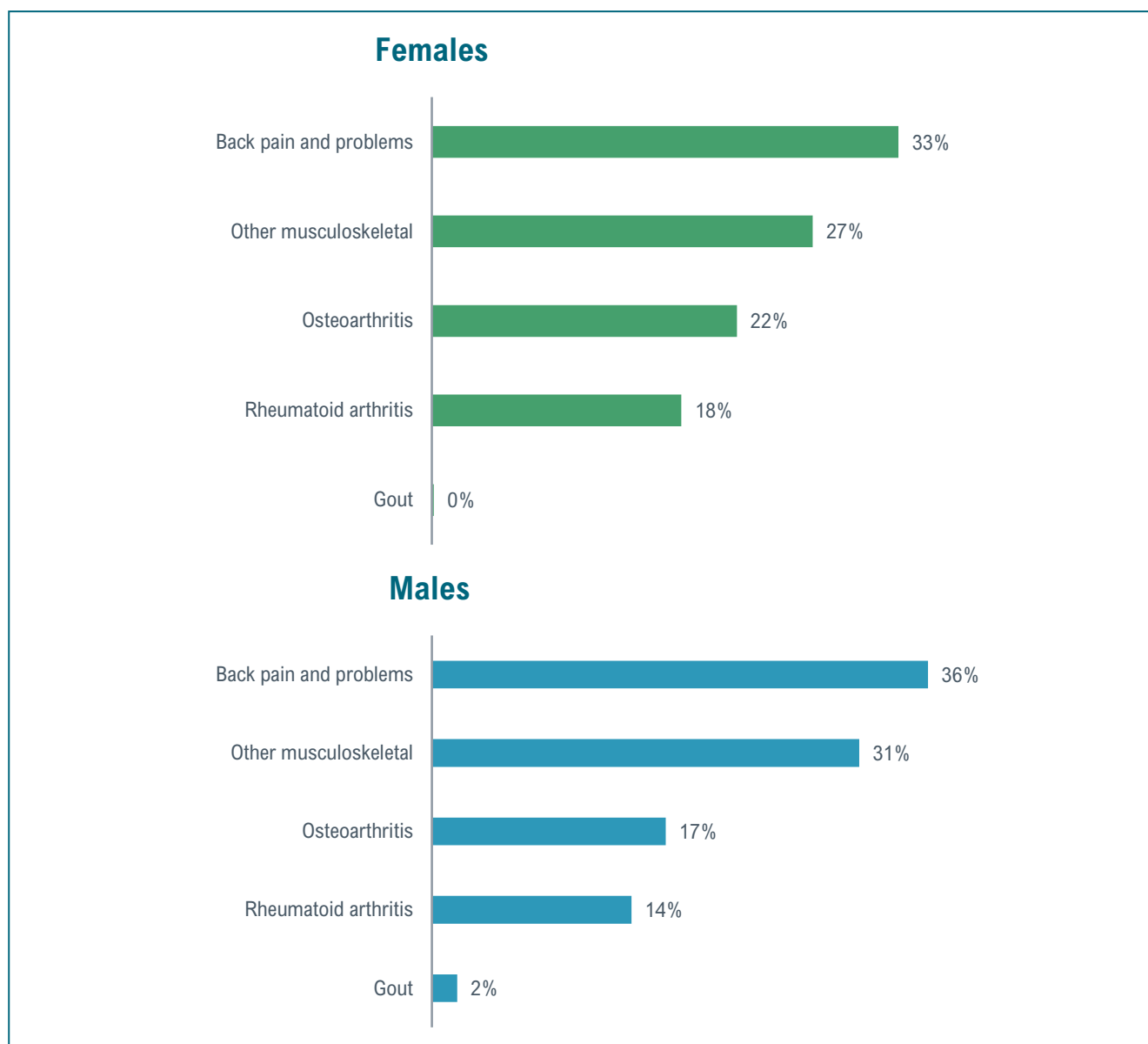
Figure 9: Proportion of total cardiovascular burden (DALY) by disease and sex, in Western Australia in 2015



Musculoskeletal conditions

- The disease group musculoskeletal conditions was the fourth highest contributing disease group to total burden.
- Overall, non-fatal burden contributed 98% of female musculoskeletal burden and 97% of the male burden.
- Most of the burden of musculoskeletal conditions occurred in males and females aged 45+ years (69% and 70% respectively). The age group 25 to 44 years contributed the second highest proportion of burden due to musculoskeletal conditions (23% of total male burden and 22% of female burden).
- Back pain and problems was the leading cause of burden in this disease group (36% of male and 33% of female burden due to musculoskeletal conditions – Figure 10).
- Osteoarthritis also caused substantial burden, particularly in females (22% compared to 17% of burden from musculoskeletal conditions in males).
- A total of 31% of male burden and 27% of female burden was due to other musculoskeletal conditions (that is, musculoskeletal conditions other than back pain and problems, osteoarthritis, rheumatoid arthritis and gout).

Figure 10: Proportion of total musculoskeletal condition burden (DALY) by disease and sex, in Western Australia in 2015



Summary

Burden of disease and injury data in WA in 2015 demonstrated an increase in burden over the life course up to the age of 84, after which it dropped as the population declined. Burden is higher among Western Australian males than females, mainly due to higher fatal burden.

The disease group that caused the most burden in WA was cancer, followed by mental and substance use disorders, and cardiovascular disease. The leading disease was coronary heart disease, followed by COPD and back pain and problems, and suicide and self-inflicted injuries. These findings can help to inform health policy and planning in WA.

Glossary⁵

Age-standardised rate: Rate that takes into account the age structure of the population.

Burden of disease (and injury): The quantified impact of a disease or injury on a population using the **disability-adjusted life year** (DALY) measure.

Condition (health condition): A broad term that can be applied to any health problem, including symptoms, diseases and certain risk factors, such as high blood cholesterol and obesity. Often used synonymously with disorder or problem.

Disability: In burden of disease analysis, any departure from an ideal health state.

Disability-adjusted life years (DALY): A year of healthy life lost, either through premature death or living with disability due to illness or injury.

Disability weight: A factor that reflects the severity of health loss from a particular health state on a scale from 0 (perfect health) to 1 (equivalent to death).

Disease: A broad term that can be applied to any health problem, including symptoms, diseases, injuries and certain risk factors, such as high blood cholesterol and obesity. Often used synonymously with condition, disorder or problem.

External cause: The environmental event, circumstance or condition that causes injury, poisoning and other adverse effect.

Fatal burden: The burden from dying prematurely as measured by years of life lost. Often used synonymously with **years of life lost** (YLL).

Health state: Reflects a combination of signs and symptoms that result health loss, and are not necessarily unique to 1 particular disease. A health state might also be a severity level of a **sequela** (typically mild, moderate and severe levels are distinguished). For example, the health state 'mild heart failure' is used as a sequela of coronary heart disease, hypertensive heart disease, congenital heart disease and several other conditions. Each health state is associated with a **disability weight**.

Incidence: Refers to the occurrence of a disease or event. The incidence rate is the number of new cases occurring during a specified time period.

Morbidity: Ill health in an individual, and levels of ill health in a population or group.

Mortality: Death.

Non-fatal burden: The burden from living with ill health as measured by years lived with disability. Often used synonymously with **years lived with disability** (YLD).

Premature death: Deaths that occur at a younger age than a selected cut-off.

Prevalence: Refers to the existence of a disease or event, whether or not it is newly occurring; the prevalence rate is the number of cases existing at a point in time (point prevalence) or over a specified time period (period prevalence).

Rate: A rate is one number (the numerator) divided by another number (the denominator). The numerator is commonly the number of events in a specified time. The denominator is the population at risk of the event. Rates (crude, age-specific and age-standardised) are generally multiplied by a number such as 100,000 to create whole numbers.

Reference life table: A table that shows, for each age, the number of remaining years a person could potentially live, to measure the **years of life lost** from dying at that age.

Risk factor: Any factor that causes or increases the likelihood of a health disorder or other unwanted condition or event.

Sequelae: Health consequences of diseases and injuries, such as heart failure due to coronary heart disease. Each sequela may be mapped to one or more **health states**.

Years lived with disability (YLD): Measures the years of what could have been a healthy life that were instead spent in states of less than full health. YLD represent non-fatal burden.

⁵ This glossary has been extracted from the AIHW Burden of Diseases 2015 report (AIHW, 2019)

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