



# Western Australian Burden of Disease Study 2015: Healthcare costs of disease groups and diseases by health region

## Introduction

The Western Australian Burden of Disease Study (WABoDS) 2015 produced estimates of the burden attributable to diseases, injuries and risk factors in the WA population (1). These estimates assess the 'human cost' of various diseases in WA.

As part of this project, the 'financial cost' (the financial impact of diseases and injuries on the health system) has been estimated (2). The first bulletin presented the financial impact of different diseases on WA, by presenting estimates of health care expenditure attributable to WABoDS disease groups and diseases, by age-group and area of expenditure, for the 2015-16 financial year (2). The second bulletin examined the costs attributable to 18 modifiable risk factors for the same time period (3). This third bulletin on costs provides an overview of healthcare expenditure for the 10 WA health regions.

## Methods

The methodology for producing the burden of disease estimates for the WABoDS is based on the Australian Burden of Disease Study 2015 (4). The results from the WABoDS, including burden of disease estimates for different disease groups and diseases, are described in detail elsewhere (1, 5-7), including burden in the health regions (8, 9).

Healthcare expenditure data for WA for 2015-16 were provided by the Australian Institute of Health and Welfare (AIHW) (4). Expenditure on the WABoDS diseases and disease groups were reported by geographical area (health region) and area of expenditure (hospital, non-hospital, or pharmaceuticals) (4). The AIHW used data at Australian Bureau of Statistics geographical area Statistical Area 3 (SA3) to map to WA health regions using the concordance file provided by the Epidemiology Directorate. Dental care expenditure [11.8% of healthcare spending (2)] was not available at SA3 level so could not be reported at health region level. Costs were allocated according to the health region of usual residence, which was not necessarily the same as the health region where care was provided.

The areas of health care expenditure included in the estimates are: hospital services, referred and un-referred medical services, Medicare-funded other health practitioner services and pharmaceuticals listed on the Pharmaceutical Benefits Scheme. Further details can be found in the previous bulletin on healthcare expenditure in WA (2). Types of expenditure excluded from the estimates are capital expenditure, spending on community and public health programs, indirect healthcare costs and dental expenditure as discussed above. Further information on the methods of estimating healthcare expenditure can be obtained from the AIHW report *Disease Expenditure Study: Overview of analysis and methodology 2015-16* (10).

## Results

Approximately \$11.6 billion (\$4,467 per person) of spending on health care in WA in 2015-16 could be attributed to the WABoDS disease groups (2). Of this, \$7.2 billion (62.2%, \$2,778 per person) was spent on hospital care, \$1.8 billion (15.5%, \$691 per person) on non-hospital medical care, \$1.2 billion (10.6%, \$471 per person) on pharmaceuticals, and \$1.4 billion (11.8%, \$527) on dental care. Because dental care could not be allocated by health region, this bulletin will report on the remaining \$10.2 billion, disaggregated by health region.

The metropolitan area (East Metro - EM, North Metro – NM and South Metro - SM) accounted for 78.6% of the health expenditure in WA (Table 1). Residents of the Kimberley (KIM) and the Pilbara (PIL) accounted the lowest proportion of expenditure: 1.9% and 1.5% of the state expenditure respectively.

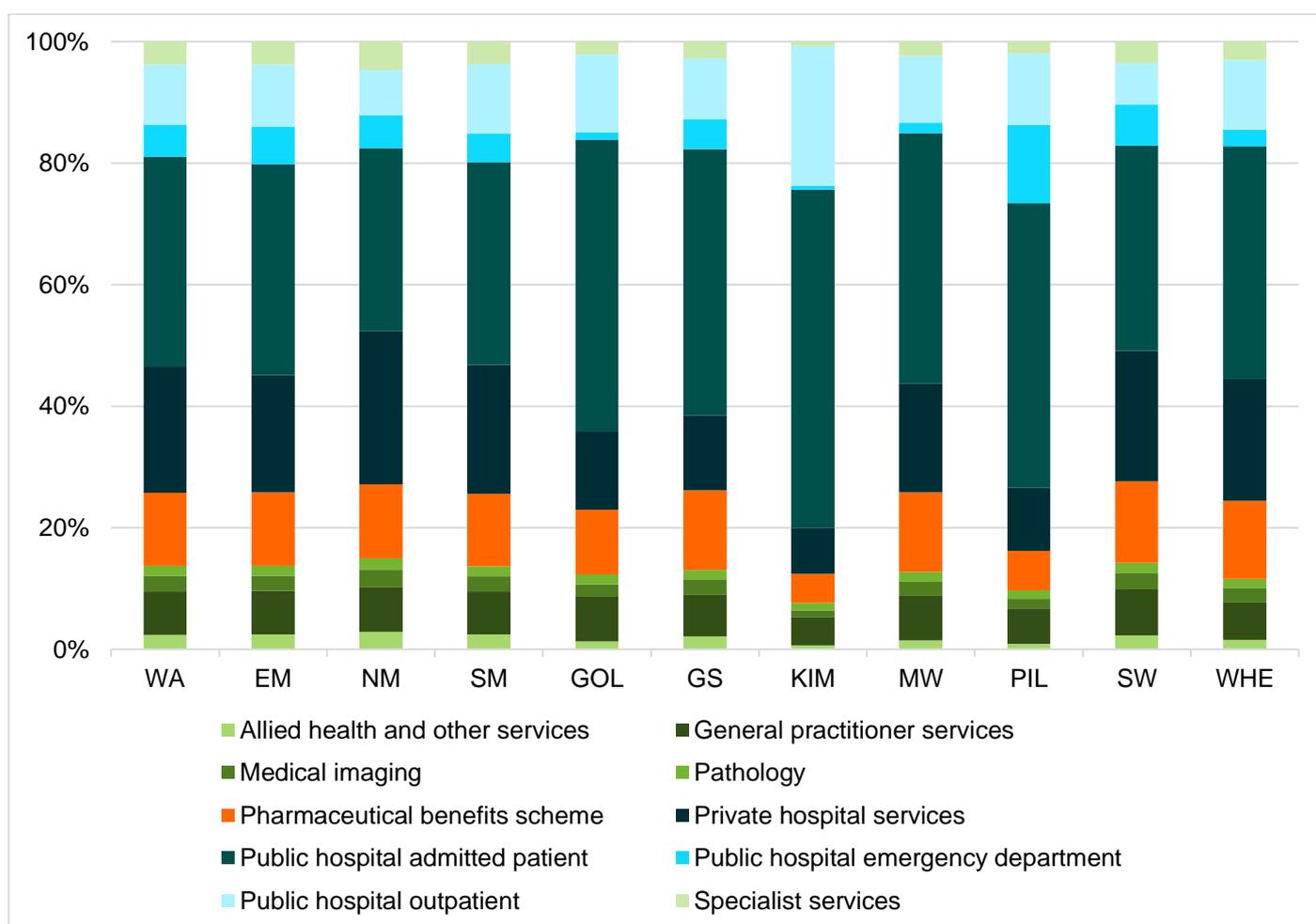
Table 1 also displays differences in per capita healthcare expenditure and population by health region. The Kimberley has smallest population but the highest per capita (\$5,022 per person) while the Pilbara the lowest per capita expenditure (\$2,668 per person), but the lowest proportion of females (36.0%) and lowest proportion of persons aged 65 years and older (2.6%). The Wheatbelt has the second highest per capita expenditure (\$4,602 per person), the highest median age (42 years) and the second highest proportion of persons age 65 years and older (18.1%). Kimberley had a much higher proportion of Aboriginal population (48.3%), followed by the Pilbara (18.3%), Midwest (13.3%) and Goldfields (12.2%).

Table 1: Per capita WA healthcare expenditure and population structure by health region, 2015/16

Health region	Healthcare expenditure		Population					
	Total in million \$ (%)	Per capita \$	Total (%)	Median age	Female	aged <15	aged >=65	Aboriginal
<b>EM</b>	2,645 (25.9%)	3,881	681,479 (26.3%)	34	49.2%	18.4%	12.2%	2.8%
<b>NM</b>	2,761 (27.0%)	3,809	724,753 (28.0%)	35	50.4%	19.2%	13.0%	1.3%
<b>SM</b>	2,620 (25.7%)	4,113	637,016 (24.6%)	36	50.4%	19.2%	14.4%	2.1%
<b>GOL</b>	205 (2.0%)	3,383	60,536 (2.3%)	33	46.4%	21.3%	9.0%	12.2%
<b>GS</b>	264 (2.6%)	4,386	60,165 (2.3%)	41	51.0%	19.8%	18.8%	4.7%
<b>KIM</b>	195 (1.9%)	5,022	38,801(1.5%)	31	47.7%	23.1%	5.6%	48.3%
<b>MW</b>	283 (2.8%)	4,166	67,878 (2.6%)	38	48.5%	20.4%	14.1%	13.3%
<b>PIL</b>	176 (1.7%)	2,668	65,859 (2.5%)	33	36.0%	17.4%	2.6%	18.3%
<b>SW</b>	701 (6.9%)	3,983	175,949 (6.8%)	38	50.5%	20.8%	15.3%	3.0%
<b>WHE</b>	358 (3.5%)	4,602	77,823 (3.0%)	42	48.1%	19.5%	18.1%	5.7%

Figure 1 displays the proportion of areas of expenditure by health region. The highest proportion of expenditure for all health regions was for public hospital admissions, ranging from 30.1% in North Metro to 55.7% in the Kimberley. The proportion of expenditure on public hospital admitted patients was lower in the metro and the South West health regions. In the Kimberley, more than half of healthcare expenditure was on public hospital admitted patients, with slightly lower proportions in the Goldfields (GOL – 48.1%) and the Pilbara (46.8%). The Kimberley also had a higher proportion of expenditure for public hospital outpatients (22.9%) compared to other health regions (e.g. Midwest – 11.0%). Similarly, the proportion of expenditure for specialist and allied health services was lower for more remote health regions.

The proportion of expenditure due to private hospital use in East Metro (19.3%), North Metro (25.3%) and South Metro (21.2%) was much higher than other health regions. Most private hospitals are in the metropolitan health regions, with only three other health regions having one private hospital each (Great Southern – GS, South West – SW, and Midwest – MW). Note that costs are incurred according to place of residence, not the health region where the care was delivered. As a result, health regions without private hospitals record private hospital expenditure as their residents presented at private hospitals in other health regions.



**Figure 1:** WA healthcare expenditure by health region areas of expenditure, 2015-16. Dental care expenditure by health region is unavailable so is excluded from the WA total for comparison purposes.

## Healthcare expenditure by disease group

The disease group with the highest healthcare expenditure in most health regions was musculoskeletal conditions ranging from 11.9% of health expenditure in the Goldfield to 14.6% in the South West (Figure 2). In the Pilbara, reproductive and maternal conditions incurred the highest expenditure (15.3%) while in the Kimberley, kidney and urinary conditions ranked first (12.5%). These two health regions had the lowest proportion of the population aged 65 years and older (Table 1) and different patterns of expenditure by disease group compared to the other health regions.

The per capita healthcare expenditure was derived to compare the cost among health regions. However, this measure does not account for differences in the age structure, proportion of Aboriginal population or proportion of males to females in the population across health regions. In addition, the per capita cost can be volatile from year-to-year, especially in small geographical areas. The total per capita healthcare expenditure for WA exclude dental care expenditure so will differ from the total reported in the previous bulletin on healthcare expenditure in WA (2).

Disease groups with high per capita expenditure were: musculoskeletal conditions (ranging from \$404 per person in the Goldfields to \$656 per person in the Wheatbelt); cardiovascular disorders (ranging from \$182 per person in the Pilbara to \$517 in the Wheatbelt); injury (ranging from \$300 per person in the Goldfields to \$518 per person in the Kimberley); and cancer (ranging from \$273 per person in Goldfields to \$487 per person in the Great Southern).

	1st	2nd	3rd	4th	5th
<b>WA</b>	Musculoskeletal (16.4%, \$500)	Cardiovascular (12.8%, \$391)	Injury (11.5%, \$351)	Reproductive/maternal (11.5%, \$350)	Cancer (11.2%, \$340)
<b>EM</b>	Musculoskeletal (11.9%, \$462)	Cardiovascular (9.7%, \$375)	Reproductive/maternal (9.4%, \$365)	Mental (8.8%, \$340)	Injury (8.7%, \$339)
<b>NM</b>	Musculoskeletal (13.0%, \$494)	Cardiovascular (9.8%, \$373)	Mental (9.3%, \$355)	Reproductive/maternal (9.3%, \$354)	Cancer (9.0%, \$342)
<b>SM</b>	Musculoskeletal (13.0%, \$536)	Cardiovascular (10.0%, \$412)	Injury (8.6%, \$354)	Cancer (8.6%, \$352)	Reproductive/maternal (8.1%, \$332)
<b>GOL</b>	Musculoskeletal (11.9%, \$404)	Reproductive/maternal (10.1%, \$343)	Cardiovascular (9.7%, \$327)	Injury (8.9%, \$300)	Cancer (8.1%, \$273)
<b>GS</b>	Musculoskeletal (13.4%, \$589)	Cancer (11.1%, \$487)	Cardiovascular (11.0%, \$481)	Injury (9.1%, \$398)	Mental (8.2%, \$359)
<b>KIM</b>	Kidney/urinary (12.5%, \$627)	Reproductive/maternal (11.7%, \$587)	Injury (10.3%, \$518)	Cardiovascular (8.3%, \$415)	Infectious (8.2%, \$410)
<b>MW</b>	Musculoskeletal (13.4%, \$556)	Cardiovascular (10.6%, \$443)	Cancer (9.9%, \$414)	Injury (8.4%, \$349)	Reproductive/maternal (7.7%, \$321)
<b>PIL</b>	Reproductive/maternal (15.3%, \$409)	Injury (12.4%, \$331)	Infectious (8.8%, \$235)	Musculoskeletal (8.3%, \$221)	Gastrointestinal (7.2%, \$192)
<b>SW</b>	Musculoskeletal (14.6%, \$581)	Cardiovascular (10.9%, \$433)	Injury (9.0%, \$360)	Cancer (8.5%, \$339)	Reproductive/maternal (7.8%, \$311)
<b>WHE</b>	Musculoskeletal (14.3%, \$656)	Cardiovascular (11.2%, \$517)	Injury (10.0%, \$462)	Cancer (10.0%, \$460)	Gastrointestinal (7.0%, \$322)

**Figure 2:** Proportion and per capita healthcare expenditure of top five disease groups by health region in WA, 2015-16. Maternal and reproductive conditions exclude normal deliveries without complications and include some conditions affecting males. Dental care expenditure by health region is unavailable so is excluded from the WA total for comparison purposes.

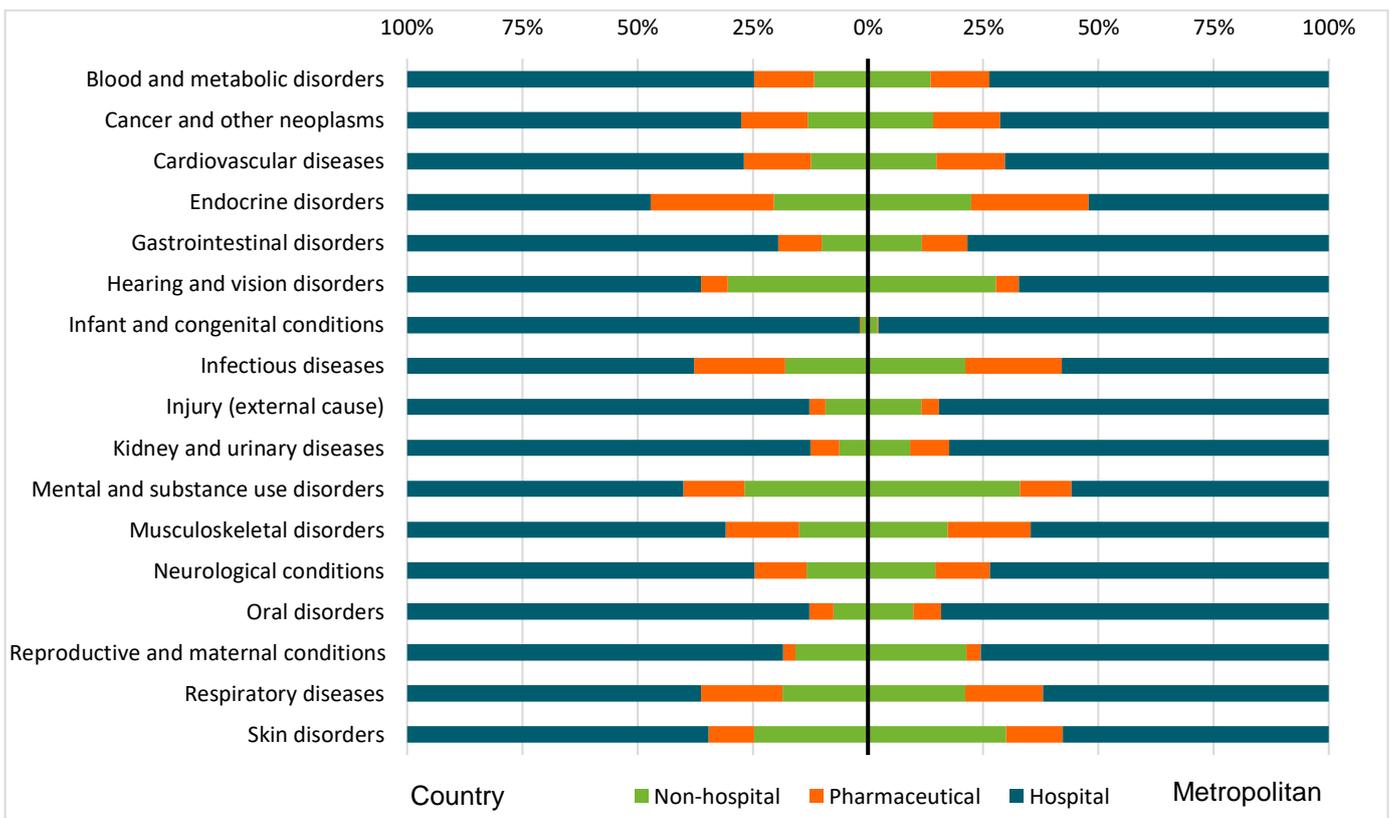
## Area of expenditure by disease group

The area of expenditure by disease group was compared for the three metropolitan health regions and the seven country health regions (Figure 3).

The proportion of healthcare expenditure spent on hospital care was slightly higher in country health regions than in the metro health regions. Notably, 82% of healthcare expenditure on reproductive and maternal conditions in the country health regions was used on hospital care with 76% of expenditure in the metro health regions on hospitals care. A larger difference was also found for infectious diseases (62% vs 58% respectively) and musculoskeletal disorders (69% vs 65% respectively). The proportion of expenditure on hospital care was lower in endocrine disorders, mental and substance use disorders, and skin disorders across all health regions. Country and metro expenditure proportions were similar for the former two disease groups, but the proportion of hospital skin costs were higher in country regions (65%) than metro regions (58%) and for mental and substance use disorders (60% vs 56% respectively).

In contrast, the proportions of healthcare expenditure spent on non-hospital care (allied health and other services, general practitioner services, medical imaging, pathology and specialist services) tended to be lower by disease group in country health regions than metro health regions. Country non-hospital costs made up 16% of healthcare expenditure for reproductive and maternal conditions but 21% in metro health regions. Differences were also found for infectious diseases (18% vs 21% respectively), cardiovascular diseases (12% vs 15%) and skin disorders (25% vs 30%).

Proportions of healthcare expenditure on pharmaceuticals were similar by disease group. Certain disease groups had higher proportions of expenditure on pharmaceuticals (endocrine disorders, musculoskeletal disorders, respiratory diseases, infectious diseases) but differences between country and metro regions were not large.



**Figure 3:** WA healthcare expenditure by disease group and areas of expenditure, comparing country (left) and metropolitan (right) health regions, 2015-16

## Healthcare expenditure on diseases

Figure 4 compares the proportion and per capita healthcare expenditure of the ten diseases that attracted the highest expenditure in each health region in 2015-16: falls was ranked in the top three diseases in all health regions. Per capita expenditure on falls ranged from \$90 per person per year in the Pilbara to \$193 per person in the Wheatbelt.

Osteoarthritis ranked in the top three diseases for all health regions except the Pilbara and the Kimberley. Per capita expenditure ranged from \$38 per person in the Pilbara to \$209 per person in the Wheatbelt.

Per capita expenditure for back pain and problems ranked in the top five in all health regions; it was lowest in the Pilbara (\$51 per person) and highest in the Wheatbelt (\$142 per person).

Skin infections (including cellulitis) ranked in the top five diseases in the Kimberley and the Pilbara (per capita expenditure: \$143 and \$82 respectively) and the top ten conditions in several other health regions.

Other conditions that were ranked in the top five by expenditure in several health regions were coronary heart disease and depressive disorders. Type 2 diabetes, rheumatoid arthritis, cataract, lower respiratory infections and anxiety disorders also ranked in the top ten diseases by expenditure.

Chronic kidney disease ranked 6<sup>th</sup> in the Kimberley (per capita expenditure: \$77) and 9<sup>th</sup> in the Goldfields (\$42 per person) but did not rank in the top 10 for any other health regions.

	1st	2nd	3rd	4th	5th	6th	7th	8th	9th	10th
<b>WA</b>	Falls (3.4%, \$133)	Osteoarthritis (3.4%, \$133)	Back pain/problems (2.9%, \$114)	Coronary heart disease (2.0%, \$80)	Depressive disorders (1.9%, \$75)	Anxiety disorders (1.7%, \$66)	Rheumatoid arthritis (1.5%, \$57)	Type 2 diabetes (1.4%, \$55)	Cataract (1.3%, \$52)	Lower respiratory infections (1.2%, \$46)
<b>EM</b>	Falls (3.2%, \$123)	Osteoarthritis (3.0%, \$116)	Back pain/problems (2.7%, \$105)	Coronary heart disease (2.0%, \$78)	Depressive disorders (2.0%, \$76)	Anxiety disorders (1.7%, \$67)	Rheumatoid arthritis (1.5%, \$57)	Type 2 diabetes (1.4%, \$54)	Schizophrenia (1.3%, \$49)	Cataract (1.2%, \$48)
<b>NM</b>	Falls (3.5%, \$134)	Osteoarthritis (3.4%, \$128)	Back pain/problems (3.0%, \$114)	Depressive disorders (2.2%, \$84)	Coronary heart disease (2.0%, \$76)	Anxiety disorders (1.9%, \$73)	Rheumatoid arthritis (1.5%, \$56)	Type 2 diabetes (1.2%, \$47)	Non-melanoma skin cancer (1.2%, \$47)	Cataract (1.2%, \$45)
<b>SM</b>	Osteoarthritis (3.5%, \$143)	Falls (3.4%, \$138)	Back pain/problems (3.0%, \$125)	Coronary heart disease (2.0%, \$83)	Depressive disorders (1.9%, \$77)	Cataract (1.7%, \$71)	Anxiety disorders (1.6%, \$67)	Rheumatoid arthritis (1.6%, \$66)	Type 2 diabetes (1.5%, \$62)	Lower respiratory infections (1.1%, \$47)
<b>GOL</b>	Osteoarthritis (3.0%, \$107)	Falls (3.0%, \$102)	Back pain/problems (2.8%, \$94)	Type 2 diabetes (1.7%, \$58)	Coronary heart disease (1.7%, \$58)	Lower respiratory infections (1.6%, \$55)	Depressive disorders (1.5%, \$51)	Skin infections (incl. cellulitis) (1.4%, \$47)	Chronic kidney disease (1.2%, \$42)	Rheumatoid arthritis (1.1%, \$38)
<b>GS</b>	Osteoarthritis (4.3%, \$187)	Falls (3.6%, \$156)	Back pain/problems (2.7%, \$119)	Coronary heart disease (2.2%, \$97)	Depressive disorders (2.1%, \$90)	Anxiety disorders (1.6%, \$71)	Type 2 diabetes (1.4%, \$62)	Lower respiratory infections (1.2%, \$52)	Rheumatoid arthritis (1.1%, \$50)	Skin infections (incl. cellulitis) (1.1%, \$49)
<b>KIM</b>	Falls (3.0%, \$151)	Skin infections incl. cellulitis (2.8%, \$143)	Back pain/problems (2.0%, \$102)	Lower respiratory infections (1.9%, \$98)	Type 2 diabetes (1.5%, \$77)	Chronic kidney disease (1.5%, \$77)	Coronary heart disease (1.5%, \$75)	Schizophrenia (1.2%, \$61)	Hepatitis C (acute) (1.1%, \$55)	Non-melanoma skin cancer (1.1%, \$54)
<b>MW</b>	Osteoarthritis (4.1%, \$170)	Falls (3.2%, \$133)	Back pain/problems (2.4%, \$102)	Coronary heart disease (2.2%, \$91)	Type 2 diabetes (1.6%, \$68)	Skin infections (incl. cellulitis) (1.6%, \$66)	Cataract (1.4%, \$56)	Depressive disorders (1.3%, \$55)	Non-melanoma skin cancer (1.3%, \$53)	Lower respiratory infections (1.2%, \$52)
<b>PIL</b>	Falls (3.4%, \$90)	Skin infections incl. cellulitis (3.1%, \$82)	Lower respiratory infections (2.1%, \$57)	Back pain/problems (1.9%, \$51)	Upper respiratory infections (1.5%, \$40)	Osteoarthritis (1.4%, \$38)	Type 2 diabetes (1.3%, \$34)	Coronary heart disease (1.3%, \$34)	Depressive disorders (1.1%, \$29)	Gallbladder/bile duct disease (1.1%, \$28)
<b>SW</b>	Osteoarthritis (4.3%, \$172)	Falls (3.5%, \$138)	Back pain/problems (3.2%, \$127)	Coronary heart disease (2.6%, \$102)	Depressive disorders (1.7%, \$69)	Anxiety disorders (1.7%, \$66)	Rheumatoid arthritis (1.6%, \$65)	Cataract (1.4%, \$55)	Type 2 diabetes (1.3%, \$54)	Lower respiratory infections (1.2%, \$49)
<b>WHE</b>	Osteoarthritis (4.5%, \$209)	Falls (4.2%, \$193)	Back pain/problems (3.1%, \$142)	Coronary heart disease (2.2%, \$102)	Type 2 diabetes (1.6%, \$76)	Depressive disorders (1.6%, \$73)	Rheumatoid arthritis (1.5%, \$71)	Cataract (1.4%, \$62)	Non-melanoma skin cancer (1.3%, \$60)	Lower respiratory infections (1.3%, \$58)

**Figure 4:** Proportion and per capita healthcare expenditure of top ten diseases by health region in WA, 2015-16. 'Other' or 'unknown' conditions, for example, other cardiovascular diseases, have been excluded from the ranking.

## Healthcare and human costs associated with the WABoDS disease groups

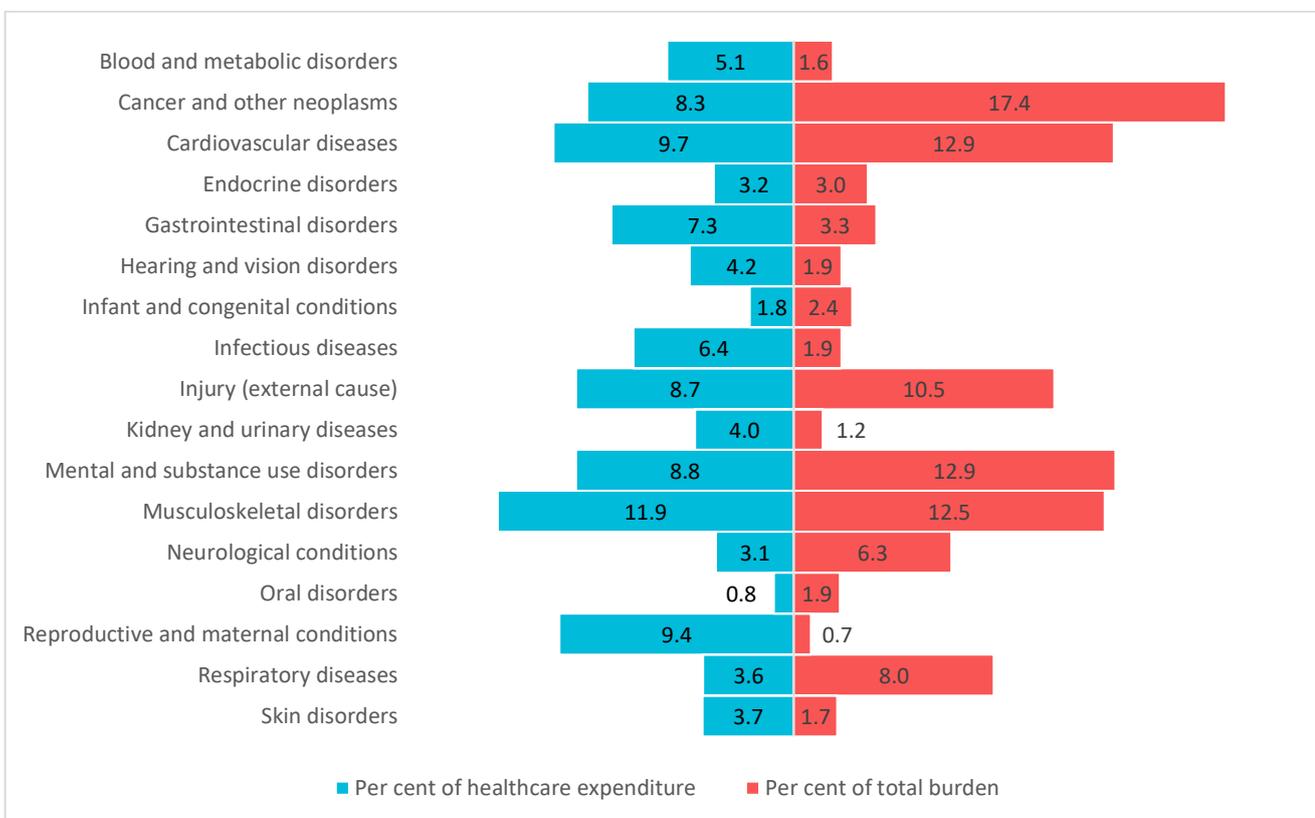
Both the human (burden of disease) and financial (healthcare expenditure) costs of conditions and disease groups can be used by government and health service providers to identify priorities for WA and design policies, programs and services that best meet the needs of the WA population. A discussion of the complexities of the relationship between healthcare expenditure and burden of disease can be found in the first bulletin in this series (2). Low expenditure relative to disease burden does not necessarily equate to a need for increased healthcare expenditure.

In the following sections, the burden of disease and healthcare expenditure will be compared for each health region.

### East Metropolitan Region

The East Metropolitan Region had an estimated population of 681,479 in 2015 of which 335,299 (49.2%) were female. The median age was 34 years and 2.8% of the population were Aboriginal persons (Table 1).

A total of \$2,644.5 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on East Metro residents in 2015-16 (Table 1). The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$314.7 million, 11.9% of healthcare expenditure), cardiovascular diseases (\$255.4 million, 9.7%) and reproductive and maternal conditions (\$249.0 million, 9.4% – Figure 5). In contrast, cancer and other neoplasms had the highest burden of disease (DALY=21,321, 17.4% of total DALY) followed by mental and substance use disorders, cardiovascular diseases and musculoskeletal disorders.

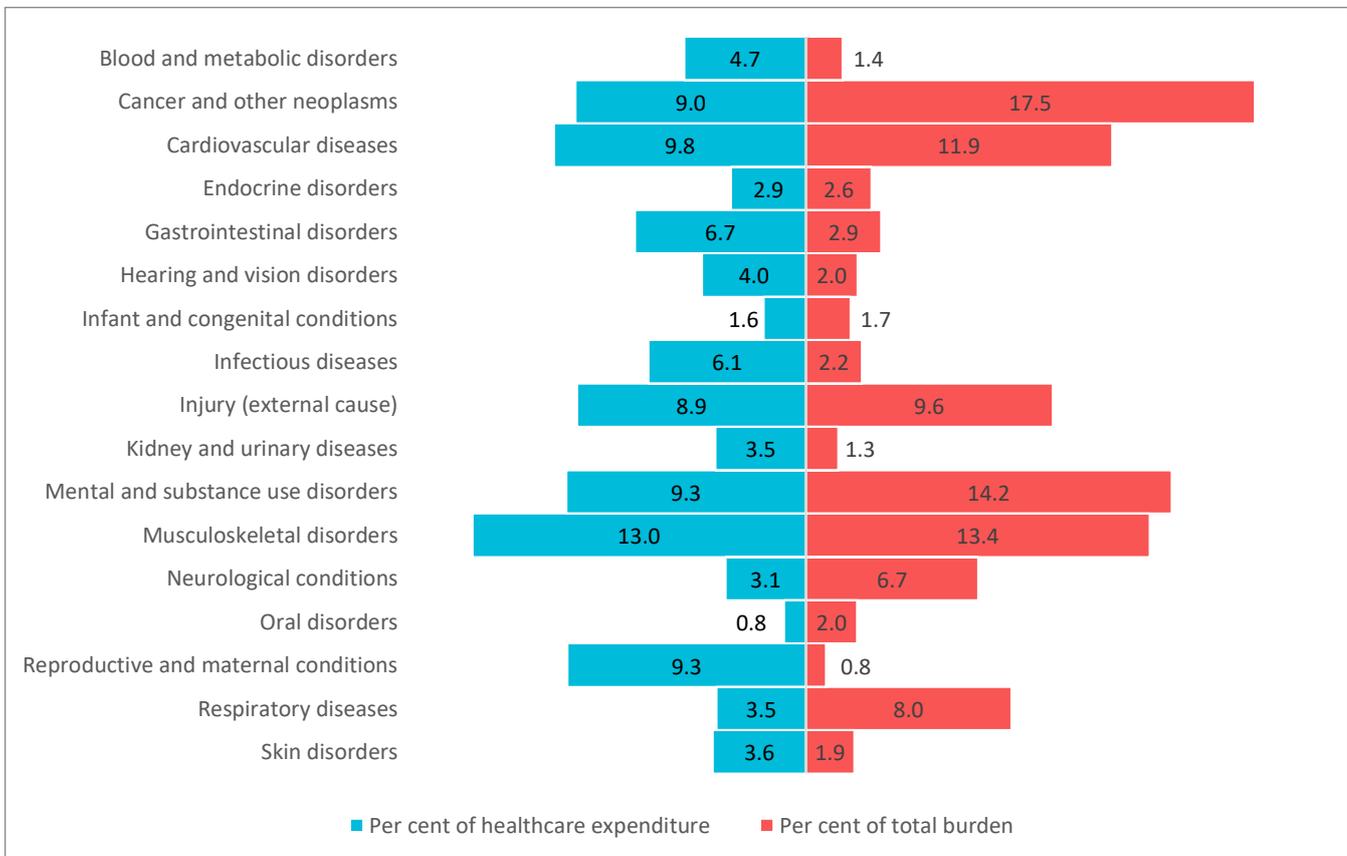


**Figure 5:** Health care expenditure and burden attributable to disease groups in East Metropolitan Region, 2015-16.

## North Metropolitan Region

The North Metropolitan Region had an estimated population of 724,753 in 2015 of which 365,602 (50.4%) were female. The median age was 35 years and 1.3% of the population were Aboriginal persons.

A total of \$2,760.5 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on North Metro residents in 2015-16. The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$358.0 million, 13.0% of total healthcare), cardiovascular diseases (\$270.4 million, 9.8%) and mental and substance use disorders (\$257.6 million, 9.3% – Figure 6). In contrast, cancer and other neoplasms had the highest burden of disease (DALY=21,154, 17.5% of total DALY) followed by mental and substance use disorders, musculoskeletal disorders and cardiovascular diseases.

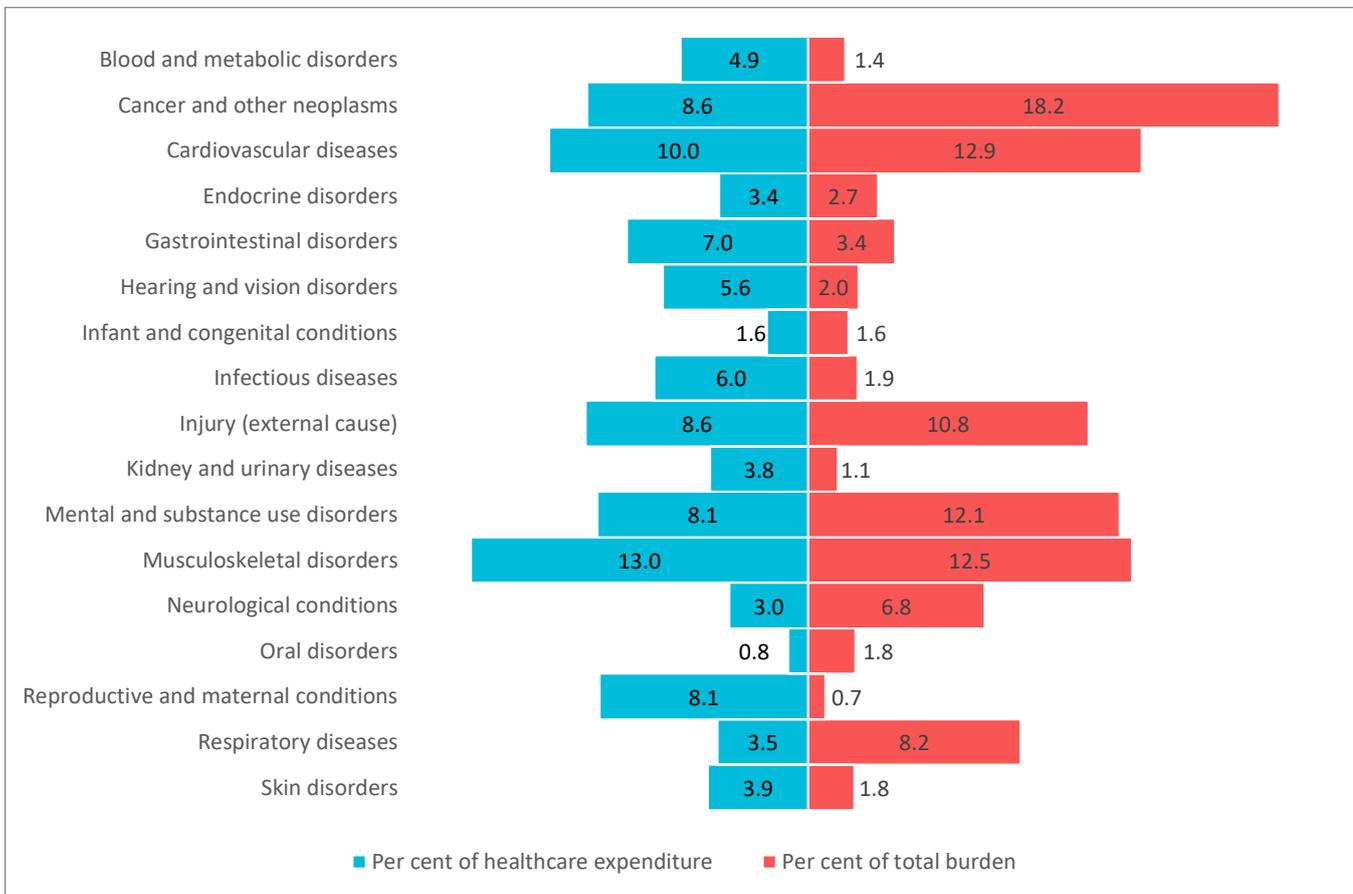


**Figure 6:** Health care expenditure and burden attributable to disease groups in North Metropolitan Region, 2015-16.

## South Metropolitan Region

The South Metropolitan Region had an estimated population of 637,016 in 2015 of which 320,878 (50.4%) were female. The median age was 36 years and 2.1% of the population were Aboriginal persons.

A total of \$2,619.9 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on South Metro residents in 2015-16. The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$341.7 million, 13.0% of total healthcare expenditure), cardiovascular diseases (\$262.7 million, 10.0%) and injury (\$225.2 million, 8.6% – Figure 7). In contrast, cancer and other neoplasms had the highest burden of disease (DALY=21,047, 18.2%) followed by cardiovascular diseases, musculoskeletal disorders, and mental and substance use disorders.

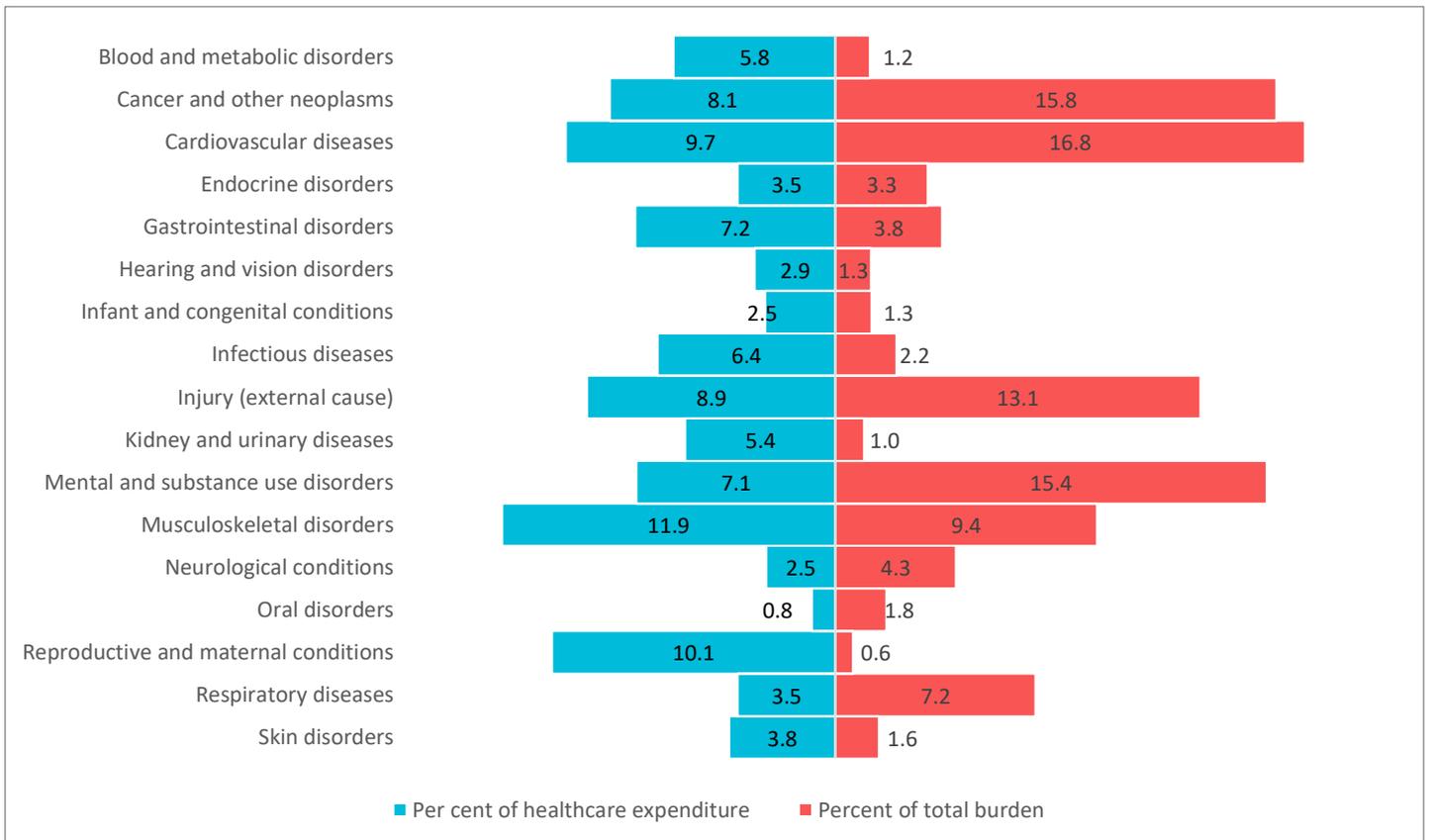


**Figure 7:** Health care expenditure and burden attributable to disease groups in South Metropolitan Region, 2015-16.

## Goldfields Region

The Goldfields Region had an estimated population of 60,536 in 2015 of which 28,061 (46.4%) were female. The median age was 33 years and 12.2% of the population were Aboriginal persons.

A total of \$204.8 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on Goldfields residents in 2015-16. The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$24.4 million, 11.9% of healthcare expenditure), reproductive and maternal health conditions (\$20.8 million, 10.1%) and cardiovascular diseases (\$19.8 million, 9.7% – Figure 8). In contrast, cardiovascular disease had the highest burden of disease (DALY=1,857, 16.8% of total DALY) followed by cancer and other neoplasms, mental and substance use disorders, and injury.

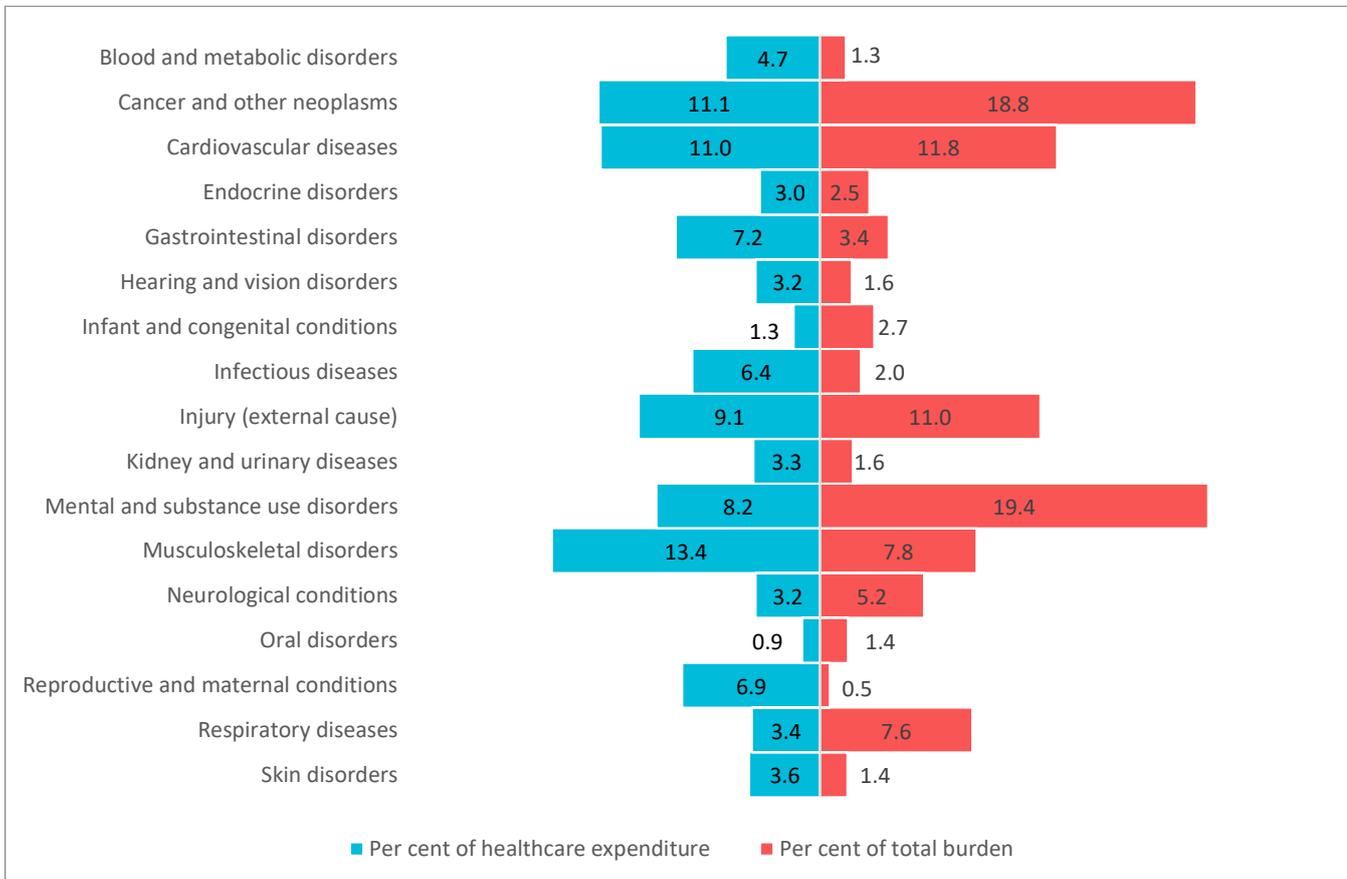


**Figure 8:** Health care expenditure and burden attributable to disease groups in Goldfields Region, 2015-16.

## Great Southern Region

The Great Southern Region had an estimated population of 60,165 in 2015 of which 30,684 (51.0%) were female. The median age was 41 years and 4.7% of the population were Aboriginal persons.

A total of \$263.9 million of the WA healthcare expenditure (excluding dental care expenditure) was spent in Great Southern in 2015-16. The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$35.4 million, 13.4% of healthcare expenditure), cancer and other neoplasms (\$29.2 million, 11.1%) and cardiovascular diseases (\$29.0 million, 11.0% – Figure 9). In contrast, mental and substance use disorders had the highest burden of disease (DALY=2,816, 19.4% of total DALY) followed by cancer and other neoplasms, cardiovascular diseases and injury.

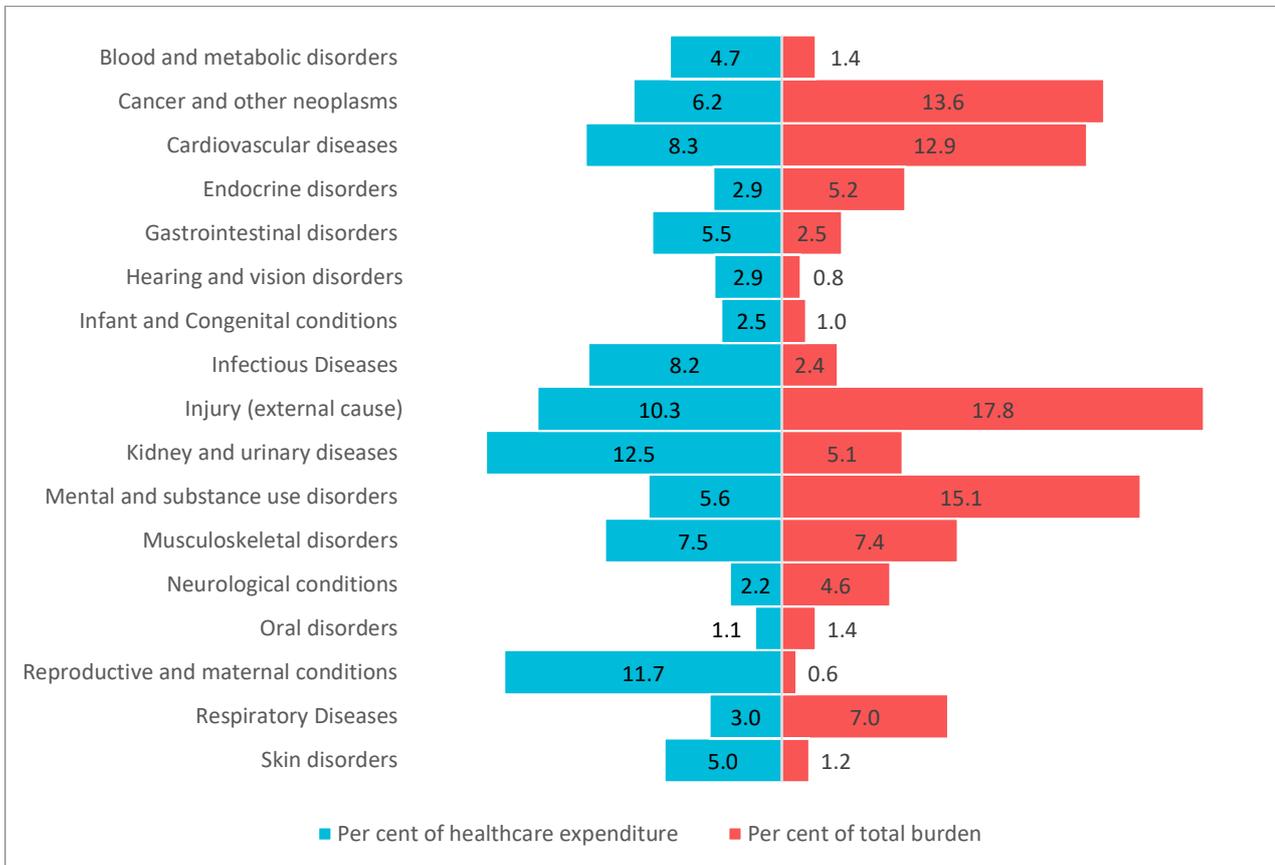


**Figure 9:** Health care expenditure and burden attributable to disease groups in Great Southern Region, 2015-16.

## Kimberley Region

The Kimberley Region had an estimated population of 38,801 in 2015 of which 18,515 (47.7%) were female. The median age was 31 years and 48.3% of the population were Aboriginal persons.

A total of \$194.9 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on Kimberley residents in 2015-16. The disease groups with the highest healthcare expenditure were kidney and urinary diseases (\$24.3 million, 12.5% of healthcare expenditure), reproductive and maternal conditions (\$22.8 million, 11.7%) and injury (\$20.1 million, 10.3% – Figure 10). In contrast, injury had the highest burden of disease (DALY=1,619, 17.8% of total DALY) followed by mental and substance use disorders, cancer and other neoplasms and cardiovascular diseases.

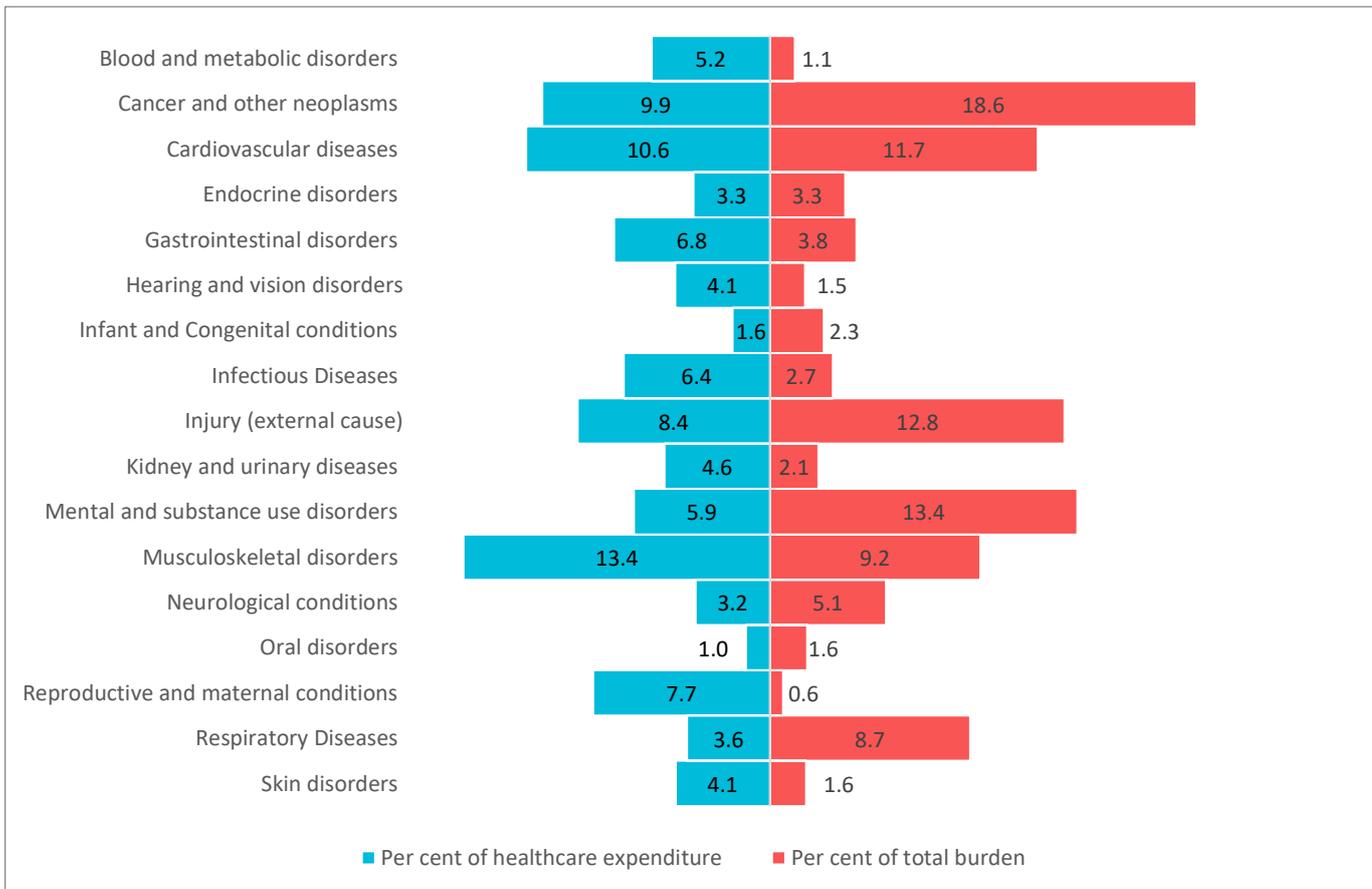


**Figure 10:** Health care expenditure and burden attributable to disease groups in Kimberley Region, 2015-16.

## Midwest Region

The Midwest Region had an estimated population of 67,878 in 2015 of which 32,921 (48.5%) were female. The median age was 38 years and 13.3% of the population were Aboriginal persons.

A total of \$282.8 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on Midwest residents in 2015-16. The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$37.8 million, 13.4% of healthcare expenditure), cardiovascular diseases (\$30.0 million, 10.6%) and cancer and other neoplasms (\$28.1 million, 9.9% – Figure 11). In contrast, cancer and other neoplasms had the highest burden of disease (DALY=2,605, 18.6% of total DALY) followed by mental and substance use disorders, injury and cardiovascular diseases.

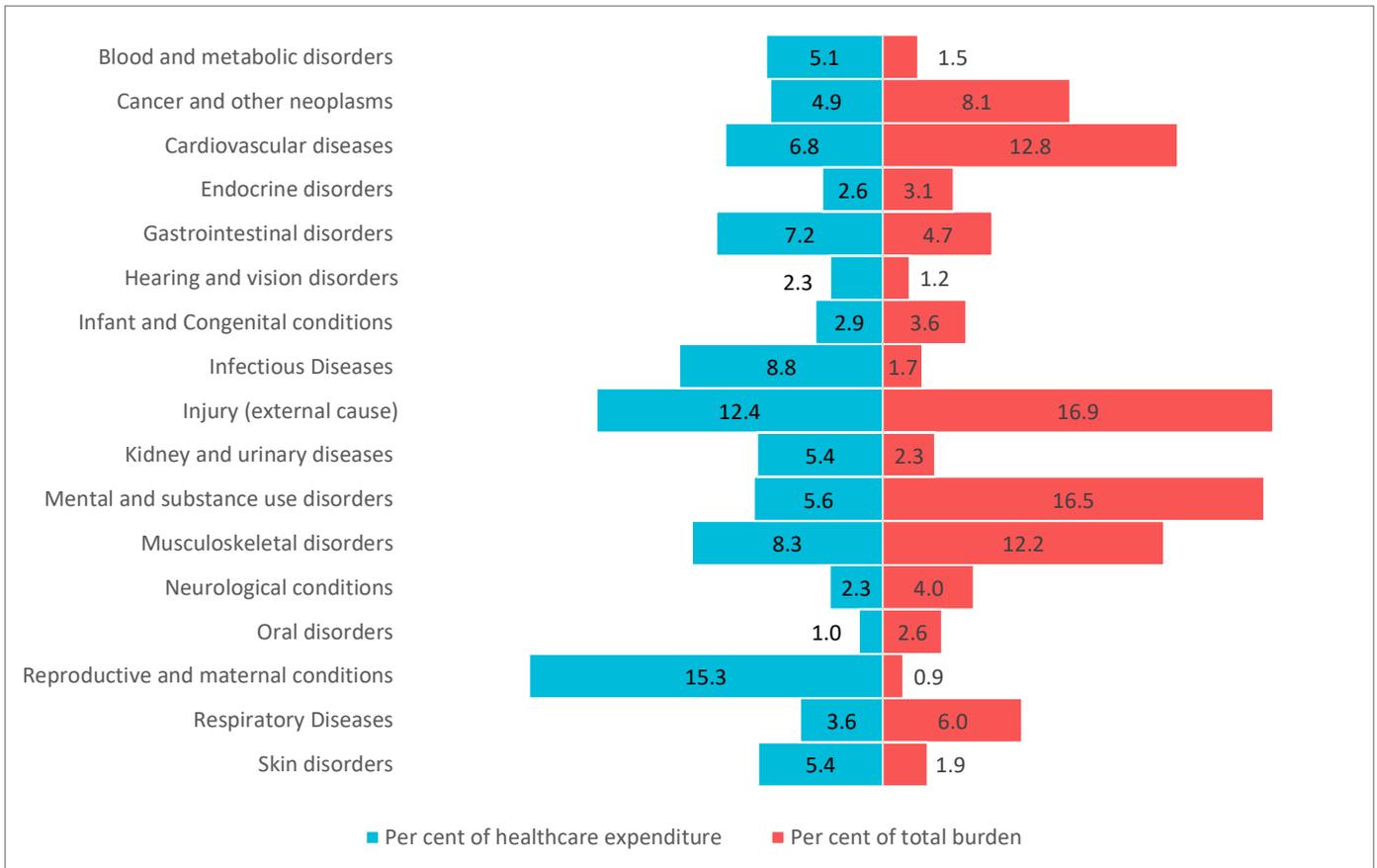


**Figure 11:** Health care expenditure and burden attributable to disease groups in Midwest Region, 2015-16.

## Pilbara Region

The Pilbara Region had an estimated population of 65,859 in 2015 of which only 23,716 (36.0%) were female. The median age was 33 years and 18.3% of the population were Aboriginal persons.

A total of \$175.7 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on the Pilbara residents in 2015-16. The disease groups with the highest healthcare expenditure were reproductive and maternal conditions (\$26.9 million, 15.3% of healthcare expenditure), injury (\$21.8 million, 12.4%) and infectious diseases (\$15.5 million, 8.8%) – Figure 12. In contrast, injury had the highest burden of disease (DALY=1,448, 16.9%) followed by mental and substance use disorders, cardiovascular diseases and musculoskeletal disorders.

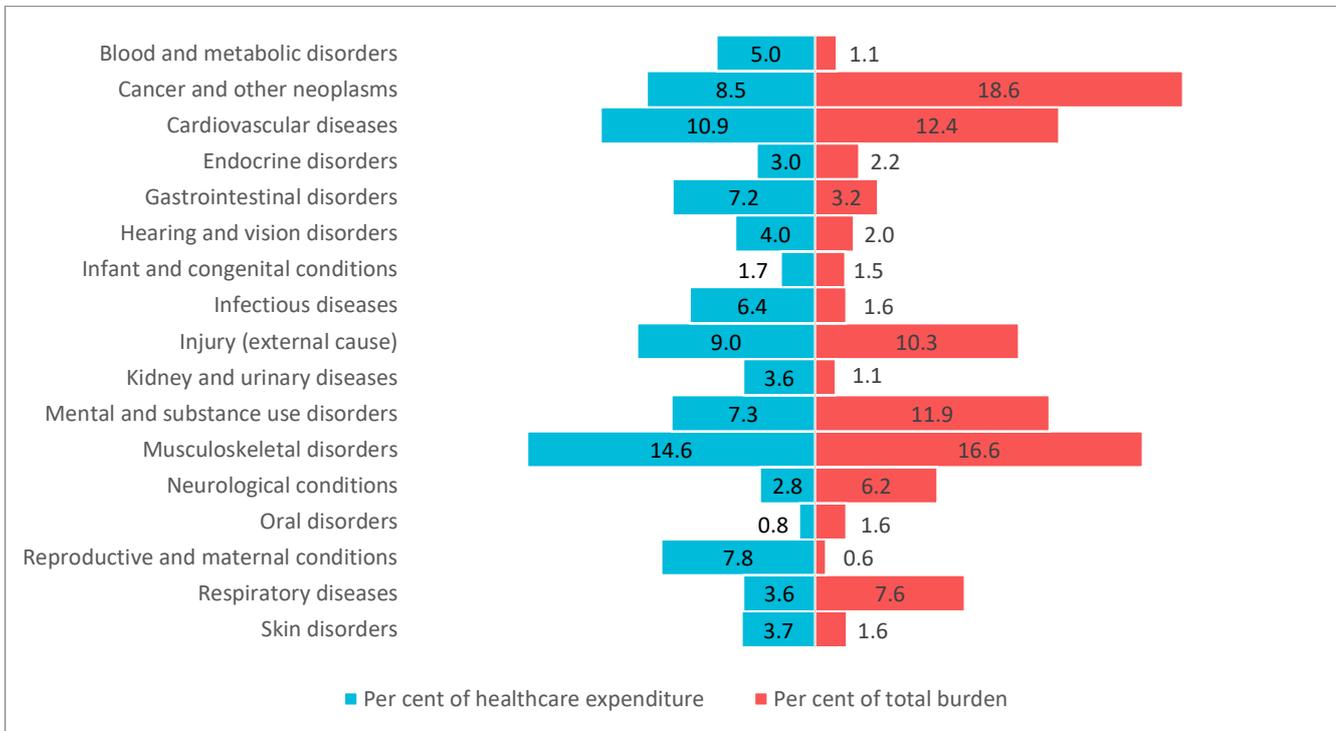


**Figure 12:** Health care expenditure and burden attributable to disease groups in Pilbara Region, 2015-16.

## South West Region

The South West Region had an estimated population of 175,949 in 2015 of which 88,856 (50.5%) were female. The median age was 38 years and 3.0% of the population were Aboriginal persons.

A total of \$700.7 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on South West residents in 2015-16. The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$102.2 million, 14.6% of total expenditure), cardiovascular diseases (\$76.2 million, 10.9%) and injury (\$63.3 million, 9.0%) – Figure 13. In contrast, cancer and other neoplasms had the highest burden of disease (DALY=6,928, 18.6% of total DALY) followed by musculoskeletal disorders, cardiovascular diseases, and mental and substance use disorders.

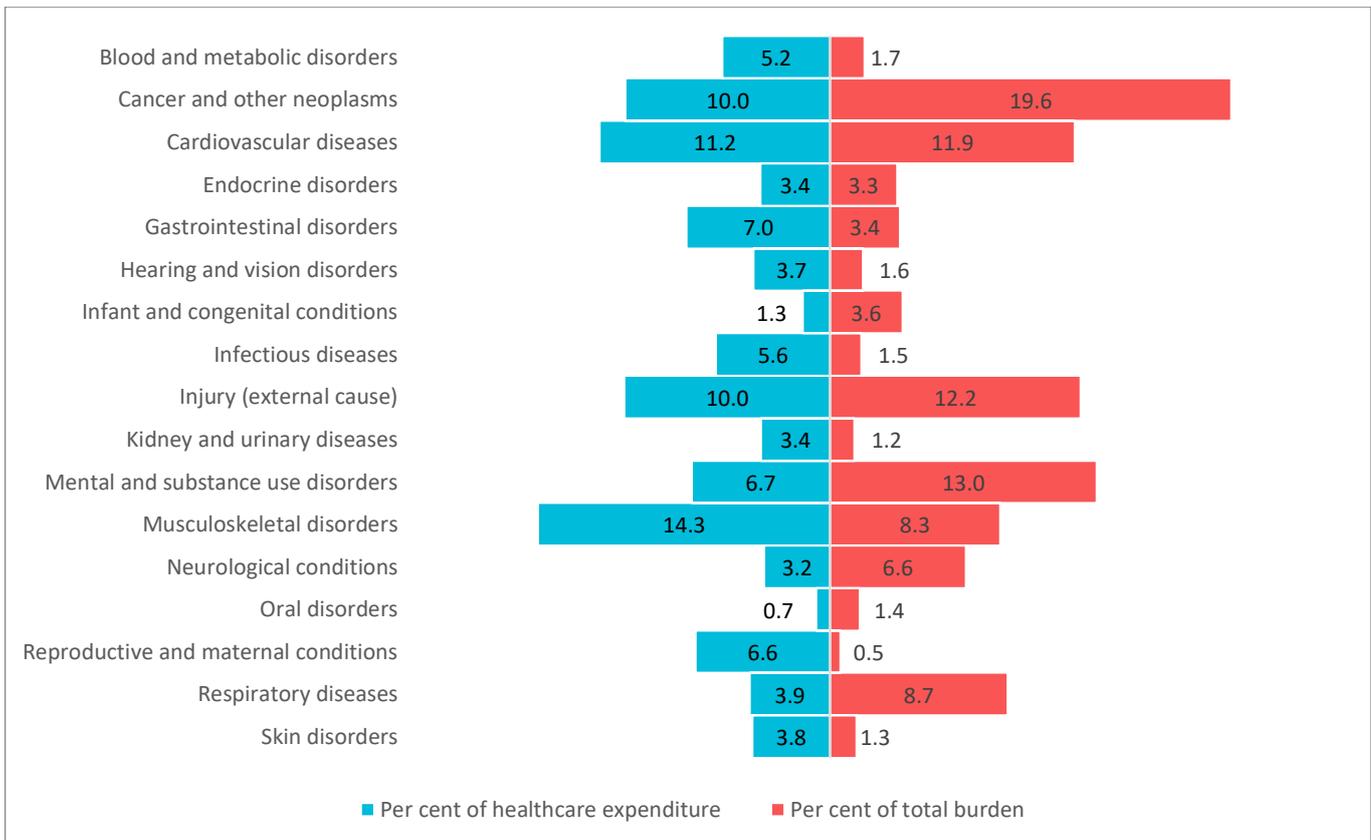


**Figure 13:** Health care expenditure and burden attributable to disease groups in South West Region, 2015-16.

## Wheatbelt Region

The Wheatbelt Region (WHE) had an estimated population of 77,823 in 2015 of which 37,425 (48.1%) were female. The median age was 42 years and 5.7% of the population were Aboriginal persons.

A total of \$358.2 million of the WA healthcare expenditure (excluding dental care expenditure) was spent on Wheatbelt residents in 2015-16. The disease groups with the highest healthcare expenditure were musculoskeletal disorders (\$51.1 million, 14.3% of healthcare expenditure), cardiovascular diseases (\$40.3 million, 11.2%), injury (\$36.0 million, 10.0%), and cancer and other neoplasms (\$35.8 million, 10.0%) – Figure 14. In contrast, cancer and other neoplasms had the highest burden of disease (DALY=3,507, 19.6% of total DALY) followed by mental and substance use disorders, injury and cardiovascular diseases.



**Figure 14:** Health care expenditure and burden attributable to disease groups in Wheatbelt Region, 2015-16.

## Summary

In 2015-16, more than \$10.2 billion was spent on health care costs attributable to the WABoDS disease groups (excluding dental care expenditure). Of this, \$8.0 billion (78.6%) was spent on residents of the three metropolitan health regions (East Metro, North Metro and South Metro) which aligned with the proportion of WA population living in those regions.

The highest proportion of healthcare expenditure in all health regions was on public hospital admissions. Remote health regions such as the Kimberley and Pilbara had higher proportion of expenditure on public hospital services (lower proportions spent on GP, private hospital and specialist services), compared to regional and metro health regions.

The disease groups with the highest per capita expenditure across most health regions were musculoskeletal disorders, cardiovascular diseases and injuries. The Wheatbelt had the highest per capita expenditure for musculoskeletal disorders and cardiovascular diseases, possibly due to their older population compared to other health regions. The Kimberley had the highest per capita healthcare expenditure on injuries across all health regions.

In most health regions, osteoarthritis, falls and back pain and problems were the diseases with the highest healthcare expenditure. In the Kimberley and the Pilbara, skin infections (including cellulitis) and lower respiratory infections incurred higher costs than osteoarthritis. Falls incurred high proportions of expenditure in all health regions.

This report provides data on the financial cost of healthcare in the WA health regions and complements previous reports on the burden of disease (8) and risk factors (9). This can assist with decision-making on policy and programs specific to the needs of each health region, particularly resource allocation, based on their population structure and healthcare needs.

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