6 Burden of disease due to breast cancer

The effect of breast cancer on the health of the population can be summarised by using a number of different measures that combine information on both mortality and non-fatal health outcomes into a single number. Such measures can be used for a range of purposes including:

- comparing the burden associated with different diseases
- comparing the effect of a particular disease among population groups or over time
- setting priorities for health planning, public health programs, as well as research and development (Murray et al. 1999).

Of the available summary measures, one of the most commonly used is the 'disability-adjusted life year' (DALY), also commonly referred to as 'burden of disease'. The DALY combines information on the extent of:

- premature death—which is measured by the years of life lost (YLL) due to disease or injury and
- non-fatal health outcomes—which is measured by years of 'healthy' life lost (YLD) due to disease, disability or injury.

In order to combine these two health measures into a summary measure, the DALY uses time as a common 'currency'. Hence, the DALY is a measure of the years of healthy life lost due to premature death (YLL) or disease, disability or injury (YLD), or a combination of the two, with one DALY equal to one lost year of 'healthy' life. The more DALYs associated with a particular disease, the greater the burden. Further information about DALYs can be found in AIHW's report on the burden of disease and injury (Begg et al. 2007a).

In this chapter, the burden of disease in Australia due to breast cancer is presented along with comparisons between other diseases that are also major contributors to the overall burden. As in other chapters, the emphasis is on females; however, information on males is also presented. The most recent burden of disease estimates for Australia are for 2003; some comparable data from 1993 and projections to 2013 are also available. These data have been published in an AIHW report by Begg and associates (2007a,b) and they form the basis of this chapter. Information on how the burden of disease estimates and projections were derived can be found in the report by Begg and associates.

Burden of disease due to breast cancer in females

Burden of disease in 2003

The total burden of disease for females in 2003 was estimated to be more than 1.2 million DALYs and the burden due to cancer was 235,034 DALYs. Table 6.1 presents the leading causes of disease burden in females, along with the three leading female cancers. Breast cancer was the sixth leading cause of burden of disease for females (60,520 DALYs). Furthermore, it accounted for 5% of all female burden of disease and one-quarter (26%) of all female burden due to cancer. Thus, breast cancer alone was responsible for about the same burden as the next leading cancer contributors together—namely, lung cancer (33,876

DALYs) and bowel cancer (28,962 DALYs). It was also roughly on par with the burden of disease caused by dementia (60,747 DALYs) and Type 2 diabetes (61,763 DALYs).

Table 6.1: Leading causes (including leading cancers) of burden of disease, females, 2003

Cause	Disability-adjusted life years (DALYs)	% of total DALYs	Rank
Anxiety and depression	126,464	10.0	1
Ischaemic heart disease	112,390	8.9	2
Stroke	65,166	5.1	3
Type 2 diabetes	61,763	4.9	4
Dementia	60,747	4.8	5
All cancers	*235,034*	*18.5*	. .
Breast cancer	60,520	4.8	6
Lung cancer	33,876	2.7	8
Bowel cancer	28,962	2.3	10
Chronic obstructive pulmonary disease	37,550	3.0	7
Asthma	33,828	2.7	9
Total for all causes	**1,268,156**	**100.0**	. .

Source: Begg et al. 2007a.

Table 6.2 and Figure 6.1 show the extent of the burden associated with the leading causes of disease burden for females that were due to both premature death (YLL) and disease, disability or injury (YLD). For breast cancer, causes of years of healthy life lost to disability include side effects during and after treatment (for example, after radiotherapy, chemotherapy or hormonal therapies), potential changes in menopause, the effects of lymphoedema and the psychosocial differences in 'life after therapy' (NBOCC 2008).

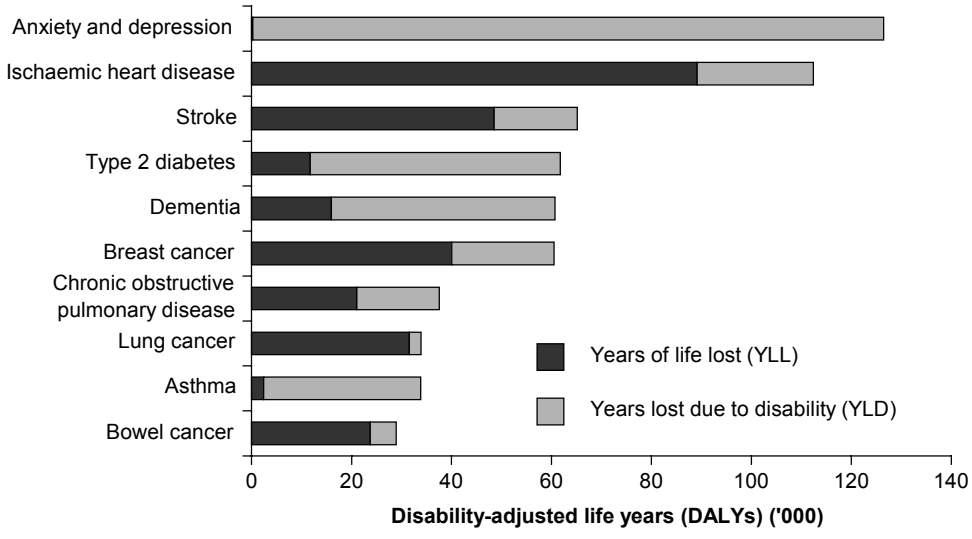
Due to the relatively poor prognosis from many cancers compared with the majority of other diseases, most cancers contribute more years of life lost (YLL) than years of healthy life lost to disability (YLD). Breast cancer is no exception, with an estimated two-thirds (66%) of the total DALYs for women being due to premature mortality (YLL). Furthermore, while this disease accounted for 3% of total years of healthy life lost to disability (YLD) from all diseases for females in 2003, it accounted for 7% of all years of life lost due to premature mortality (YLL). Thus, on this latter measure, it ranked third of all diseases, after ischaemic heart disease (16% of total YLL) and stroke (9% of total YLL). In regard to all cancers, breast cancer represented almost half (47%) of all years of healthy life lost to disability and 21% of the mortality burden.

While two-thirds of DALYs for breast cancer are due to premature mortality (YLL), the corresponding proportion for a number of other cancers is higher. For instance, 93% of DALYs for lung cancer for women were due to premature mortality rather than disability; the corresponding figure for bowel cancer was 82%. This corresponds with other research that has found lower relative survival for those with lung and bowel cancers compared with breast cancer (AIHW, CA & AACR 2008).

Table 6.2: Leading causes of burden of disease by fatal (YLL) and non-fatal (YLD) components, females, 2003

	Fatal component		Non-fatal component		Total		
Cause	Years of life lost (YLL)	% of total YLL	Years of life lost due to disability (YLD)	% of total YLD	Disability-adjusted life years (DALYs)	% of DALYs due to YLL	% of DALYs due to YLD
Anxiety and depression	221	—	126,244	18.1	126,464	0.2	99.8
Ischaemic heart disease	89,152	15.7	23,238	3.3	112,390	79.3	20.7
Stroke	48,548	8.5	16,619	2.4	65,166	74.5	25.5
Type 2 diabetes	11,751	2.1	50,012	7.2	61,763	19.0	81.0
Dementia	16,009	2.8	44,738	6.4	60,747	26.4	73.6
All cancers	*191,794*	*33.7*	*43,240*	*6.2*	*235,034*	81.6	18.4
Breast cancer	40,080	7.0	20,440	2.9	60,520	66.2	33.8
Lung cancer	31,551	5.5	2,325	0.3	33,876	93.1	6.9
Bowel cancer	23,735	4.2	5,227	0.7	28,962	82.0	18.0
Chronic obstructive pulmonary disease	21,025	3.7	16,525	2.4	37,550	56.0	44.0
Asthma	2,423	0.4	31,405	4.5	33,828	7.2	92.8
Total for all causes	**569,181**	**100.0**	**698,975**	**100.0**	**1,268,156**	**44.9**	**55.1**

Source: Begg et al. 2007a.



Source: Begg et al. 2007a.

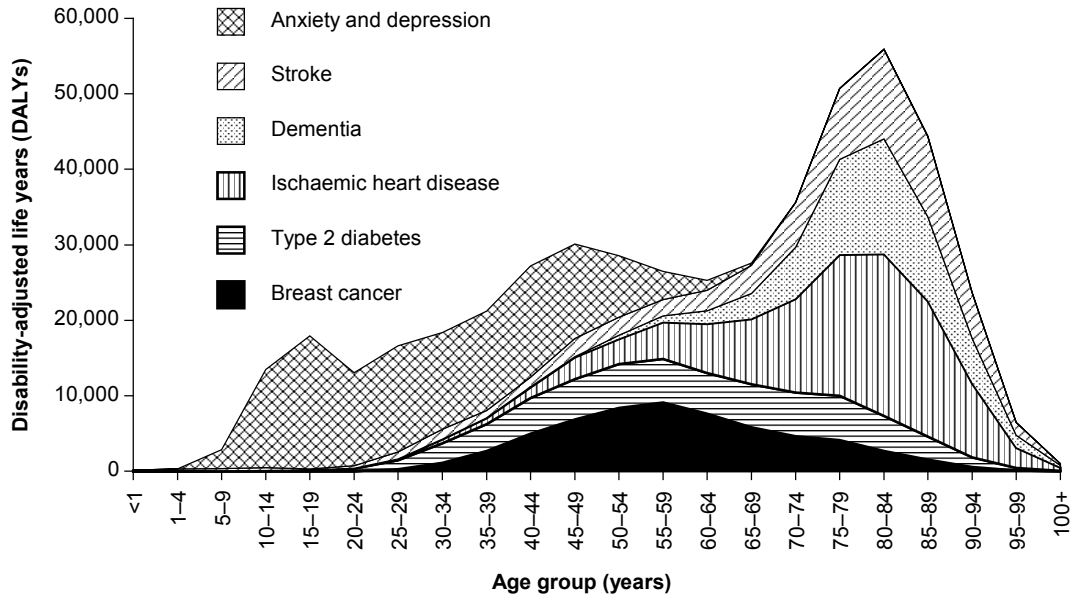
Figure 6.1: Leading causes of burden of disease by fatal (YLL) and non-fatal (YLD) components, females, 2003

Other diseases that have acute and commonly fatal outcomes, such as stroke and ischaemic heart disease, also had a relatively high proportion of total DALYs due to years of life lost (79% and 75%, respectively). In contrast, while anxiety and depression contributed greatly to the total burden of disease for women in 2003 (10% of total DALYs), virtually all of that

burden resulted from years lost to disability (100%), rather than premature mortality. The burden associated with Type 2 diabetes and dementia are also largely due to years lost to disability (81% and 74%, respectively).

Differences by age

The leading causes of the burden of disease tend to affect women at different stages of life. As shown in Figure 6.2, in 2003, anxiety and depression accounted for the highest burden of disease for females in the younger age groups (i.e. those less than 45 years of age). In contrast, stroke, dementia and ischaemic heart disease accounted for a relatively high proportion of the burden at older ages (for those aged 75 years and over). The burden on females from breast cancer tended to concentrate in women aged 40 to 69 years, with this disease accounting for 10% of the total burden of disease for women in that age range.



Note: The data for this figure are shown in Appendix Table D6.1.

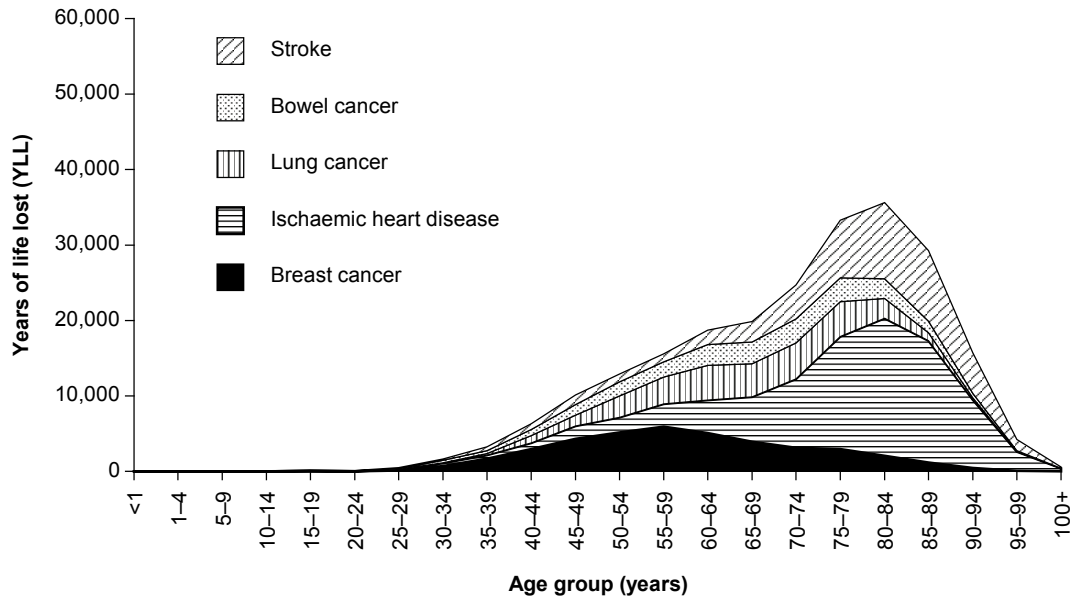
Source: Begg et al. 2007b.

Figure 6.2: Leading causes of burden of disease by age group, females, 2003

As noted earlier, the majority of the burden of disease due to breast cancer is due to premature mortality (YLL) rather than non-fatal burden. Figure 6.3 shows the burden of disease due only to premature mortality for the five leading causes of burden due to YLL according to age group. As indicated, breast cancer was the leading cause of premature mortality for middle-aged women in 2003. For example, it alone comprised 17% of all years of life lost for women aged 40 to 59 years. In contrast, the proportion of the burden due to years of life lost for women in that same age span from ischaemic heart disease and stroke was considerably less (7% and 4%, respectively).

Trends

While burden of disease estimates were also produced for 1993, they cannot be compared with the 2003 estimates due to substantial differences in the methodologies used to derive the estimates. Nonetheless, the rank of the various diseases at a particular time period can be compared (Begg et al. 2007a).



Note: The data for this figure are shown in Appendix Table D6.2.

Source: Begg et al. 2007b.

Figure 6.3: Leading causes of years of life lost by age group, females, 2003

As shown in Table 6.3, breast cancer was the fourth leading cause of female burden of disease in 1993. While this is a higher rank compared with its rank of sixth in 2003, the proportion of total DALYs accounted for by breast cancer were similar at the two time points (both 5%).

Projections in the ranking of diseases were also undertaken by Begg and associates (2007a). These projections were based on past incidence and mortality trends, as well as projected population estimates. As shown in Table 6.3, the projections suggest that breast cancer will remain the sixth leading cause of burden of disease into the future. However, these researchers also predicted a drop in the proportion of total DALYs from all diseases that are due to breast cancer—in 2013, the projected proportion of the total burden of disease for women that will be due to breast cancer is 4.3%, while the projected proportion for 2023 is 3.5%.

Burden of disease due to breast cancer in males

Among males, the total burden of disease in 2003 was estimated to be more than 1.3 million DALYs and the burden due to cancer was 264,382 DALYs (Table 6.4). Breast cancer

contributed a total of 134 DALYs for males, with these DALYs comprised exclusively of years of life lost.

Considering the burden of disease from breast cancer for both males and females together, the total estimated number of DALYs from breast cancer in 2003 was 60,654.

Table 6.3: Leading[(a)] causes of burden of disease, females, estimated for 1993 and 2003 and projected for 2013 and 2023

	Rank				Per cent of total DALYs			
Cause	**1993**	**2003**	**2013**	**2023**	**1993**	**2003**	**2013**	**2023**
Anxiety and depression	2	1	1	1	9.8	10.0	9.6	8.7
Ischaemic heart disease	1	2	2	4	12.4	8.9	7.5	6.1
Stroke	3	3	5	5	5.9	5.1	4.4	3.8
Type 2 diabetes	6	4	3	2	3.7	4.9	6.4	8.0
Dementia	5	5	4	3	3.7	4.8	5.9	7.4
Breast cancer	4	6	6	6	5.1	4.8	4.3	3.5
Chronic obstructive pulmonary disease	7	7	8	8	3.1	3.0	2.9	2.8
Lung cancer	10	8	7	7	2.3	2.7	3.1	3.5
Asthma	8	9	9	9	2.9	2.7	2.5	2.4
Bowel cancer	9	10	10	12	2.6	2.3	2.2	1.9

(a) 'Leading' causes of burden of disease are based on number of disability-adjusted life years (DALYs) in 2003.

Source: Begg et al. 2007a,b.

Table 6.4: Leading causes (including selected cancers) of burden of disease by fatal (YLL) and non-fatal (YLD) components, males, 2003

	Fatal component		Non-fatal component		Total		
Cause	**Years of life lost (YLL)**	**% of total YLL**	**Years of life lost due to disability (YLD)**	**% of total YLD**	**Disability-adjusted life years (DALYs)**	**% of total DALYs**	**Rank**
Ischaemic heart disease	128,991	18.2	22,116	3.4	151,107	11.1	1
Type 2 diabetes	15,273	2.2	55,903	8.5	71,176	5.2	2
Anxiety and depression	113	0.0	65,208	10.0	65,321	4.8	3
Stroke	36,152	5.1	17,144	2.6	53,296	3.9	5
Chronic obstructive pulmonary disease	26,183	3.7	23,018	3.5	49,201	3.6	6
All cancers	*220,159*	*31.0*	*44,223*	*6.8*	*264,382*	*19.4*	*. .*
Lung cancer	51,505	7.3	3,523	0.5	55,028	4.0	4
Prostate cancer	23,175	3.3	13,372	2.0	36,547	2.7	9
Bowel cancer	27,997	3.9	6,646	1.0	34,643	2.5	10
Breast cancer	134	—	0	—	134	—	>100
Total for all causes	**709,597**	**100.0**	**655,017**	**100.0**	**1,364,614**	**100.0**	**. .**

Source: Begg et al. 2007a,b.