Potential Years of Life Lost: variations by age, socioeconomic disadvantage and remoteness

Findings

Background

Potential years of life lost (PYLL) is a measure of the sum of the potential years of life lost from deaths at 15 years (60 years), 45 years (30 years) and so on, assuming those dying at those ages had all lived to 74 years of age. As such, it is an important measure of the mortality burden and is sometimes used as an indicator of the social and economic impact of premature deaths. When analysed by geographical area, it shows the extent of inequality in the burden of these premature deaths borne across Australia.

Overall

Almost two thirds of PYLL over the period 2015 to 2019 were for males (62.8%) and over one third were for females (37.2%). The widest gap was at ages 15 to 24 years, with the male death rate 2.5 times that for females.

At the chapter (broadest) level to which causes of death are coded, the highest rates of PYLL were from cancer and external causes, both of which were highest in the Northern Territory, and lowest in the Australian Capital Territory. Looking at individual causes of death, suicide accounts for the largest number of PYLL (4.1 PYLL per 1,000 population, 10.4% of all PYLL), with substantially more PYLL for males than females (3.1 times at all ages and 3.34 times at ages 25 to 44 years).

Equity gap

For all causes of premature mortality, the rate of PYLL in the most disadvantaged areas was over twice (2.22 times) that in the least disadvantaged areas. For the two most common causes of premature mortality at the chapter level, the rate for all cancers was 67% higher and for external causes it was 2.25 times that in the most disadvantaged areas. For individual causes of death there are substantial equity gaps for chronic obstructive pulmonary disease (5.22 times higher in the most disadvantaged areas), diabetes (5.04 times), road traffic injury (3.62 times) and lung cancer (2.57 times).

Rates of PYLL generally increase with remoteness and are highest for people who lived in the most remote areas of Australia. The rate of PYLL for those in the Very Remote areas of Australia, compared with the rate in the Major Cities areas, was over double (2.6 times) for premature death from all causes, over three (3.08) times for external causes and 42% higher for lung cancer; for individual causes of death, there were substantial equity gaps for diabetes (8.22 times higher in the most remote areas), road traffic injury (6.66 times), COPD (4.06 times) and lung cancer (62% higher).

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Related Fact sheets

Potential Years of Life Lost by Aboriginal and Torres Strait Islander people: variations by age, socioeconomic disadvantage and remoteness

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Potential Years of Life Lost: variations by age, socioeconomic disadvantage and remoteness

Background

Some 34% of all deaths over the years 2015 to 2019 occurred before 75 years of age, although the proportion varies by sex and by cause, as shown here.

However, depending on the age at which a person dies, the number of years of life lost, had they lived until, say, 74 years of age, will vary. Potential years of life lost (PYLL) is a measure of the sum of the potential years of life lost from deaths at 15 years (60 years), 45 years (30 years) and so on, assuming those dying at those ages had all lived to 74 years of age.

Further, a particular PYLL value will be higher if mortality among young people, for example from suicide or road traffic accidents, is high; chronic diseases causing death among older people, on the other hand, have little effect on these values.

As such, it is an important measure of the mortality burden and is sometimes used as an indicator of the social and economic impact of premature deaths [1]. When analysed by geographical area, it shows the extent of inequality in the burden of these premature deaths borne across Australia.

In this Fact sheet we offer comment on some findings from data available in the Social Health Atlas, and highlight variations by geographical area (based on a person's usual residence recorded in the death certificate), presented by socioeconomic status and Remoteness Area, and by Indigenous status.

The data

Some notable variations seen in the data for the five years 2015 to 2019 are described below [2].

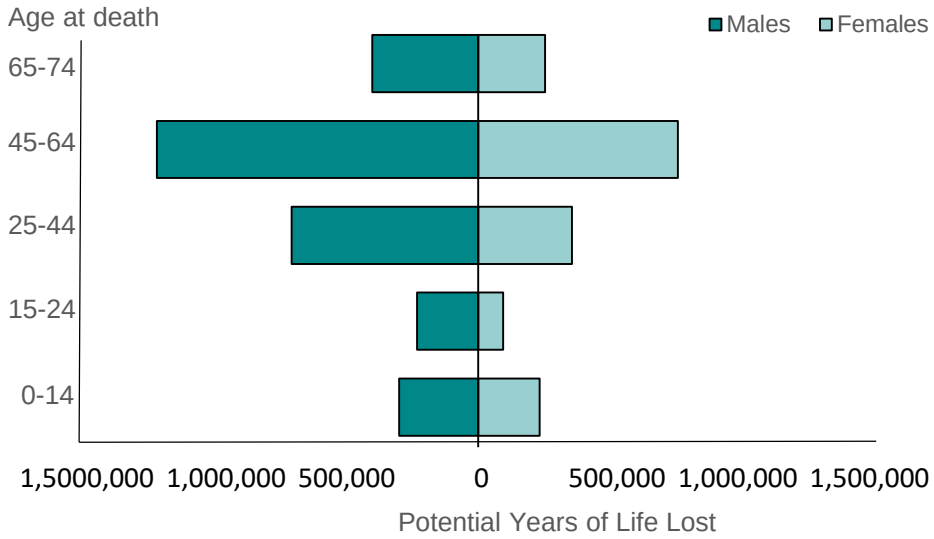
Overall

In Australia, there were 896,592 PYLL per year over this period, close to two thirds of which were for males (62.8%) and over one third were for females (37.2%).

Age group and **sex**

Males accounted for more PYLL than females in each age group, with the largest difference in the 15 to 24 year age group, with males accounting for nearly two and a half (2.47) times the number of PYLL by females: at other ages, the differences were 29% more at ages 0 to 14 ears, 99% at ages 25 to 44, 61% at ages 45 to 64 and 59% at ages 65 to 74 years (Figure 1).

Figure 1: PYLL from premature death by age group and sex, Australia, 2015 to 2019



Cause of death: at the chapter (broadest) level of the International Classification of Diseases to which the cause of death is coded

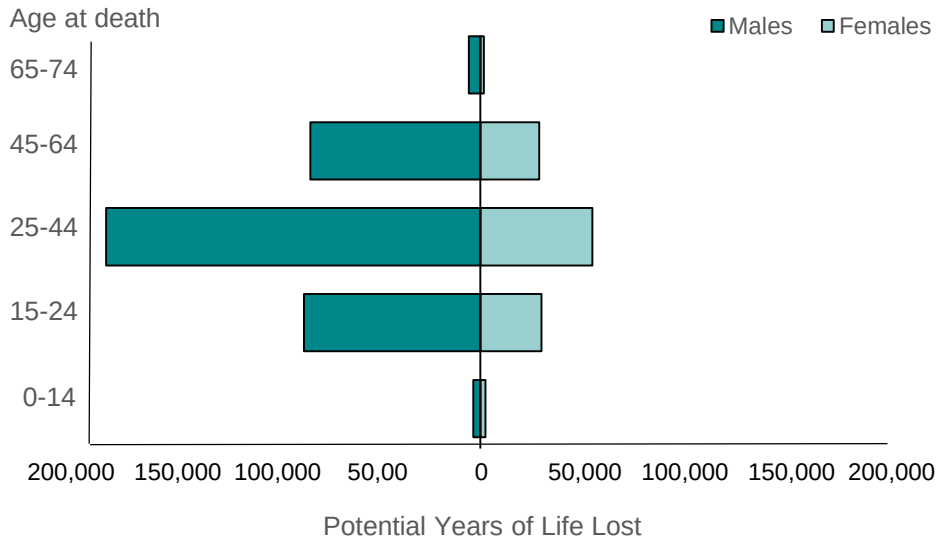
The highest rates of PYLL were recorded for premature deaths from cancer (with total cancers accounting for 12.2 PYLL per 1,000 population), with the range between the States and Territories being from 10.6 PYLL per 1,000 population in the Australian Capital Territory, to 15.9 PYLL per 1,000 population in the Northern Territory (Table 1).

The second highest rates at the chapter level were from external causes (9.7 PYLL per 1,000 population), ranging from 7.3 in the Australian Capital Territory to 28.0 in the Northern Territory (Table 1).

Cause of death: by individual cause under the International Classification of Diseases

Looking at individual causes of death, suicide accounts for the largest number of PYLL (4.1 PYLL per 1,000 population, 10.7% of all PYLL), with substantially more PYLL for males than females (3.1 times at all ages and 3.34 times at ages 25 to 44 years: Figure 2).

Figure 2: PYLL from premature death from suicide, by age group and sex, Australia, 2015 to 2019



Other individual causes of note were for deaths from ischaemic heart disease (2.7 PYLL per 1,000 population), breast cancer (females, 2.3 PYLL per 1,000 population), lung cancer (2.1 PYLL per 1,000 population) and road traffic injury (1.6 PYLL per 1,000 population).

By socioeconomic disadvantage

Rates of PYLL are generally highest for people who lived in the most **disadvantaged areas** of Australia (Figure 3).

- for **all causes**, the rate in the most disadvantaged areas was over twice (2.22 times) that in the least disadvantaged areas – this is referred to as the equity gap;
- for the two most common causes of premature mortality at the chapter level, as noted above, the rate for **all cancers** was 67% higher and for **external causes** was 2.25 times that in the most disadvantaged areas;
- for **individual causes of death**, there are substantial equity gaps for chronic obstructive pulmonary disease (COPD, 5.22 times higher in the most disadvantaged areas), diabetes (5.04 times), road traffic injury (3.62 times) and lung cancer (2.57 times).

Figure 3: Impact of PYLL from selected causes of premature death by socioeconomic status quintiles[1], Australia, 2015 to 2019

Standardised ratios, Australia = 100 (figures in brackets show the number of PYLL)

Chapter level

Extent of socioeconomic disadvantage	All Causes (4,482,959)	All Cancers (1,401,955)	External cause (1,107,450)
Least disadvantaged (Q1)	64	75	63
Quintile 2	80	87	78
Quintile 3	95	99	97
Quintile 4	115	111	117
Most disadvantaged (Q5)	143	126	141
Rate ratio	2.22**	1.67**	2.25**

Key: Variation from national rate
- 20.1% and more above Australian rate
- 10.1 to 20% above Australian rate
- within +/- 10% of Australian rate
- 10.1 to 20% below Australian rate
- 20.1% and more below Australian rate

Rate ratio is the ratio of the rate in the Most disadvantaged to that in the Least disadvantaged areas: ** the rate ratio is statistically significant at the *P*<0.01 level

Specific causes

Extent of socioeconomic disadvantage	Lung cancer (240,373)	Diabetes (91,048)	COPD (95,499)	Road traffic injury (180,731)
Least disadvantaged (Q1)	56	38	35	42
Quintile 2	78	65	60	67
Quintile 3	98	83	84	94
Quintile 4	119	120	130	134
Most disadvantaged (Q5)	145	190	182	153
Rate ratio	2.57**	5.04**	5.22**	3.62**

[1] Quintiles compiled from data by Population Health Area using the Index of Relative Socio-economic Disadvantage: further details can be found here https://phidu.torrens.edu.au/help-and-information/about-our-data/geographical-structures#quintiles-of-socioeconomic-disadvantage-of-area.

By Remoteness Area

Rates of PYLL generally increase with **remoteness** and are highest for people who lived in the most remote areas of Australia (Figure 4). For those who lived in the Very Remote areas of Australia, the rate of PYLL, compared with the rate in the Major Cities areas, was:

- over twice (2.6 times) that for premature death from **all causes**, with relatively higher rates in the other three Remoteness Areas (RAs) (Inner Regional, 30% above the Major Cities rate; Outer Regional 51% above; and Remote, 74% above);
- for the two most common causes of premature mortality noted above, over three (3.08) times for premature deaths from **external causes** and 42% higher from premature deaths from **lung cancer**;
- for **individual causes of death**, there were substantial equity gaps for diabetes (8.22 times higher in the most remote areas), road traffic injury (6.66 times), COPD (4.06 times) and lung cancer (62% higher).

In contrast, the rate of PYLL from premature death from colorectal cancer in the Remote and Very Remote areas is around three quarters of the national rate; and for cancer of the female breast the rate is only above the national rate in the Inner Regional areas.

Figure 4: Impact of PYLL from selected causes of premature death by Remoteness Area[2], Australia, 2015 to 2019

Standardised ratios, Australia = 100 (figures in brackets show the number of PYLL)

Chapter level

Remoteness Area	All Causes (4,482,959)	All Cancers (1,401,955)	External causes (1,107,450)
Major Cities	88	93	82
Inner Regional	115	111	129
Outer Regional	134	116	154
Remote	154	112	190
Very Remote	230	133	252
Rate ratio	2.60**	1.42**	3.08**

Key: Variation from national rate

- 20.1% and more above Australian rate
- 10.1 to 20% above Australian rate
- within +/- 10% of Australian rate
- 10.1 to 20% below Australian rate
- 20.1% and more below Australian rate

Rate ratio is the ratio of the rate in the Very Remote to that in the Major Cities areas: ** the rate ratio is statistically significant at the *P*<0.01 level

Specific causes

Remoteness Area	Lung cancer (240,373)	Diabetes (91,048)	COPD (95,499)	Road traffic injury (180,731)
Major Cities	90	82	78	62
Inner Regional	114	108	131	169
Outer Regional	128	138	152	220
Remote	128	242	178	297
Very Remote	146	677	317	413
Rate ratio	1.62**	8.22**	4.06**	6.66**

[2] Details of Remoteness Areas can be found here https://phidu.torrens.edu.au/help-and-information/about-our-data/geographical-structures#remoteness-areas.

References

1. Australian Institute of Health and Welfare (AIHW), Deaths in Australia. Available from https://www.aihw.gov.au/reports/web/152/deaths/deaths-in-australia/contents/age-at-death; last accessed 6 June 2022.

2. Data produced by PHIDU, based on Cause of Death Unit Record Files supplied by the Australian Coordinating Registry and the Victorian Department of Justice, on behalf of the Registries of Births, Deaths and Marriages and the National Coronial Information System; 2016 to 202