

# 5 Neoplasms

This chapter discusses mortality due to the broad category of neoplasms (including cancers and benign neoplasms, ICD-10, chapter 2, codes C00-D48). It then provides further analysis of specific diseases within this broad category. The specific neoplasms included are:

1. lung cancer;
2. colorectal cancer;
3. breast cancer;
4. cervical cancer;
5. prostate cancer;
6. melanoma; and
7. 'other' neoplasms.

These neoplasms were chosen because they tend to be the most frequently occurring causes of neoplasm deaths (except for melanoma, which is a frequently occurring cancer).

## Summary of findings

The overall mortality of Australians due to neoplasms is higher for males from regional areas than males from Major Cities, but similar to those in Major Cities for males from remote areas, and for females from all areas (Table 5.2). Compared to those in Major Cities, death rates from neoplasms are:

- similar for females and 1.05 times as high for males in regional areas; and
- similar in remote areas for both sexes.

This broad observation does not take into account two factors previously stated on page 33, namely the likely effect on rates of high Indigenous mortality coupled with their greater representation outside Major Cities, and the possible effect of the migration of the frail aged. Indigenous mortality from neoplasms is 1.5 times as high as Major Cities non-Indigenous mortality, influencing rates for the total population in remote areas.

For non-Indigenous people:

- in regional areas, death rates were about 1.05 times as high for males and similar for females to those for their counterparts in Major Cities; and
- in remote areas, death rates for both sexes were not significantly different from those in Major Cities.

When analysis is restricted to non-Indigenous Australians under the age of 65, the same pattern remains, but with a greater differential for males (1.1 times as many deaths as expected in regional areas) and with rates for females remaining similar or becoming 1.04 times as high in Inner Regional areas.

Death rates for Indigenous people in this age group were 3 and 4 times as high as for their Major Cities non-Indigenous counterparts.

Death rates due to neoplasms in each area decreased by 1-2 % annually between 1992 and 1999, and, for females, at 6% per annum in Very Remote areas. Decreases tended to be lower in Inner Regional areas than in Major Cities.

Annually, there were 373 'excess' deaths due to neoplasms outside Major Cities (232, 133, 3 and 6 in each of the four areas). However, there were 47 fewer deaths than expected amongst those who were aged 75 years and older (that is, there were 420 'excess' deaths of those younger than 75 years). Of these people, 15% were younger than 50 years old, 59% were aged 50–64 years and 26% were 65–74 years. About 60% were male. For non-Indigenous people, the percentages were similar, while for Indigenous people, 23% were aged 25–44, 60% were aged 45–64 years and 15% were 65 years or older (Table 5.1).

Neoplasms account for 28% of all deaths (but only 11% of 'excess' deaths) and about 13% of Indigenous deaths (but 7% of the 'excess' Indigenous deaths).

### **Summary/discussion of individual causes of death reviewed in this chapter**

There is a wide range of neoplasms that contribute to deaths that are due to the broad category of 'neoplasms'. A number of specific neoplasms have been described in this chapter, but 'other' neoplasms account for half of all neoplasm deaths.

Of the annual 12,549 deaths of people outside Major Cities due to neoplasms, 50% were due to 'other' neoplasms, but only 11% of the total 373 'excess' neoplasm deaths each year were due to this broad cause.

Of the other causes, lung and colorectal cancer were responsible for 19% and 13% of neoplasms deaths, but while lung cancer was responsible for 14% of the 'excess' neoplasm deaths, colorectal cancer accounted for 31% of the 'excess'.

Prostate cancer and melanoma were responsible for 8% and 3% of all neoplasm deaths, but were responsible for 35% and 10% of the 'excess' neoplasm deaths respectively. Finally, breast and cervical cancer, although responsible for 8% of all neoplasm deaths, were responsible for very few 'excess' deaths outside Major Cities.

Of those specific neoplasms examined, only for lung cancer and for 'other' neoplasms were there fewer deaths than expected amongst the elderly in the more remote areas. While there were only 52 'excess' deaths due to lung cancer overall, for those younger than 70 years, there were 112 'excess' deaths each year (that is, more), of whom the vast majority were male and 80% were from regional areas. Similarly, while there were 40 'excess' deaths each year due to 'other' neoplasms, there were 105 fewer deaths than expected for people 70 years and older, and 145 'excess' deaths of those younger than 70 years (over 80% were male).

All of the 'excess' deaths due to colorectal cancer occurred in regional areas (124 more than expected each year); there were fewer than expected deaths due to this cause in remote areas. Over 80% of the 'excess' deaths occurred in people who were 55–84 years, and more than half of these were female.

**Table 5.1: Summary table of deaths due to neoplasms for all persons, 1997–1999**

Cause	Annual deaths outside Major Cities			Annual 'excess' deaths outside Major Cities			Age groups in which the 'excess' occurs
	No.	%	% male	No.	%	% male <sup>(a)</sup>	
Lung cancer	2,386	19%	72%	52	14%	>100%	97%: 45–69 Many fewer than expected 70+
Colorectal cancer	1,675	13%	55%	117	31%	44%	19%: 40–54 66%: 55–74 18%: 75–84
Breast cancer	845	7%	0%	–11	–3%	0%	No clear pattern
Cervical cancer	92	<1%	0%	9	2%	0%	No strong pattern, tending to those 35 years and older
Prostate cancer	973	8%	100%	131	35%	100%	90%: 60–84
Melanoma	353	3%	68%	36	10%	96%	80%:45–70
Other neoplasms	6,218	50%	57%	40	11%	>100%	85% 50–70 Fewer than expected older than 70
Total neoplasms	12,549	100%	59%	373	100%	>100%	80%: 50–70 Fewer than expected older than 70

(a) In some cases there were fewer deaths of females than expected, with the result that there were more 'excess' deaths of males than for the total population.

Note: Descriptions of the age groups within which the 'excess' occurs apply only to the total population.

Source: AIHW National Mortality Database.

There were 5 and 6 fewer deaths of females than expected due to breast cancer in regional and remote areas respectively each year.

There were slightly fewer deaths than expected due to cervical cancer in Inner Regional areas, but 12 more than expected in Outer Regional and remote areas.

Although 74% of all deaths due to prostate cancer were of males aged 60–84 years, over 90% of the 'excess' deaths occurred in those who were aged 60–84 years. Almost all (95%) of the deaths and 'excess' deaths were from regional areas.

There were 36 'excess' deaths due to melanoma, all in regional areas. Essentially all of the 'excess' was contributed by males, and 90% occurred in those aged 45–69 years.

**Table 5.2: The ratio of observed deaths from neoplasms to those expected if Major Cities<sup>(a)</sup> rates applied in each ASGC Remoteness area, 1997–1999**

Broad cause	Population	IR	OR	R <sup>(b)</sup>	VR <sup>(b)</sup>	National <sup>(c)</sup>
Lung cancer	All persons	1.0	1.0	<b>*1.1</b>	<b>*1.3</b>	n.p.
	Non-Indigenous	1.0	1.0	1.1	1.2	n.p.
	Non-Indigenous (aged 0–64 years)	<b>*1.1</b>	<b>*1.1</b>	1.1	<b>*1.8</b>	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	<b>*2.1</b>
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	<b>*3.2</b>
Colorectal cancer	All persons	<b>*1.1</b>	<b>*1.1</b>	1.0	<b>*0.7</b>	n.p.
	Non-Indigenous	<b>*1.1</b>	<b>*1.1</b>	1.0	0.8	n.p.
	Non-Indigenous (aged 0–64 years)	<b>*1.2</b>	<b>*1.2</b>	1.0	0.8	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	<b>*0.6</b>
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	0.7
Breast cancer <sup>(d)</sup>	All persons	1.0	1.0	0.9	0.8	n.p.
	Non-Indigenous	1.0	1.0	0.9	0.7	n.p.
	Non-Indigenous (aged 0–64 years)	1.0	1.0	0.8	0.8	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	1.1
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	1.2
Cervical cancer <sup>(d)</sup>	All persons	1.0	<b>*1.3</b>	1.5	<b>*3.3</b>	n.p.
	Non-Indigenous	0.9	1.2	1.1	1.1	n.p.
	Non-Indigenous (aged 0–64 years)	1.0	1.1	0.9	0.7	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	<b>*6.5</b>
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	<b>*5.9</b>
Prostate cancer <sup>(d)</sup>	All persons	<b>*1.1</b>	<b>*1.2</b>	1.2	1.0	n.p.
	Non-Indigenous	<b>*1.1</b>	<b>*1.2</b>	1.2	1.2	n.p.
	Non-Indigenous (aged 0–64 years)	<b>*1.4</b>	<b>*1.4</b>	1.6	1.2	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	0.8
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	1.3
Melanoma	All persons	<b>*1.2</b>	1.0	0.9	0.6	n.p.
	Non-Indigenous	<b>*1.2</b>	1.1	0.9	0.8	n.p.
	Non-Indigenous (aged 0–64 years)	<b>*1.3</b>	<b>*1.2</b>	1.0	0.8	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	<b>*0.1</b>
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	<b>*0.1</b>
Other neoplasms	All persons	1.0	1.0	1.0	1.0	n.p.
	Non-Indigenous	1.0	1.0	<b>*0.9</b>	<b>*0.8</b>	n.p.
	Non-Indigenous (aged 0–64 years)	<b>*1.1</b>	1.0	0.9	0.9	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	<b>*1.7</b>
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	<b>*2.1</b>

(continued)

**Table 5.2 (continued): The ratio of observed deaths from neoplasms to those expected if Major Cities<sup>(a)</sup> rates applied in each ASGC Remoteness area, 1997–1999**

Broad cause	Population	IR	OR	R <sup>(b)</sup>	VR <sup>(b)</sup>	National <sup>(c)</sup>
Total neoplasms <sup>(d)</sup>	All persons	*1.0+	*1.0+	1.0	1.0	n.p.
	Non-Indigenous	*1.0+	*1.0+	1.0	*0.9	n.p.
	Non-Indigenous (aged 0–64 years)	*1.1	*1.1	1.0	1.0	n.p.
	Indigenous	n.p.	n.p.	n.p.	n.p.	*1.5
	Indigenous (aged 0–64 years)	n.p.	n.p.	n.p.	n.p.	*1.9

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities). Caution should be used when making inferences about ratios that are not significantly different from 1.

- (a) While the number of expected deaths for the total population is based on the death rates of the total population from Major Cities, the expected number of deaths for the non-Indigenous population is based on the death rates of the non-Indigenous population from Major Cities. Because non-Indigenous people comprise the overwhelming majority (99%) of the population in Major Cities, these two standards are very similar, but not identical. This means that the ratios for the five population groups are not strictly comparable.
- (b) Ratios calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).
- (c) The ratios for Indigenous persons are for SA, WA, NT and Qld combined. Data for the total and non-Indigenous populations for this (SA, WA, NT and Qld) area adds little relevant information and has not been published (n.p.). Because of concerns about the quality of the data, ratios for Indigenous people have not been published (n.p.) for each area.
- (d) Ratios for breast, cervical and prostate cancer have been calculated for females and for males (as appropriate). Standard rates were those for females or males (as appropriate) from Major Cities.

*Notes*

- 1. 1.0+ indicates that there were slightly (but significantly) more deaths than expected (but less than 1.05 times more).
- 2. 1.0– indicates that there were slightly (but significantly) fewer deaths than expected (but more than 0.95 times as many).

Source: AIHW National Mortality Database.

The trends in the rate of death due to the range of neoplasms showed little consistency across the five areas.

Lung cancer death rates were elevated in remote areas primarily due to the influence of Indigenous mortality, for whom rates are about double the rate for their non-Indigenous counterparts from Major Cities. Lower death rates for the elderly reduced rates for non-Indigenous people so rates in all areas were not significantly different from those in Major Cities. Death rates for males younger than 65 years were about 1.1–1.3 times as high in regional areas and 1.9 times as high in Very Remote areas, with rates for similar aged females not significantly different from those for their counterparts from Major Cities.

Colorectal cancer death rates were 1.1 times in regional areas and 0.7 times (that is, lower) in Very Remote areas those for their counterparts from Major Cities. For non-Indigenous people younger than 65 years old, death rates in regional areas were 1.2 times those for similar people from Major Cities. Rates in remote areas were not significantly different to those in Major Cities. There were fewer deaths of Indigenous people due to this cause than expected.

Breast cancer death rates in regional and remote areas were not significantly different from those for females from Major Cities, and there were about as many deaths of Indigenous women due to this cause as expected.

Cervical cancer death rates were elevated in Outer Regional and Very Remote areas, possibly as a result of higher mortality amongst Indigenous women, for whom rates were 6.5 times those for non-Indigenous women from Major Cities. For non-Indigenous women, there was essentially no difference in mortality due to cervical cancer across the areas.

Prostate cancer death rates were 1.1 and 1.2 times as high in Inner and Outer Regional areas. For non-Indigenous males younger than 65 years, rates in these areas were 1.4 times those for their counterparts from Major Cities. Rates in remote areas were not significantly higher

than in Major Cities, and there were about as many deaths of Indigenous males due to this cause as expected.

Melanoma death rates were 1.3 times as high for males in Inner Regional areas, and not significantly different for males in the other areas, or for females in any area compared to those in Major Cities. This pattern also applies to non-Indigenous people. For non-Indigenous males younger than 65 years, rates in Inner and Outer Regional areas were 1.5 and 1.3 times those for their counterparts in Major Cities respectively; rates for similar aged females were not significantly different from those in Major Cities. The very low rates in Indigenous populations had a negligible effect in lowering overall melanoma death rates in remote areas.

Death rates due to 'other' neoplasms were similar in all areas. Rates for elderly non-Indigenous people in remote areas were lower than for their Major Cities counterparts; for non-Indigenous males younger than 65 years, rates were 1.1 times as high in Inner Regional areas. The death rate for Indigenous people due to 'other' neoplasms was about twice that for non-Indigenous people from Major Cities.

## 5.1 Overview—neoplasms

Between 1997 and 1999, an annual average of 35,604 Australians died as a result of neoplasms, comprising 20,102 males and 15,502 females (Table 5.3). Most of these deaths (23,055) occurred in Major Cities, with a further 11,884 in Inner and Outer Regional areas and the remaining 665 in Remote and Very Remote areas.

Neoplasms were responsible for 28% of all deaths nationally, and 11% of the 'excess' deaths in areas outside Major Cities.

**Table 5.3: Average annual deaths due to neoplasms, 1997–1999**

	MC	IR	OR	R	VR	Total
Males (no.)	12,697	4,675	2,313	297	120	20,102
Females (no.)	10,358	3,352	1,544	173	75	15,502
<b>Persons (no.)</b>	<b>23,055</b>	<b>8,027</b>	<b>3,857</b>	<b>470</b>	<b>195</b>	<b>35,604</b>
Non-Indigenous males <sup>(a)</sup> (per cent)	100	100	98	94	66	99
Non-Indigenous females <sup>(a)</sup> (per cent)	100	99	98	91	56	99
<b>Non-Indigenous persons<sup>(a)</sup> (per cent)</b>	<b>100</b>	<b>100</b>	<b>98</b>	<b>93</b>	<b>63</b>	<b>99</b>
Non-Indigenous males (0–64 yrs) (no.)	3,335	1,227	648	90	34	5,334
Non-Indigenous females (0–64 yrs) (no.)	2,950	975	472	57	19	4,473
<b>Non-Indigenous persons (0–64 yrs) (no.)</b>	<b>6,285</b>	<b>2,202</b>	<b>1,120</b>	<b>147</b>	<b>53</b>	<b>9,807</b>
<b>Indigenous persons<sup>(b)</sup> (no.)</b>	<b>n.p.</b>	<b>n.p.</b>	<b>n.p.</b>	<b>n.p.</b>	<b>n.p.</b>	<b>196</b>

(a) Percentages and counts are rounded to the nearest whole number.

(b) The number of Indigenous deaths is the average annual number registered in SA, WA, NT and Qld in the period 1997–1999. An average of a further 74 were registered annually in the other jurisdictions. Counts of deaths have not been reported for Indigenous people by area because of concerns about data accuracy.

Source: AIHW National Mortality Database.

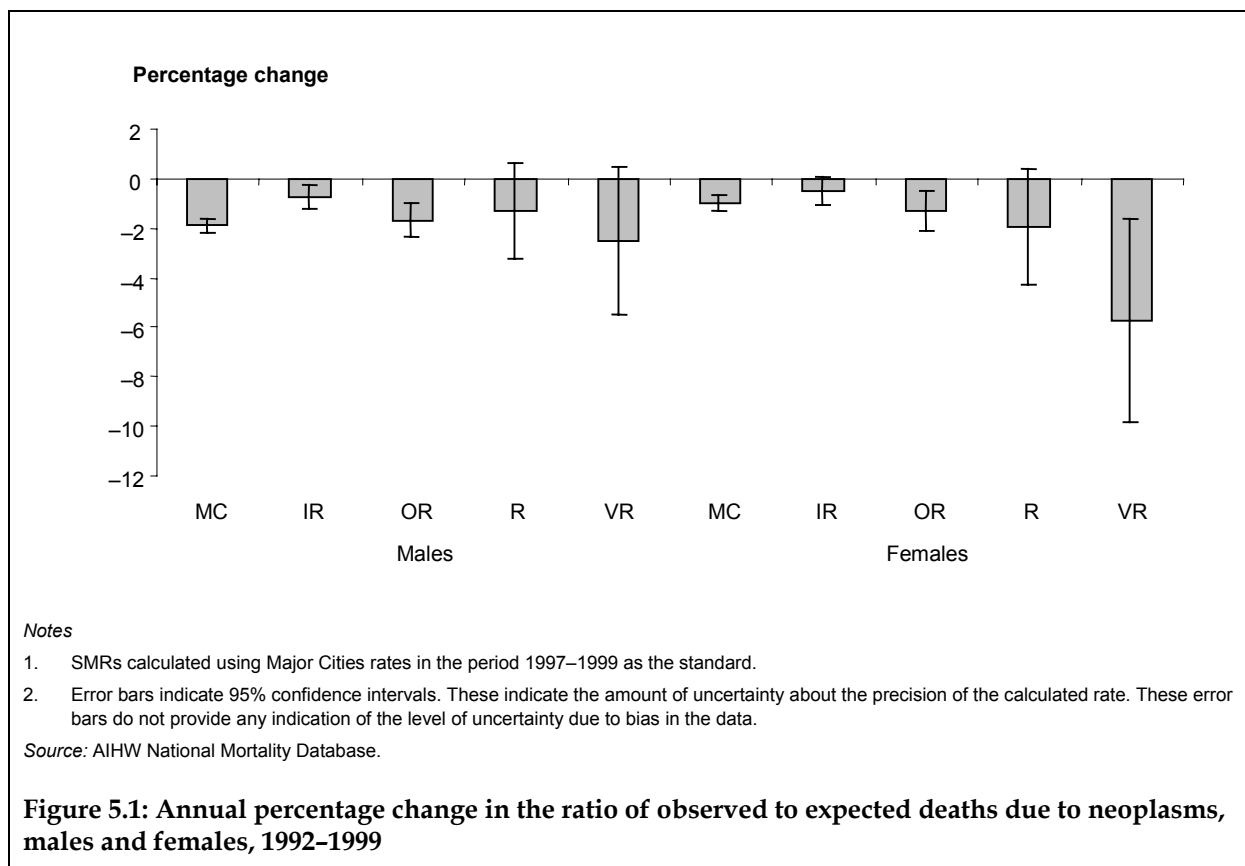
## Trends in mortality due to neoplasms

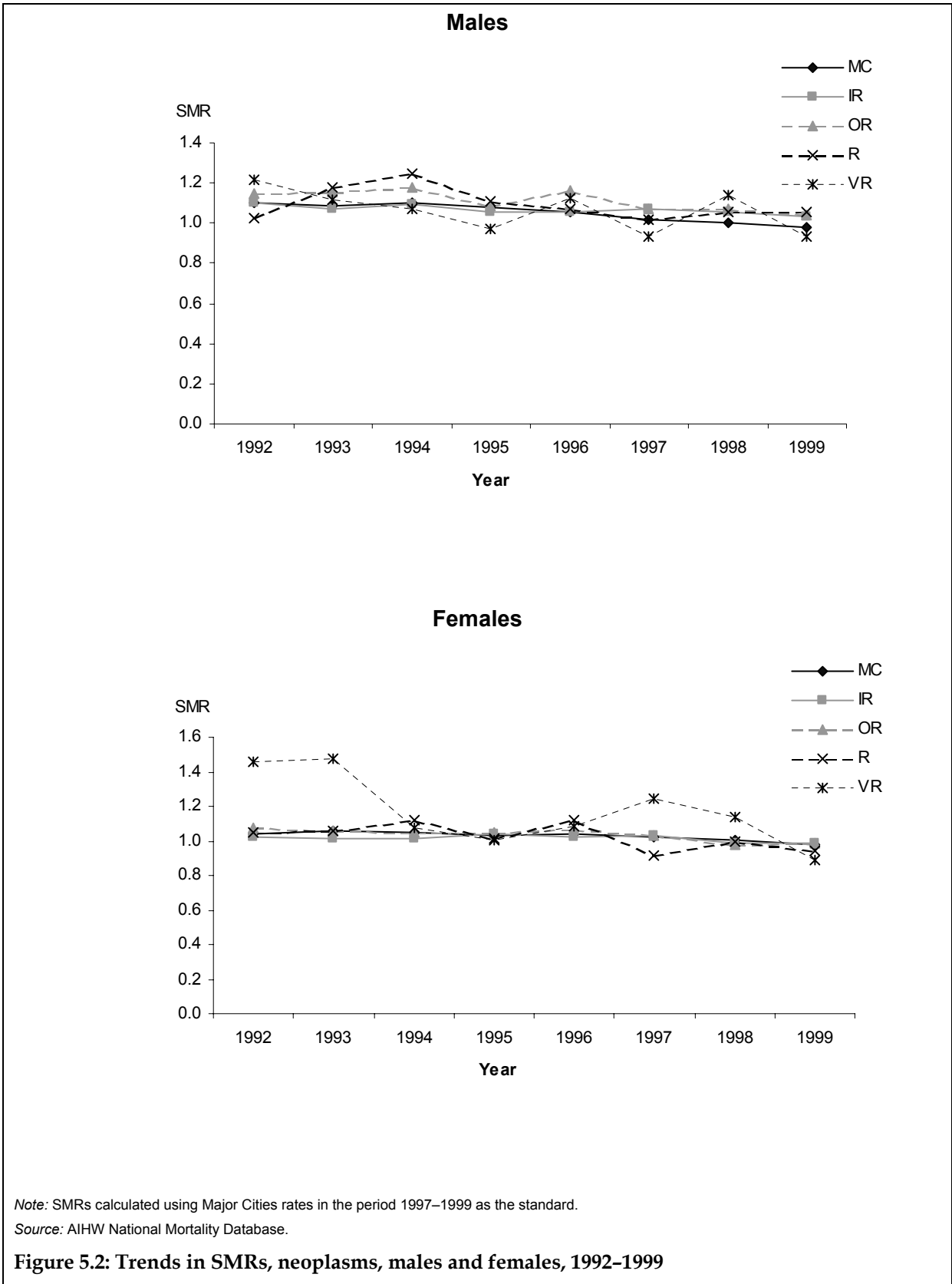
Death rates from this cause for both males and females decreased in all areas between 1992 and 1999, however, the decrease was statistically significant for males only in Major Cities, Inner Regional and Outer Regional areas; and for females only in Major Cities, Outer Regional and Very Remote areas (Figures 5.1 and 5.2).

For males, annual percentage decreases were generally of the order of 1–2% in each area; for females annual percentage decreases were of similar magnitude. In Very Remote areas, this annual decrease for females was larger at 6% (such that the ratio of observed to expected deaths decreased from approximately 1.5 to less than 1.0 over the period 1992–1999).

For both sexes, the rate of decrease in Inner Regional areas was less than in the other areas (significantly less for Inner Regional males than for Major Cities males).

About 15% of the reductions in the total number of ‘excess’ deaths were due to decreases in neoplasm death rates, except in Inner Regional areas where neoplasms contributed only 7% to the decrease in the overall ‘excess’.







## Death rates due to neoplasms

Mortality due to neoplasms was higher for some groups living outside Major Cities, but for many groups death rates were not significantly different, or were lower.

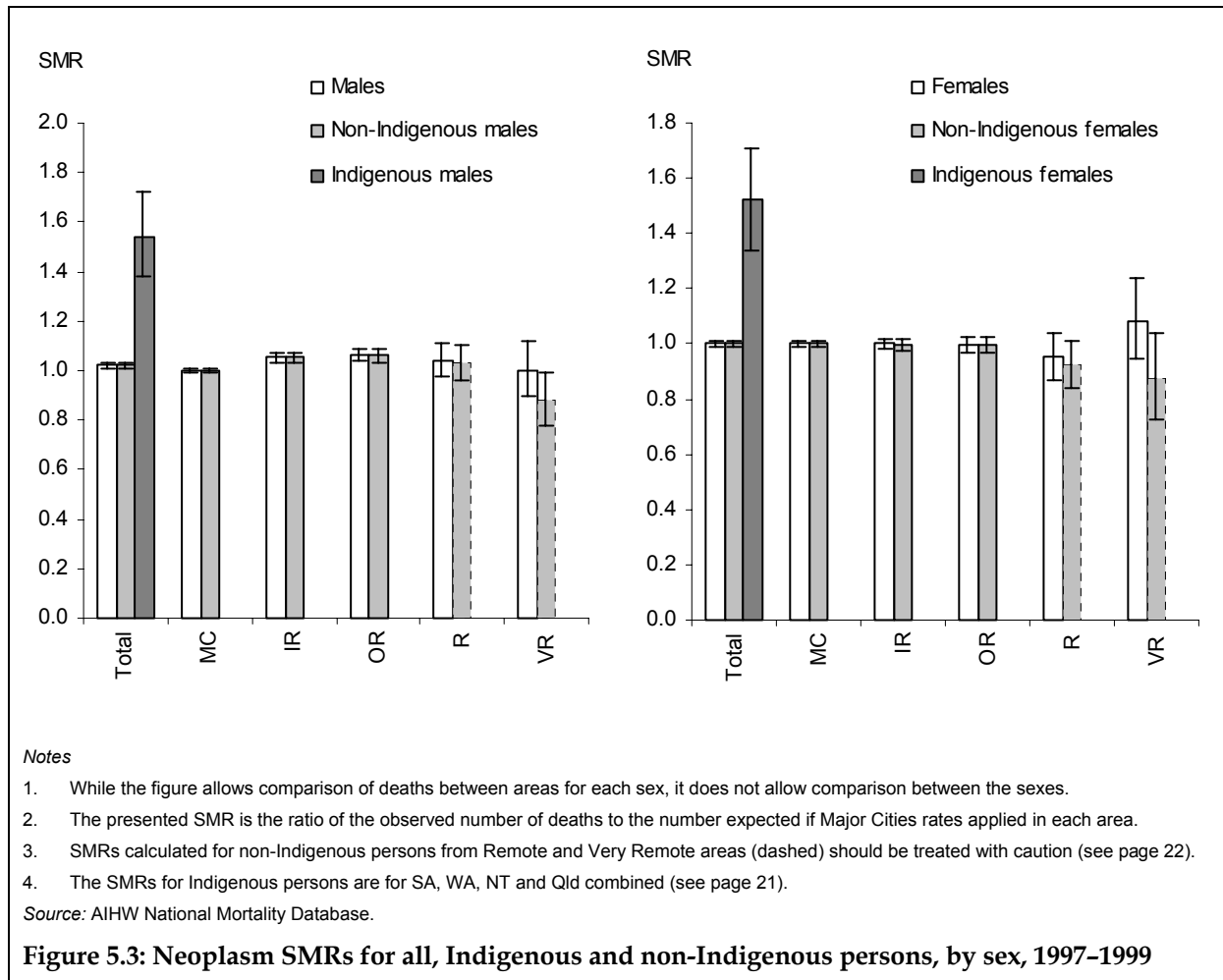


Figure 5.3 and Tables 5.4 and 5.5 show that:

- For males in Inner and Outer Regional areas, rates were 1.05 times those in Major Cities.
- For males in Remote and Very Remote areas, rates were not significantly different from those in Major Cities.
- For females, rates were not significantly different in any area from rates in Major Cities.
- Mortality for Indigenous males and females was 1.5 times as high as for their non-Indigenous counterparts who lived in Major Cities; this higher mortality slightly raises the average death rate due to neoplasms in the more remote areas.

These figures would appear, on the surface, to show that mortality as a result of neoplasms is slightly (5%) higher for males who live in regional areas than for those who live in Major Cities, but suggests little inter-regional difference for regional females or for people who live in remote areas.

The above rates are influenced, however, by the number of Indigenous people living outside Major Cities and the higher overall mortality of Indigenous people due to neoplasms. As in

the previous chapter pertaining to mortality as a result of circulatory disease, without examining the mortality of the Indigenous and non-Indigenous populations separately, it is premature to draw the conclusion that remoteness is a factor influencing cancer death rates.

### **Mortality of Indigenous people**

Based on 1997–1999 death registrations, neoplasms accounted for 13% of deaths of Indigenous people living in Queensland, South Australia, Western Australia and the Northern Territory. Neoplasms accounted for 28% of all deaths among the Australian population as a whole, making neoplasms the second most common cause of death nationally. However, Indigenous males and females had higher death rates from this cause than the total population. While for several neoplasms (for example, lung, cervical and ‘other’ neoplasms), Indigenous people had higher death rates, there were some (colorectal, breast, prostate and melanoma) for which death rates were similar to or lower than those for non-Indigenous people from Major Cities.

In 1997–1999, there were approximately 1.5 times as many deaths of Indigenous people as expected (Table 5.5). Over half (57%) of these deaths were attributable to ‘other’ neoplasms (stomach, ovary, pancreas, etc.), a further 24% were due to lung cancer, while colorectal, breast, cervical and prostate cancer accounted for 5%, 7%, 4% and 3% respectively. A higher prevalence of cancer risk factors such as smoking and high-risk alcohol consumption, as well as the possibility that cancers may be detected at a later stage in Indigenous people (ABS 2002) would contribute to higher mortality as a result of cancer.

As discussed on page 21, uncertainty about the accuracy of identification of Indigenous deaths prevents reporting of Indigenous mortality in rural and remote areas.

### **Mortality of non-Indigenous people**

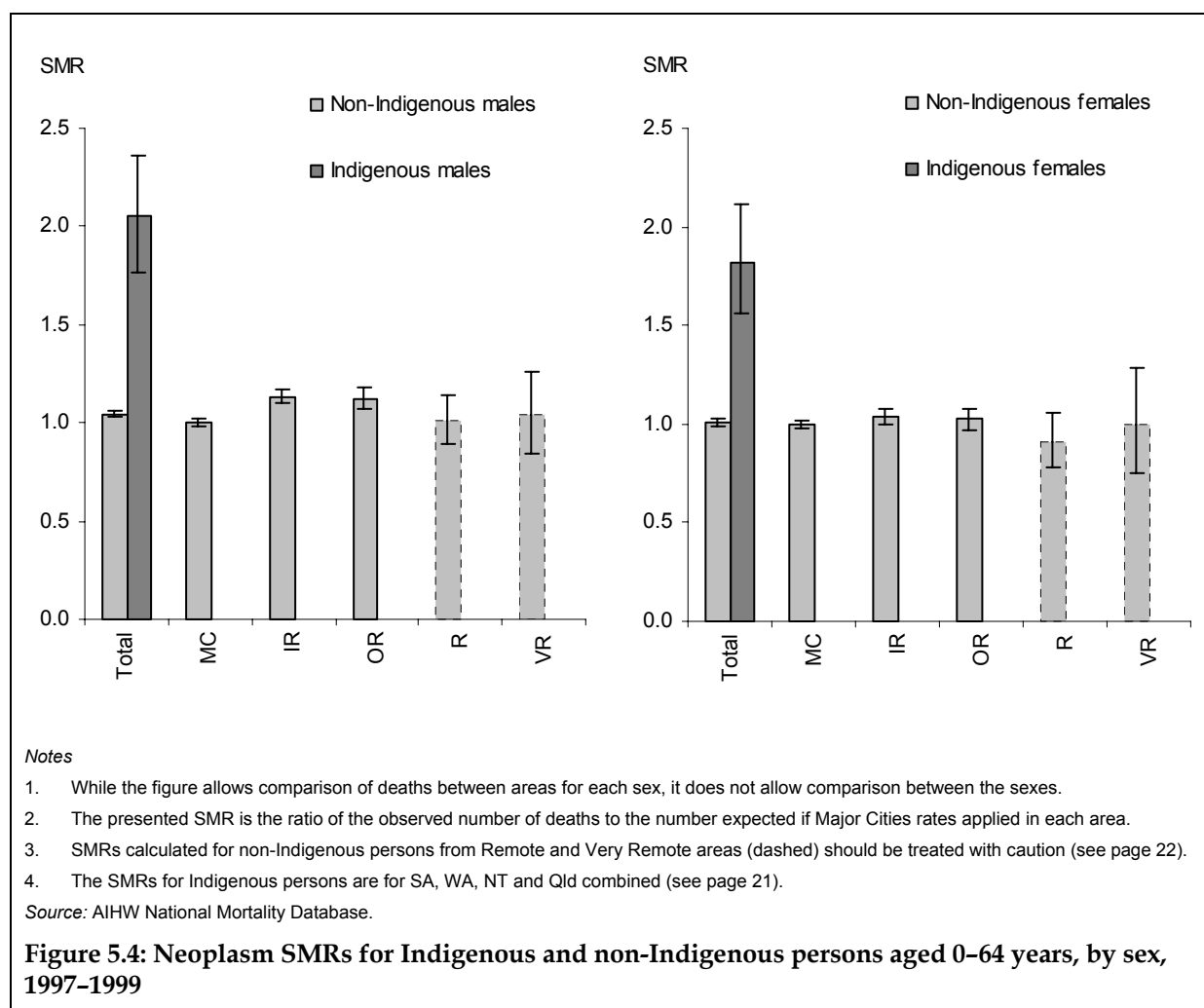
The inter-regional pattern for death rates due to neoplasms was similar for non-Indigenous people and the total population, except that in Remote and Very Remote areas, rates were more likely to be lower than in Major Cities, although they were still not significantly lower (Table 5.5).

### **Mortality of people aged 0–64 years**

Frequently, and as stated elsewhere, death rates of elderly non-Indigenous people from remote and very remote areas are found to be substantially lower than those of similar aged people living in other areas, possibly reflecting a movement of older people with known health conditions into more populated areas to receive treatment, and eventually dying there. These lower rates can substantially affect the summary statistic described for non-Indigenous people above. For this reason, rates for 0–64-year-old non-Indigenous people are also presented here (Figure 5.4 and Table 5.5).

Death rates from neoplasms for Indigenous males and females who are younger than 65 years are approximately double the rates for non-Indigenous males and females of the same age from Major Cities.

Death rates due to neoplasms for non-Indigenous males younger than 65 years were 1.1 times as high in regional areas as for similar males in Major Cities, however, rates in remote areas were not significantly different from those in Major Cities. For non-Indigenous females in this age group, the rates were 1.05 times as high in Inner Regional areas, but not significantly different in the other areas from those in Major Cities.



## Variation by age group: neoplasms

An analysis of age-specific death rates gives more detailed information about each age group to confirm and supplement findings resulting from the broad analysis above using standardised mortality ratios.

### Age-specific rates

Compared to rates in Major Cities, death rates in 1997-1999 as a result of neoplasms tended to be slightly higher for most age groups (but not for those 75 years or older) in most regional and remote areas (Table 5.4 and Figures 5.5 and 5.6).

For both males and females, death rates were negligible until age 25 years. For males in Major Cities, the rates then rose to reach 210 deaths per 100,000 per year at age 45-64 years and 2,156 deaths per 100,000 per year for those 75 years and older. For females in Major Cities, the pattern was similar; with rates in the oldest age groups half that for their male counterparts.

**Table 5.4: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, neoplasms, males and females, 1997–1999**

Age group (years)	Male					Female				
	MC rate	IR	OR	R	VR	MC rate	IR	OR	R	VR
		(ratio)					(ratio)			
0–4	5	1.07	1.03	0.33	2.30	3	<b>*1.73</b>	1.10	0.77	1.39
5–14	4	0.96	0.72	0.93	0.62	4	<b>*0.50</b>	0.61	0.01	0.58
15–24	6	1.17	1.34	1.19	1.61	4	1.10	0.88	1.08	1.75
25–44	19	<b>*1.12</b>	1.09	0.87	1.28	24	<b>*1.10</b>	1.00	1.00	1.25
45–64	213	<b>*1.14</b>	<b>*1.15</b>	1.11	<b>*1.31</b>	179	1.03	1.05	1.00	<b>*1.34</b>
65–74	1,028	<b>*1.04</b>	<b>*1.08</b>	1.12	1.02	586	0.98	0.99	1.13	1.24
75+	2,156	1.02	1.00	0.94	<b>*0.67</b>	1,167	0.99	0.98	<b>*0.81</b>	<b>*0.70</b>
Total	..	<b>1.05</b>	<b>1.06</b>	1.04	1.00	..	1.00	1.00	0.95	1.08

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Notes*

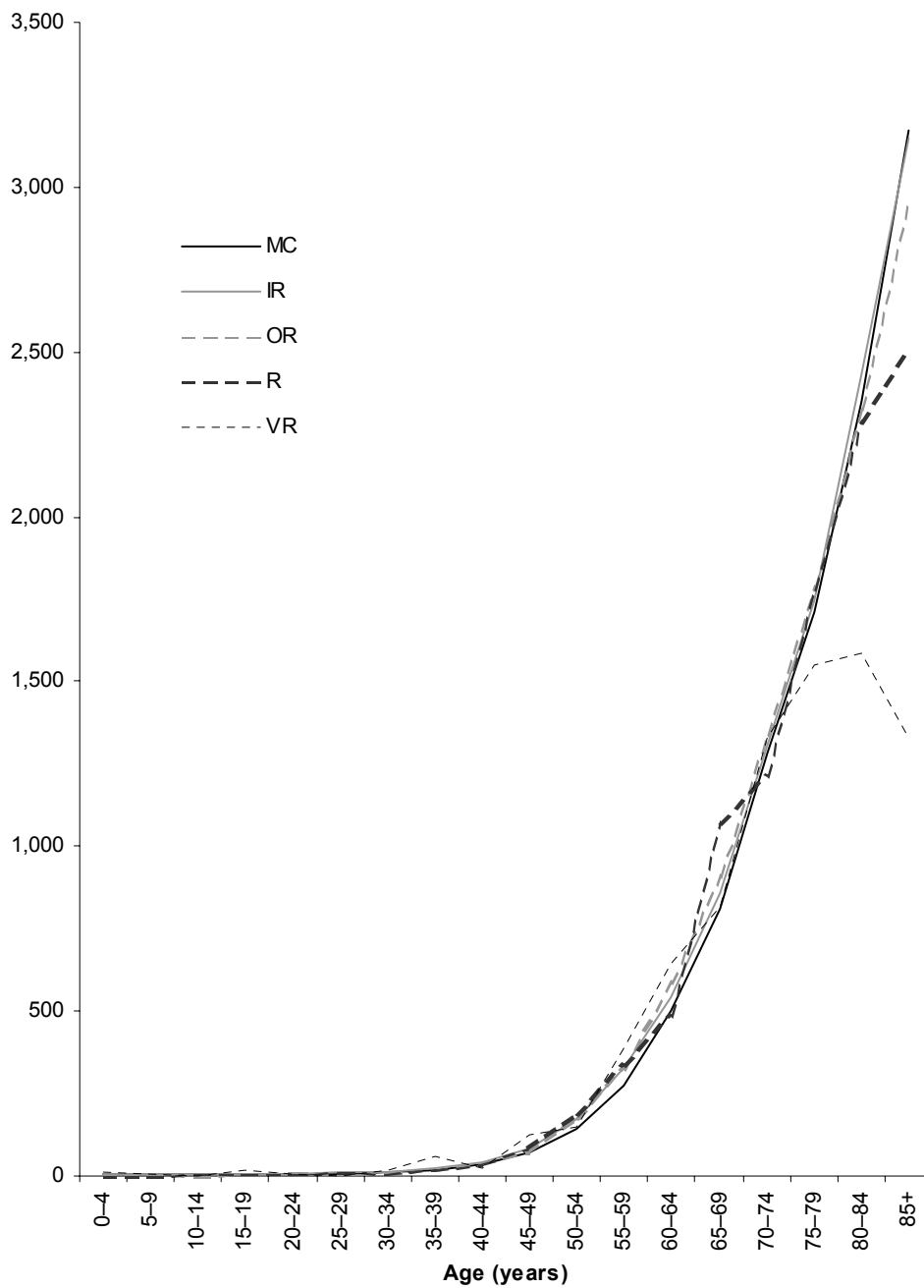
1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.

Source: AIHW National Mortality Database.

Age-specific death rates for males and females due to cancer and other neoplasms were frequently not significantly different for people living in regional and remote areas from those living in Major Cities. However, for most age groups (except 5–14-year-olds and those older than 75 years), rates tended to be higher outside Major Cities.

For males in Inner and Outer Regional areas, death rates were frequently 10% (or more) higher than in Major Cities. Females in regional areas had death rates that appeared to be similar to those in Major Cities or perhaps a little higher in young adulthood (to 44 years) and early childhood (0–4 years).

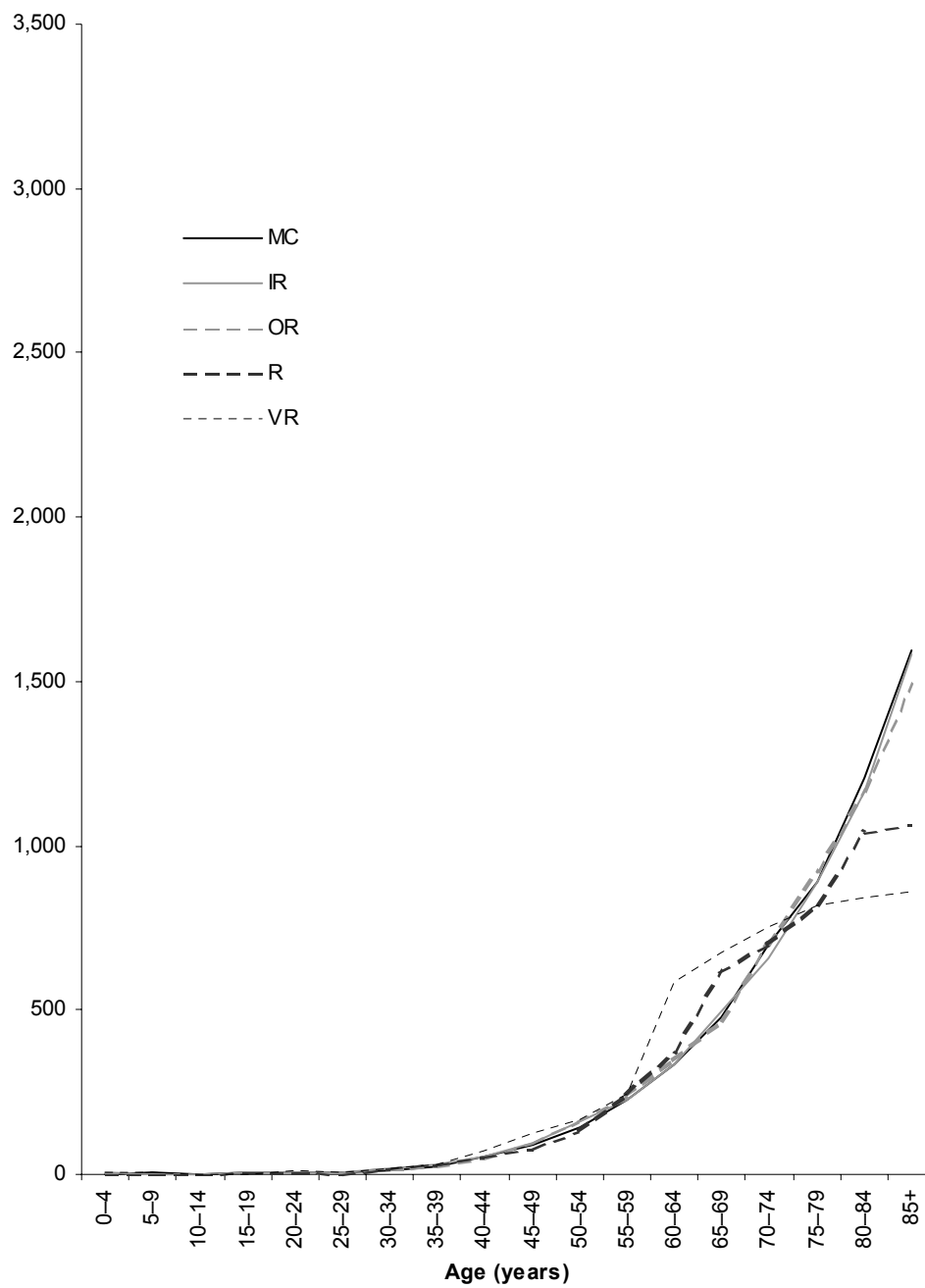
**Deaths per 100,000  
population**



Source: AIHW National Mortality Database.

**Figure 5.5: Age-specific death rates due to neoplasms, by ASGC Remoteness area for males, 1997-1999**

**Deaths per 100,000 population**



Source: AIHW National Mortality Database.

**Figure 5.6: Age-specific death rates due to neoplasms, by ASGC Remoteness area for females, 1997-1999**

In Remote areas, age-specific rates for those younger than 75 years were not significantly different from rates in Major Cities. Death rates for females older than this were 0.8 times those in Major Cities.

In Very Remote areas, death rates for most age groups younger than 75 years were elevated (but were not significantly different to those in Major Cities). Death rates for 45–64-year-olds were more than 1.3 times as high as rates for similar people in Major Cities.

For those older than 75 years, death rates as a result of neoplasms in regional areas were either not significantly different or, in remote areas, were lower or significantly lower (to 0.7 times the Major Cities rates in Very Remote areas (0.8 times for females in Remote areas)).

#### **Age-specific rates for Indigenous people**

Death rates of Indigenous people are greater than for non-Indigenous people, irrespective of where the latter live (Table 5.5 and Figures 5.7 and 5.8).

Age-specific death rates tended to be higher for Indigenous males and females than for non-Indigenous people in any area, with the exception that rates for those aged 75 years and older were similar to rates for non-Indigenous people from Major Cities. For those who were aged 25–64 years, there were approximately two to three times as many deaths as expected if non-Indigenous Major Cities rates applied to the Indigenous population. For those aged 65–74 years, death rates were 1.3 to 1.4 times rates for non-Indigenous people from Major Cities.

#### **Age-specific rates for non-Indigenous people**

Death rates as a result of neoplasms for non-Indigenous males living in regional areas were higher (Table 5.5 and Figures 5.7 and 5.8), frequently by up to 15% (although rates for those older than 75 years were similar to rates for counterparts in Major Cities). Death rates for non-Indigenous males in remote areas were not significantly different from their counterparts from Major Cities, except for those who were 75 years and older from Very Remote areas (for whom rates were 0.6 times those in Major Cities (that is, lower)).

**Table 5.5: The ratio of observed deaths to those expected as a result of neoplasms if Major Cities non-Indigenous rates applied to the non-Indigenous population in each ASGC Remoteness area and to the Indigenous population, 1997–1999**

Age group (years)	Male						Female					
	MC rate	Non-Indigenous				Indigenous	MC rate	Non-Indigenous				Indigenous
		IR	OR	R	VR			IR	OR	R	VR	
		(ratio)						(ratio)				
0–4	5	1.13	1.05	0.38	1.75	1.2	3	<b>*1.82</b>	1.04	0.94	0.12	2.1
5–14	4	0.98	0.72	1.11	0.30	0.5	4	<b>*0.52</b>	0.67	0.01	0.00	0.9
15–24	6	1.13	1.35	0.69	0.98	2.1	4	1.13	0.87	0.57	1.68	1.4
25–44	19	<b>*1.13</b>	1.04	0.73	0.49	<b>*2.7</b>	24	<b>*1.11</b>	1.00	0.81	0.78	<b>*1.9</b>
45–64	214	<b>*1.14</b>	<b>*1.14</b>	1.06	1.13	<b>*2.0</b>	179	1.03	1.03	0.95	1.07	<b>*1.9</b>
65–74	1,028	<b>*1.04</b>	<b>*1.07</b>	1.11	0.99	<b>*1.3</b>	586	0.98	0.99	1.12	1.02	<b>*1.4</b>
75+	2,155	1.02	1.01	0.97	<b>*0.62</b>	1.0	1,168	0.98	0.97	<b>*0.81</b>	<b>*0.66</b>	1.0
Total	..	<b>*1.05</b>	<b>*1.06</b>	1.03	0.88	<b>*1.5</b>	..	1.00	0.99	0.92	0.87	<b>*1.5</b>
0–64	..	<b>*1.13</b>	<b>*1.13</b>	1.01	1.04	<b>*2.1</b>	..	<b>*1.04</b>	1.02	0.91	0.99	<b>*1.8</b>

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld.
4. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.
5. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

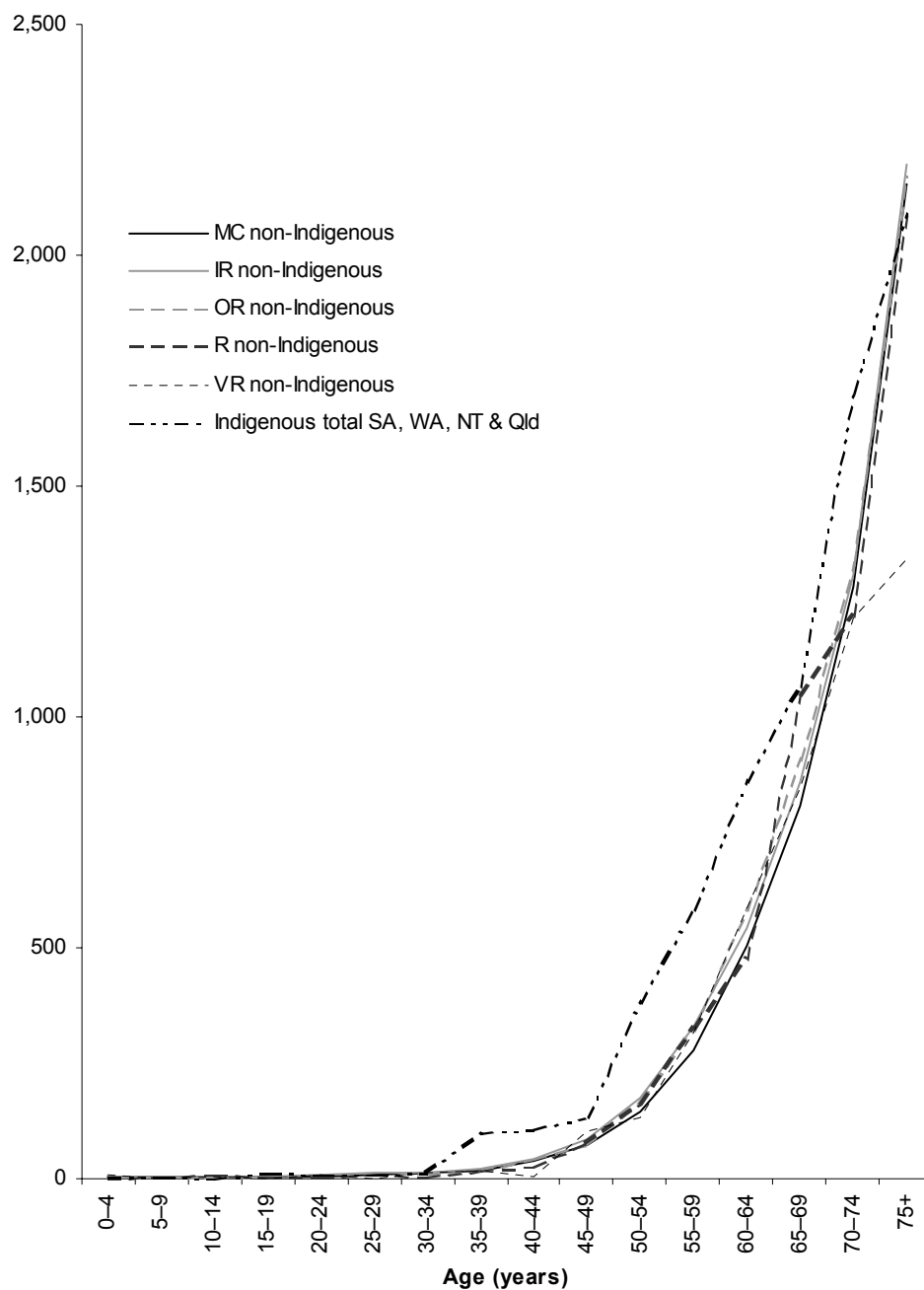
Source: AIHW National Mortality Database.

For non-Indigenous females, death rates as a result of neoplasms were not clearly higher, except in a couple of groups. For females older than 75 years, rates were similar in regional areas and significantly lower in remote areas than for those from Major Cities. In Inner Regional areas, rates were either not significantly different, slightly (1.1 times) higher in 25–44-year-olds, significantly (1.8 times) higher in those younger than 5 years, or significantly (0.5 times) lower in those who were 5–14 years old.

Death rates for the oldest age group in Remote and Very Remote areas were significantly lower than for their counterparts in Major Cities (0.8 and 0.7 times respectively).



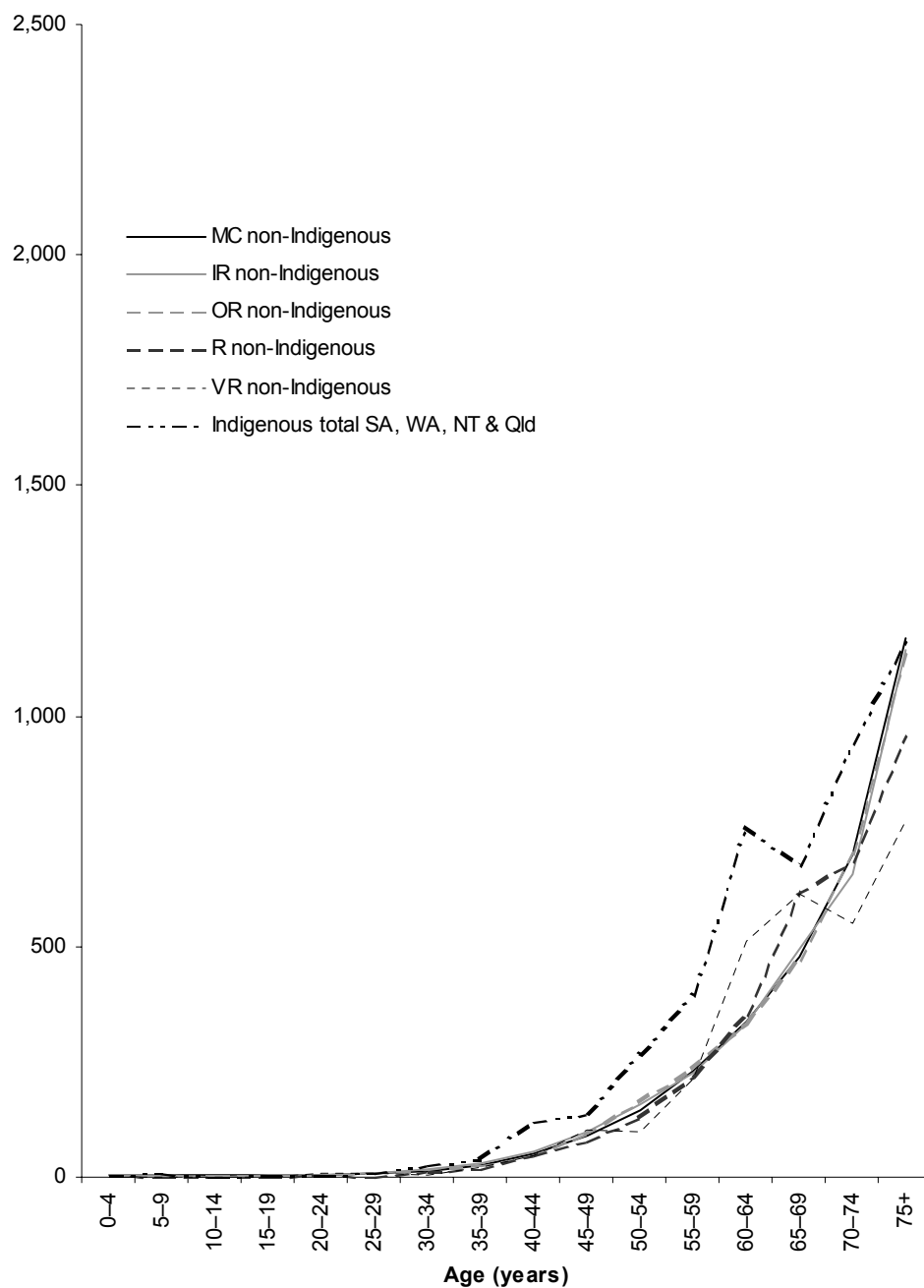
**Deaths per 100,000 population**



Source: AIHW National Mortality Database.

**Figure 5.7: Age-specific death rates due to neoplasms, by ASGC Remoteness area for non-Indigenous males and for SA, WA, NT and Qld Indigenous males, 1997-1999**

**Deaths per 100,000 population**



Source: AIHW National Mortality Database.

**Figure 5.8: Age-specific death rates due to neoplasms, by ASGC Remoteness area for non-Indigenous females and for SA, WA, NT and Qld Indigenous females, 1997-1999**

## **'Excess' deaths due to neoplasms**

'Excess' deaths are defined as 'how many more observed deaths occurred than would be expected, if death rates in Major Cities were applied to the populations in each area outside Major Cities'.

'Excess' deaths gives a measure of the absolute number of 'extra' people who died outside Major Cities, and places these in perspective against the ratios shown in Tables 5.4 and 5.5. For example, although the ratio of observed deaths to those expected if Major Cities had applied may have been relatively high in a particular area, it may not have involved a large number of people. Conversely, a low rate ratio in another area may translate into a relatively large number of 'excess' deaths because of a larger base population.

### **Annual 'excess' deaths**

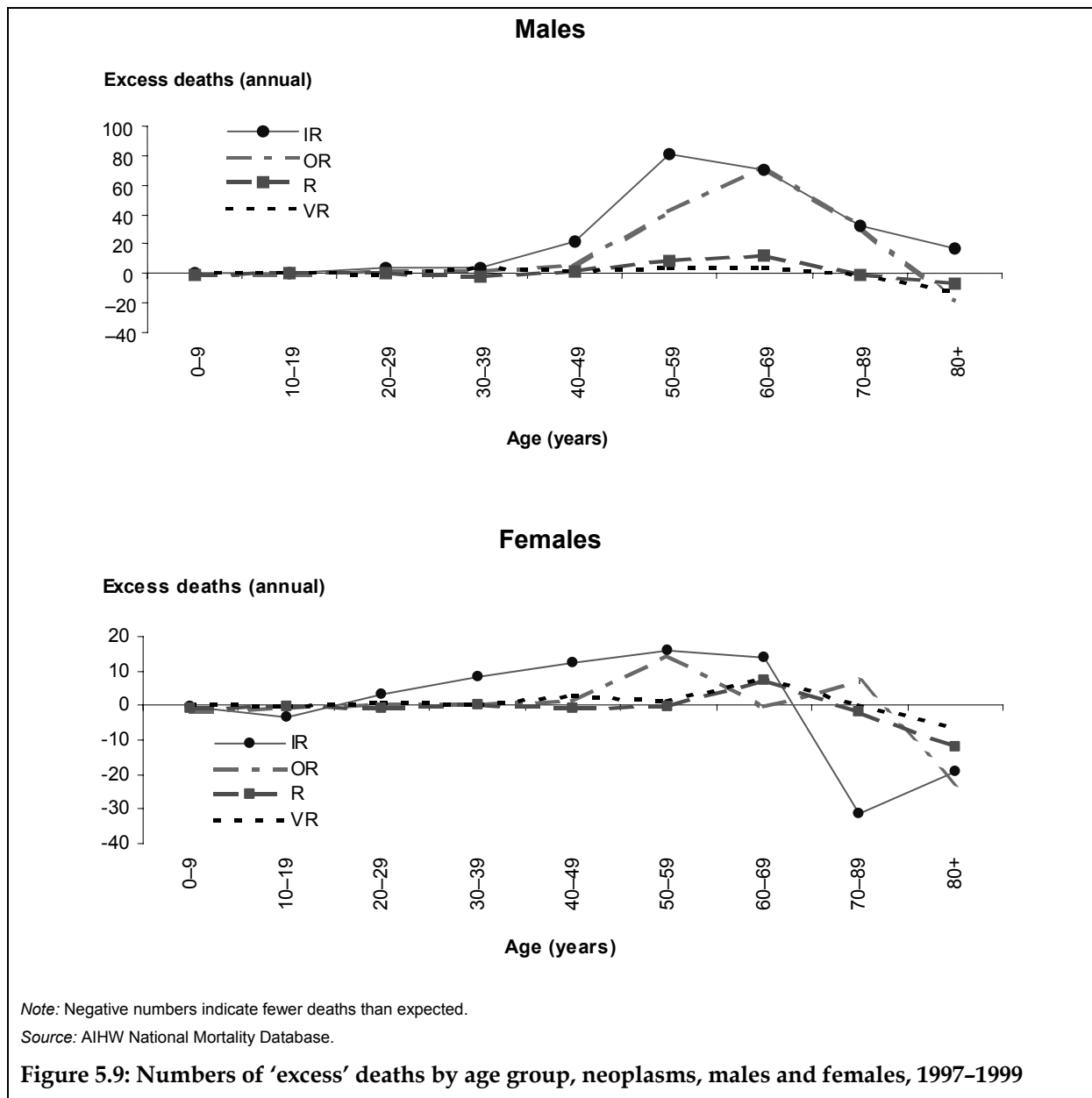
Outside Major Cities, there were 373 'excess' deaths annually as a result of neoplasms; 379 'excess' deaths of males and 6 fewer deaths of females than expected.

Annually, there were 232, 135, 12 and 0 'excess' deaths of males in the four areas outside Major Cities. The bulk (approximately 80%) of these 'excess' male deaths occurred in those aged 50–69 years (Figure 5.9 and Appendix B).

Even though there were fewer deaths than expected for females, there were 6 more deaths than expected in Very Remote areas annually (and 9 fewer than expected in Remote areas). The picture for females is complicated by the fact that there are substantially fewer deaths than expected for females aged 70 years and older. So, in fact, for females younger than 70 years who live outside Major Cities, there are about 80 more deaths than expected each year (slightly fewer than expected in those younger than 20 years, and about 90 more than expected for those aged 20–69 years, with the bulk of these occurring in women older than 50 years).

There were slightly fewer deaths than expected for males younger than 15 years, and 35 fewer deaths each year for those older than 84 years. This leaves an 'excess' of 416 deaths annually for males aged 15–84 years who live outside Major Cities, more than half of which were in the 50–69 year age group.

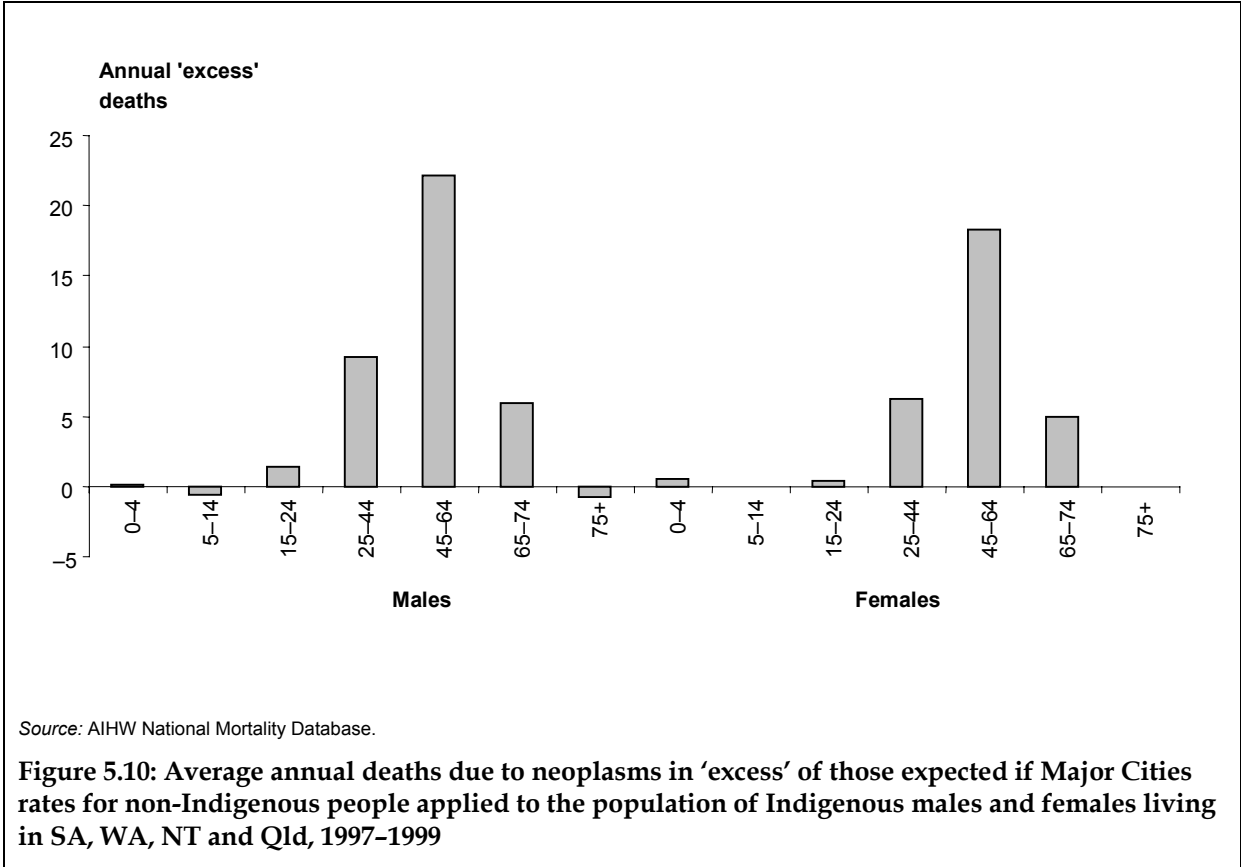
As noted previously, the fewer deaths than expected in the older age groups may be a consequence of older people with known poor health moving into more populated areas to receive treatment, and eventually dying there.



### Annual 'excess' deaths of Indigenous people

In the Indigenous population there were 38 'excess' deaths of males and 30 'excess' deaths of females, resulting from neoplasms annually. These were calculated on the basis that Major Cities rates for non-Indigenous people had applied to the Indigenous population living in South Australia, Western Australia, the Northern Territory and Queensland. It is most likely that there were also 'excess' deaths of Indigenous people from these diseases in the other jurisdictions for which identification is considered less accurate (New South Wales, Victoria, Tasmania and the Australian Capital Territory).

The majority of these deaths occurred in relatively young age groups compared with the total population. For Indigenous males, 25% of the 'excess' was in those aged 25–44 years, 60% occurred in those aged 45–64 years; and 16% in those aged 65–74 years. For Indigenous females the numbers of excess deaths were lower, but the pattern similar; 21% were 25–44 years, 60% were in the 45–64 years age group, and 17% were aged 65–74 years (Figure 5.10 and Appendix B).

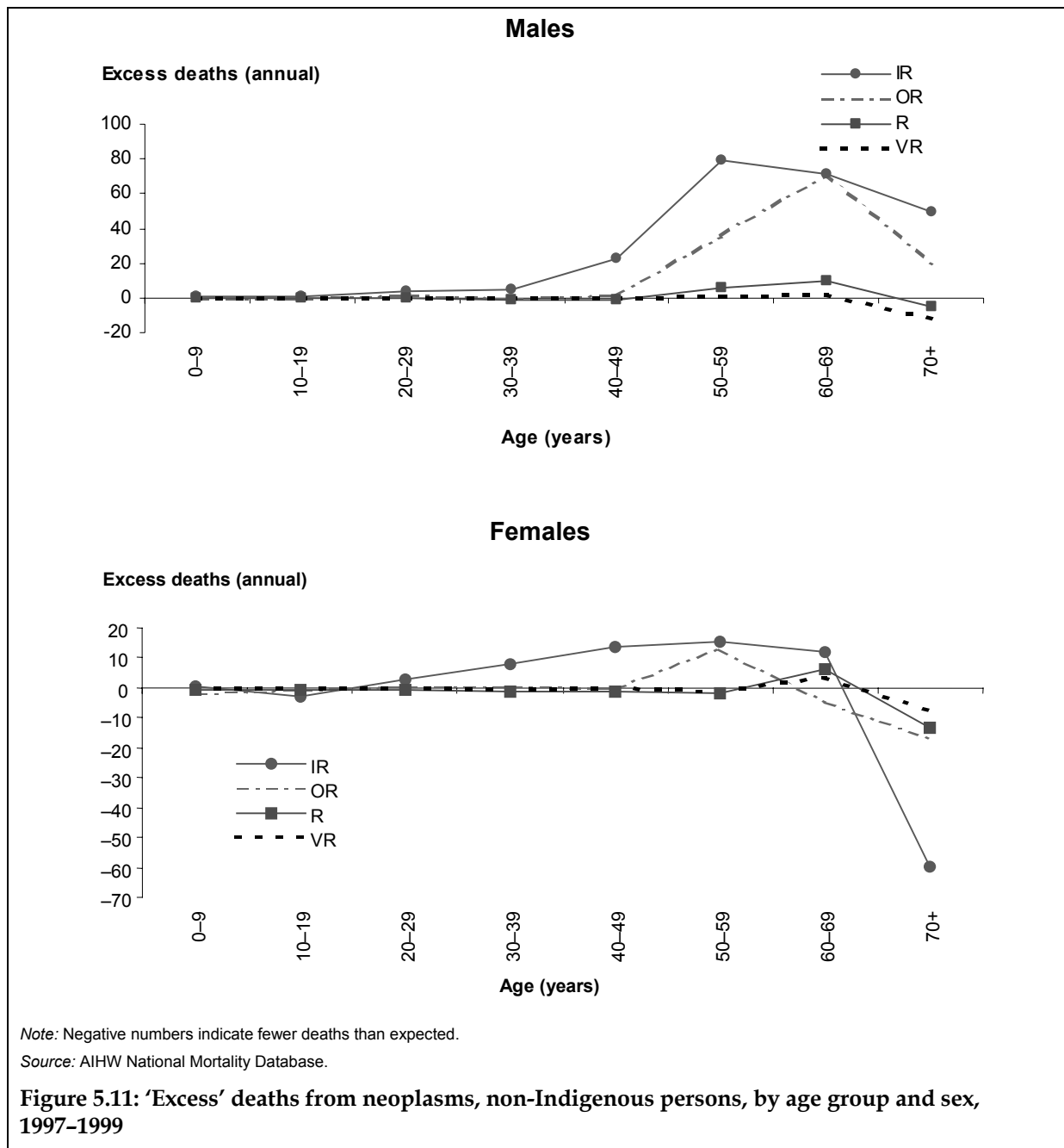


**Annual 'excess' deaths of non-Indigenous people**

Annually, there were 321 'excess' deaths of non-Indigenous people, compared with 379 'excess' deaths in the total population. Of these, there were 359 more deaths of non-Indigenous males and 38 fewer deaths of non-Indigenous females than expected; 233, 129, 8 and -11 'excess' deaths of males and 10, 9, 13 and 6 fewer deaths of females than expected in the four areas outside Major Cities.

For non-Indigenous males from regional areas, over 90% of the 'excess' occurred amongst those older than 45 years with roughly similar contribution from most age groups. In Remote and Very Remote areas respectively, there were 5 and 13 fewer deaths than expected of males 70 years or older, which substantially reduced the total number of 'excess' deaths in those areas (Figure 5.11 and Appendix B).

For non-Indigenous females 70 years and older, there were substantially fewer deaths than expected, while for those younger than 70 years, there were 50, 8, 0 and 1 more deaths than expected in the four areas outside Major Cities.



## 5.2 Lung cancer

Smoking is the main cause of lung cancer (ICD-10 codes C33, C34). People who live outside Major Cities are more likely to be smokers than those living in Major Cities (AIHW: Strong et al. 1998), and Indigenous people are twice as likely to smoke as the total population (ABS 2002).

### Summary of findings

Lung cancer is the leading cause of cancer death in Australia.

Annually, lung cancer was responsible for the deaths of 6,658 people (4,634 males and 2,076 females), 2,334 of whom were living in areas outside Major Cities. Of these 6,658 deaths, 47 were of Indigenous people living in South Australia, Western Australia, the Northern Territory and Queensland.

Lung cancer death rates tended to be higher for males outside Major Cities. Rates were 1.1 and 1.3 times as high in Outer Regional and Very Remote areas respectively. Rates in Inner Regional and Remote areas were not significantly different to those in Major Cities. Rates for females were not significantly higher except in Very Remote areas where there were 1.4 times as many deaths as expected.

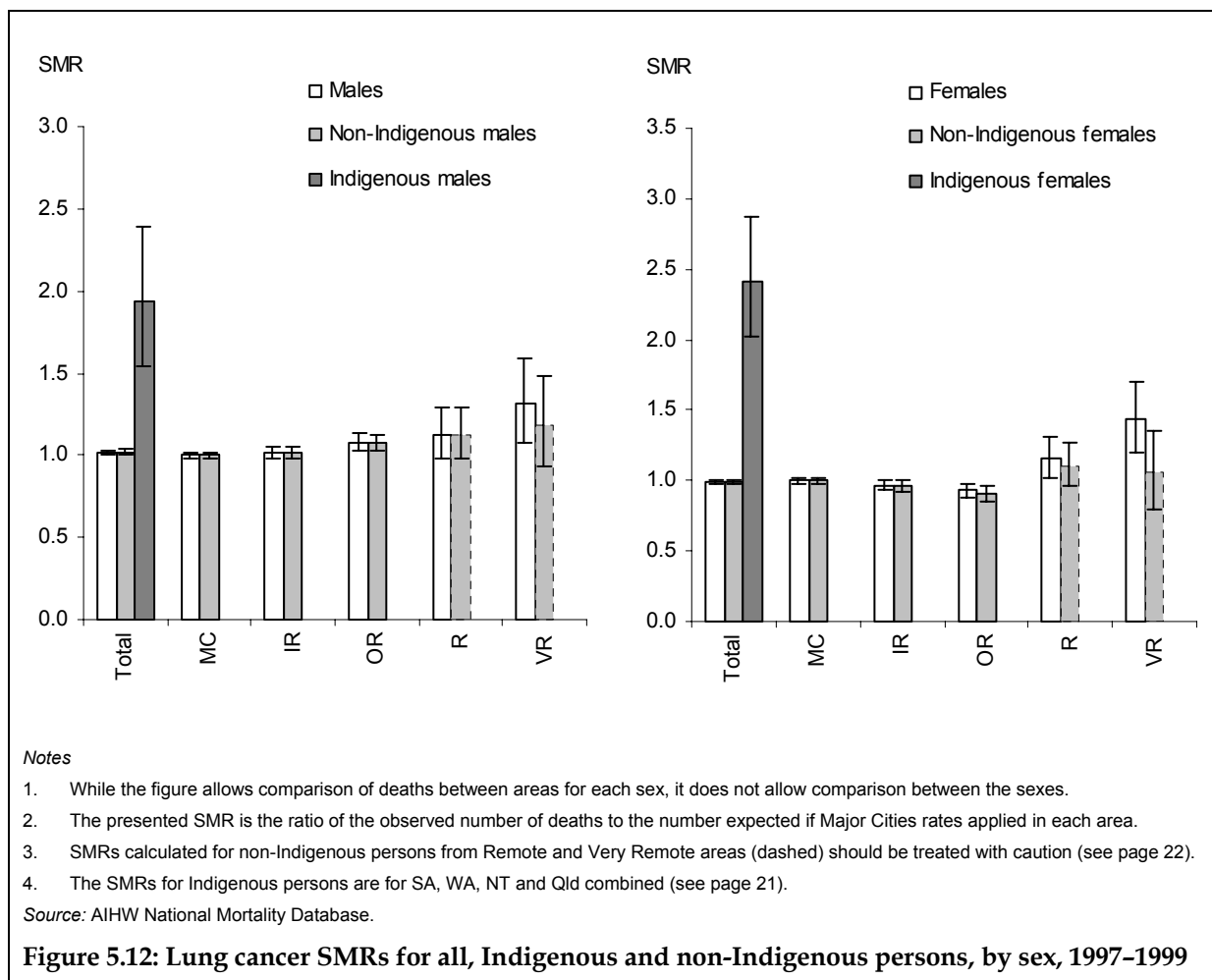
There were about twice as many deaths of Indigenous people as expected from lung cancer.

Death rates for non-Indigenous people who were 75 years or older were lower in remote areas, substantially lowering overall lung cancer death rates in those areas. For non-Indigenous males younger than 65 years, there were 1.1–1.3 and 1.9 times as many deaths as expected in regional and Very Remote areas, and although rates appeared to be elevated for females outside Major Cities, they were not significantly higher.

Annually as a result of lung cancer, there were 52 'excess' deaths (76 more males and 23 fewer females than expected). However, there were fewer deaths than expected due to this cause in those who were 70 years and older in all areas. For those who were younger than 70 years, there were 112 'excess' deaths, almost all of which occurred in those aged 45–69 years. Of these, 40, 45, 12 and 15 occurred in the four areas outside Major Cities.

### Overall mortality due to lung cancer

Annually in the period 1997–1999, there were 2,927, 1,051, 547, 74 and 35 deaths of males and 1,397, 442, 195, 28 and 13 deaths of females, respectively, in the five areas as a result of lung cancer.



Death rates due to lung cancer tended to be either not significantly higher or tended to be higher outside Major Cities (Figure 5.12 and Table 5.6).

- Death rates for males tended to be higher outside Major Cities, although the difference did not reach statistical significance in Inner Regional and Remote areas. However, in Outer Regional and Very Remote areas, rates for males were 1.1 and 1.3 times as high as for males from Major Cities.
- Death rates for females tended to be slightly (and not significantly) lower in regional areas and higher in remote areas, with 1.4 times as many deaths as expected in Very Remote areas.
- There were about twice as many deaths of Indigenous people due to lung cancer as expected.

In Major Cities, death rates for males rose from about 0 per 100,000 per year at age 40 years, to about 400 per 100,000 per year at age 75 years. For females the pattern was similar but the rate at age 75 years was about 140 per 100,000 per year.

Death rates as a result of lung cancer were, for most age/sex groups, not significantly different from those in Major Cities. However, for males aged 45-64 years, rates in Inner Regional, Outer Regional and Very Remote areas were 1.1, 1.3 and 2.2 times as high respectively as for males from Major Cities. For females 25 years and older from regional areas, rates were not significantly different and generally lower (0.9 times the Major Cities



rate for 65–74-year-old females from Inner Regional areas) than rates for counterparts from Major Cities. Rates for females 25–74 years old in remote areas tended to be higher than in Major Cities (rates for 45–64-year-old females from Very Remote areas were 2.2 times as high as rates for females in that age group from Major Cities). Rates for people 75 years and older living outside Major Cities were similar to or lower than rates for people of that age living in Major Cities, but not significantly lower.

**Table 5.6: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, lung cancer, males and females, 1997–1999**

Age group (years)	Male					Female				
	MC rate	IR	OR	R	VR	MC rate	IR	OR	R	VR
		(ratio)					(ratio)			
0–4	0	..	..	..	..	0	..	..	..	..
5–14	0	..	..	..	..	<1	0.00	0.00	0.00	0.00
15–24	<1	0.00	2.85	4.07	0.00	<1	0.00	0.00	0.00	0.00
25–44	1	1.37	1.32	0.57	0.87	2	1.01	0.73	0.72	2.20
45–64	51	<b>*1.11</b>	<b>*1.28</b>	1.24	<b>*2.15</b>	26	1.09	0.97	1.35	<b>*2.20</b>
65–74	285	1.00	1.07	1.23	0.92	107	<b>*0.89</b>	0.96	1.17	1.24
75+	442	0.98	0.95	0.91	0.92	133	0.95	0.88	1.01	0.62
Total	..	1.02	<b>*1.08</b>	1.13	<b>*1.31</b>	..	0.96	0.93	1.16	<b>*1.43</b>

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.

Source: AIHW National Mortality Database.

As a result of lung cancer, there were 18, 41, 8 and 8 ‘excess’ deaths of males annually in the four areas, 16 and 15 fewer deaths than expected for females in Inner and Outer Regional areas respectively, as well as 4 and 4 more deaths of females than expected in Remote and Very Remote areas. There were fewer deaths than expected in males older than 80 years and females older than 70 years. The bulk of the ‘excess’ deaths occurred among males who were 50–79 years old, with 91 more deaths than expected outside Major Cities annually. There were no clear ‘excess’ deaths of females at any stage of life.

### Indigenous population

Annually in the period 1997–1999, there were 47 deaths of Indigenous people (29 males and 18 females) in South Australia, Western Australia, the Northern Territory and Queensland. There would also have been a number of deaths due to this cause in the other jurisdictions where identification is less reliable. Of these 47 deaths, there were 25 (14 males and 11 females) more than expected.

There were 1.9 and 2.4 times as many deaths of Indigenous males and females as expected (Table 5.7). For those aged 25–64 years, there were 3–5 times as many deaths as expected, with most (70%) of the total ‘excess’ deaths occurring in those aged 45–64 years.

## Non-Indigenous population

Annually, there were 2,918, 1,044, 537, 71 and 24 deaths of non-Indigenous males and 1,390, 438, 188, 25 and 7 deaths of non-Indigenous females in the five areas as a result of lung cancer.

- Death rates for males were higher in each area outside Major Cities, but not significantly higher (except for Outer Regional areas where rates were 1.1 times those in Major Cities).
- Death rates for females were 0.9 times Major Cities rates in Outer Regional areas but otherwise were not significantly different (Table 5.7).

**Table 5.7: The ratio of observed deaths to those expected as a result of lung cancer if Major Cities non-Indigenous rates applied to the non-Indigenous population in each ASGC Remoteness area and to the Indigenous population, 1997-1999**

Age group (years)	Male						Female					
	MC rate	Non-Indigenous				Indig-enous	MC rate	Non-Indigenous				Indig-enous
		IR	OR	R	VR			IR	OR	R	VR	
0-4	0	..	..	..	..	..	0	..	..	..	..	..
5-14	0	..	..	..	..	..	<1	0.00	0.00	0.00	0.00	0.0
15-24	<1	0.00	3.01	4.73	0.00	0.0	<1	0.00	0.00	0.00	0.00	0.0
25-44	1	1.39	1.27	0.24	1.19	<b>*5.4</b>	2	1.01	0.62	0.78	0.58	<b>*3.9</b>
45-64	51	<b>*1.11</b>	<b>*1.26</b>	1.17	<b>*1.92</b>	<b>*2.7</b>	26	1.09	0.92	1.19	1.57	<b>*3.7</b>
65-74	284	1.00	1.06	<b>*1.27</b>	0.88	1.2	107	<b>*0.89</b>	0.96	1.15	0.94	1.4
75+	442	0.97	0.96	0.94	0.76	1.5	133	0.95	<b>*0.87</b>	1.02	0.70	1.3
Total	..	1.02	<b>*1.08</b>	1.13	1.18	<b>*1.9</b>	..	0.96	<b>*0.91</b>	1.11	1.05	<b>*2.4</b>
0-64	..	<b>*1.12</b>	<b>*1.27</b>	1.14	<b>*1.88</b>	<b>*2.9</b>	..	1.08	0.90	1.15	1.47	<b>*3.7</b>

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

### Notes

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld.
4. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.
5. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

Source: AIHW National Mortality Database.

Overall, for those living outside Major Cities, death rates due to lung cancer were 4% higher for non-Indigenous males, but were not significantly different for non-Indigenous females, compared with their counterparts inside Major Cities.

Age-specific death rates for non-Indigenous people living in Major Cities were similar to those for the total population living in Major Cities.

The pattern exhibited by age-specific death rates is similar for non-Indigenous people to that for the total population. However, death rates for 45-64-year-old non-Indigenous females were not significantly higher in Very Remote areas.

As a result of lung cancer, there were 16, 38, 8 and 4 'excess' deaths of non-Indigenous males annually in the four areas respectively, and -17, -19, 2 and 0 'excess' deaths of non-Indigenous females in these areas. There were (23) fewer deaths than expected in males older than 70 years, with most (83) of the total 'excess' deaths in males aged 50–69 years. There were substantially fewer (43 fewer) deaths than expected of females older than 60 years, but a small 'excess' (11) for those who were 40–59 years.

## **Mortality for those aged 0–64 years**

### **Indigenous population**

Annually there were 29 (16 male, 13 female) deaths of Indigenous people younger than 65 years in South Australia, Western Australia, the Northern Territory and Queensland as a result of lung cancer. There would also have been a number of deaths due to this cause in the other jurisdictions. Of these 29 deaths, there were 25 (14 males and 11 females) more than expected.

For Indigenous males and females who were younger than 65 years old, there were 2.9 and 3.7 times as many deaths as expected (Table 5.7).

### **Non-Indigenous population**

Annually, there were 717, 264, 160, 22 and 13 deaths of non-Indigenous males younger than 65 years and 372, 130, 53, 9 and 3 deaths of non-Indigenous females younger than 65 years in the five areas, as a result of lung cancer.

Outside Major Cities, there were more deaths of non-Indigenous males than expected due to lung cancer, but for non-Indigenous females the number of deaths was not significantly more than expected (Table 5.7).

- Death rates for males were 1.1, 1.3 and 1.9 times as high in Inner Regional, Outer Regional and Very Remote areas as for males from Major Cities. Rates for males in Remote areas were not significantly different from rates for males from Major Cities.
- Death rates for females were not significantly different across remoteness categories.

Annually as a result of lung cancer, there were 27, 34, 3 and 6 'excess' deaths of non-Indigenous males and 10, -6, 1 and 1 'excess' deaths of non-Indigenous females who were younger than 65 years, in the four areas outside Major Cities. Most of the 'excess' deaths of males occurred in those 50–70 years old.

## 5.3 Colorectal cancer

Colorectal cancer (ICD-10 code C18–C21) is the most commonly diagnosed cancer in Australia (AIHW 2002a). 'A large proportion of colorectal cancer cases are preventable given its association with modifiable risk factors such as poor diet and physical inactivity. This proportion may be as high as 66–75%. Also if detected in its early stages, colorectal cancer is highly manageable and treatable' (AIHW 2002a). People who live outside Major Cities may have poorer access to healthy food, and people living in remote areas are more likely to be physically inactive (AIHW 2002b). Indigenous people are likely to have diets that are less healthy than those of non-Indigenous people for a range of reasons (ABS 2001c).

### Summary of findings

Annually, colorectal cancer was responsible for the deaths of 4,630 people (2,501 males and 2,129 females); 1,675 of these people came from areas outside Major Cities. Of these 4,630 deaths, 10 were of Indigenous people living in South Australia, Western Australia, the Northern Territory and Queensland.

Colorectal cancer death rates tended to be 10% higher in regional areas, with rates similar or lower in remote areas.

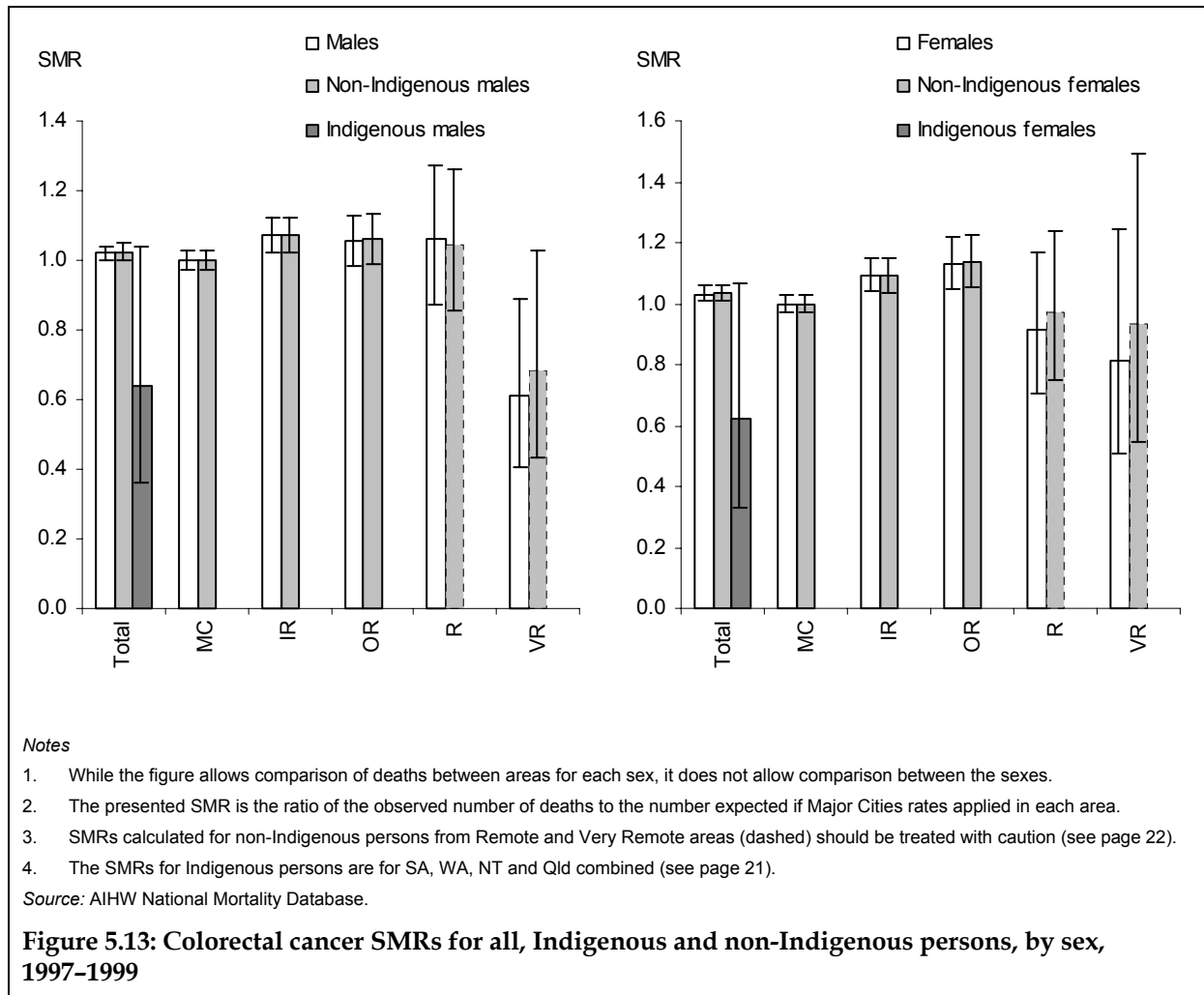
There were fewer (0.6 times as many) deaths of Indigenous people than expected due to colorectal cancer (although for males and females separately, rates were not significantly different to those for their non-Indigenous Major Cities counterparts).

As for the total population above, colorectal cancer death rates for non-Indigenous people tended to be 10% higher in regional areas, with about as many deaths as expected in remote areas.

Annually, there were 117 'excess' deaths due to colorectal cancer outside Major Cities (83, 41, 0 and -7 in each of the four areas). Almost all of these were non-Indigenous people. Over 80% of the 'excess' deaths occurred in those 55 years and older.

## Overall mortality due to colorectal cancer

Annually, there were 1,575, 592, 286, 38 and 9 deaths of males and 1,380, 489, 232, 22 and 7 deaths of females in the five areas as a result of colorectal cancer.



Death rates due to colorectal cancer tended to be higher in regional areas and lower in remote areas than in Major Cities, although frequently the differences were not statistically significant (Figure 5.13 and Table 5.8).

- Death rates for males in Inner Regional areas were 1.1 times as high as in Major Cities, but were not significantly different in Outer Regional and Remote areas. In Very Remote areas rates were 0.6 times those in Major Cities (that is, lower).
- Death rates for females in Inner and Outer Regional areas were 1.1 times the Major Cities rate, with rates in Remote and Very Remote areas lower, but not significantly lower than in Major Cities.
- There were 0.6 times as many deaths of Indigenous people due to colorectal cancer as expected, however the number of observed deaths for each sex, although lower, was not significantly different from the number expected for each sex.

**Table 5.8: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, colorectal cancer, males and females, 1997–1999**

Age group (years)	Male					Female				
	MC rate	IR	OR	R	VR	MC rate	IR	OR	R	VR
		(ratio)					(ratio)			
0–4	0	..	..	..	..	0	..	..	..	..
5–14	<1	2.33	0.79	0.00	0.00	<1	0.01	0.00	0.00	0.00
15–24	<1	2.49	0.11	11.43	0.00	<1	3.62	3.90	0.00	0.00
25–44	2	1.14	1.29	0.67	0.02	2	1.00	0.87	0.57	1.20
45–64	31	<b>*1.21</b>	1.10	1.06	0.53	21	<b>*1.20</b>	<b>*1.28</b>	1.00	1.21
65–74	134	1.03	1.05	1.27	1.03	78	1.08	1.07	1.13	0.60
75+	243	1.02	1.01	0.85	<b>*0.37</b>	173	1.06	1.11	0.79	0.61
Total	..	<b>*1.07</b>	1.05	1.06	<b>*0.61</b>	..	<b>*1.09</b>	<b>*1.13</b>	0.92	0.82

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Note*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.

Source: AIHW National Mortality Database.

In Major Cities, death rates due to colorectal cancer rose slowly with age at first, then more rapidly to 360 per 100,000 per year for males older than 85 years and 260 per 100,000 per year for similar aged females.

- There were up to 30% more deaths of 45–64-year-old males and females than expected in regional areas.
- Death rates for those who were 65–74 years old tended to be slightly (but not significantly) higher in each area than in Major Cities.
- For males and females who were 75 years and older, there were about the same number of deaths as expected, except in remote areas where there were fewer deaths than expected (0.4 times the number expected for males from Very Remote areas).

As a result of colorectal cancer, there were 40, 15, 2 and –6 ‘excess’ deaths of males annually, and 42, 27, –2 and –2 ‘excess’ deaths of females annually in the four areas. The bulk of the ‘excess’ occurred in those older than 60 years.

### Indigenous population

Annually in the period 1997–1999, there were 9 deaths of Indigenous people (5 males and 4 females) in South Australia, Western Australia, the Northern Territory and Queensland as a result of colorectal cancer. There would also have been a number of deaths due to this cause in the other jurisdictions where identification is less reliable. These 9 deaths were 6 fewer than expected.

There were 0.6 times as many deaths of Indigenous males and females as expected (Table 5.9).

## Non-Indigenous population

Annually, there were 1,573, 590, 284, 35 and 8 deaths of non-Indigenous males and 1,378, 487, 230, 22 and 6 deaths of non-Indigenous females in the five areas, as a result of colorectal cancer.

There were about 1.1 times as many deaths of non-Indigenous males and females as expected in regional areas due to colorectal cancer, but about as many deaths as expected in remote areas (Table 5.9).

**Table 5.9: The ratio of observed deaths to those expected as a result of colorectal cancer if Major Cities non-Indigenous rates applied to the non-Indigenous population in each ASGC Remoteness area and to the Indigenous population, 1997–1999**

Age group (years)	Male						Female						
	MC rate	Non-Indigenous				Indig-enous	MC rate	Non-Indigenous				Indig-enous	
		IR	OR	R	VR			IR	OR	R	VR		
													(ratio)
0–4	0	..	..	..	..	..	0	..	..	..	..	..	..
5–14	<1	2.37	0.84	0.00	0.00	0.0	<1	0.01	0.00	0.00	0.00	0.00	0.0
15–24	<1	2.53	0.11	0.00	0.00	11.5	<1	3.67	4.15	0.00	0.00	0.00	0.0
25–44	2	1.15	1.33	0.72	0.03	0.0	2	1.02	0.91	0.63	1.84	0.0	0.0
45–64	31	<b>*1.21</b>	1.10	1.08	0.60	0.6	21	<b>*1.20</b>	<b>*1.28</b>	1.07	1.23	0.9	0.9
65–74	134	1.02	1.05	1.22	1.07	1.0	78	1.08	1.07	1.18	0.64	0.9	0.9
75+	243	1.02	1.03	0.85	0.47	0.3	173	1.05	1.11	0.83	0.80	0.2	0.2
Total	..	<b>*1.07</b>	1.06	1.04	0.68	0.6	..	<b>*1.09</b>	<b>*1.14</b>	0.97	0.94	0.6	0.6
0–64	..	<b>*1.21</b>	1.11	1.04	0.55	0.6	..	<b>*1.19</b>	<b>*1.25</b>	1.01	1.32	0.8	0.8

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

### Notes

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld.
4. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.
5. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

Source: AIHW National Mortality Database.

Age-specific rates for non-Indigenous people living in Major Cities were similar to those for the total population living in Major Cities.

The pattern exhibited by age-specific death rates is similar for non-Indigenous people to that for the total population, although death rates for males older than 75 years in Very Remote areas, though still low, were not significantly lower.

As a result of colorectal cancer, there were 40, 16, 1 and –4 ‘excess’ deaths of non-Indigenous males annually, and 40, 28, –1 and 0 ‘excess’ deaths of non-Indigenous females annually in the four areas outside Major Cities. The bulk (80–90%) of the ‘excess’ deaths occurred in those older than 50 or 60 years.

## **Mortality for those aged 0–64 years**

### **Indigenous population**

Annually there was an average of 5 (2 male, 2 female<sup>2</sup>) deaths of Indigenous people younger than 65 years in South Australia, Western Australia, the Northern Territory and Queensland as a result of colorectal cancer. There would also have been a number of deaths due to this cause in the other jurisdictions. These 5 deaths were 2 (1 male and 1 female) fewer than expected.

For Indigenous males and females who were younger than 65 years old, the number of observed deaths, although slightly lower, was not significantly different from the number expected (Table 5.9).

### **Non-Indigenous population**

Annually, there were 450, 178, 87, 13 and 2 deaths of non-Indigenous males younger than 65 years and 322, 123, 63, 7 and 3 deaths of non-Indigenous females younger than 65 years in the five areas as a result of colorectal cancer.

In regional areas there were about 1.2 times as many deaths of 0–64-year-old non-Indigenous people as expected due to colorectal cancer. In remote areas, however, the difference between the observed and expected number of deaths was not significant (Table 5.9).

As a result of colorectal cancer, there were 31, 9, 1 and -2 'excess' deaths of non-Indigenous males younger than 65 years annually, and 20, 13, 0 and 1 'excess' deaths of non-Indigenous females younger than 65 years annually in the four areas outside Major Cities. The bulk of the 'excess' deaths occurred in males older than 55 years and females older than 45 years.

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<sup>2</sup> Numbers for each sex do not add to the number for persons due to rounding.



## 5.4 Breast cancer

Breast cancer (ICD-10 code C50) is the most common cancer detected in women and one of the most common causes of death from cancer for women. Illness and death as a result of breast cancer can be reduced through population-based screening and effective follow-up treatment (AIHW 2002b).

### Summary of findings

Annually, breast cancer was responsible for the deaths of 2,577 people (20 males and 2,557 females); 852 of these people came from areas outside Major Cities. Of these 2,577 deaths, 13 were of Indigenous people living in South Australia, Western Australia, the Northern Territory and Queensland.

Breast cancer death rates for females in each area were not significantly different from rates in Major Cities.

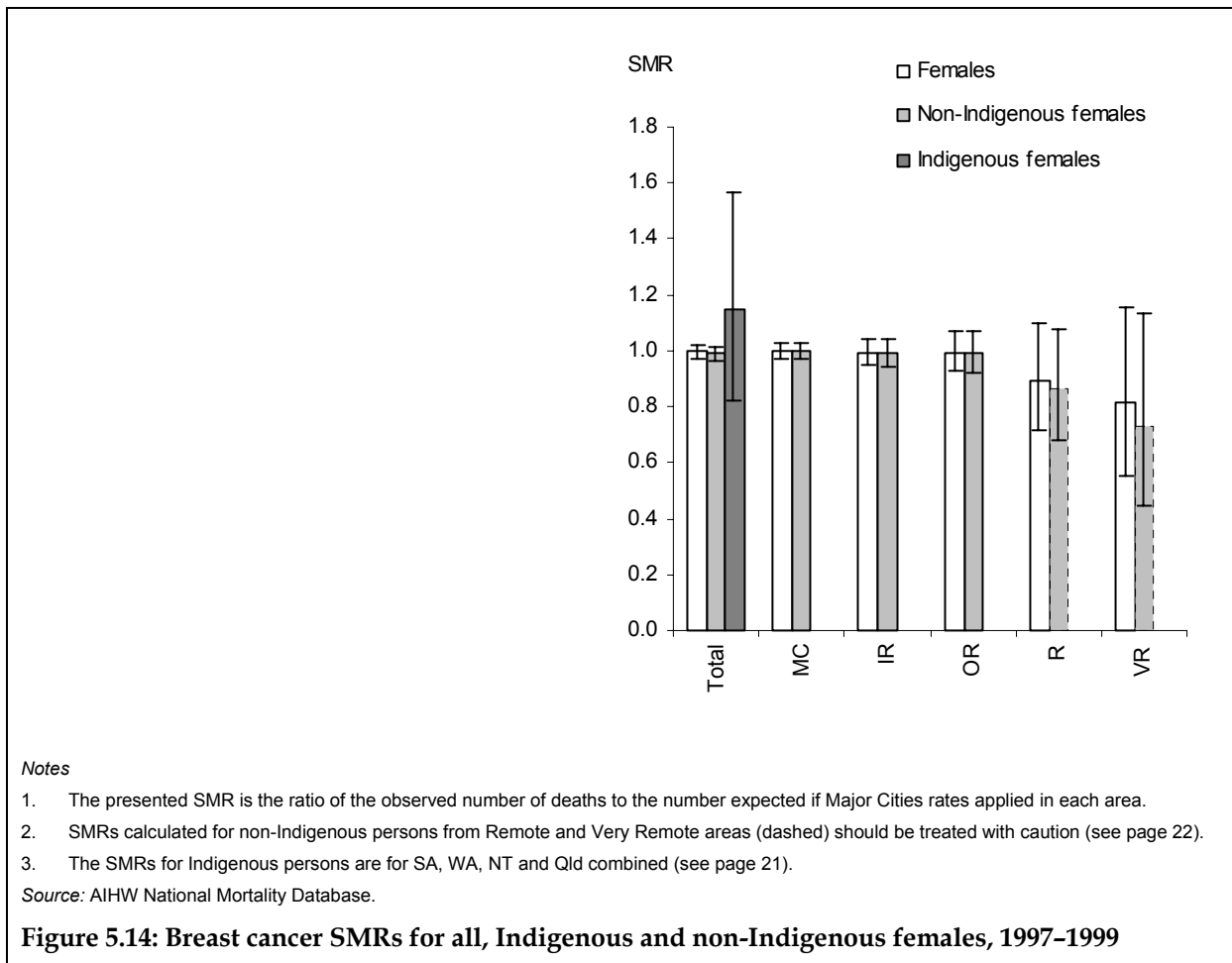
There were about as many deaths of Indigenous women as expected from breast cancer.

As for the total population of females, breast cancer death rates for non-Indigenous females in each area were not significantly different from rates in Major Cities.

Annually, there were 11 fewer deaths than expected due to breast cancer outside Major Cities.

## Overall mortality due to breast cancer

Annually, there were very few deaths of males and 1,711, 548, 258, 29 and 10 deaths of females, respectively, in the five areas as a result of breast cancer.



Death rates for females were not significantly different across the areas (but did tend to be lower outside Major Cities). There were about as many observed deaths of Indigenous women due to breast cancer as expected (Figure 5.14 and Table 5.10).

In Major Cities, death rates as a result of breast cancer for females rose from close to 0 per 100,000 per year at age 35 years to 190 per 100,000 per year at age 85 years and older.

In no age group in any area was the number of observed deaths significantly different from the number expected due to this cause.

As a result of breast cancer, there were 3, 2, 4 and 2 fewer deaths of females than expected annually in the four areas.

**Table 5.10: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, breast cancer, females, 1997–1999**

Age group (years)	MC rate	(ratio)			
		IR	OR	R	VR
0–4	0	..	..	..	..
5–14	0	..	..	..	..
15–24	<1	4.29	1.94	0.00	0.00
25–44	8	1.09	1.06	1.23	1.31
45–64	48	0.99	0.96	0.80	0.70
65–74	80	0.95	1.02	0.90	1.08
75+	136	1.00	1.00	0.88	0.51
Total	..	0.99	0.99	0.89	0.81

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.

Source: AIHW National Mortality Database.

### Indigenous population

Annually in the period 1997–1999, there were 13 deaths of Indigenous women in South Australia, Western Australia, the Northern Territory and Queensland. There would also have been a number of deaths due to this cause in the other jurisdictions where identification is less reliable. These 13 deaths were 2 more than expected; the difference between the number observed and expected was not significant (Table 5.11).

### Non-Indigenous population

Annually, there were few deaths of non-Indigenous males and 1,707, 545, 253, 26 and 7 deaths of non-Indigenous females, respectively, in the five areas as a result of breast cancer.

There was no significant difference between the number of deaths observed and the number expected in any area, but there was a weak (non-significant) tendency for there to be slightly fewer deaths than expected in remote areas (Table 5.11).

Age-specific rates for non-Indigenous females living in Major Cities were similar to those for the total population living in Major Cities.

In no age group in any area was the number of observed deaths of non-Indigenous females significantly different from the number expected due to this cause.

There were 4, 2, 4 and 2 fewer deaths than expected of non-Indigenous females as a result of breast cancer annually in the four areas outside Major Cities.

**Table 5.11: The ratio of observed deaths to those expected as a result of breast cancer if Major Cities non-Indigenous rates applied to the non-Indigenous female population in each ASGC Remoteness area and to the Indigenous female population in SA, WA, NT and Qld, 1997-1999**

Age group (years)	MC rate	Non-Indigenous				Indigenous
		IR	OR	R	VR	(ratio)
0-4	0	..	..	..	..	..
5-14	0	..	..	..	..	..
15-24	<1	4.37	2.07	0.00	0.00	0.0
25-44	8	1.09	1.06	0.99	1.00	<b>*2.0</b>
45-64	48	0.99	0.96	0.81	0.70	0.9
65-74	80	0.95	1.03	0.94	1.14	0.7
75+	136	1.00	0.99	0.84	0.34	1.4
Total	..	0.99	0.99	0.86	0.73	1.1
0-64	..	1.01	0.98	0.85	0.77	1.2

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld. While the table allows comparison of deaths between areas, it does not allow comparison between the age groups.
4. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

Source: AIHW National Mortality Database.

## Mortality for those aged 0-64 years

### Indigenous population

Annually there were 10 deaths of Indigenous women younger than 65 years in South Australia, Western Australia, the Northern Territory and Queensland as a result of breast cancer. There would also have been a number of deaths due to this cause in the other jurisdictions. These 10 deaths were 2 more than expected but the difference was not significant (Table 5.11).

### Non-Indigenous population

Annually, there were very few deaths of males and 796, 254, 121, 14 and 4 deaths of non-Indigenous females younger than 65 years in the five areas, respectively, as a result of breast cancer.

The death rate for 0-64-year-old non-Indigenous females in each of the areas was not significantly different from that in Major Cities (Table 5.11).

Annually, as a result of breast cancer, there were 2 more deaths, and 3, 3 and 1 fewer deaths of non-Indigenous females younger than 65 years than expected in the four areas outside Major Cities.

## 5.5 Cervical cancer

Cervical cancer (ICD-10 code C53) is responsible for a substantial number of cancer deaths among females. Cervical screening using Pap smear tests is an effective way to identify pre-cancerous abnormalities. The early stages of the disease are easy to treat, preventing the occurrence of cancer (AIHW: Strong et al. 1998).

### Summary of findings

Annually, cervical cancer was responsible for the deaths of 260 women; 92 of these women came from areas outside Major Cities. Of these 260 deaths, 8 were of Indigenous women living in South Australia, Western Australia, the Northern Territory and Queensland.

There were about as many deaths of females due to this cause as expected in Inner Regional areas, 1.3 times as many as expected in Outer Regional areas, more (but not significantly more) than expected in Remote areas, and 3.3 times as many deaths as expected in Very Remote areas.

There were about seven times as many deaths of Indigenous women as expected from cervical cancer. These much higher rates were evident for all life stages from 25 years onwards.

In each of the areas outside Major Cities, there were about as many deaths of non-Indigenous females due to this cause as expected. The higher rates for the total population, particularly in the remote zone are largely due to the very high rates in the Indigenous population.

For the total population outside Major Cities, there were 9 'excess' deaths, all in Outer Regional and remote areas. A very small proportion of these were non-Indigenous women; the bulk were Indigenous women.

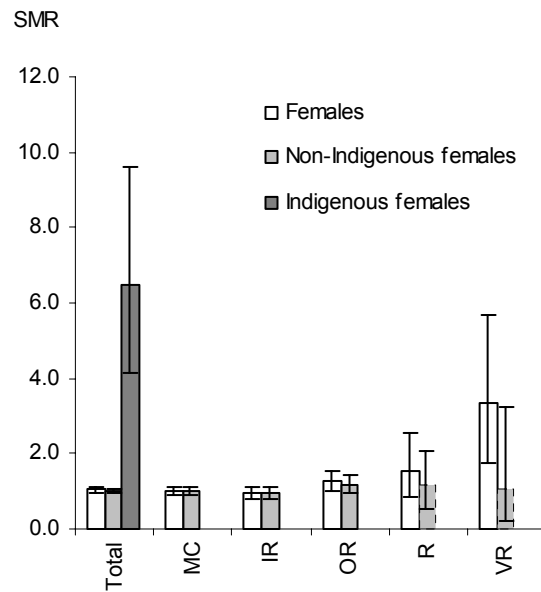
### Overall mortality due to cervical cancer

Annually, there were 167, 51, 32, 5 and 4 deaths of females in the five areas respectively as a result of cervical cancer.

The death rate due to cervical cancer tended to be higher outside Major Cities (Figure 5.15 and Table 5.12).

Death rates for females in Inner Regional and Remote areas were not significantly different from rates for females from Major Cities (although rates in Remote areas were elevated). However, rates for females from Outer Regional and Very Remote areas were 1.3 and 3.3 times those for females from Major Cities, respectively.

There were about 7 times as many observed deaths of Indigenous women due to cervical cancer as expected.



*Notes*

1. The presented SMR is the ratio of the observed number of deaths to the number expected if Major Cities rates applied in each area.
2. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas (dashed) should be treated with caution (see page 22).
3. The SMRs for Indigenous persons are for SA, WA, NT and Qld combined (see page 21).

Source: AIHW National Mortality Database.

**Figure 5.15: Cervical cancer SMRs for all, Indigenous and non-Indigenous females, 1997-1999**

In Major Cities, death rates for females rose from almost 0 per 100,000 per year at age 30 years to 17 per 100,000 per year at age 85 years.

For most age groups in most areas, there tended to be more deaths than expected as a result of this cause, but for only two groups were these differences significantly different. For 45-64-year-old women from Very Remote areas and for women 75 years and older from Outer Regional areas, there were 4.0 and 1.5 times as many deaths as expected.

As a result of cervical cancer, there were -3, 7, 2 and 3 'excess' deaths of females annually in the four areas.

**Table 5.12: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, cervical cancer, females, 1997–1999**

Age group (years)	MC rate	IR	OR	R	VR
		(ratio)			
0–4	0	..	..	..	..
5–14	0	..	..	..	..
15–24	<1	1.31	3.85	0.00	0.00
25–44	1	1.17	1.44	2.43	1.37
45–64	4	0.99	1.03	0.96	<b>*4.02</b>
65–74	8	0.81	1.21	2.32	4.06
75+	13	0.91	<b>*1.47</b>	1.08	3.95
Total	..	0.95	<b>*1.27</b>	1.53	<b>*3.32</b>

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.

Source: AIHW National Mortality Database.

### Indigenous population

Annually in the period 1997–1999, there were 8 deaths of Indigenous women in South Australia, Western Australia, the Northern Territory and Queensland as a result of cervical cancer. There would also have been a number of deaths due to this cause in the other jurisdictions where identification is less reliable. Of these 8 deaths, there were 7 more than expected (Table 5.13). This higher rate of death may indicate poorer access to screening or follow-up treatment.

### Non-Indigenous population

Annually, there were 167, 50, 29, 3 and 1 deaths of non-Indigenous females in the five areas, respectively, as a result of cervical cancer.

There were about as many deaths of females due to this cause as expected in each area (Table 5.13).

Age-specific rates for non-Indigenous females living in Major Cities were similar to those for the total population living in Major Cities.

There were no significant differences between the numbers of observed and expected deaths for any age group due to this cause.

As a result of cervical cancer, there were -3, 4, 0 and 0 'excess' deaths of non-Indigenous females annually in the four areas outside Major Cities.

**Table 5.13: The ratio of observed deaths to those expected as a result of cervical cancer if Major Cities non-Indigenous rates applied to the non-Indigenous female population in each ASGC Remoteness area and to the Indigenous female population in SA, WA, NT and Qld, 1997–1999**

Age group (years)	MC rate	Non-Indigenous				Indigenous
		IR	OR	R	VR	(ratio)
0–4	0	..	..	..	..	..
5–14	0	..	..	..	..	..
15–24	<1	1.33	4.10	0.00	0.00	0.0
25–44	1	1.18	1.20	0.78	0.28	<b>*8.6</b>
45–64	4	0.99	1.01	1.02	1.02	<b>*4.1</b>
65–74	8	0.81	1.04	1.86	1.41	<b>*9.0</b>
75+	13	0.89	1.43	1.11	1.78	<b>*6.5</b>
<b>Total</b>	..	0.94	1.18	1.15	1.07	<b>*6.5</b>
<b>0–64</b>	..	1.05	1.09	0.93	0.73	<b>*5.9</b>

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld. While the table allows comparison of deaths between areas, it does not allow comparison between the age groups.
4. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

Source: AIHW National Mortality Database.

## Mortality for those aged 0–64 years

### Indigenous population

Annually there were 5 deaths of Indigenous women younger than 65 years in South Australia, Western Australia, the Northern Territory and Queensland as a result of cervical cancer. There would also have been a number of deaths due to this cause in the other jurisdictions. These 5 deaths were about 4 more than expected (Table 5.13).

### Non-Indigenous population

Annually, there were 79, 26, 13, 2 and 0 deaths of non-Indigenous females younger than 65 years in the five areas, respectively, as a result of cervical cancer.

The death rate for 0–64-year-old non-Indigenous females in each of the areas was not significantly different from that in Major Cities (Table 5.13).

As a result of cervical cancer, there were 1, 1, 0 and 0 ‘excess’ deaths of non-Indigenous females younger than 65 years annually in the four areas outside Major Cities.



## 5.6 Prostate cancer

Prostate cancer (ICD-10 code C61) is the most commonly diagnosed cancer in males after non-melanocytic skin cancer and, after lung cancer, it is the second most common cause of cancer death in males (AIHW 2002b).

### Summary of findings

Annually, prostate cancer was responsible for the deaths of 2,500 males; 973 of these males came from areas outside Major Cities. Of these 2,500 deaths, 5 were of Indigenous males living in South Australia, Western Australia, the Northern Territory and Queensland.

There were 1.1–1.2 times as many deaths of males due to prostate cancer in regional areas, and about as many as expected in remote areas (with about 1.15 times as many deaths as expected overall due to this cause outside Major Cities).

There were about as many deaths of Indigenous men as expected due to prostate cancer.

As in the total population, there were 1.1–1.2 times as many deaths of non-Indigenous males due to prostate cancer in regional areas. In each of the remote areas, death rates were higher, but not significantly higher.

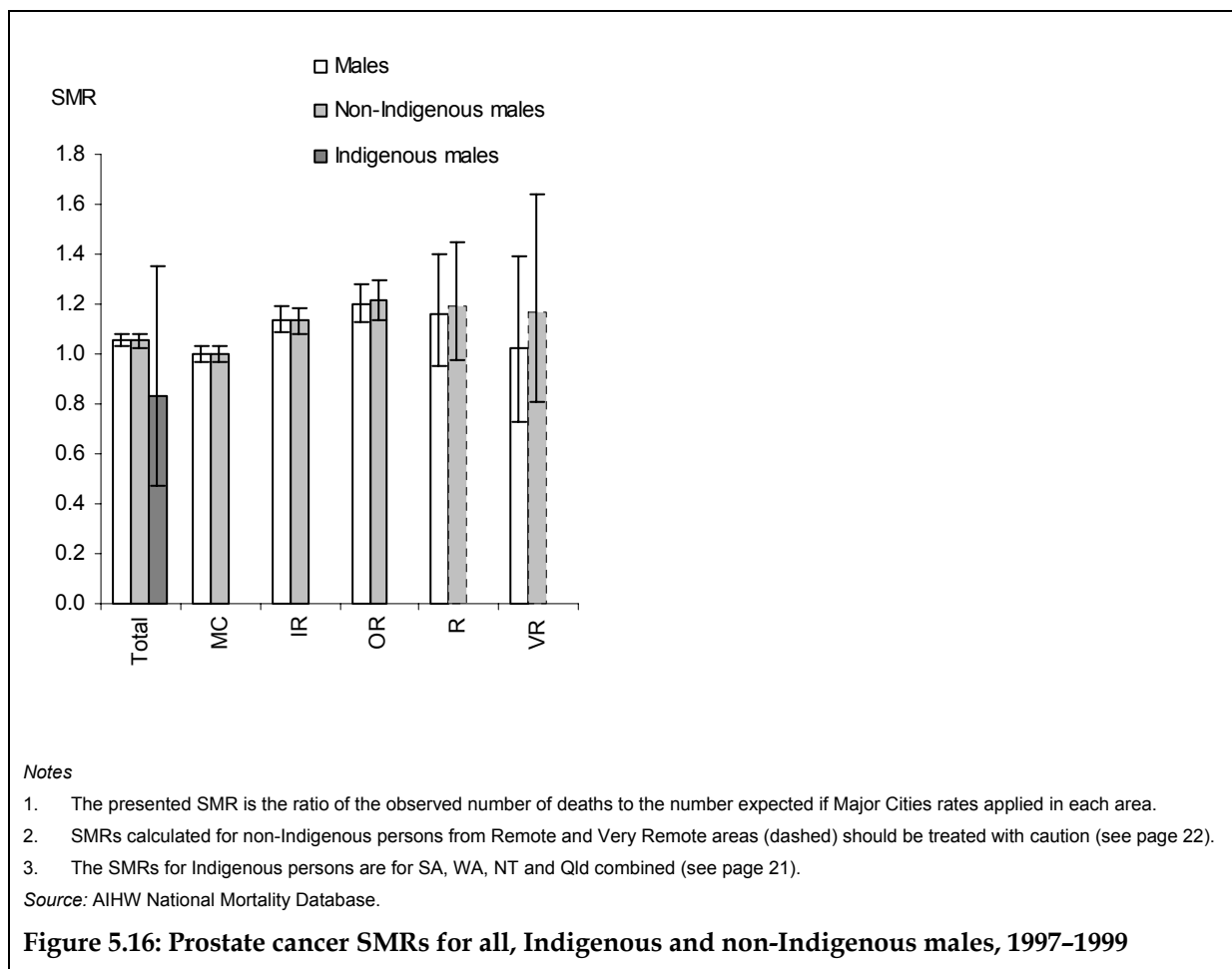
Annually, there were 131 'excess' deaths due to prostate cancer outside Major Cities (73, 52, 5 and 0 in each of the four areas). Almost all of these were non-Indigenous men. Most (95%) of the 'excess' deaths occurred in men who were 60 years and older.

### Overall mortality prostate cancer

Annually, there were 1,527, 614, 309, 36 and 13 deaths of males in the five areas, as a result of prostate cancer.

The death rate due to prostate cancer tended to be higher outside Major Cities (Figure 5.16 and Table 5.14).

- Death rates for males in Inner Regional areas and Outer Regional areas were 1.1 and 1.2 times respectively those in Major Cities. Death rates in Remote and Very Remote areas, although slightly higher, were not significantly different from rates in Major Cities.
- There were about as many observed deaths of Indigenous men due to prostate cancer as expected.



In Major Cities, death rates for males rose from close to 0 per 100,000 per year at age 45 years to 790 per 100,000 per year at age 85 years and older.

Practically all deaths due to prostate cancer occurred in those 45 years and older. For males from regional areas, there were 1.4, 1.2-1.3, and 1.1-1.2 times as many deaths as expected of 45-64-year-old, 65-74-year-old and those 75 years and older respectively. In remote areas, there were about as many deaths as expected in each age group, except in Very Remote areas, where there were 1.9 times as many deaths of 65-74-year-old males as expected.

As a result of prostate cancer, there were 73, 52, 5 and 0 'excess' deaths of males annually in the four areas. The bulk of the 'excess' deaths occurred in those older than 60 years.

**Table 5.14: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, prostate cancer, males, 1997–1999**

Age group (years)	MC rate	IR	OR	R	VR
		(ratio)			
0–4	0	..	..	..	..
5–14	0	..	..	..	..
15–24	<1	0.00	0.00	0.00	0.00
25–44	<1	0.92	0.00	0.00	9.51
45–64	8	<b>*1.42</b>	<b>*1.43</b>	1.58	0.98
65–74	98	<b>*1.22</b>	<b>*1.28</b>	1.06	<b>*1.88</b>
75+	421	<b>*1.08</b>	<b>*1.15</b>	1.15	0.68
Total	..	<b>*1.14</b>	<b>*1.20</b>	1.16	1.02

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
  2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
- Source: AIHW National Mortality Database.

### Indigenous population

Annually in the period 1997–1999, there were 5 deaths of Indigenous males due to prostate cancer in South Australia, Western Australia, the Northern Territory and Queensland. There would also have been a number of deaths due to this cause in the other jurisdictions where identification is less reliable. These 5 deaths were one fewer than expected annually (Table 5.15).

### Non-Indigenous population

Annually, there were 1,525, 612, 308, 35 and 11 deaths of non-Indigenous males in the five areas respectively, as a result of prostate cancer.

There were 1.1 and 1.2 times as many deaths of non-Indigenous males than expected due to prostate cancer in Inner Regional and Outer Regional areas (Table 5.15). Although not significantly higher in either the Remote or Very Remote areas individually, there were 1.2 times as many deaths as expected in the total Remote/Very Remote area.

Age-specific rates for non-Indigenous males living in Major Cities were similar to those for the total population living in Major Cities (compare Tables 5.14 and 5.15).

The pattern of age-specific death rates for non-Indigenous males due to this cause is similar to that for the total population of males described earlier.

As a result of prostate cancer, there were 73, 54, 6 and 2 ‘excess’ deaths of non-Indigenous males annually, in the four areas outside Major Cities. The bulk of the ‘excess’ deaths occurred in those older than 60 years.

**Table 5.15: The ratio of observed deaths to those expected as a result of prostate cancer if Major Cities non-Indigenous rates applied to the non-Indigenous male population in each ASGC Remoteness area and to the Indigenous male population in SA, WA, NT and Qld, 1997–1999**

Age group (years)	MC rate	Non-Indigenous				Indigenous
		IR	OR	R	VR	
		(ratio)				
0–4	0	..	..	..	..	..
5–14	0	..	..	..	..	..
15–24	<1	0.0	0.0	0.0	0.0	0.0
25–44	<1	0.92	0.0	0.0	0.0	11.3
45–64	8	<b>*1.42</b>	<b>*1.44</b>	1.63	1.26	0.9
65–74	98	<b>*1.22</b>	<b>*1.27</b>	1.02	<b>*2.05</b>	1.4
75+	421	<b>*1.08</b>	<b>*1.17</b>	1.21	0.80	0.5
Total	..	<b>*1.13</b>	<b>*1.21</b>	1.20	1.17	0.8
0–64	..	<b>*1.40</b>	<b>*1.41</b>	1.59	1.23	1.3

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld. While the table allows comparison of deaths between areas, it does not allow comparison between the age groups.
4. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

Source: AIHW National Mortality Database.

## Mortality for those aged 0–64 years

### Indigenous population

Annually there was about one death of an Indigenous man younger than 65 years in South Australia, Western Australia, the Northern Territory and Queensland as a result of prostate cancer. There would also have been a number of deaths due to this cause in the other jurisdictions. This one death was about the number expected (Table 5.15).

### Non-Indigenous population

Annually, there were 105, 49, 26, 4 and 1 deaths of non-Indigenous males younger than 65 years in the five areas respectively, as a result of prostate cancer.

In regional areas, there were 1.4 times as many deaths of 0–64-year-old non-Indigenous males as expected (Table 5.15). In remote areas the numbers of observed and expected deaths were not significantly different to those in Major Cities.

As a result of prostate cancer, there were 14, 8, 2 and 0 ‘excess’ deaths of non-Indigenous males younger than 65 years annually in the four areas outside Major Cities. The bulk of the ‘excess’ deaths occurred in males older than 60 years.

## 5.7 Melanoma

Melanoma (ICD-10 code C43) is one of the most commonly diagnosed cancers, but can frequently be effectively treated, and consequently it is less important as a cause of death. Risk factors are fair skin, poor use of skin protection measures and sun exposure under the age of 10 years (AIHW: Strong et al. 1998).

### Summary of findings

Annually, melanoma was responsible for the deaths of 954 people (611 males and 344 females); 353 of these people came from areas outside Major Cities. Of these 954 deaths, there was less than one death of an Indigenous person living in South Australia, Western Australia, the Northern Territory and Queensland.

There were 1.3 times as many deaths of males as expected due to melanoma in Inner Regional areas, and about as many deaths of males as expected in Outer Regional and remote areas.

There were about as many deaths of females due to this cause as expected in each of the areas outside Major Cities.

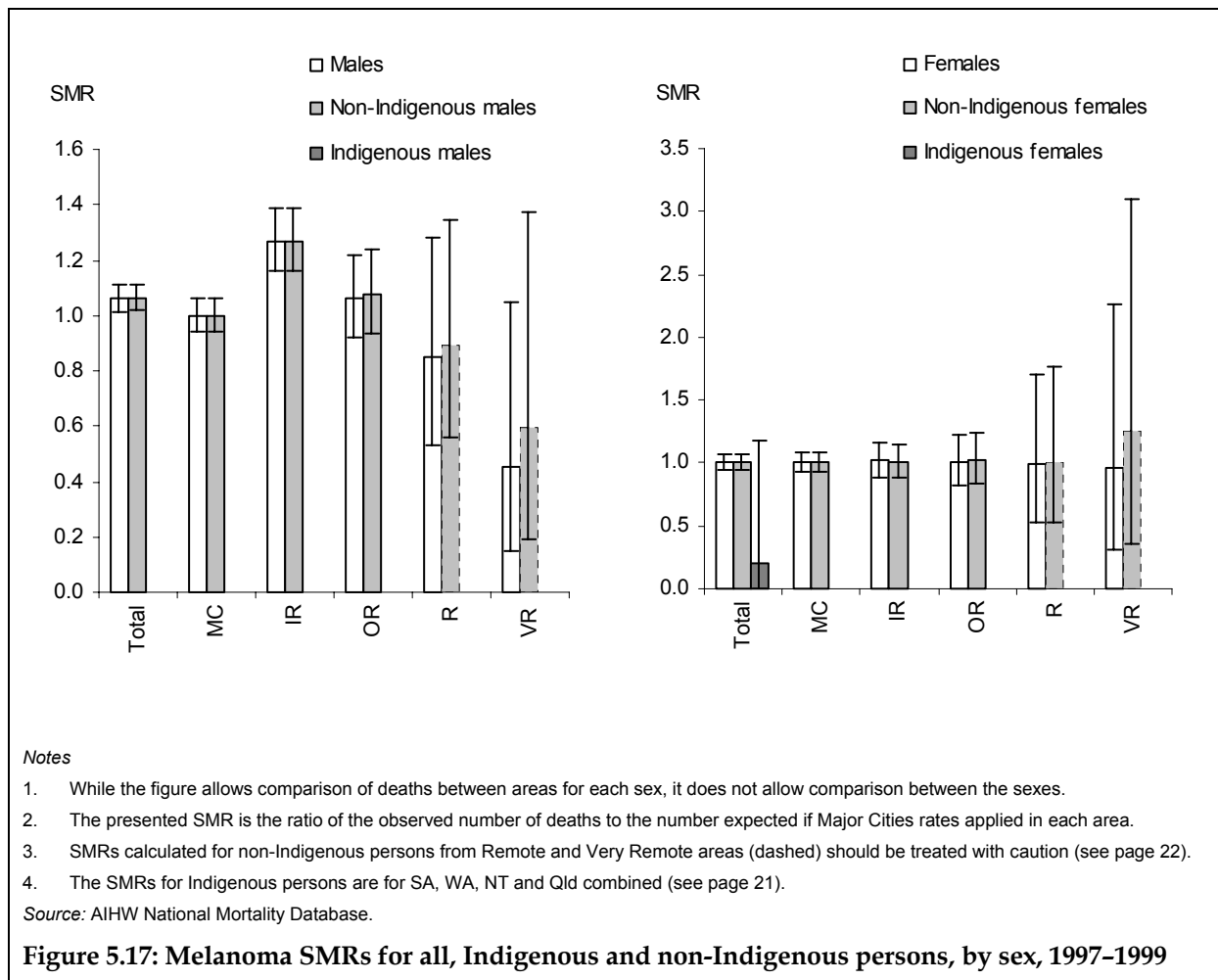
There were about one-tenth as many deaths of Indigenous people as expected from melanoma.

Similar to the situation for the total population, there were 1.3 times as many deaths of non-Indigenous males as expected due to melanoma in Inner Regional areas. In the other areas, the numbers of deaths of males were not significantly different from the number expected, and there were about as many deaths of non-Indigenous females as expected due to this cause in each of the areas outside Major Cities.

Annually, there were 36 'excess' deaths due to melanoma outside Major Cities (35, 4, -1 and -2 in each of the four areas). Essentially all of these were non-Indigenous males and, clearly, almost all occurred in Inner Regional areas. About 90% of the 'excess' occurred in those who were aged 45-74 years.

## Overall mortality due to melanoma

Annually, there were 373, 162, 68, 7 and 2 deaths of males and 229, 74, 35, 4 and 2 deaths of females in the five areas respectively, as a result of melanoma.



- In Inner Regional areas, there were 1.3 times as many deaths of males as expected but for males in the other areas and for females generally, there were as many or fewer deaths than expected due to melanoma. There tended to be fewer deaths of males (though not significantly fewer) than expected as a result of melanoma in Remote and Very Remote areas (Figure 5.17 and Table 5.16).
- There were very few deaths of Indigenous people due to melanoma.

In Major Cities, death rates for males and females rose from close to 0 per 100,000 per year at age 20 and 30 years to 60 and 30 per 100,000 per year at age 85 years.

Age-specific death rates as a result of melanoma tend to be higher in regional areas than in Major Cities, however, the pattern is less clear in remote areas, where some age groups show substantially fewer deaths than expected.

**Table 5.16: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, melanoma, males and females, 1997–1999**

Age group (years)	Male					Female				
	MC rate	IR	OR	R	VR	MC rate	IR	OR	R	VR
		(ratio)					(ratio)			
0–4	0	..	..	..	..	0	..	..	..	..
5–14	0	..	..	..	..	0	..	..	..	..
15–24	<1	0.19	2.68	0.00	0.00	<1	1.20	2.86	0.00	0.00
25–44	2	<b>*1.44</b>	1.25	0.64	0.55	2	0.98	1.17	0.94	0.80
45–64	8	<b>*1.47</b>	1.22	1.03	0.47	4	1.01	1.13	1.27	1.05
65–74	26	<b>*1.21</b>	1.06	0.67	0.39	11	1.21	0.92	1.19	1.23
75+	48	1.11	0.83	0.90	0.42	21	0.91	0.87	0.63	0.89
Total	..	<b>*1.27</b>	1.06	0.85	0.45	..	1.02	1.01	0.99	0.96

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.

Source: AIHW National Mortality Database.

In Inner Regional areas, there were 1.2–1.5 times as many deaths of 25–74-year-old males as expected. There were also more deaths than expected for males of this age in Outer Regional areas, however the difference for each age group was not significant. In each of the remote areas, rates in most age groups were lower (but not significantly lower).

For females, death rates in each age group and area were not significantly different to those in Major Cities.

Death rates for people 75 years and older in all areas outside Major Cities tended to be lower (but not significantly lower) than for their counterparts in Major Cities.

As a result of melanoma, there were 34, 4, -1 and -2 'excess' deaths of males annually, and 1, 0, 0 and 0 'excess' deaths of females annually in the four areas. The bulk of the 'excess' deaths occurred in those older than 50 years.

### Indigenous population

Annually in the period 1997–1999, there were virtually no deaths of Indigenous people due to melanoma in South Australia, Western Australia, the Northern Territory and Queensland, probably due to the natural skin protection developed over a vast historical period of exposure to high levels of ultra-violet radiation (Table 5.17).

### Non-Indigenous population

Annually, there were 372, 161, 68, 7 and 2 deaths of non-Indigenous males and 229, 74, 35, 4 and 1 deaths of non-Indigenous females in the five areas respectively as a result of melanoma.

There were 1.3 times as many deaths of non-Indigenous males as expected due to melanoma in Inner Regional areas (Table 5.17). In the other areas, the numbers of deaths were not significantly different from the number expected.

There were about as many deaths of non-Indigenous females as expected due to this cause in each of the areas outside Major Cities.

**Table 5.17: The ratio of observed deaths to those expected as a result of melanoma if Major Cities non-Indigenous rates applied to the non-Indigenous population in each ASGC Remoteness area and to the Indigenous population, 1997-1999**

Age group (years)	Male						Female					
	MC rate	Non-Indigenous				Indig-enous	MC rate	Non-Indigenous				Indig-enous
		IR	OR	R	VR			IR	OR	R	VR	
		(ratio)						(ratio)				
0-4	0	..	..	..	..	0	..	..	..	..	..	..
5-14	0	..	..	..	..	0	..	..	..	..	..	..
15-24	<1	0.20	2.83	0.00	0.00	0.0	<1	1.22	3.04	0.00	0.00	0.0
25-44	2	<b>*1.45</b>	1.29	0.70	0.77	0.0	2	0.99	1.21	1.03	1.25	0.0
45-64	8	<b>*1.47</b>	1.24	1.08	0.61	0.0	4	1.00	1.15	1.23	1.07	0.6
65-74	26	<b>*1.21</b>	1.07	0.69	0.51	0.0	11	1.21	0.93	1.24	1.80	0.0
75+	48	1.11	0.83	0.95	0.55	0.0	21	0.89	0.87	0.66	1.18	0.0
Total	..	<b>*1.27</b>	1.08	0.89	0.59	0.0	..	1.01	1.02	1.01	1.26	0.2
0-64	..	<b>*1.45</b>	<b>*1.27</b>	0.97	0.65	0.0	..	1.00	1.20	1.14	1.12	0.3

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld.
4. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.
5. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

Source: AIHW National Mortality Database.

Age-specific rates for non-Indigenous people living in Major Cities were similar to those for the total population living in Major Cities.

The pattern for age-specific death rates is similar to that for the total population, with the exception that rates in more remote areas were slightly higher than for the total population in the same area (reflecting lower rates of death for Indigenous people from this cause).

As a result of melanoma, there were 34, 5, -1 and -1 'excess' deaths of non-Indigenous males annually, and 1, 1, 0 and 0 'excess' deaths of non-Indigenous females annually in the four areas outside Major Cities. The bulk of the 'excess' deaths occurred in those older than 50 years.



## **Mortality for those aged 0–64 years**

### **Indigenous population**

Annually in the period 1997–1999, there were virtually no deaths from melanoma of Indigenous people who were younger than 64 years in South Australia, Western Australia, the Northern Territory and Queensland (Table 5.17).

### **Non-Indigenous population**

Annually, there were 152, 69, 32, 4 and 1 deaths of non-Indigenous males younger than 65 years and 94, 29, 17, 2 and 1 deaths of non-Indigenous females younger than 65 years in the five areas respectively as a result of melanoma.

In Inner and Outer Regional areas, there were 1.5 and 1.3 times as many deaths of 0–64-year-old non-Indigenous males as expected as a result of melanoma (Table 5.17). Otherwise (for remote area males and for females from all areas) the numbers of observed and expected deaths as a result of melanoma were not significantly different.

As a result of melanoma, there were 22, 7, 0 and –1 ‘excess’ deaths of non-Indigenous males younger than 65 years annually, and 0, 3, 0 and 0 ‘excess’ deaths of non-Indigenous females younger than 65 years annually in the four areas outside Major Cities. For males, ‘excess’ deaths were largely from those older than 30 years, with the contribution increasing with age.

## 5.8 'Other' neoplasms

'Other' neoplasms (ICD-10 codes C00–D48, excluding the specific neoplasms described in this report) include all of those not otherwise included in this report including neoplasms such as cancer of the bladder, kidney and stomach, leukaemia, non-malignant neoplasms and many others. They constitute a relatively large proportion of cancers and any substantial inter-regional differences may suggest further work.

### Summary of findings

Annually, 'other' neoplasms were responsible for the deaths of 17,973 people (9,837 males and 8,137 females); 6,218 of these people came from areas outside Major Cities. Of these 17,973 deaths, 112 were of Indigenous people living in South Australia, Western Australia, the Northern Territory and Queensland.

Death rates for males and females due to 'other' neoplasms were not significantly higher than in Major Cities, except in Inner Regional areas, where there were 1.03 times as many deaths of males as expected (that is, rates were slightly higher).

There were almost twice (1.7 times) as many deaths of Indigenous people as expected from 'other' neoplasms.

While death rates for non-Indigenous people due to this cause were essentially the same as for the total population in regional areas (that is, as above), rates in remote areas are lower. In Remote and Very Remote areas there were about 0.9 and 0.8 times as many deaths of non-Indigenous people as expected.

Low rates in remote areas amongst those 75 years and older lowered overall rates for non-Indigenous people. For non-Indigenous people who were 0–64 years old, there were about as many deaths of regional females as expected and up to 1.1 times as many deaths of Inner Regional non-Indigenous males as expected due to this cause. In remote areas, although there were fewer deaths than expected, the difference between the number of observed and expected deaths was not significant.

Annually, there were 40 'excess' deaths due to 'other' neoplasms annually outside Major Cities (45, 4, -11 and 2 in each of the four areas). However, in all age groups 70 years and older, there were fewer deaths than expected. For those younger than 70 years there were 145 'excess' deaths due to this cause (76, 48, 8 and 14 in each of the four areas). Of these 145 'excess' deaths, 123 were deaths of males (66, 43, 7 and 7).

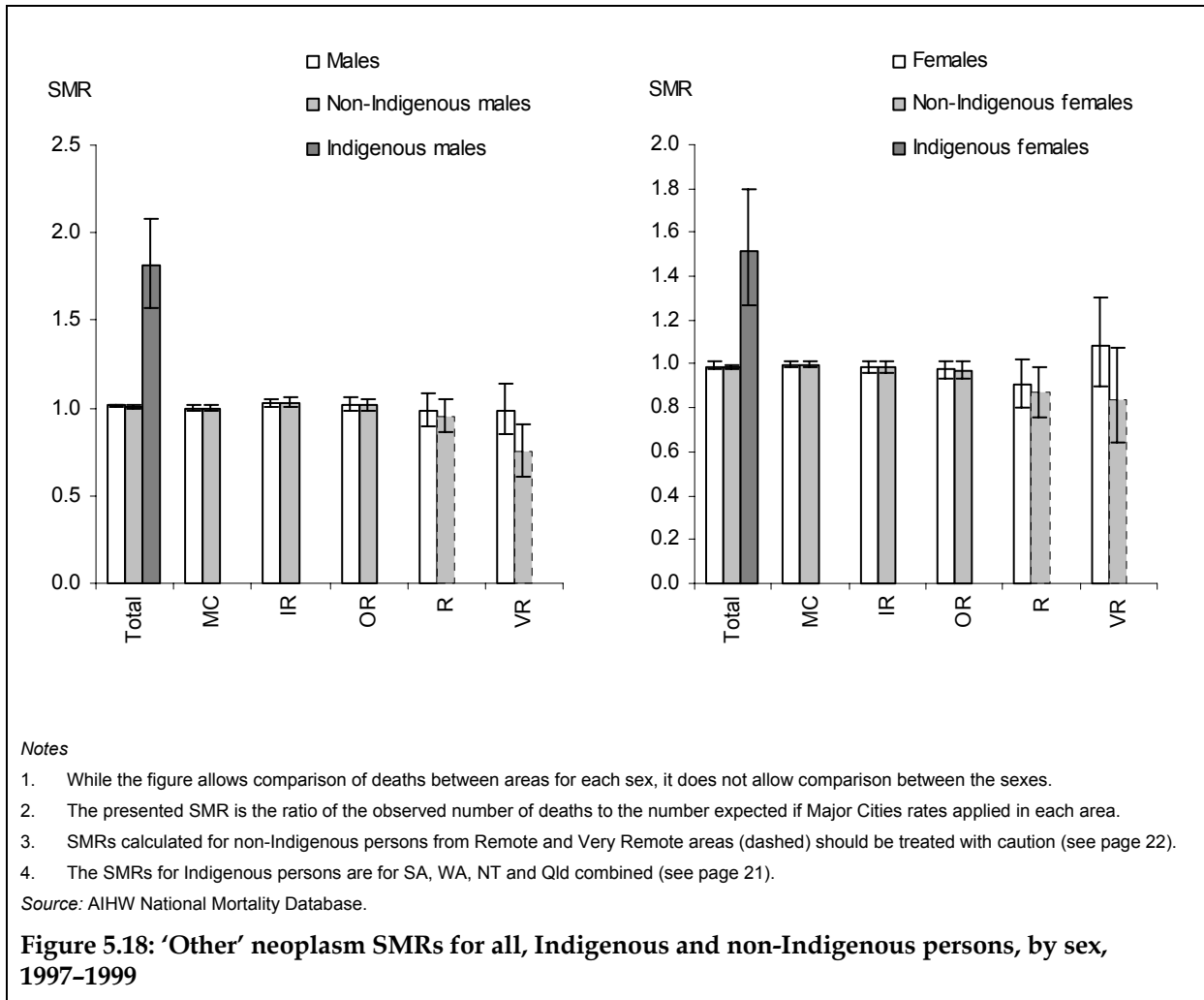
There were 'only' 6 'excess' deaths annually of non-Indigenous people due to this cause, however, similar to the situation for the total population, relatively low death rates amongst the elderly in remote areas reduced the overall 'excess'. For non-Indigenous people younger than 70 years, there were 113 'excess' deaths (81, 36, 1 and -3), and again most (100) were male (and 90% of this 'excess' occurred in those aged 50–69 years).

There were 45 'excess' deaths of Indigenous people in the four jurisdictions for which data is believed to be more reliable. The bulk of the 'excess' deaths for Indigenous people occurs at younger ages than for non-Indigenous people (25–64 years and 45–74 years for males and females respectively).

## Overall mortality due to 'other' neoplasms

'Other' neoplasms are those other specific neoplasms (for example, leukaemia, stomach cancer and so on) which have not been described individually in previous sections.

Annually, there were 6,282, 2,252, 1,101, 141 and 60 deaths of males and 5,474, 1,747, 792, 85 and 38 deaths of females in the five areas respectively, as a result of 'other' neoplasms.



Death rates for males and females due to 'other' neoplasms (Figure 5.18 and Table 5.18) were not significantly different to those in Major Cities, except in Inner Regional areas where there were 1.03 times as many deaths of males as expected (that is, rates were slightly higher).

There were 1.5–1.8 times as many deaths of Indigenous people due to 'other' neoplasms as expected.

In Major Cities, death rates for males were approximately 5 per 100,000 per year until age 30 years, then rose to 1,500 per 100,000 per year for those 85 years and older; for females, death rates were less than 10 per 100,000 per year until age 35 years, then rose to 980 per 100,000 per year for those 85 years and older.

**Table 5.18: The ratio of observed deaths to those expected if Major Cities rates applied in each ASGC Remoteness area, 'other' neoplasms, males and females, 1997–1999**

Age group (years)	Male					Female				
	MC rate	IR	OR	R	VR	MC rate	IR	OR	R	VR
		(ratio)					(ratio)			
0–4	5	1.07	1.03	0.33	2.30	3	<b>*1.73</b>	1.10	0.77	1.39
5–14	4	0.92	0.72	0.94	0.63	4	<b>*0.52</b>	0.63	0.01	0.59
15–24	5	1.20	1.32	0.94	1.74	4	0.99	0.63	1.23	2.00
25–44	14	1.05	1.01	0.97	1.52	10	<b>*1.16</b>	0.94	0.78	1.14
45–64	115	<b>*1.08</b>	<b>*1.09</b>	1.04	1.22	76	0.98	1.06	1.00	1.36
65–74	485	1.01	1.05	1.05	0.95	302	1.00	0.97	1.15	1.37
75+	999	1.01	0.96	0.90	<b>*0.64</b>	692	0.98	0.95	<b>*0.76</b>	0.71
Total	..	<b>*1.03</b>	1.02	0.99	0.99	..	0.99	0.98	0.91	1.08

\* Significantly different from 1 (that is, rates are significantly different from those in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.

Source: AIHW National Mortality Database.

There were few age groups for which rates were significantly different to those in Major Cities. For regional males who were 45–64 years old there were about 10% more deaths than expected. For people 75 years and older, there tended to be fewer deaths than expected, this difference becoming significant in remote areas (0.6 and 0.8 times as many deaths of Very Remote area males and Remote area females respectively).

As a result of 'other' neoplasms, there were 67, 24, -2 and -1 'excess' deaths of males annually, and -22, -20, -9 and 3 'excess' deaths of females annually in the four areas outside Major Cities. There were fewer deaths than expected amongst those older than 70 years. The bulk of the 'excess' deaths occurred for males aged 50–70 years, while for females there was very little 'excess', with fewer deaths than expected in almost all groups (but a small 'excess' in those aged 50–70 years).

### Indigenous population

Annually in the period 1997–1999, there were 112 deaths of Indigenous people (67 males and 45 females) in South Australia, Western Australia, the Northern Territory and Queensland. There would also have been a number of deaths due to this cause in the other jurisdictions where identification is less reliable. Of these 112 deaths, there were 45 (30 males and 15 females) more than expected.

There were 1.8 and 1.5 times as many deaths of Indigenous males and females as expected (Table 5.19). For males, 78% of the 'excess' occurred amongst 25–64-year-olds, with a further 15% occurring among 65–74-year-olds; for females, 88% of the 'excess' occurred among 45–74-year-olds.

## **Non-Indigenous population**

Annually, there were 6,264, 2,247, 1,077, 129 and 34 deaths of non-Indigenous males and 5,460, 1,739, 778, 77 and 21 deaths of non-Indigenous females in the five areas as a result of 'other' neoplasms.

- There were 1.03 times as many deaths of non-Indigenous males as expected due to 'other' neoplasms in Inner Regional areas, about as many as expected in Outer Regional and Remote areas, and 0.8 times as many as (that is, fewer than) expected in Very Remote areas (Table 5.19).
- There were as many deaths of non-Indigenous females as expected in Inner and Outer Regional areas, 0.9 times as many deaths as expected in Remote areas and 0.9 times as many as (but not significantly fewer than) expected in Very Remote areas.

Age-specific rates for non-Indigenous people living in Major Cities were similar to those for the total population living in Major Cities.

The pattern exhibited for non-Indigenous people by age-specific death rates is similar to that for the total population. In remote areas (particularly Very Remote areas), age-specific rates tended to be lower and closer to, or lower than rates in Major Cities than was the case for the total population.

As a result of 'other' neoplasms, there were 71, 17, -6 and -12 'excess' deaths of non-Indigenous males annually, and 27, 21, 12 and 4 fewer deaths of non-Indigenous females than expected annually in the four areas outside Major Cities. For those 70 years or older, there were fewer deaths of non-Indigenous males in Outer Regional, Remote and Very Remote areas and fewer deaths of non-Indigenous females than expected in all areas. The bulk of the 'excess' deaths occurred for non-Indigenous males aged 50-70 years, while for non-Indigenous females there were no 'excess' deaths, with fewer deaths than expected in almost all groups (but a small 'excess' in those aged 50-70 years).

## **Mortality for those aged 0-64 years**

### **Indigenous population**

Annually there were 70 (43 male, 26 female) deaths of Indigenous people younger than 65 years in South Australia, Western Australia, the Northern Territory and Queensland as a result of 'other' neoplasms. There would also have been a number of deaths due to this cause in the other jurisdictions. Of these 70 deaths, there were 36 (24 males and 12 females) more than expected.

For Indigenous males and females who were younger than 65 years, there were 2.3 and 1.8 times as many deaths as expected (Table 5.19).

**Table 5.19: The ratio of observed deaths to those expected as a result of 'other' neoplasms if Major Cities non-Indigenous rates applied to the non-Indigenous population in each ASGC Remoteness area and to the Indigenous population, 1997–1999**

Age group (years)	Male						Female					
	MC rate	Non-Indigenous				Indigenous	MC rate	Non-Indigenous				Indigenous
		IR	OR	R	VR			IR	OR	R	VR	
		(ratio)						(ratio)				
0–4	5	1.13	1.05	0.38	1.75	1.2	3	<b>*1.82</b>	1.04	0.94	0.12	2.1
5–14	4	0.94	0.72	1.12	0.31	0.5	4	<b>*0.54</b>	0.69	0.01	—	1.0
15–24	5	1.16	1.32	0.68	1.06	2.0	4	1.02	0.60	0.65	1.95	1.6
25–44	14	1.07	0.94	0.79	0.45	<b>*3.1</b>	10	<b>*1.17</b>	0.96	0.68	0.44	1.3
45–64	115	<b>*1.09</b>	1.06	0.96	0.92	<b>*2.3</b>	76	0.99	1.04	0.90	1.09	<b>*2.1</b>
65–74	485	1.02	1.05	1.02	0.85	<b>*1.5</b>	302	1.00	0.98	1.12	1.06	<b>*1.5</b>
75+	999	1.01	0.96	0.92	<b>*0.53</b>	1.2	692	0.97	0.95	<b>*0.77</b>	<b>*0.65</b>	1.0
Total	..	<b>*1.03</b>	1.02	0.95	<b>*0.75</b>	<b>*1.8</b>	..	0.98	0.97	<b>*0.87</b>	0.84	<b>*1.5</b>
0–64	..	<b>*1.08</b>	1.05	0.93	0.85	<b>*2.3</b>	..	1.01	1.01	0.83	0.93	<b>*1.8</b>

\* Significantly different from 1 (that is, rates are significantly different from those for non-Indigenous people in Major Cities).

*Notes*

1. Caution should be used when making inferences about ratios that are not significantly different from 1.
2. MC rates for non-Indigenous persons are expressed as deaths per 100,000 population per year. Total (crude) MC rate is largely meaningless and is not included.
3. Ratios for Indigenous people are for SA, WA, NT and Qld.
4. While the table allows comparison of deaths between areas for each sex, it does not allow comparison between the sexes or age groups.
5. SMRs calculated for non-Indigenous persons from Remote and Very Remote areas should be treated with caution (see page 22).

Source: AIHW National Mortality Database.

### Non-Indigenous population

Annually, there were 1,907, 665, 341, 47 and 16 deaths of non-Indigenous males younger than 65 years and 1,287, 414, 204, 23 and 8 deaths of non-Indigenous females younger than 65 years in the five areas respectively as a result of 'other' neoplasms.

In regional areas, there were more deaths of males (about 1.1 times as many as expected in Inner Regional areas) and about as many deaths of females as expected. In each of the remote areas, there were fewer, but not significantly fewer, deaths of 0–64-year-old males and females than expected (Table 5.19).

As a result of 'other' neoplasms, there were 52, 15, –4 and –3 'excess' deaths of non-Indigenous males younger than 65 years, and 3, 3, –5 and –1 'excess' deaths of non-Indigenous females younger than 65 years annually in the four areas outside Major Cities. There was little 'excess', or fewer deaths of males than expected amongst those 60–64 years, with more than 70% of the 'excess' typically amongst 50–59-year-old males.