

4 Diabetes mortality among Aboriginal and Torres Strait Islander peoples

4.1 Introduction

The previous chapter highlighted the considerable contribution that diabetes may make to all-cause mortality. Among Aboriginal and Torres Strait Islander peoples (Indigenous Australians), diabetes (mainly Type 2) is known to be an even greater cause of morbidity and mortality compared with the general population. Indigenous Australians are considered to have one of the highest rates of Type 2 diabetes in the world (McCarty et al. 1996).

This chapter explores diabetes-related deaths among Indigenous Australians and compares their mortality patterns to those of non-Indigenous Australians. The chapter has three sections:

- diabetes as the underlying cause or an associated cause of death;
- diabetes as the underlying cause of death; and
- diabetes as an associated cause of death.

At present there is considerable variation in the accuracy of identification of Indigenous Australians across the States and Territories within the mortality data. In 1997 and 1998 only mortality data for Western Australia, South Australia and the Northern Territory are considered to be of adequate quality for analysis (over 90% of Indigenous deaths so identified), and so form the basis of the Indigenous analysis in this chapter. For comparability purposes, the non-Indigenous estimates include data from these jurisdictions only.

To allow for more detailed analysis, mortality data for 1997 and 1998 have been combined. Disaggregation by age and sex has been undertaken where the numbers are sufficiently large.

4.2 Diabetes as the underlying cause or an associated cause of death

Diabetes was the underlying or associated cause of death in 16.4% of Indigenous deaths and 7.2% of non-Indigenous deaths in Western Australia, South Australia and the Northern Territory in 1997 and 1998 (Table 4.1).

Among Indigenous Australians the proportion of diabetes-related deaths was considerably higher for females than males (20.6% compared with 13.3%), especially when diabetes was the underlying cause of death (8.6% for females, 4.7% for males). In comparison, among non-Indigenous Australians there was little difference in the proportions between males and females. However, age-standardised death rate comparisons indicate no significant difference between Indigenous males and females (229.3 compared with 238.0 per 100,000),

whereas for non-Indigenous Australians the death rate among males was significantly higher than among females (24.5 compared with 13.5 per 100,000) (Table A1).

The age-standardised death rate comparisons also clearly indicate that diabetes-related deaths among Indigenous males and females were 9 and 18 times those of non-Indigenous males and females respectively.

Table 4.1: Diabetes as a cause of death, Indigenous and non-Indigenous Australians^(a), 1997 and 1998

Cause of death	Indigenous			Non-Indigenous		
	Males	Females	Persons	Males	Females	Persons
Proportion of all deaths (%)						
Underlying	4.7	8.6	6.3	2.1	2.2	2.2
Associated	8.6	12.0	10.0	5.1	4.8	5.0
<i>Total diabetes deaths</i>	<i>13.3</i>	<i>20.6</i>	<i>16.4</i>	<i>7.2</i>	<i>7.0</i>	<i>7.2</i>
Number						
Underlying	50	68	118	504	468	972
Associated	92	95	187	1,208	1,019	2,227
<i>Total diabetes deaths</i>	<i>142</i>	<i>163</i>	<i>305</i>	<i>1,712</i>	<i>1,487</i>	<i>3,199</i>
Total deaths	1,071	790	1,861	23,631	21,096	44,727

(a) Includes deaths only for Western Australia, South Australia and Northern Territory.

Note: One death with diabetes as an associated cause and 16 deaths with diabetes not as an associated cause were unable to be assigned to the Indigenous identifier.

Source: AIHW National Mortality Database.

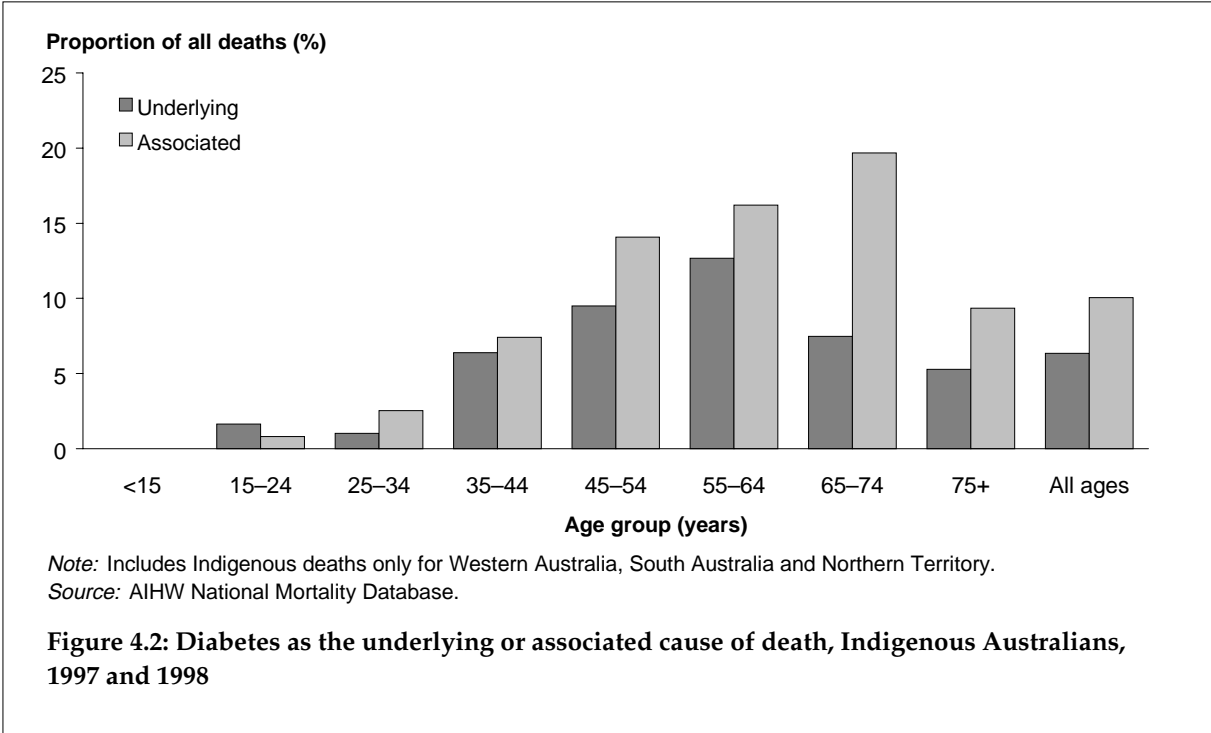
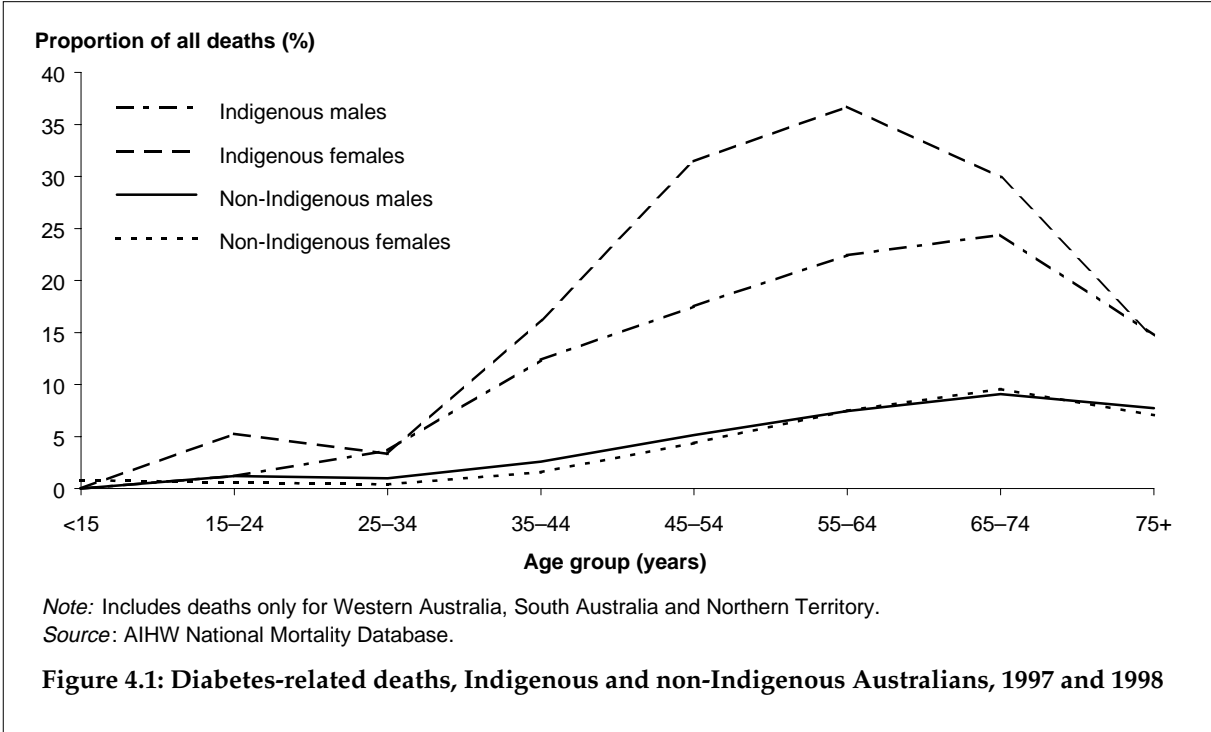
Although the proportion of diabetes-related deaths overall is twice as high among Indigenous Australians compared with non-Indigenous Australians, this varies across each of the age groups. For the 15–64 age range, the proportion of diabetes-related deaths among Indigenous Australians was around four times that of non-Indigenous Australians. The largest difference occurred among 35–44-year-olds where the proportion among Indigenous Australians was 6 times that of non-Indigenous Australians. The magnitude of the difference in proportion between Indigenous and non-Indigenous Australians declined after age 65 (Figure 4.1).

Among non-Indigenous Australians the proportion of diabetes-related deaths for males and females is similar across the different age groups, but among Indigenous Australians there is a noticeable difference, with Indigenous females having a higher proportion of diabetes-related deaths across most age groups.

Diabetes-related deaths (underlying or associated) rise in proportion with increasing age. Over 60% of all Indigenous deaths from diabetes occur among those aged 55 and over. Age-specific proportions increased from 2.5% for 15–24-year-olds to 28.9% for those aged 55–64 years. Proportions declined thereafter to 14.6% among those aged 75 and over (Figure 4.1).

While diabetes is twice as likely to be recorded as the associated cause rather than the underlying cause of death at the national level, among Indigenous Australians the overall difference is not as marked (1.6 times as likely). Across most age groups among Indigenous Australians diabetes was recorded as an associated cause of death more often than it was the underlying cause of death (Figure 4.2). In particular, in the 65–74 age group diabetes was 2.6

times as likely to be recorded as an associated cause of death than as the underlying cause of death.



4.3 Diabetes as the underlying cause of death

Diabetes was recorded as the underlying cause of death almost three times as often among Indigenous Australians (6.3%) as non-Indigenous Australians (2.2%) in 1997 and 1998. Indigenous females were almost twice as likely to have diabetes recorded as the underlying cause of death compared with Indigenous males (8.6% compared with 4.7%), whereas among non-Indigenous Australians the proportion was similar in both sexes (Table 4.1).

The peak age group for diabetes as the underlying cause of death among Indigenous Australians was 55–64 years where it reached 12.7% (Figure 4.2).

Associated causes of death

When diabetes was the underlying cause of death in 1997 and 1998, diseases of the circulatory system was less likely to be recorded as an associated cause among Indigenous Australians compared with non-Indigenous Australians (66.9% compared with 83.8%) (Table 4.2).

Table 4.2: Deaths where diabetes is the underlying cause of death by associated causes of death, Indigenous and non-Indigenous Australians^(a), 1997 and 1998

Associated causes of death	Indigenous			Non-Indigenous		
	Males	Females	Persons	Males	Females	Persons
	Proportion of diabetes deaths (%)					
Diseases of the circulatory system	68.0	66.2	66.9	85.5	82.1	83.8
Diseases of the genito-urinary system	48.0	55.9	52.5	23.4	23.7	23.6
Diseases of the respiratory system	14.0	13.2	13.6	18.3	16.2	17.3
Mental disorders	14.0	10.3	11.9	8.5	8.8	8.6
Infectious and parasitic diseases	22.0	16.2	18.6	7.9	10.0	9.0
Endocrine, nutritional and metabolic diseases and immunity disorders ^(b)	16.0	14.7	15.3	8.1	11.1	9.6
Diseases of the digestive system	8.0	7.4	7.6	4.2	6.0	5.0
Neoplasms	0.0	0.0	0.0	7.1	5.8	6.5
Injury and poisoning	0.0	4.4	2.5	4.2	4.5	4.3
Diseases of the nervous system and sense organs	6.0	2.9	4.2	4.8	4.7	4.7
Diseases of the musculoskeletal systems and connective tissue	4.0	1.5	2.5	2.6	4.3	3.4
Diseases of the blood and blood-forming organs	4.0	10.3	7.6	2.2	2.6	2.4
Other ^(c)	2.0	1.5	1.7	1.8	1.3	1.5
Total deaths where diabetes is the underlying cause (number)	50	68	118	504	468	972

(a) Includes deaths only for Western Australia, South Australia and Northern Territory.

(b) Excludes deaths where diabetes is an associated cause.

(c) Other includes diseases of the skin and subcutaneous tissue, congenital anomalies, certain conditions originating in the perinatal period, symptoms, signs and ill-defined conditions.

Note: Column percentages do not sum to 100, as more than one disease category may be recorded on the death certificate as an associated cause.

Source: AIHW National Mortality Database.

In comparison, diseases of the genito-urinary system was twice as likely to be recorded as an associated cause among Indigenous Australians compared with non-Indigenous Australians (52.5% and 23.6% respectively). Indigenous Australians were also more likely to have infectious and parasitic diseases, and endocrine, nutritional and metabolic diseases and immunity disorders listed as an associated cause than non-Indigenous Australians.

The pattern of associated causes where diabetes is the underlying cause of death is generally similar for Indigenous males and females (Table 4.2).

When investigating the clustering of certain associated causes when diabetes was the underlying cause, it was found that diseases of the circulatory system and diseases of the genito-urinary system (which includes renal disease) were more likely to be listed together as associated causes among Indigenous Australians compared with non-Indigenous Australians (25.4% compared with 15.8%).

4.4 Diabetes as an associated cause of death

Diabetes was an associated cause of death in 10.0% of Indigenous deaths and 5.0% of non-Indigenous deaths in 1997 and 1998 (Table 4.1).

The peak age group for diabetes as an associated cause of death among Indigenous Australians was 65–74 years where it reached 19.7% (Figure 4.2).

Diabetes as an associated cause of death within each underlying cause of death disease group

Diabetes was an associated cause of death in 187 Indigenous deaths (10.0% of all deaths in Indigenous people) in 1997 and 1998. This number was too small to accurately compare proportions across several of the disease groups. However, the following observations can be made.

For endocrine, nutritional and metabolic diseases and immunity disorders, diseases of the circulatory, genito-urinary and digestive systems, diseases of the musculoskeletal systems and connective tissue, and neoplasms the proportion of deaths where diabetes was an associated cause were at least twice as high among Indigenous Australians compared with non-Indigenous Australians (Table 4.3). The number of deaths is too small to make any reliable comparisons between males and females.

Table 4.3: Deaths associated with diabetes within each underlying cause of death, Indigenous and non-Indigenous Australians^(a), 1997 and 1998

Underlying causes of death	Indigenous	Non-Indigenous	Indigenous	Non-Indigenous
	Per cent		Number	
Endocrine, nutritional and metabolic diseases and immunity disorders ^(b)	19.0	6.9	4	26
Diseases of the circulatory system	20.6	7.2	112	1,276
Diseases of the genito-urinary system	17.0	7.7	9	64
Infectious and parasitic diseases	13.9	6.4	5	30
Diseases of the musculoskeletal systems and connective tissue	33.3	4.4	2	9
Diseases of the digestive system	9.7	4.5	9	64
Diseases of the blood and blood-forming organs	12.5	2.8	1	4
Diseases of the respiratory system	8.4	4.5	18	209
Neoplasms	8.9	3.7	20	461
Diseases of the nervous system and sense organs	2.5	2.8	1	27
Mental disorders	3.4	2.3	2	25
Injury and poisoning	1.0	0.8	3	24
Other ^(c)	0.7	1.1	1	8
All underlying causes of death^(b)	10.7	5.1	187	2,227

(a) Includes Indigenous deaths only for Western Australia, South Australia and Northern Territory.

(b) Excludes deaths where diabetes is the underlying cause.

(c) Other includes congenital anomalies, diseases of the skin and subcutaneous tissue, complications of pregnancy, childbirth and the puerperium, certain conditions originating in the perinatal period, symptoms, signs and ill-defined conditions.

Note: One death with diabetes as an associated cause was unable to be assigned to the Indigenous identifier.

Source: AIHW National Mortality Database.

Comparison of each of the underlying causes of death where diabetes is an associated cause and where it is not an associated cause

Among Indigenous Australians where diabetes is an associated cause of death, the most common underlying cause of death in 1997 and 1998 was diseases of the circulatory system (59.9%), followed by neoplasms (10.7%) and diseases of the digestive system (9.6%). Where diabetes was not an associated cause, diseases of the circulatory system still accounted for the highest proportion of Indigenous deaths (27.8%), followed by injury and poisoning (18.9%), neoplasms (13.2%) and diseases of the respiratory system (12.7%). For non-Indigenous Australians the ranking of the underlying causes reflects the national level with diseases of the circulatory system, neoplasms and diseases of the respiratory the three leading causes irrespective of diabetes being an associated cause (Table 4.4).

Among Indigenous Australians, diseases of the circulatory system was recorded twice as often as the underlying cause of death when diabetes was an associated cause than when it was not an associated cause (59.9% compared with 27.8%). Among both Indigenous and non-Indigenous Australians, diabetes was less often associated with injury and poisoning (Table 4.4).

Table 4.4: Distribution of the underlying causes of death associated and not associated with diabetes, Indigenous and non-Indigenous Australians^(a), 1997 and 1998

Underlying causes of death	Indigenous		Non-Indigenous	
	Associated with diabetes	Not associated with diabetes	Associated with diabetes	Not associated with diabetes
	Proportion of deaths (%)			
Diseases of the circulatory system	59.9	27.8	57.3	39.4
Neoplasms	10.7	13.2	20.7	28.6
Diseases of the respiratory system	9.6	12.7	9.4	10.7
Diseases of the digestive system	4.8	5.4	2.9	3.3
Diseases of the genito-urinary system	4.8	2.8	2.9	1.9
Mental disorders	1.1	3.7	1.1	2.5
Injury and poisoning	1.6	18.9	1.1	6.9
Infectious and parasitic diseases	2.7	2.0	1.3	1.1
Endocrine, nutritional and metabolic diseases and immunity disorders ^(b)	2.1	1.1	1.2	0.8
Diseases of nervous system and sense organs	0.5	2.5	1.2	2.3
Diseases of the musculoskeletal systems and connective tissue	1.1	0.3	0.4	0.5
Diseases of the blood and blood-forming organs	0.5	0.4	0.2	0.3
Other ^(c)	0.5	9.3	0.4	1.7
<i>Total deaths (%)</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>	<i>100.0</i>
Total deaths (number)	187	1,556	2,227	41,528

(a) Includes Indigenous deaths only for Western Australia, South Australia and Northern Territory.

(b) Excludes deaths where diabetes is the underlying cause.

(c) Other includes congenital anomalies, diseases of the skin and subcutaneous tissue, complications of pregnancy, childbirth and the puerperium, certain conditions originating in the perinatal period, symptoms, signs and ill-defined conditions.

Note: One death with diabetes as an associated cause and 16 deaths with diabetes not as an associated cause were unable to be assigned to the Indigenous identifier.

Source: AIHW National Mortality Database.

4.5 Discussion

This chapter has highlighted that diabetes-related deaths are substantially higher among Indigenous Australians than non-Indigenous Australians. In 1997 and 1998, Indigenous Australians were twice as likely to die from diabetes-related deaths compared with their non-Indigenous counterparts. When accounting for the different age structures of the Indigenous and non-Indigenous populations this difference is even greater, with Indigenous males 9 times and Indigenous females 18 times as likely to die from diabetes-related deaths compared with other Australians. Consistent with this finding, numerous studies have shown that Indigenous Australians continue to suffer substantially higher mortality rates and much worse health status than other Australians (Benham & Howe 1994).

Age distribution

For both Indigenous and non-Indigenous Australians, diabetes-related deaths are substantially higher among older Australians. The difference in the proportion of diabetes-related deaths between Indigenous and non-Indigenous Australians varies with age, with the largest difference occurring among 35–44-year-olds, where the proportion among Indigenous Australians is six times that of non-Indigenous Australians. After age 65 the differences in proportions decline. Morbidity associated with diabetes has been shown to appear up to 20–30 years earlier in Aborigines compared with other Australians (Guest 1995).

Diabetes as the underlying cause of death

Diabetes is almost three times as likely to be recorded as the underlying cause of death among Indigenous Australians compared with non-Indigenous Australians. The previous chapter indicated that people with Type 1 diabetes are more likely to have diabetes reported as the underlying cause of death, but this is generally not the case for Indigenous Australians. Type 1 diabetes is relatively less common in Indigenous Australians, but rates of Type 2 diabetes are extremely high (McCarty et al. 1996).

Indigenous females are almost twice as likely as Indigenous males to have diabetes reported as an underlying cause of death. This result is consistent with the findings of a study of Aboriginal people in Western Australia which showed that the age-standardised mortality rates for endocrine, nutritional and metabolic disorders (diabetes accounts for over 90% of these deaths) among Aboriginal females was 1.7 times that among Aboriginal males (Veroni et al. 1994).

Strong association with infectious and parasitic diseases and diseases of the genito-urinary system and circulatory system

Diabetes is predominantly associated with diseases of the genito-urinary system (mainly renal failure) and infectious and parasitic diseases, with these diseases reported twice as often among Indigenous Australians compared with other Australians. A study of Aboriginal people in central Australia has shown that renal disease was the direct cause of death in more than 22% of Aboriginal deaths, infections accounted for almost 21% of Aboriginal deaths and coronary heart disease for almost 14% of deaths (Phillips et al. 1995). The results presented in this chapter also show that diseases of the circulatory system, while still accounting for the largest proportion of deaths, are less prominent as an associated cause among Indigenous Australians compared with non-Indigenous Australians and that diseases of the genito-urinary system are more prominent. A possible explanation for this is that among Indigenous Australians with diabetes as the underlying cause of death, renal disease may be selectively competing with coronary heart disease as an associated cause of death (Phillips et al. 1995).

Among Indigenous Australians, diseases of the circulatory system is recorded twice as often as the underlying cause of death when diabetes is an associated cause than when it is not an associated cause (59.9% compared with 27.8%). As was indicated in the previous chapter, much of the excess mortality among people with diabetes is attributable to deaths from diseases of the circulatory system, a pattern that is reflected perhaps even more strongly among Indigenous Australians. Evidence suggests that Indigenous Australians experience higher mortality rates than the general Australian population, with Indigenous Australians

dying from diseases of the circulatory system at twice the rate of other Australians (AIHW 1999).

Possible reasons for the higher death rates among Indigenous Australians

Indigenous Australians have one of the highest rates of Type 2 diabetes in the world (McCarty et al. 1996). The prevalence of diabetes among Indigenous adults is suspected to be as high as 10–30%, 2–4 times that of other Australians (de Courten et al. 1998). It is not clear why diabetes is more common among Indigenous Australians, but it is thought to be a combination of a genetic basis and the rapid change from a traditional way of life to a more 'westernised' lifestyle. This lifestyle is marked by decreased physical activity and a high-fat, low-fibre diet that promotes obesity, high blood cholesterol and high blood pressure (AIHW 1999).

The risk factor profile of Indigenous Australians is worse than that of non-Indigenous Australians, particularly for physical activity and obesity. Indigenous females are 1.7 times and Indigenous males 1.4 times as likely to be obese as other Australians. Indigenous Australians are also more likely to report no physical activity in their leisure time (AIHW 1999). Increased physical activity is now being recognised as perhaps the most feasible way of modifying glucose intolerance, a risk factor for developing diabetes and macrovascular disease (Guest & O'Dea 1992).