Australian-born males have been used as the standard population for males, while Australian-born females have been used as the standard population for females. The use of different standards for males and females was adopted to reflect any differences in the Australian-born male and female age-specific rates. However, it should be noted that this means that it is not possible to compare SPRs for males with those for females.

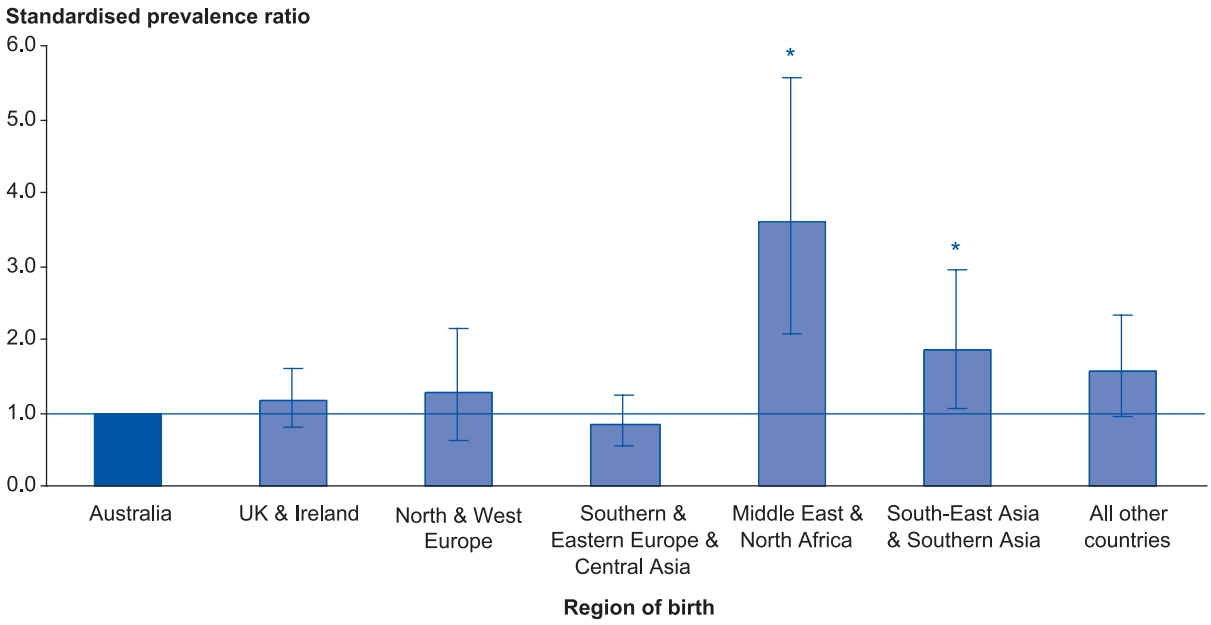
The direct method of standardisation was used for incidence rates, hospital separation rates and mortality rates for people.

Results

Prevalence based on self-report

In 2001, the standardised prevalence ratios (SPRs) for self-reported diabetes (i.e. diabetes reported as a current, long-term condition) for men who were born in the Middle East and North Africa and in South-East and Southern Asia were significantly greater than 1.0 (Figure 1). This means that in these regions of birth, the number of men reporting that they had diabetes was significantly higher than expected based on the age-specific rates for Australian-born men. Men born in the Middle East and North Africa reported 3.6 times more diabetes than expected, while those born in South-East and Southern Asia reported 1.9 times more diabetes than expected.

Figure 1: Standardised prevalence ratios for self-reported diabetes, males by birthplace, 2001



Notes

1. Indirectly age-standardised to the Australian-born male population in the 2001 NHS.
2. Includes males aged 20 years and over.
3. The estimates for North & West Europe, Middle East & North Africa and South-East & Southern Asia have relative standard errors greater than 25% and should be interpreted with caution.

* Indicates significantly different from Australia.

Source: 2001 National Health Survey, ABS.

A picture of diabetes in overseas-born Australians

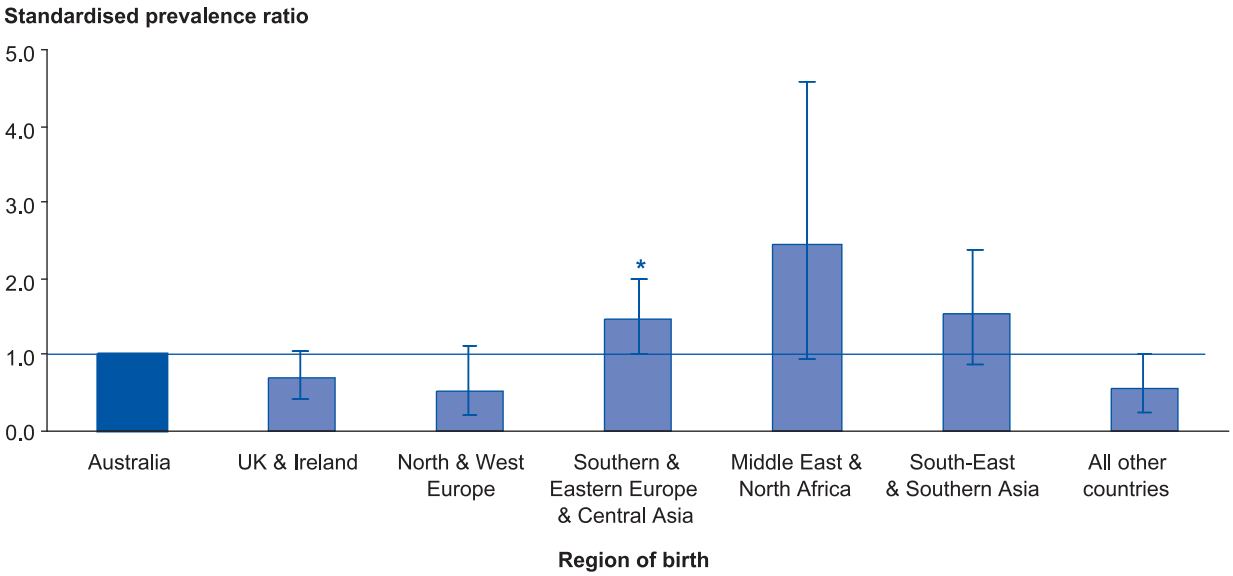
Among women in 2001, only those born in Southern and Eastern Europe and Central Asia reported significantly more cases of diabetes than expected based on rates for Australian-born women, with an SPR of 1.5 (Figure 2).

While women born in the Middle East and North Africa and in South-East Asia and Southern Asia had large SPRs (2.4 and 1.5 respectively), these differences were not statistically significant. This non-significant result was due to the large standard errors and small sample sizes for these regions in 2001.

The Middle East and North Africa had the highest SPR for both sexes, followed by South-East Asia and Southern Asia (although with large standard errors for females). Examination of age-standardised rates for Australian-born men and women indicated no significant difference in the prevalence of self-reported diabetes between men (3.7%) and women (3.9%). Similarly, for other regions of birth, there were no significant differences in the crude prevalence rates for men and women.

The ABS 1995 NHS had a sample size of around 57,600 respondents, twice that of the 2001 NHS sample size. This larger sample size meant that a more detailed analysis could be undertaken of self-reported diabetes prevalence in 1995 by region of birth.

Figure 2: Standardised prevalence ratios for self-reported diabetes, females by birthplace, 2001



Notes

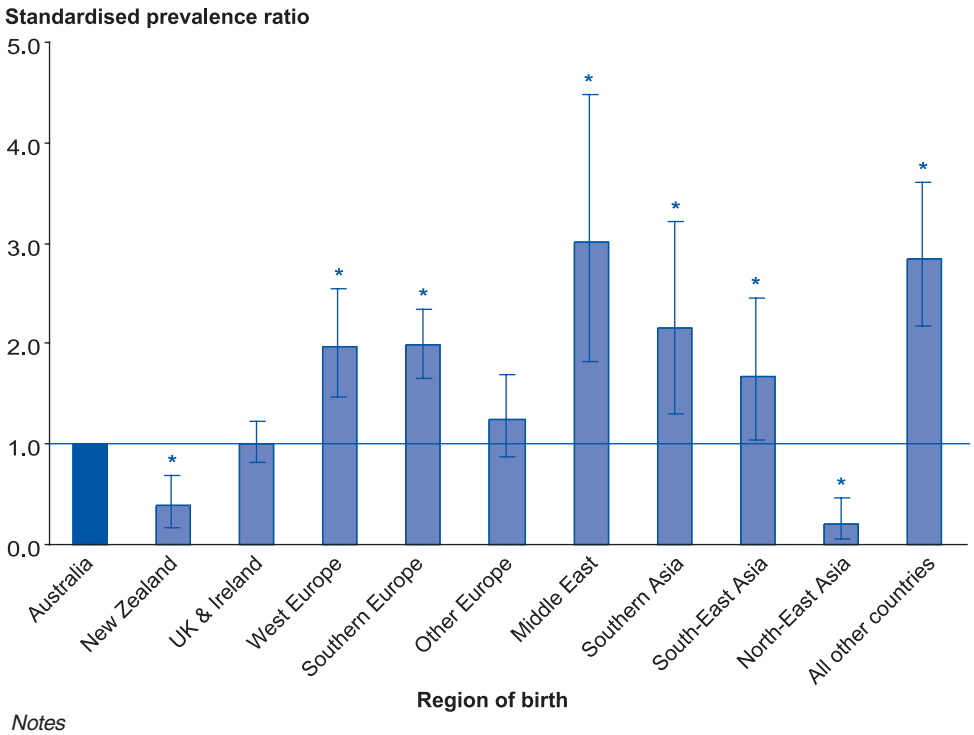
1. Indirectly age-standardised to the Australian-born female population in the 2001 NHS.
2. Includes females aged 20 years and over.
3. The estimates for North & West Europe, Middle East & North Africa, South-East Asia & Southern Asia and All other countries have relative standard errors of greater than 25% and should be interpreted with caution.

* Indicates significantly different from Australia.

Source: Australian Bureau of Statistics 2001 National Health Survey.

In 1995, the numbers of men, aged 20 years and over, born in West Europe, Southern Europe, Middle East, Southern Asia, South-East Asia, and All other countries who reported that they had diabetes were significantly higher than expected based on the age-specific rates for Australian-born men (Figure 3). For example, the number of cases of diabetes reported by men born in the Middle East was three times higher than expected based on Australian-born male rates. Men born in New Zealand had an SPR that was significantly lower than expected based upon Australian-born rates.

Figure 3: Standardised prevalence ratios for self-reported diabetes, males by birthplace, 1995



Notes

1. Indirectly age-standardised to the Australian-born male population in the 1995 NHS.
2. Includes males aged 20 years and over.
3. The estimate for New Zealand has a relative standard error of greater than 25% and should be interpreted with caution.
4. The estimate for North-East Asia has a relative standard error of 50% and is considered too unreliable for general use.

* Indicates significantly different from Australia.

Source: 1995 National Health Survey, ABS.

For women in 1995, only those born in the United Kingdom and Ireland, Southern Europe, Other Europe (i.e. Northern, South-Eastern and Eastern Europe), and All other countries reported significantly more cases of diabetes than expected based on Australian-born female rates (Figure 4). As for men, women born in New Zealand reported fewer cases of diabetes than expected.

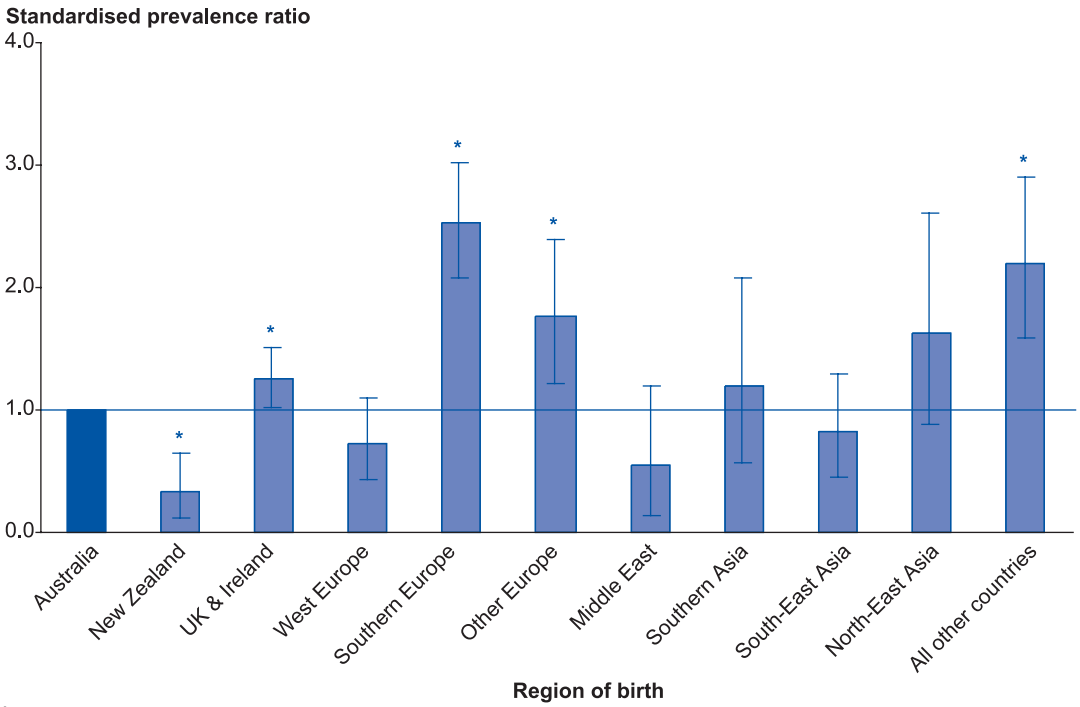
Although it is not possible to directly compare SPRs for men with those for women, the striking difference between the SPRs for men and women born in West Europe warrants some comment. A comparison of crude (i.e. not adjusted for age) rates showed that men born in West Europe reported a significantly higher prevalence of diabetes than women

A picture of diabetes in overseas-born Australians

born in that region. Significant differences in the crude rates between men and women were also observed for those born in the Middle East and North-East Asia, however the rates for females born in the Middle East and males born in North-East Asia had very high relative standard errors.

While the regions of birth reported for 2001 and 1995 are not exactly the same, it is possible to see some consistent patterns in the data, particularly for men. Men born in the Middle East, South-East Asia and Southern Asia reported more diabetes than expected in both 1995 and 2001. Women born in Southern Europe also appear to have reported more diabetes than expected in both survey years. In contrast, there appears to be little evidence of a difference in self-reported diabetes prevalence rates in either year among men born in the United Kingdom and Ireland compared with Australian-born men.

Figure 4: Standardised prevalence ratios for self-reported diabetes, females by birthplace, 1995



Notes

1. Indirectly age-standardised to the Australian-born female population in the 1995 NHS.
2. Includes females aged 20 years and over.
3. The estimates for New Zealand, Southern Asia, South-East Asia and North-East Asia have relative standard errors of greater than 25% and should be interpreted with caution.
4. The estimate for the Middle East has a relative standard error of 50% and is considered too unreliable for general use.

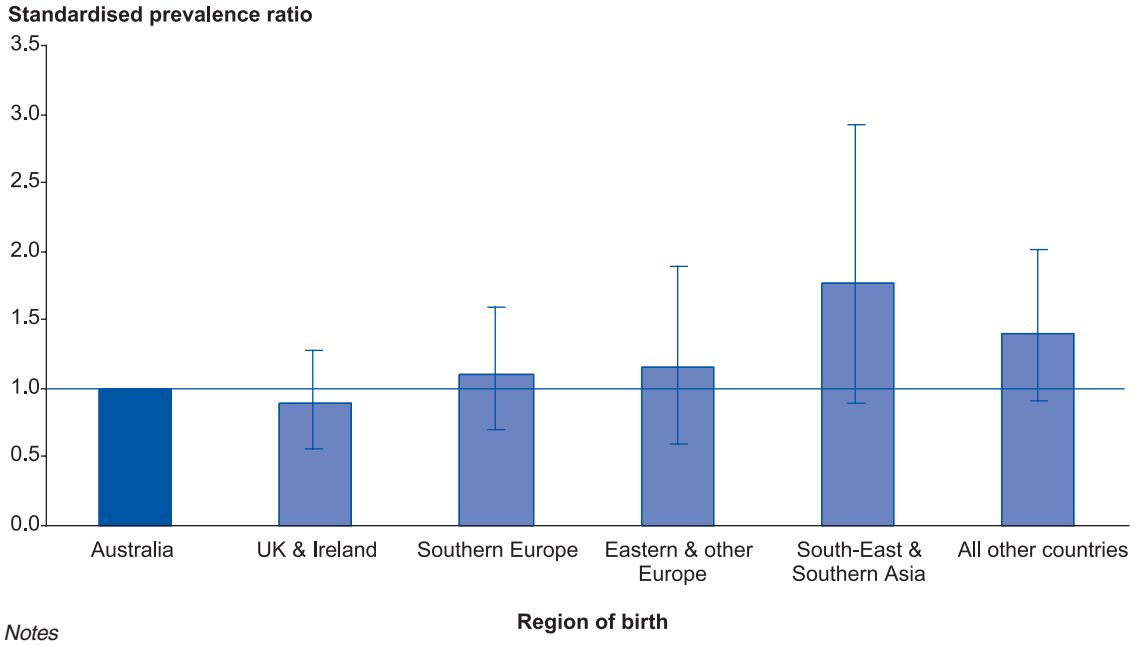
* Indicates significantly different from Australia.

Source: 1995 National Health Survey, ABS.

Prevalence based on measurement of glucose levels

The 1999–2000 AusDiab Study measured plasma glucose levels in a sample of 11,247 people aged 25 years and over. These data could not be analysed by sex because of small numbers for most regions of birth. No significant differences in the age-adjusted prevalence rates for diabetes were observed between Australian-born persons and persons born overseas (Figure 5). However, this is probably because the survey was not designed to provide prevalence estimates by region of birth and therefore did not have large enough sample sizes to detect significant differences by region of birth.

Figure 5: Standardised prevalence ratios for measured diabetes, persons by birthplace, 1999–2000



Notes

1. Indirectly age-standardised to the Australian-born male and female populations in the 1999–2000 AusDiab Study.
2. Includes persons aged 25 years and over.
3. The estimates for Eastern & other Europe and South-East & Southern Asia have relative standard errors of greater than 25% and should be interpreted with caution.

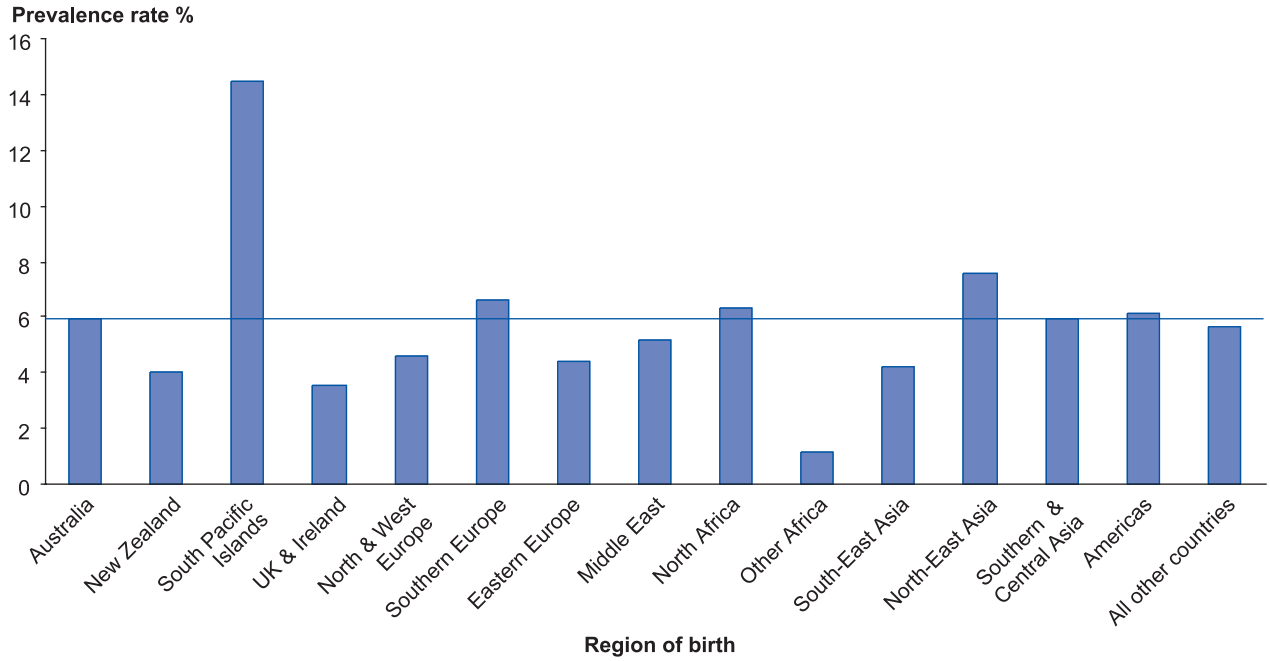
Source: 1999–2000 AusDiab Study.

International comparisons

To provide some context to diabetes prevalence rates among overseas-born Australians, it is interesting to look at the corresponding overseas regions' prevalence rates. However migrants to Australia are not representative of their region of origin, and therefore overseas rates may differ considerably from the overseas-born Australian rates. Data collated by the International Diabetes Federation (IDF) indicate that diabetes prevalence rates are higher in the regions of South Pacific Islands (14.4%), Southern Europe (6.7%), North Africa (6.3%), North-East Asia (7.6%) and the Americas (6.1%) compared with Australia (5.9%). All other regions had lower prevalence rates than Australia (Figure 6). These comparisons should be interpreted with caution, as the IDF data were derived from a variety of measured and self-reported data, with preference given to measured data, and varying methodologies and data sources were used to compile and extrapolate the IDF data into the regions.

A picture of diabetes in overseas-born Australians

Figure 6: International diabetes prevalence rates by region



Notes

1. Includes people aged 20–79 years.
2. These data are not age-standardised and therefore the age distribution of the population should be considered when interpreting these estimates.

Source: IDF 2000.

Incidence

The only available national incidence data on diabetes are those held on the National Diabetes Register. The Register holds information on people with all types of insulin-treated diabetes (including Type 1, Type 2 and gestational diabetes), who started using insulin since January 1999 and who have consented to be on the Register. The following results combine all types of diabetes treated by insulin.

Data for the period 1999–2001 show that there was substantial variation in insulin-treated diabetes incidence by birthplace (Table 3). Incidence per 100,000 population was highest among those born in the Middle East and North Africa (79.8 and 93.3 for males and females respectively), and Southern and Central Asia (78.4 and 91.9 for males and females respectively). Both these groups had incidence rates that were substantially higher than those of the Australian-born registrants (46.2 males and 40.5 females per 100,000 population), being more than 50% higher for males and more than double for females.

These results should be interpreted as indicative only, as coverage of insulin-treated Type 2 diabetes is not complete at this stage. However they do suggest that further research into differentials in insulin-treated Type 2 diabetes incidence by country of birth is warranted.

Table 3: National Diabetes Register, registrants aged 15 years and over at diagnosis by region of birth and sex, 1999–2001

Region of birth	Males		Females	
	Number	Average annual rate per 100,000 population	Number	Average annual rate per 100,000 population
Australia	6,713	46.2	6,629	40.5
Oceania (excluding Australia)	244	44.5	326	54.5 *
North & West Europe	909	32.9 *	757	29.9 *
Southern & Eastern Europe	1,344	61.4 *	1,050	53.7 *
Middle East & North Africa	267	79.8 *	276	93.3 *
Other Africa	86	52.9	75	41.2
South-East Asia	223	54.2	337	55.3 *
North-East Asia	134	42.8	213	53.4
Southern & Central Asia	200	78.4 *	242	91.9 *
Americas	98	46.5	82	39.8

Note: Rates age-standardised to the 2001 Standard Australian Population.

* Indicates significantly different from Australia.

Source: National Diabetes Register, AIHW.

Diabetes-related hospital separations

Diabetes-related hospital separations data presented here are for 1999–00 and include separations with a primary or additional diagnosis of diabetes (ICD-10-AM codes E10, E11, E13, E14; NCCH 1998). Hospital separations data are records of each discharge, transfer, death or change in the type of episode of care; the data may include multiple separations by the same patient.

The 1999-00 data were coded according to insulin dependency rather than diabetes type. Type of diabetes is not easily derived from insulin dependency because Type 2 diabetes may or may not be insulin dependent, therefore these results are presented as all diabetes-related separations.

Diabetes is mostly treated in the community through medical practitioners and allied health professionals. Hospital separations for diabetes include only severe cases and do not give a full picture of diabetes prevalence.

After adjusting for age, males and females born in Australia had similar rates of diabetes-related hospital separations (24 and 27 per 1,000 respectively) in 1999–00 (Figure 7). People born in the South Pacific Islands, Southern Europe, the Middle East and North Africa and women from South-East Asia had significantly higher rates of hospital separations. Most notably, the rates of diabetes hospitalisations for men and women born in the South Pacific Islands were 54 and 71 per 1,000 respectively. People born in the following regions had a lower rate of diabetes-related hospital separations than those born in Australia: New Zealand; United Kingdom and Ireland; North and West Europe; North-East Asia; females from Eastern Europe and Central Asia, and the Americas; and males from South-East Asia.

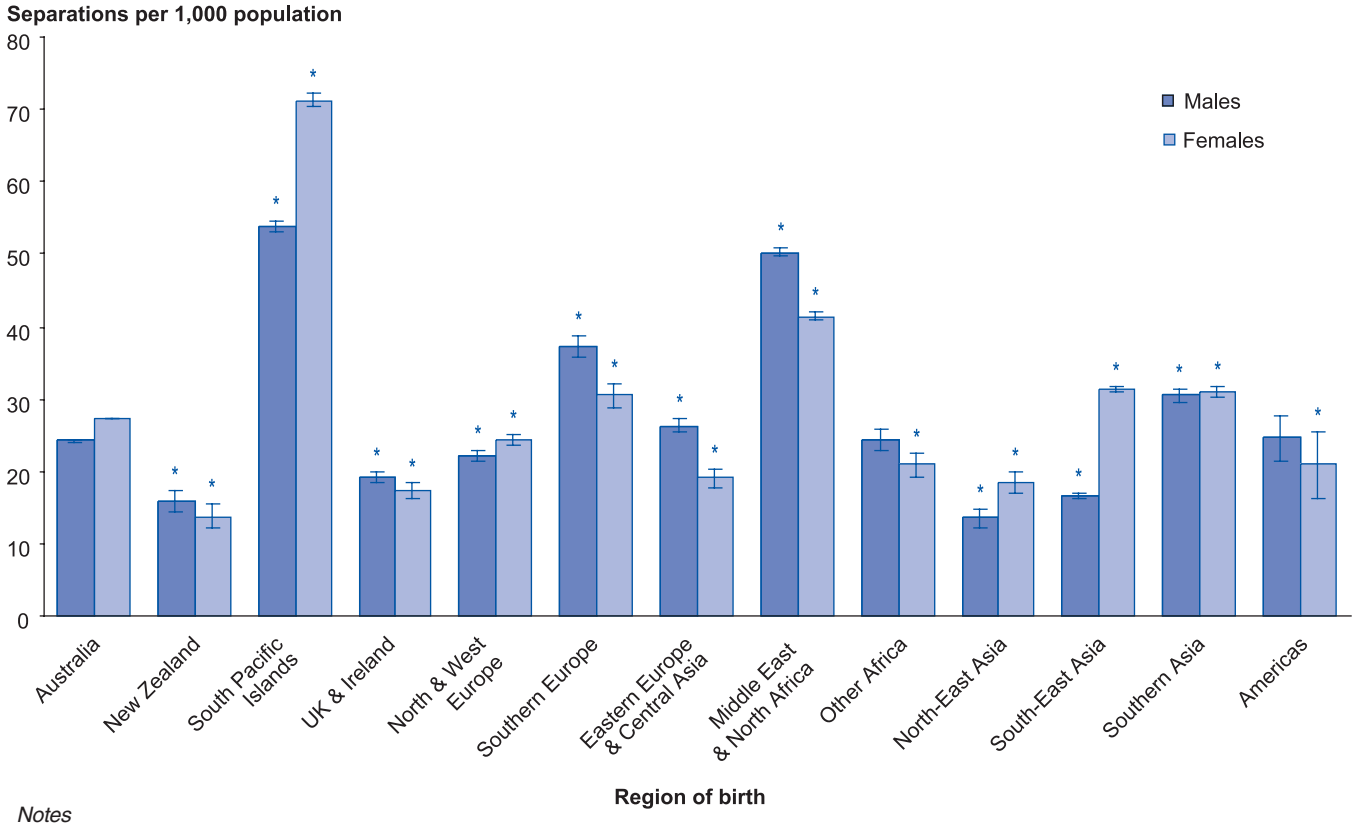
A picture of diabetes in overseas-born Australians

Comparable differentials occurred in total hospital separations in Australia (AIHW 2001, Table 6.8). For example, in 1999–00, Australia-born people had 307 hospitalisations per 1,000 and New Zealand-born people had 243 but the following countries of birth had a higher rate: Papua New Guinea (351), Fiji (399) and other Oceania (512). A higher diabetes-related hospital separation rate amongst people born in these South Pacific Islands may be due to factors replicated across many health conditions.

Males born in Southern Europe, Eastern Europe and Central Asia, and Middle East and North Africa had significantly higher hospital separation rates than females born in the same regions. Conversely, females born in Australia, the South Pacific, North-East Asia, South-East Asia, and Southern Asia had higher hospitalisation rates than their male counterparts.

Diabetes-related hospital separation rates between sub-population groups are affected by various factors including diabetes prevalence, severity of the condition, differing admission practices and levels of service provision, multiple admissions for treatment of chronic complications (such as dialysis), and the use of alternative healthcare services

Figure 7: Age-standardised rate of diabetes-related hospital separations, by region of birth, 1999–00



Notes

1. Standardised to the 2001 Standard Australian Population (ABS).
2. Includes people aged 20 years and over.

* Indicates significantly different from Australia.

Source: National Hospital Morbidity Database, AIHW.

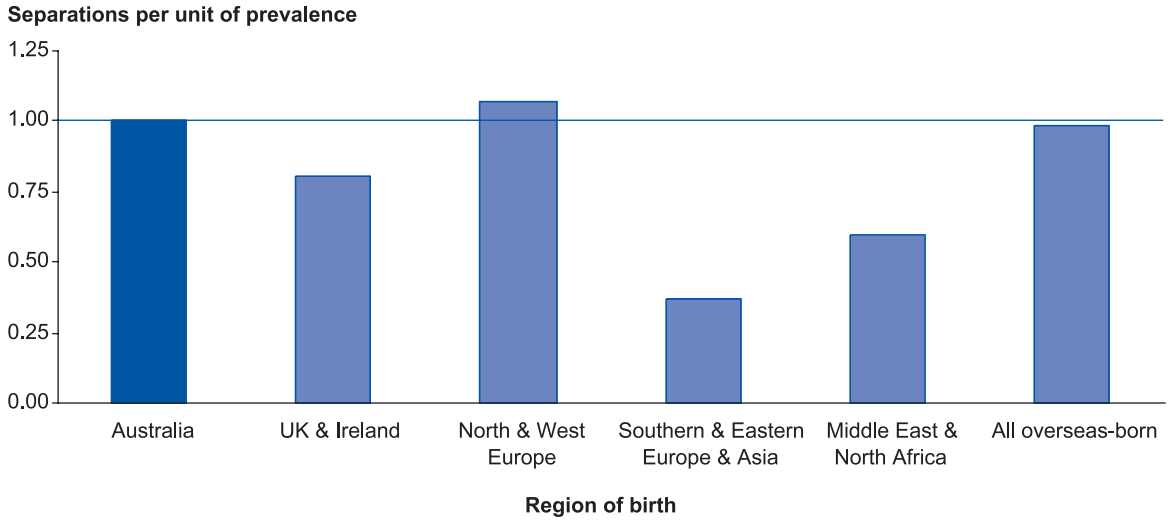
such as diabetes educators, allied health professionals and general practitioners (AIHW 2001). Hospital care is predominantly more necessary for severe cases with complications. For example in Queensland, the probability of diabetes-related hospitalisation increases with an increase in complications (Queensland Health 2002).

In order to more clearly examine patterns of hospital separation rates due to factors other than differing levels of diabetes between these groups, hospitalisations per unit of prevalence rather than per unit of the general population are presented as a ratio in comparison to the Australian rate (Figure 8) (see Appendix A for more detail). This removes the effect of prevalence between regions of birth and therefore the contribution of diabetes severity (and other components of hospital separation data as discussed above) is made more prominent.

For a given level of diabetes prevalence, overall there is little difference between Australian-born and all overseas-born hospitalisations. However, compared to people born in Australia, people born in the United Kingdom and Ireland, Middle East and North Africa, and Southern and Eastern Europe and Asia have fewer hospitalisations per unit of prevalence.

This situation prevails despite higher rates of prevalence and hospitalisations for some of these regions of birth compared to Australian-born people. This demonstrates that hospital separation rates are not a direct reflection of prevalence rates and that other factors could be impacting upon some overseas-born people differently to Australian-born people. In an attempt to determine whether the repetitive nature of dialysis is a major factor in separation rates, diabetes hospital separations where dialysis was coded as a diagnosis or procedure undertaken were analysed. Generally, in diabetes-related hospital separations, dialysis is a rare event (less than 5%) regardless of country of birth.

Figure 8: Ratio of hospital separations per unit of prevalence, by region of birth



Notes

1. Age-standardised to the 2001 Standard Australian Population (ABS).
2. Includes people aged 20 years and over.

Sources: National Hospital Morbidity Database 1999–00, AIHW; 2001 National Health Survey, ABS.

A picture of diabetes in overseas-born Australians

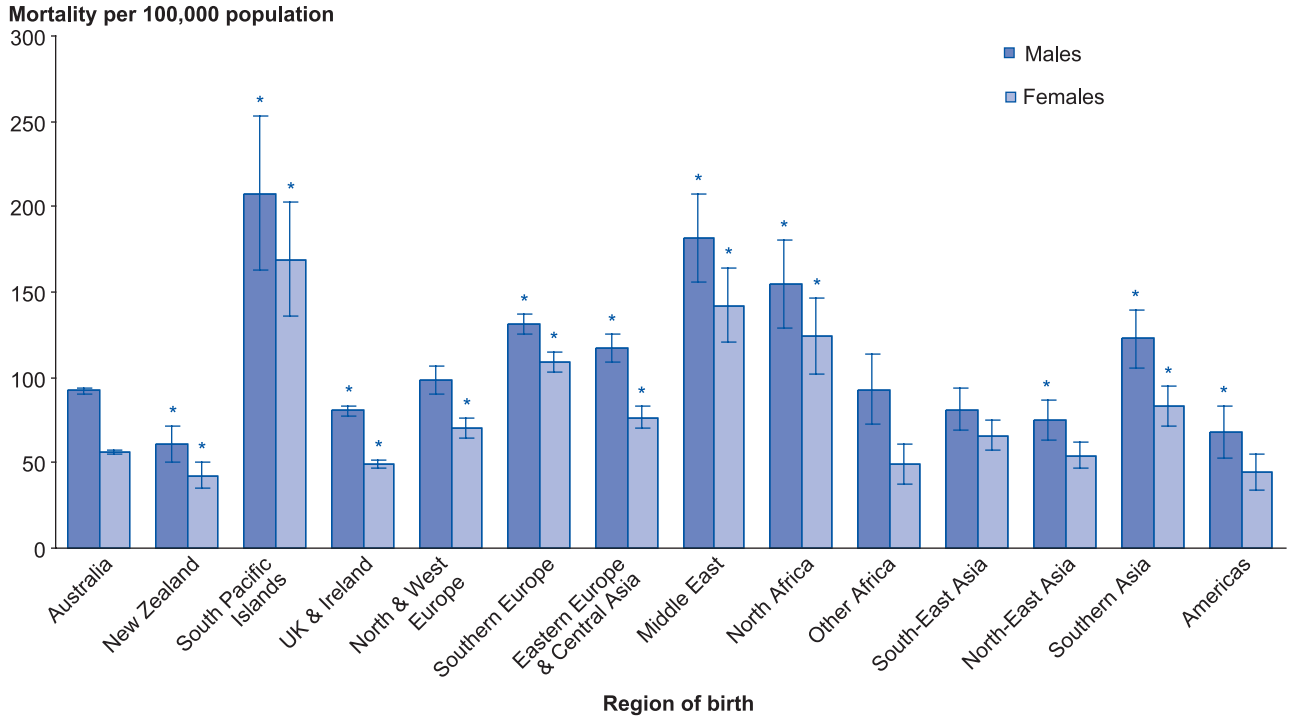
Mortality from diabetes

Diabetes-related deaths reported here are for 1997–2000 and include deaths where diabetes was either the underlying or an associated cause of death (ICD-10 codes E10, E11, E13, E14; WHO 1977). At the national level, diabetes is twice as likely to be listed as an associated cause of death than as the underlying cause of death (AIHW: Mathur et al. 2000).

The highest diabetes death rates were recorded amongst people born in the South Pacific Islands (208 male and 169 female deaths per 100,000) in 1997–2000. In comparison, Australian-born men and women had diabetes death rates of 92 and 57 deaths per 100,000 respectively. However, a high degree of statistical variability is present within some of the regions and therefore differences should be interpreted carefully (Figure 9).

Males and females born in the Middle East (181 and 142 deaths per 100,000 population respectively), North Africa (155 and 125) and Southern Asia (122 and 84) also had higher mortality rates compared to those born in Australia. Except for the UK and Ireland (80 and 49 deaths per 100,000), all regions of Europe also had higher mortality rates than Australia.

Figure 9: Age-standardised mortality rates, by birthplace and sex, 1997–2000



Notes

1. Age-standardised to the 2001 Standard Australian Population (ABS).
2. Data for people aged 25 years and over.

* Indicates significantly different from Australia.

Source: National Mortality Database, AIHW.

In each region, male mortality rates were higher than the corresponding female rates. The difference between the male and female rates was statistically significant for those born in Australia, New Zealand, United Kingdom and Ireland, North and West Europe, Southern Europe, Eastern Europe and Central Asia, Other Africa, North-East Asia and Southern Asia.

In their study of mortality from 1994–1996, Strong et al. (1998) found that underlying cause diabetes mortality rates were 16% and 11% (males and females respectively) lower for 'UK & Ireland-born people'; 32% and 87% higher for people born in 'North & West Europe, the former USSR and Baltic States'; and 12% and 37% higher for people born in 'Asia' than the Australian-born rates.

Diabetes death rates are difficult to compare internationally, and usually underestimate the true extent of deaths caused by diabetes (Colagiuri et al. 1998). This is because the mortality burden of diabetes often presents itself in associated problems such as renal disease, heart disease and stroke (AIHW 1998).

Discussion

Rates of diabetes differ widely between Australians of different regions of birth and the level of difference varies between population health indicators. It is difficult to explain why diabetes prevalence, hospital separation and mortality rates vary so much, amongst regions of birth, but could be due to disparities in access; and utilisation and attitudes to healthcare including hospitals, diabetes management services, and diabetes educational resources (von Hofe et al. 2002).

Males and females born in the Middle East and North Africa had the highest standardised prevalence ratios (3.60 and 2.43 respectively) and the highest incidence rate ratios (1.73 and 2.30) of diabetes compared to Australian-born males and females (Table 4). Men from Southern Europe and Eastern Europe and Central Asia; and women from the United Kingdom and Ireland had the lowest standardised prevalence ratio compared to Australian-born people (0.85 and 0.71 respectively), though these differences were not all significant. Men and women from the United Kingdom and Ireland and North and West Europe had incident rates significantly lower than Australian-born people.

It is unfortunate that prevalence rates for South Pacific Island-born people are unavailable, as these people have the highest hospitalisation (2.22 males and 2.62 females) and mortality (2.25 and 2.98) rate ratios compared to Australian-born people. The second highest hospitalisation rate ratios are for males and females born in the Middle East and North Africa (2.07 and 1.52 respectively); and Middle Eastern-born people also have the second highest mortality rate ratios (1.96 and 2.51) (Table 4).

Rates of diabetes prevalence, incidence, hospitalisations and mortality for men and women born in the Middle East and North Africa were consistently higher than Australian-born rates. However, this expected uniform pattern was not apparent across all regions of birth. For example, men born in the United Kingdom and Ireland reported 17% more diabetes than Australian-born men, but had 21% less hospitalisations and 13% less mortality than Australian-born men. Similarly, men born in Southern and Eastern Europe and Central Asia had lower prevalence rates compared to Australian-born men, yet had higher hospitalisation and mortality rates than their Australian-born counterparts.