



**SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY**

---

---

## **EPIDEMIOLOGY OF DIABETES**

**OCTOBER 2007**



**The University of Sydney**

The Serious and Continuing Illness Policy and Practice Study (SCIPPS), an NHMRC funded program conducted at The Australian National University and The University of Sydney and administered by The Menzies Centre for Health Policy



## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

---

---

This report was written by Ms Beverley Essue and Dr Masoud Mirzaei and reviewed by Professor Stephen Leeder and Associate Professor Ruth Colagiuri. This paper was produced as a collaboration of the SCIPPS project.

Suggested citation: Essue B, Mirzaei M, Leeder SR, Colagiuri R. Epidemiology of diabetes. The Serious and Continuing Illness Policy and Practice Study (SCIPPS), The Menzies Centre for Health Policy, 2007. URL: access date:.

The Serious and Continuing Illness Policy and Practice Study (SCIPPS) is an NHMRC funded program conducted at the Australian National University and the University of Sydney and administered by the Menzies Centre for Health Policy.

<http://www.ahpi.health.usyd.edu.au/scipps/index.php>

*Contacts:*

**NSW:**

The University of Sydney

Tel: 02 9036 7007

Email: [scipps@med.usyd.edu.au](mailto:scipps@med.usyd.edu.au)

**ACT:**

The Australian National University

Tel: 02 6125 0782

Email: [scipps@anu.edu.au](mailto:scipps@anu.edu.au)

### EPIDEMIOLOGY OF DIABETES

Diabetes is a group of disorders in which an insulin deficiency and/or impaired effectiveness of insulin action results in an excess of glucose circulating in the blood (WHO, 2006). The most common form of diabetes is non-insulin dependant diabetes, commonly known as type 2 diabetes. It affects approximately 85-95% of all people with diabetes and generally develops in adulthood; although in the past decade the average age of onset for type 2 diabetes has been decreasing (Colagiuri et al, 2002).

#### *Risk factors*

There are several well-known risk factors associated with the development of type 2 diabetes. These include: age; a genetic predisposition due to ethnicity, Aboriginality and/or a family history of diabetes; and various lifestyle factors including, physical inactivity and poor diet (Colagiuri et al, 2002). Diabetes is often associated with obesity, which itself causes insulin resistance and leads to high blood sugar levels (Colagiuri et al, 2002; IDF, 2006).

### **GLOBAL PROFILE**

#### *Prevalence*

Approximately 246 million people worldwide are currently estimated to have diabetes, a global prevalence of 5.9% (IDF, 2006). This is expected to rise to 380 million people and a global prevalence of 7.1% by 2025 (King et al, 1998). Type 2 diabetes is the most common form of diabetes and accounts for 85-95% of all diabetes in developed countries and an even higher proportion in developing countries (IDF, 2006). It is now epidemic within many developing and newly industrialised countries (Wild et al, 2004).

Diabetes is slightly more prevalent in females than in males. Estimates for 2007 suggest that approximately 2.0 million more women will develop type 2 diabetes compared to men (IDF, 2006). It is most prevalent in the 40-80 year old age group, primarily because type 2 diabetes generally affects older individuals (IDF, 2006). However, it is by no means solely a problem of older people: the age of onset of type 2 diabetes has fallen, resulting in a heavier disease burden during the productive years.

### *Mortality*

Diabetes is expected to cause 3.8 million deaths among adults 20 years of age and older in 2007, approximately 6.0% of the total world mortality (IDF, 2006). Over two thirds of these deaths will occur in developing countries (IDF, 2006). The proportion of worldwide deaths attributable to diabetes is estimated to be higher in females than in males, with 2.0 million and 1.8 million deaths respectively estimated to occur in 2007 (IDF, 2006). The overall mortality rate for diabetes is comparable to the global mortality attributable to HIV/AIDS. Although the age at death is very different, this highlights the magnitude of the burden of diabetes (Roglic et al, 2005).

### *Burden of disease*

1.3% of all disability adjusted life years (DALYs) were attributable to diabetes in 2001, 20.0 million DALYs (Mathers et al, 2001). The 2007 direct health expenditure on the care of people with diabetes will range between \$232 billion and \$422 billion US (IDF, 2006). About 12% of this expenditure will occur in the Western Pacific region (including Australia, China, Japan and Korea), where 27% of the global diabetes burden exists. Three-quarters of this global expenditure will be used for the care of individuals aged 50-80 years as the prevalence of diabetes is highest in this age group and the impact of complications is greatest and most expensive in older individuals (IDF, 2006).

## **AUSTRALIAN PROFILE**

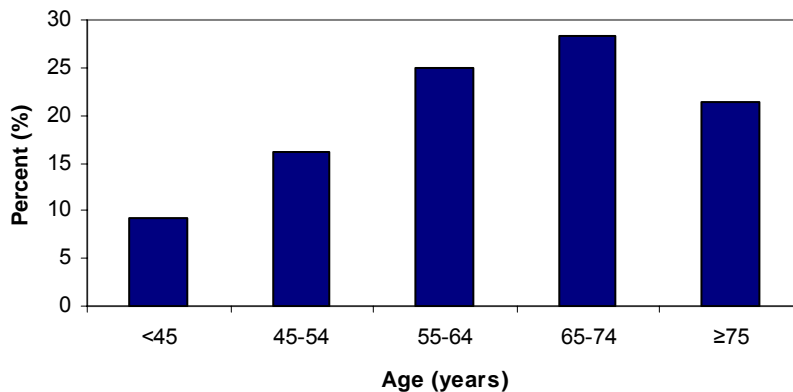
### *Prevalence*

There are two main sources of diabetes prevalence data for the Australian population: the Australian Diabetes, Obesity and Lifestyle Study (AusDiab), which estimated diabetes prevalence based on the measurement of blood glucose levels among participants and the 2004-05 National Health Survey, administered the Australian Bureau of Statistics (ABS), which is based on self-reported diabetes. The former is considered most accurate as it provides an estimate of the proportion of the population with undiagnosed diabetes.

The AusDiab study estimated that 3.7% of Australians 25 years and older had diagnosed diabetes and another 3.7% had undiagnosed diabetes in 2000-01 (Dunstan et al, 2002). The total national prevalence was thus 7.4% - 945,600 Australians - double the rate 20 years ago (Dunstan et al, 2002). The National Health Survey found type 2 diabetes occurred most commonly in individuals over 40 years of age (Dunstan et al, 2002), the prevalence increased with age and was highest

among those 65-74 years of age (ABS, 2006a) (Figure 1). While global data showed little gender difference in the prevalence of diabetes (IDF, 2006), more Australian men (14.7%<sup>1</sup>) were affected than Australian women (11.4%<sup>1</sup>).

**Figure 1:** Age-specific prevalence of self-reported type 2 diabetes in Australia, 2004-05



Source: (ABS, 2006a)

An estimated 16.3% of Australians had either impaired glucose tolerance or impaired fasting glucose, increasing their risk of developing type 2 diabetes in the future (Dunstan et al, 2002). Furthermore, 60% of the AusDiab study sample was either overweight or obese, which is an independent risk factor for type 2 diabetes. A further 30% had hypertension, which is a key correlate for type 2 diabetes (Dunstan et al, 2002).

The Indigenous population were more than three times as likely as the non-Indigenous populations to report some form of diabetes (ABS, 2006b). The prevalence of diagnosed diabetes among Indigenous Australians was 12.0% in 2004-05, a rate which is likely higher given the high proportion of undiagnosed diabetes in the population (AIHW, 2006).

Diabetes is disproportionately higher in Australia's immigrant population. For example, 29% of the Australian population was born overseas (ABS, 2004a) but 35% of individuals who reported having diabetes were not born in Australia (Holdenson et al, 2003). Again, this is likely an

<sup>1</sup> Age standardised prevalence (from AusDiab study) using 2001 Australian census data from ABS (ABS 2001).

underestimation given the high proportion of individuals with undiagnosed diabetes. The national patterns of diabetes prevalence ranged considerably depending on an individual's ethnicity and country of birth. The originating regions that accounted for the highest diabetes prevalence, incidence of insulin-treated diabetes and diabetes-related hospitalisations and/or mortality were: the South Pacific Islands; Southern Europe; Eastern Europe and Central Asia; the Middle East; North Africa and; Southern Asia (Holdenson et al, 2003).

Several indicators of socio-economic status (SES) have been used to assess the potential relationship between SES and diabetes prevalence. The 1999-2000 Australian Institute of Health and Welfare (AIHW) Health Report used educational attainment as an indicator of SES and reported no significant SES differences in the prevalence of diabetes in people 25 years of age and over (AIHW, 2004). This conflicted with the 2001 National Health Survey, which showed that the prevalence of self-reported diabetes was in fact twofold higher in the most disadvantaged areas of the country compared to less disadvantaged areas (ABS, 2002). This latter finding is further supported by a study conducted by the ABS, that found that the proportion of people with diabetes is higher in areas classified to experience greater disadvantage (ABS, 1999).

### ***Incidence***

Findings from the five year AusDiab follow-up study indicated that approximately eight in 1,000 Australians develop diabetes every year (Barr et al, 2006). Individuals with pre-diabetes were 10-20 times more likely to develop diabetes than those with normal blood glucose levels. These two factors, as well as the increasing number of new cases of obesity, the metabolic syndrome and kidney disease demonstrate that abnormal glucose metabolism is significantly impacting the health of the Australian population (Barr et al, 2006).

### ***Mortality***

In 2004, diabetes was the underlying cause of death for 3,599 deaths and was listed as an associated cause of death in 8,136 cases (AIHW, 2006). Where diabetes was listed as an associated cause of death, coronary heart disease was listed as the underlying cause of death in 30.5% of cases and stroke in 7.5% of cases (AIHW, 2006).

The death rate for diabetes increases with age. In 2004, 86.0% of people who died as a result of diabetes complications were over the age of 65 years and the average age at death for males and

females was 75 years and 79 years respectively for that year (AIHW, 2006). The age-standardised death rate for diabetes as the underlying cause of death was stable for males and slightly decreased for females over the period of 1997–2004 (AIHW, 2006) and was estimated as 19.3 per 100,000 and 13.4 per 100,000 respectively for 2005 (AIHW, 2007).

Among Indigenous Australians, both males and females experience significantly higher mortality from diabetes - in individuals 55-64 years of age the proportion of diabetes deaths is four times greater than that of non-indigenous individuals (ABS, 2005).

### ***Burden of disease***

Diabetes is acknowledged to be the most common reason for commencing renal dialysis, the most common cause of blindness in people under the age of 60 years; the most common cause of non-traumatic lower-limb amputation and a major cause of cardiovascular disease (Barr et al, 2006). Diabetes caused 5.5% of the total disease burden experienced in Australia in 2003, 143,800 DALYs, with type 2 diabetes representing 92% of this burden and diabetes-related complications representing 15% of the total burden (Begg et al, 2007). Type 2 diabetes was among the top five leading causes of disease burden in both males and females in this same year. The risk of disease burden associated with diabetes increased linearly in both sexes until the age of 85 years, after which it declined (Begg et al, 2007).

The ABS 2003 Survey of Disability, Aging and Carers found that 355,800 individuals who reported having diabetes, also reported experiencing a disability (ABS, 2004b). Of these, 85,900 reported diabetes as the main disabling condition and 148,400 reported having a severe or profound disability, meaning they required some level of assistance with their self-care, mobility and communication needs (ABS, 2004b).

Diabetes encounters represented 2.2% of all encounters managed by general practitioners in 2004-05, a rate of 3.2 per 100 encounters (Britt et al, 2003). It imposes a substantial burden on the Australian health care system in terms of direct expenditure on hospitalisations, aged and other care, medications, diagnostic services and other out-of-hospital medical care, including general practitioners and community health services (Dixon et al, 2006). An estimated \$2.2 billion is spent annually on individuals with type 2 diabetes who are over the age of 40 years (Colagiuri et al, 2003). Factoring in the indirect cost of carers and Commonwealth benefits provided to people with

diabetes, increases the total annual expenditure to about \$6 billion; a figure that does not include indirect costs associated with absenteeism and lost productivity due to premature mortality (Colagiuri et al, 2003).

In 2000-01, Australia allocated 1.7% of the national health care budget to diabetes care, including \$289 million on hospital services, \$183 million on out of hospital medical services and \$234 million on pharmaceuticals (Dixon et al, 2006). Expenditure was highest for individuals 45 years of age and older, but within this group, is greatest for those aged 75 years and older, where the risk for complications and the cost of management and care are greatest. Given that the age of onset of type 2 diabetes is decreasing, an associated increase in annual expenditure on diabetes management and care is expected.

### **DIABETES IN THE AUSTRALIAN CAPITAL TERRITORY AND WESTERN SYDNEY**

Information on the prevalence and burden of diabetes within the ACT and Western Sydney was taken from three main sources: 2004-05 National Health Survey; 2006 ACT Chief Health Officer Report; and 2005-06 SWAHS Annual Report. An additional source accessed was the Division of General Practice (DGP) Population Health Profiles, produced by the Public Health Information Development Unit (PHIDU), the University of Adelaide. This additional source provided data on chronic conditions and risk factors, including prevalence estimates, estimated from the 2001 National Health Survey, and so are based on self-report. Details of the model used to calculate these estimates are available from the PHIDU (PHIDU, 2007a; 2007b; 2007c; 2007d; 2007e). The numbers indicated are estimates for a DGP area, not measured events as are death statistics. Therefore, they should only be used as indicators of likely levels of a condition or risk factor in the given areas.

The ACT DGP covers the entire ACT area. There are four DGPs that cover the majority of the Sydney West Areas Health Service jurisdiction (the Lithgow Local Government Area is the only exception, which is covered by the New South Wales (NSW) Central West DGP): Blue Mountains, Hawkesbury-Hills (formerly Hawkesbury), Nepean and WentWest (formerly Western Sydney).

### The ACT

#### *Prevalence*

The prevalence of type 2 diabetes increased from 1995 to 2005. This increase has been attributed to the increasing prevalence among ACT males that occurred in this period. In 2004-05 the diabetes prevalence was approximately 3.8%, which was likely an underestimation of the true prevalence (ABS, 2006a). Among the individuals with type 2 diabetes in 2001, 73.0% were also overweight or obese, which can increase the risk of experiencing diabetes related complications (PHIDU, 2007a).

#### *Mortality*

Diabetes was among the top 15 leading causes of death in 2003, with 36 deaths with diabetes as the underlying cause of death, a death rate of 8.2 deaths per 100,000. The mortality rate remained fairly stable in the past decade and was well below the Australian death rate in 2003 (Dugdale et al, 2006). When combined with all cases where diabetes was listed as an associated cause of death, there were 87 diabetes-related deaths in total in ACT in 2003, with most deaths occurring in older individuals (Dugdale et al, 2006).

The PHIDU classifies deaths occurring before 75 years of age as premature deaths, given the current life expectancy in Australia. This is used as an indicator of the health status of an area. During 2000-02, 37 deaths were recorded as premature deaths, an annual rate of 5.1 per 100,000 population, which is comparable to the Western Sydney and Australian rates (Figure 2) (PHIDU, 2005a).

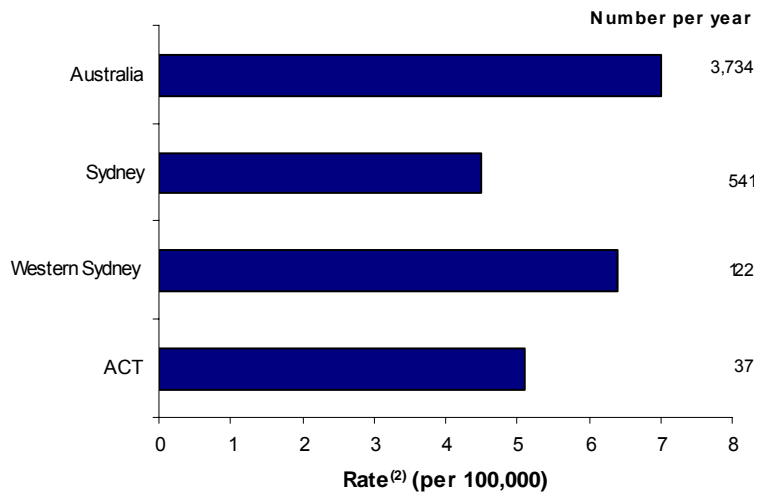
#### *Avoidable hospitalisations*

The PHIDU classifies avoidable hospitalisations as an indicator of the availability and accessibility of primary care in an area. It identifies conditions in which timely and effective care, delivered in primary care settings, could have reduced the risk of hospitalisation associated with a condition.

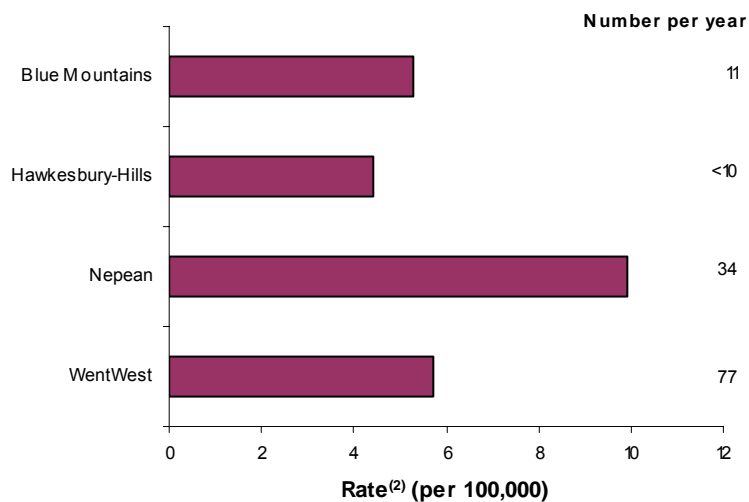
There were 1,151 avoidable hospitalisations due to diabetes complications in 2001-02, a rate of 421.4 per 100,000, which is well below the Western Sydney and Australian rates (Figure 3) (PHIDU, 2007a).

## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

**Figure 2a:** Rates of premature death due to diabetes for Australia, Sydney, Western Sydney<sup>(1)</sup> and the ACT, 2000-02



**Figure 2b:** Rates of premature death due to diabetes for the DGPs within Western Sydney, 2001-02



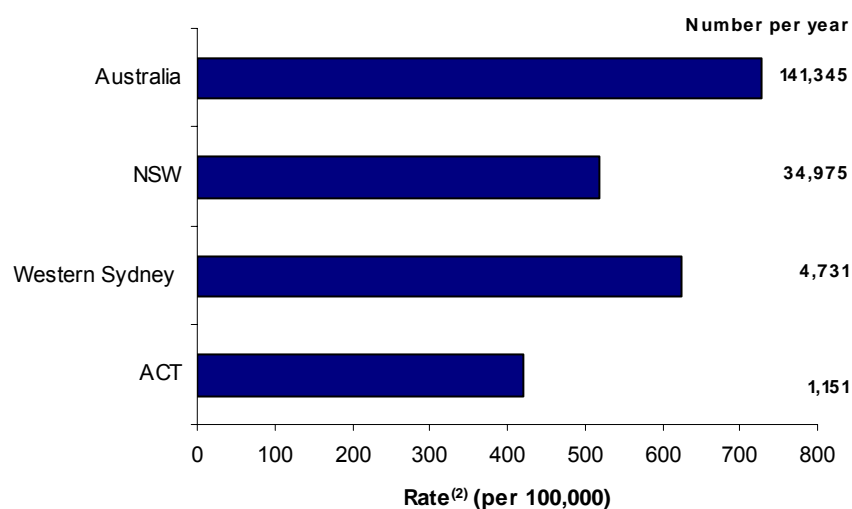
(1) Author's calculation from data from the Public Health Information Development Unit (PHIDU). Calculation does not include data from the Lithgow LGA. The Hawkesbury-Hills DGP has not been included in this aggregated rate as the number of premature deaths due to diabetes is less than 10 in this period for this DGP.

(2) Rate is the indirect age-standardised rate per 100,000 population.

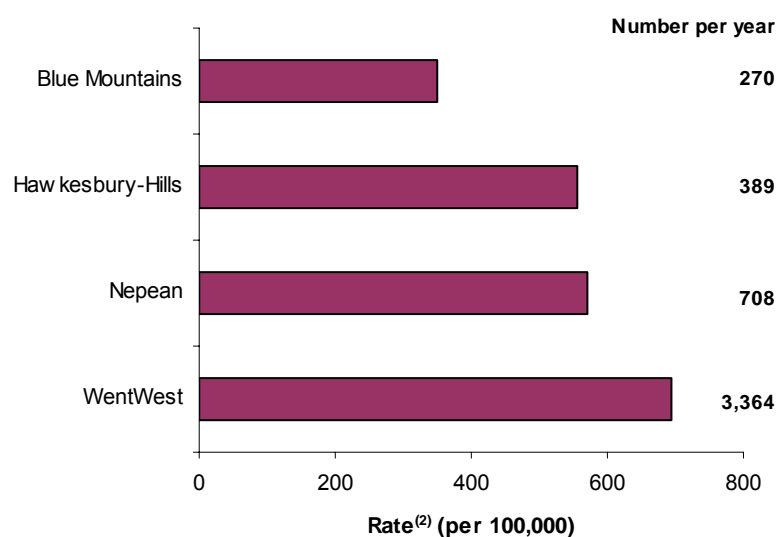
Source: (PHIDU, 2005a; 2005b; 2005c; 2005d; 2005e)

## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

**Figure 3a:** Avoidable hospitalisation rates for diabetes complications for Australia, NSW, Western Sydney<sup>(1)</sup> and the ACT, 2001-02



**Figure 3b:** Avoidable hospitalisation rates for diabetes complications for the DGPs within Western Sydney, 2001-02



(1) Author's calculation from data from the PHIDU. Calculation does not include data from the Lithgow LGA.

(2) Rate is the indirect age-standardised rate per 100,000 population.

Source: (PHIDU, 2007a; 2007b; 2007c; 2007d; 2007e)

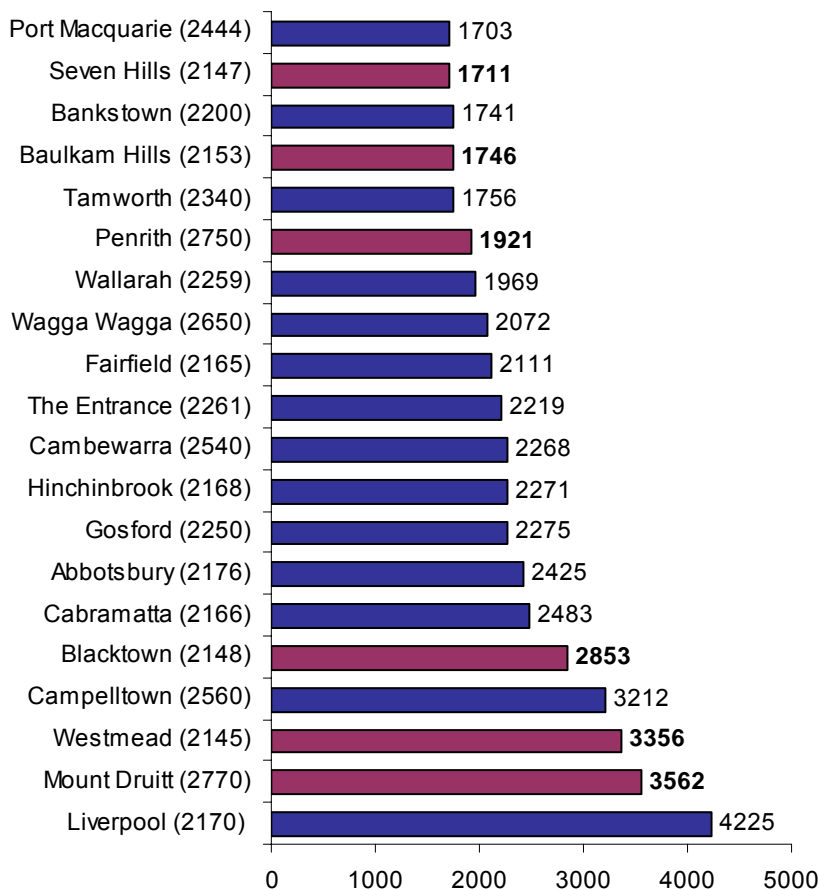
## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

### Western Sydney

#### *Incidence*

The National Diabetes Services Scheme (NDSS) records newly registered people with diabetes who are accessing services within a given area. This scheme may include individuals who are not newly diagnosed and so these data are indicative only and therefore cannot be viewed as true estimates of diabetes incidence. Figure 4 illustrates the postcodes within NSW that have the highest number of registered diabetes cases on the NDSS. Six of the top 20 postcodes are within the SWAHS, with Mt Druitt, Westmead and Blacktown among the top five geographical areas with the highest number of registered diabetes cases.

**Figure 4:** Top 20 post codes with highest number of registered diabetes cases on the NDSS



Postcodes within the SWAHS are coloured maroon have bolded numbers.

Source: (MHCS, 2006)

### *Prevalence*

The PHIDU approximated the prevalence of diabetes in the four Western Sydney DGPs from the 2001 National Health Survey results. From this, approximately 19,686 individuals were reported to have type 2 diabetes in 2001, a rate of 26.3 per 100,000 (PHIDU, 2007b; 2007c; 2007d; 2007e). Sixty-three percent of these individuals were also overweight or obese (PHIDU, 2007b; 2007c; 2007d; 2007e). The 2005-06 SWAHS Annual Report, also reported the prevalence of lifestyle risk factors for type 2 diabetes in the Western Sydney population. Obesity and overweight in this population increased from 44% in 1995 to 52% in 2005 (SWAHS, 2006). Similarly, the level of reported inactivity also increased from 44% in 1998 to 49% in 2005 (SWAHS, 2006). The only indication of diet was based on fruit and vegetable consumption. The proportion of SWAHS residents who intake the recommended quantity of fruits increased from 45% in 1997 to 49% in 2005, however the intake of vegetables is decreasing (SWAHS, 2006). These risk factor estimates may foreshadow future increases in diabetes in this area.

### *Mortality*

In 2000-02, approximately 122 deaths were recorded as premature deaths, an annual rate of 6.4 per 100,000 population, which was higher than the rate for the ACT area but lower than the overall Australian rate (Figure 2) (PHIDU, 2005a; 2005b; 2005c; 2005d; 2005e).

### *Avoidable hospitalisations*

There were 4,731 avoidable hospitalisations due to diabetes complications in the Western Sydney area in 2001-02, a rate of 625.0 per 100,000 (Figure 3) (PHIDU, 2007b; 2007c; 2007d; 2007e).

### *Co-morbidities*

Type 2 diabetes is commonly associated with other co-morbidities. Average co-morbidity in Western Sydney was consistent with NSW rates for the period of 1997-2000 (Table 1). Cardiovascular diseases were the most common co-morbidities associated with diabetes; 63% of cases had ischaemic heart disease, 20% of cases had heart failure and 18% of cases had other forms of heart disease (Table 1) (EIRE, 2004).

## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

**Table 1:** Selection of chronic illnesses and major co-morbidities in all ages, Western Sydney and NSW residents, 1997-2000.

<b>UNDERLYING CAUSE OF DEATH</b>	<b>WESTERN SYDNEY</b>		<b>NSW</b>	
	<b>Total as underlying cause</b>	<b>% co-existing condition</b>	<b>Total as underlying cause</b>	<b>% co-existing condition</b>
<b>Ischaemic heart disease (ICD10 I20-I25)</b>	3,361		39,538	
<i>Co-existing contributory causes:</i>				
Other forms of heart disease (I30-I49,I51,I52)		1,043 (31.0%)		12,054 (30.5%)
Heart failure* (I50)		720 (21.0%)		9,146 (23.1%)
All forms of diabetes (E10-E14)		388 (12.0%)		3,858 (9.7%)
Organic mental disorders (F00-F09)		240 (7.1%)		2,064 (5.2%)
<b>Diabetes* (E10,E11)</b>	125		1,322	
<i>Co-existing contributory causes:</i>				
Ischaemic heart disease (I20-I25)		79 (63.2%)		719 (54.4%)
Other forms of heart disease (I30-I49,I51,I52)		23 (18.4%)		282 (21.3%)
Heart failure* (I50)		25 (20%)		211 (15.8%)
<b>Heart Failure* (I50)</b>	282		4,108	
<i>Co-existing contributory causes:</i>				
Other forms of heart disease (I30-I49,I51,I52)		82 (29.1%)		852 (20.7%)
Pneumonia/influenza (J10-J18)		66 (23.4%)		1,132 (27.6%)
Renal failure (N17-N19)		68 (24.1%)		746 (18.2%)
Chronic lower respiratory disease (J40-J47)		45 (16.0%)		502 (12.2%)
Organic mental disorders (F00-F09)		27 (9.6%)		395 (9.6%)
Cerebrovascular disease (I60-I69)		27 (9.6%)		375 (9.1%)
Diabetes* (E10-E14)		38 (13.5%)		275 (6.7%)
<b>Pneumonia n influenza (J10-J18)</b>	188		2,704	
<i>Co-existing contributory causes:</i>				
Signs & symptoms (R50-R69)		32 (17.0%)		385 (14.2%)
Other forms of heart disease (I30-I49,I51,I52)		25 (13.3%)		260 (9.6%)
Heart failure* (I50)		18 (9.6%)		218 (8.1%)
Ischaemic heart disease (I20-I25)		23 (12.2%)		295 (10.9%)
Other bacterial diseases (A30-A49)		33 (17.6%)		323 (11.9%)
<b>Chronic obstructive pulmonary disease * (J44)</b>	521		6,614	
<i>Co-existing contributory causes:</i>				
Other forms of heart disease (I30-I49,I51,I52)		90 (17.3%)		867 (13.1%)
Heart failure* (I50)		104 (20.0%)		1,261 (19.1%)
Pneumonia/influenza (J10-J18)		135 (25.9%)		2,057 (31.1%)
Ischaemic heart disease (I20-I25)		112 (21.5%)		1,131 (17.1%)

\* SCIPPS index conditions.

Source: (EIRE, 2004)

### CONCLUSION

This document summarises what is currently known about the epidemiological profile of diabetes globally and within Australia. The focus on the ACT and Western Sydney areas provides a backdrop for the consideration of the issues that are raised and addressed in the SCIPPS project. This information highlights the fact that diabetes is a common and continuing problem that poses a substantial burden associated with disability in the study areas.

A number of issues discussed here are relevant to the development of effective policies to better manage diabetes and its associated complications, these include: the increasing incidence of key lifestyle risk factors may suggest an increase in the prevalence of diabetes within the next decade; the risk of diabetes complications increases with age, at which point they become harder and more expensive to manage; individuals are increasingly developing type 2 diabetes at younger ages, resulting in a heavier disease burden during the productive years; and most importantly, diabetes contributes to a number of other diseases, all of which further complicate the effective management of this condition.

The disproportionate prevalence of diabetes among many immigrant populations and among Indigenous Australians also indicates a need to ensure equitable access to services to effectively manage diabetes. This is particularly relevant within Western Sydney, as this area has both the largest new immigrant population in all of New South Wales and is also where Australia's largest Indigenous urban communities reside.

Finally, there is a large body of high quality evidence about which practices and processes of clinical care lead to the best diabetes outcomes, most of which has been synthesised into National Health and Medical Research Council Guidelines. Despite this, only about 20% of people in with diabetes in Australia receive the recommended annual cycle of assessments and care and there is emerging evidence that increasing co-payments for health care and medications is seriously hindering people in lower socioeconomic categories from complying with medication and self care regimens. These factors directly impact on how effectively individuals are able to manage their condition. In addition to the areas previously identified, there is also a need to develop policy solutions that enable individuals to access the recommended standards of treatment and support services recommended by the current clinical guidelines.

## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

---

### References:

- ABS. Health Status: Health & socioeconomic disadvantage of area. Australian Social Trends, 1999, Cat. No: 4102.0 Canberra: Australian Bureau of Statistics, 1999.  
<http://www.abs.gov.au/ausstats/abs@.nsf/2f762f95845417aeca25706c00834efa/21a26c94c69f98daca2570ec00112610!OpenDocument> (accessed 30.30.2007).
- ABS. 2001 National Health Survey: Summary of results. Cat. No. 4364.0. Canberra: Australian Bureau of Statistics, 2002.  
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/allprimarymainfeatures/0E3F9F6786419026CA25711F0008D22F?opendocument> (accessed 30.06.2007).
- ABS. Australian Social Trends, 2004, Cat. No: 4102.0. Canberra: Australian Bureau of Statistics, 2004a.  
<http://www.abs.gov.au/Ausstats/abs@.nsf/0/999B9257FAE07DF5CA256E9E00263527?opendocument> (accessed 30.05.2007).
- ABS. Disability, aging and carers, Australia: Summary of findings. Cat. No. 4430.0. Canberra: Australian Bureau of Statistics, 2004b.  
[http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/Lookup/978A7C78CC11B702CA256F0F007B1311/\\$File/44300\\_2003.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/Lookup/978A7C78CC11B702CA256F0F007B1311/$File/44300_2003.pdf) (accessed 26.06.2007).
- ABS. The Health and Welfare of Australia's Aboriginal and Torres Strait Islander Peoples, 2005. Cat. No: 4704.0. Canberra: Australian Bureau of Statistics and Australian Institute of Health and Welfare 2005.  
<http://www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4704.0Main+Features12005?OpenDocument> (accessed 04.04.2007).
- ABS. 2004-05 National Health Survey: Summary of results. Cat. No. 4364.0. Canberra: Australian Bureau of Statistics, 2006a.  
[http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/3B1917236618A042CA25711F00185526/\\$File/43640\\_2004-05.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/3B1917236618A042CA25711F00185526/$File/43640_2004-05.pdf) (accessed 20.06.2007).
- ABS. National Aboriginal and Torres Strait Islander Health Survey, 2004-05, Cat. No: 4715.0 Canberra: Australian Bureau of Statistics, 2006b.  
[http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/B1BCF4E6DD320A0BCA25714C001822BC/\\$File/47150\\_2004-05.pdf](http://www.ausstats.abs.gov.au/ausstats/subscriber.nsf/0/B1BCF4E6DD320A0BCA25714C001822BC/$File/47150_2004-05.pdf) (accessed 13.06.2007).
- AIHW. Heart, stroke and vascular diseases, Australian facts 2004. Canberra: Australian Institute of Health and Welfare, 2004. <http://www.aihw.gov.au/publications/cvd/hsvd04/hsvd04.pdf> (accessed 21.05.2007).
- AIHW. Australia's Health 2006, no 10. Canberra: Australian Institute of Health and Welfare, 2006.  
<http://www.aihw.gov.au/publications/index.cfm/title/10321> (accessed 03.04.2007).
- AIHW. Latest Mortality Data: Overview. Canberra: Australian Institute of Health and Welfare, 2007.  
[http://www.aihw.gov.au/mortality/data/current\\_data.cfm](http://www.aihw.gov.au/mortality/data/current_data.cfm) (accessed 26.06.2007).
- Barr E, Magliano D, Zimmet P, Polkinghorne K, Atkins R, Dunstan D, Murray S, Shaw J. AusDiab 2005: The Australian Diabetes, Obesity and Lifestyle Study. Tracking the accelerating epidemic: Its causes and outcomes. 2006. [http://www.diabetes.com.au/pdf/AUSDIAB\\_Report\\_Final.pdf](http://www.diabetes.com.au/pdf/AUSDIAB_Report_Final.pdf) (accessed 01.08.2007).
- Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez A. The burden of disease and injury in Australia 2003. Canberra, 2007. <http://www.aihw.gov.au/publications/hwe/bodaiia03/bodaiia03.pdf> (accessed 06.07.2007).

## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

---

Britt H, Miller G, Knox S, Charles J, Valenti L, Henderson J, Pan Y, Bayram C, Harrison C. General practice activity in Australia 2002-03. Canberra, 2003. <http://www.aihw.gov.au/publications/gep/gpaa02-03/gpaa02-03.pdf> (accessed June 26).

Colagiuri S, Colagiuri R, Conway B, Grainger D, Davey P. DiabCo\$t Australia: Assessing the burden of Type 2 Diabetes in Australia. Canberra: Diabetes Australia, 2003. [http://www.diabetes.net.au/PDF/ACDS20031212\\_DiabCost\\_Report\\_03\\_SCREEN.pdf](http://www.diabetes.net.au/PDF/ACDS20031212_DiabCost_Report_03_SCREEN.pdf) (accessed 30.04.2007).

Colagiuri S, Zimmet P, Hepburn A, Colagiuri R. Evidence based guidelines for type 2 diabetes: Case detection and diagnosis. Diabetes Australia and National Health and Medical Research Council. Canberra, 2002. [http://www.nhmrc.gov.au/publications/synopses/\\_files/di9.pdf](http://www.nhmrc.gov.au/publications/synopses/_files/di9.pdf) (accessed 31.07.2007).

Dixon T, Webbie K. The national system for monitoring diabetes in Australia. Canberra: Australia Institute of Health and Welfare, 2006. <http://www.aihw.gov.au/publications/index.cfm/title/10219> (accessed 03.04.2007).

Dugdale P, Guest C, Kelsall L. ACT Chief Health Officer's Report. Canberra, 2006. <http://www.health.act.gov.au/c/health?a=sendfile&ft=p&fid=1155002538&sid=> (accessed 15.06.2007).

Dunstan DW, Zimmet PZ, Welborn TA, De Courten MP, Cameron AJ, Sicree RA, Dwyer T, Colagiuri S, Jolley D, Knuiman M, Atkins R, Shaw JE. The rising prevalence of diabetes and impaired glucose tolerance: the Australian Diabetes, Obesity and Lifestyle Study. *Diabetes Care*. 2002; 25: 829-34.

EIRE. Heart Failure in Western Sydney. EIRE short report series, June 2004. Sydney: Sydney West Area Health Service: Centre for Epidemiology, Indicators, Research and Evaluation, 2004. [http://www.wsahs.nsw.gov.au/services/dsdph/Epi/Publicat/CCF\\_V4.pdf](http://www.wsahs.nsw.gov.au/services/dsdph/Epi/Publicat/CCF_V4.pdf) (accessed 30.04.2007).

Holdenson Z, Catanzariti L, Phillips G, Waters A-M. A picture of diabetes in overseas-born Australians. Canberra: Australian Institute of Health and Welfare, 2003. <http://www.aihw.gov.au/publications/index.cfm/title/9390> (accessed 04.03.2007).

IDF. Diabetes Atlas, 3rd Edition. Brussels: International Diabetes Federation, 2006.

King H, Aubert RE, Herman WH. Global burden of diabetes, 1995-2025: prevalence, numerical estimates, and projections. *Diabetes Care*. 1998; 21: 1414-1431.

Mathers C, Lopez A, Murray C. Global burden of disease and risk factors. The burden of disease and mortality by condition: Data, methods and results for 2001. Geneva: World Health Organisation, 2001. <http://files.dcp2.org/pdf/GBD/GBD03.pdf> (accessed 05.05.2007).

MHCS. Analysis of National Diabetes Services Scheme data from Culturally And Linguistically Diverse (CALD) communities. Multicultural Health Communication Services, NSW, 2006. (accessed 02.04.2007).

PHIDU. Population health profile of the ACT Division of General Practice. Population Profile Series No. 119. Adelaide, 2005a. [http://www.publichealth.gov.au/pdf/profiles/2005/222\\_ACT\\_DGP.pdf](http://www.publichealth.gov.au/pdf/profiles/2005/222_ACT_DGP.pdf) (accessed 13.06.2007).

PHIDU. Population health profile of the Blue Mountains Division of General Practice. Population Profile Series No. 35. Adelaide, 2005b. [http://www.publichealth.gov.au/pdf/profiles/2005/238\\_Blue\\_Mountains\\_DGP.pdf](http://www.publichealth.gov.au/pdf/profiles/2005/238_Blue_Mountains_DGP.pdf) (accessed 13.06.2007).

## SERIOUS AND CONTINUING ILLNESS POLICY AND PRACTICE STUDY

---

PHIDU. Population health profile of the Hawkesbury Division of General Practice. Population Profile Series No. 36. Adelaide, 2005c. [http://www.publichealth.gov.au/pdf/profiles/2005/240\\_Hawkesbury\\_DGP.pdf](http://www.publichealth.gov.au/pdf/profiles/2005/240_Hawkesbury_DGP.pdf) (accessed 13.06.2007).

PHIDU. Population health profile of the Nepean Division of General Practice. Population Profile Series No. 34. Adelaide, 2005d. [http://www.publichealth.gov.au/pdf/profiles/2005/237\\_Nepean\\_DGP.pdf](http://www.publichealth.gov.au/pdf/profiles/2005/237_Nepean_DGP.pdf) (accessed 13.06.2007).

PHIDU. Population health profile of the Western Sydney Division of General Practice. Population Profile Series No. 6. Adelaide, 2005e. [http://www.publichealth.gov.au/pdf/profiles/2005/206\\_Western\\_Sydney\\_DGP.pdf](http://www.publichealth.gov.au/pdf/profiles/2005/206_Western_Sydney_DGP.pdf) (accessed 13.06.2007).

PHIDU. Population health profile of the ACT Division of General Practice: supplement. Population Profile Series: No. 119a. Adelaide, 2007a. [http://www.publichealth.gov.au/pdf/profiles/2007/222\\_ACT\\_supp.pdf](http://www.publichealth.gov.au/pdf/profiles/2007/222_ACT_supp.pdf) (accessed 30.05.2007).

PHIDU. Population health profile of the Blue Mountains Division of General Practice: supplement. Population Profile Series: No. 35a. Adelaide, 2007b. [http://www.publichealth.gov.au/pdf/profiles/2007/238\\_Blue\\_Mountains\\_supp.pdf](http://www.publichealth.gov.au/pdf/profiles/2007/238_Blue_Mountains_supp.pdf) (accessed 30.05.2007).

PHIDU. Population health profile of the Hawkesbury-Hills Division of General Practice (formerly Hawkesbury DGP): supplement. Population Profile Series: No. 36a. Adelaide, 2007c. [http://www.publichealth.gov.au/pdf/profiles/2007/240\\_Hawkesbury-Hills\\_supp.pdf](http://www.publichealth.gov.au/pdf/profiles/2007/240_Hawkesbury-Hills_supp.pdf) (accessed 30.05.2007).

PHIDU. Population health profile of the Nepean Division of General Practice: supplement. Population Profile Series: No 34a. Adelaide, 2007d. [http://www.publichealth.gov.au/pdf/profiles/2007/237\\_Nepean\\_supp.pdf](http://www.publichealth.gov.au/pdf/profiles/2007/237_Nepean_supp.pdf) (accessed 30.05.2007).

PHIDU. Population health profile of the WentWest Division of General Practice (formerly Western Sydney DGP): supplement. Population Profile Series: No. 6a. Adelaide, 2007e. [http://www.publichealth.gov.au/pdf/profiles/2007/206\\_WentWest\\_supp.pdf](http://www.publichealth.gov.au/pdf/profiles/2007/206_WentWest_supp.pdf) (accessed 30.05.2007).

Roglic G, Unwin N, Bennett PH, Mathers C, Tuomilehto J, Nag S, Connolly V, King H. The Burden of Mortality Attributable to Diabetes: Realistic estimates for the year 2000. *Diabetes Care*. 2005; 28: 2130-2135.

SWAHS. Annual Report 2005-2006: Care first. Sydney: Sydney West Area Health Service, 2006. <http://www.wsahs.nsw.gov.au/services/publicaffairs/documents/AnnualReport0506.pdf> (accessed 25.06.2007).

WHO. Definition and diagnosis of diabetes mellitus and intermediate hyperglycaemia. World Health Organisation and International Diabetes Federation, 2006. [http://www.idf.org/webdata/docs/WHO\\_IDF\\_definition\\_diagnosis\\_of\\_diabetes.pdf](http://www.idf.org/webdata/docs/WHO_IDF_definition_diagnosis_of_diabetes.pdf) (accessed 08.06.2007).

Wild S, Roglic G, Green A, Sicree R, King H. Global prevalence of diabetes: estimates for the year 2000 and projections for 2030. *Diabetes Care*. 2004; 27: 1047-53.