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# **Diabetes expenditure in Australia 2008–09**



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*Authoritative information and statistics  
to promote better health and wellbeing*

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Australian Institute of Health and Welfare  
Canberra

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**Please note that there is the potential for minor revisions of data in this report. Please check the online version at <[www.aihw.gov.au](http://www.aihw.gov.au)> for any amendments.**

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# Abbreviations

|        |                                                          |
|--------|----------------------------------------------------------|
| AIHW   | Australian Institute of Health and Welfare               |
| BEACH  | Bettering the Evaluation and Care of Health              |
| COAG   | Council of Australian Governments                        |
| CVD    | Cardiovascular disease                                   |
| GDM    | Gestational diabetes mellitus                            |
| GP     | general practitioner                                     |
| ICD-10 | International Classification of Diseases, tenth revision |
| IGR    | Impaired glucose regulation                              |
| JDRF   | Juvenile Diabetes Research Foundation                    |
| MBS    | Medicare Benefits Schedule                               |
| NDSS   | National Diabetes Service Scheme                         |
| NHCDC  | National Hospital Cost Data Collection                   |
| NHMD   | National Hospital Morbidity Database                     |
| NHS    | National Health Survey                                   |
| NPHEd  | National Public Hospitals Establishment Database         |
| PBS    | Pharmaceutical Benefits Scheme                           |
| RPBS   | Repatriation Pharmaceutical Benefits Scheme              |

# Symbols

|      |                                                                                                           |
|------|-----------------------------------------------------------------------------------------------------------|
| –    | nil or rounded to zero                                                                                    |
| ..   | not applicable                                                                                            |
| n.a. | not available                                                                                             |
| n.p. | not publishable because of small numbers, confidentiality or other concerns about the quality of the data |

# Summary

This report presents information on expenditure for diabetes in Australia in 2008–09, as well as information on how this expenditure has changed in the last decade and how it is expected to grow in the future. Expenditure is presented by sex, age and diabetes type for 2000–01 to 2008–09. The report also looks at how per service expenditure differs from per capita expenditure across age groups and by diabetes type.

The report is based primarily on recurrent diabetes expenditure for the health-care sectors hospital admitted patient services, out-of-hospital medical expenses, and blood glucose lowering medications. There is also a section on additional expenditure that mainly reports on funding of government programs to help manage diabetes in the community and funding for research into the disease.

It should be noted that not all health-care expenditure can be allocated to a specific disease because expenditure in areas such as capital works or administration is common to all diseases. For this reason, the estimates in the report are based on about 70% of total health-care expenditure. There are other limitations to the data and these are explained in the Methods section of the report.

## Main findings

- In 2008–09, estimated expenditure for diabetes, allocated by health-care sector, totalled \$1,507 million – 2.3% of all allocated health-care expenditure in Australia. An additional \$153 million was spent on government programs and subsidies, research and gestational diabetes programs.
- Diabetes expenditure increased by 86% between 2000–01 and 2008–09 while expenditure for all diseases increased by 60% in the same period.
- Type 2 diabetes accounted for at least 60% of diabetes expenditure in 2008–09.
- In 2008–09, diabetes expenditure for hospital admitted patient services was conservatively estimated at \$647 million, for out-of-hospital medical expenses it was \$362 million and for blood glucose lowering medications it was \$498 million.
- After adjusting for inflation, the biggest increase in diabetes health-care expenditure from 2000–01 to 2008–09 was for hospital admitted patient services – expenditure more than doubled, from \$300 million to \$647 million.

# Introduction

Diabetes is a significant health problem in Australia. It was the main cause of 4,170 deaths in 2009 (3% of all deaths) and an associated cause in many more, contributing to 1 out of every 10 deaths (AIHW 2012a). Between 1997 and 2007, diabetes was a particularly common contributory cause for deaths involving chronic and unspecified kidney failure (20%), coronary heart disease (16%) and asthma (16%) (AIHW 2012b). The most recent estimate of the number of Australians with diabetes is around 986,900, or 4.5% of the Australian population (ABS 2012), but the true burden of disease is thought to be much greater because many more of those with diabetes may be unaware that they have the condition. For example, the 2009–10 Victorian Health Monitor suggests that for every three diagnosed cases of diabetes in Victoria, there is one undiagnosed case (Victorian Department of Health 2012). Diabetes generates a considerable economic burden, both at an individual level and to the Australian health-care system.

The report updates expenditure information in the Australian Institute of Health and Welfare (AIHW) publication *Diabetes Australian facts 2008* (AIHW 2008). Most data are drawn from the AIHW Disease Expenditure Database and presented by age, sex and type of diabetes for 2008–09. Changes in expenditure for 2000–01 to 2008–09 are also examined and additional information on diabetes treatment products, gestational diabetes programs and government-funded projects and research is included.

Between 2000–01 and 2008–09, allocated health-care expenditure for diabetes increased from \$811 million to \$1,507 million, an increase of 86%. For all diseases, the comparable increase in expenditure was 60%. Diabetes expenditure increased from 2.0% to 2.3% of expenditure for all diseases over this period.

The increasing prevalence of diabetes in Australia is influenced by a number of factors, including an ageing population (noting that diabetes prevalence increases with age), increases in the number of new cases (incidence) of diabetes (which is being driven primarily by increases in obesity), and decreasing mortality rates among those with diabetes. Immigration from countries with higher diabetes prevalence rates may also have served to increase diabetes prevalence in Australia (Magliano et al. 2009).

It is estimated that as a result of ageing alone, the number of people with Type 2 diabetes will double between 2000 and 2051 and health-care costs for diabetes will increase 2.5 times. In addition, if obesity and inactivity prevalence rates continue to rise, the financial burden of treating Type 2 diabetes could quadruple by 2051 (Davis et al. 2006).

### Box 1: Diabetes in Australia

Based on self-reported data from the Australian Bureau of Statistics' 2011-12 Australian Health Survey, an estimated 986,900 Australians had been diagnosed with diabetes (excluding gestational diabetes) at some time in their lives. This represented 4.5% of the Australian population. Of those diagnosed, 54% were male and 46% were female.

#### Type 1 diabetes

- An estimated 113,400 people had Type 1 diabetes (12% of people with diabetes).
- Of those with Type 1 diabetes, around 68,600 (60%) were male and 44,800 (40%) were female.

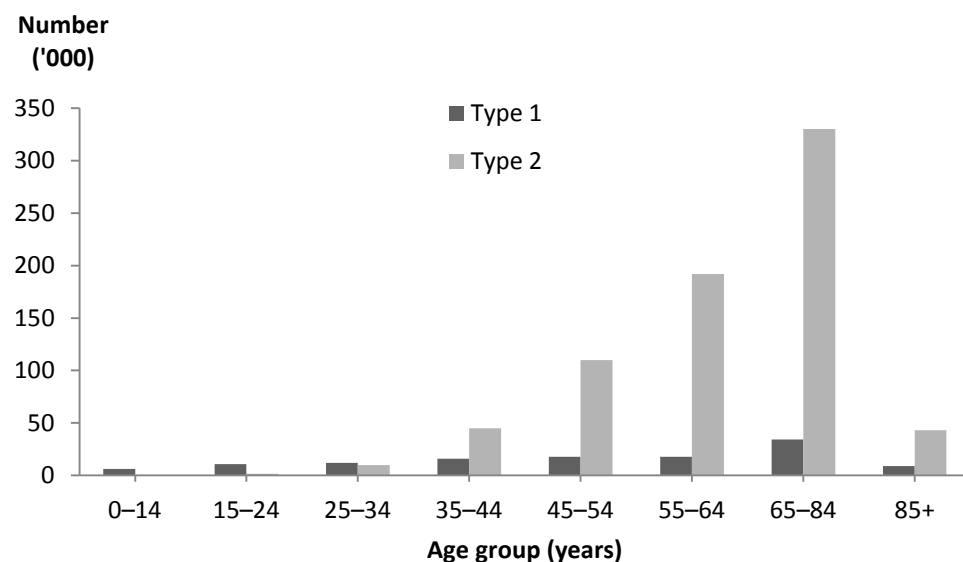
#### Type 2 diabetes

- An estimated 842,300 people had Type 2 diabetes (85% of people with diabetes).
- Of those with Type 2 diabetes, around 448,200 (53%) were male and 394,100 (47%) were female.

#### Age distribution

The age distribution of people with Type 1 and Type 2 diabetes was derived from the National Diabetes Services Scheme (NDSS) as at 30 June 2009.

- The number of people with Type 1 diabetes increased steadily with age, from 16,803 in the 0 to 24 year age group to 43,195 of those aged 65 and over. About 50% of those with Type 1 diabetes were aged 55 and over.
- The number of people with Type 2 diabetes also increased with age, from 1,974 of those aged 0 to 24 to 373,532 of those aged 65 and over. About 77% of those with Type 2 diabetes were aged 55 and over.



Source: AIHW analysis of the National Diabetes Services Scheme database.

Figure 1: Number of people with diabetes, by diabetes type and age group, 30 June 2009

# Methods

The expenditure estimates reported here provide a broad picture of the use of health system resources classified by disease. The method for estimating disease expenditure is generally a 'top-down' approach where total expenditure across the health system is estimated and then allocated to the relevant conditions. Although this method yields consistency, good coverage and totals that add up to known expenditures, it is not as sensitive or accurate for any specific disease as a detailed 'bottom-up' analysis of actual costs incurred by patients with that disease. In most cases, however, a bottom-up analysis is not possible due to a lack of data.

The predominant source of information for this report is the AIHW Disease Expenditure Database. It provides a broad picture of the use of health system resources classified by disease group, and is a reference source for planners and researchers interested in costs and use patterns for particular disease groups. These results are also useful for comparing expenditure for different diseases and for ranking diseases by levels of expenditure. Estimates in the Disease Expenditure Database are derived by combining information from the National Hospital Morbidity Database (NHMD), the National Public Hospitals Establishments Database (NPHED), the Health Expenditure Database, the National Hospital Cost Data Collection (NHCDC) and the Bettering the Evaluation and Care of Health (BEACH) survey. The AIHW is continually seeking to improve the methods used to produce these estimates. As a consequence, disease expenditure estimates are subject to revision and the most recently published results may not be comparable with previously published data.

The Disease Expenditure Database contains estimates of expenditure by disease category, age group and sex for admitted patient hospital services, out-of-hospital medical services, prescription pharmaceuticals, optometrical and dental services, community mental health services and public health cancer screening. (Note that throughout this report prescription pharmaceuticals are referred to as blood glucose lowering medications. This change was made to make it clear that only expenditure for medications to treat diabetes has been included and that expenditure for other medications that a person with diabetes may be taking – to treat a co-existing condition – is not included in this report.)

A data quality statement for the Disease Expenditure Database is in Appendix A. This provides information on a range of aspects of the quality of the data being reported by the AIHW and is included to assist readers in understanding the limitations of the data and in making informed judgments about their use of the data.

It is not possible to allocate all expenditure on health goods and services by disease. Expenditure that could not be allocated by disease includes: capital expenditure, non-admitted patient hospital services, over-the-counter drugs, other health practitioner services (except optometry), community health services expenditure (except community mental health), expenditure on public health programs (except cancer screening programs), health administration, health aids and appliances, and patient transport (ambulance). As a result, the estimates in this report are conservative as they are based on the approximately 70% of total direct health expenditure that can be allocated by disease (AIHW 2010). Diabetes health-care expenditure for high-level residential aged care is not included in this report because it is categorised as a welfare sector rather than a health-care sector.

Readers need to bear in mind that cost-of-illness data only provide estimates of the impact a disease has on health system expenditures. The estimates of the cost of treating and/or

preventing a disease cannot be used to indicate the loss of health due to that disease, or to understand other effects, such as loss of productivity.

Care should be taken not to interpret expenditure associated with disease treatment as simply an estimate of the savings that would result from prevention of disease. Conversion of the opportunity cost – or the benefits forgone – of resources being devoted to disease treatment into expenditure savings involves a number of additional considerations. See, for example, AIHW: Mathers & Penm 1998.

## Hospital admitted patients

Expenditure for hospital admitted patient services is based on hospital separations (episodes of care) and is allocated to the International Classification of Diseases, tenth revision (ICD-10) code recorded as the principal diagnosis for each separation. No expenditure is allocated for additional diagnoses. In 2009–10, diabetes was a principal diagnosis in 96,166 hospitalisations and an additional diagnosis in a further 248,514 (AIHW 2012a), which suggests that expenditure for hospital admitted patient services is likely to be a conservative estimate of the true level of diabetes-related expenditure.

In this report, expenditure was assigned to diabetes when the principal diagnosis was either ICD-10 AM code E10 (Type 1 diabetes mellitus), E11 (Type 2 diabetes mellitus), E13 (Other specified diabetes mellitus) or E14 (Unspecified diabetes mellitus). Diabetic complications that are included in the ICD-10 as subtypes of ICD-10 codes E10–E14 were included in this assessment under the appropriate diagnostic code (Table 1). Unless specifically assigned to diabetes as a principal diagnosis, expenditure on complications of diabetes, such as heart or kidney disease, is allocated to those diseases and is not included in diabetes expenditure. If, for example, the principal diagnosis for a hospital separation was cardiovascular disease (CVD) with an additional diagnosis of diabetes, then all the expenditure associated with that separation would be counted as expenditure for CVD and the expenditure associated with treating the diabetes in that patient while they were in hospital would not be captured. By way of illustration, in 2008–09, about 23% of hospitalisations with a principal diagnosis of chronic kidney disease had an additional diagnosis of diabetes.

**Table 1: Principal diagnosis ICD-10 AM codes used for hospital admitted patient services**

| ICD-10 AM code                                 | Description                                          |
|------------------------------------------------|------------------------------------------------------|
| E10                                            | Type 1 diabetes mellitus                             |
| E11                                            | Type 2 diabetes mellitus                             |
| E13                                            | Other specified diabetes mellitus                    |
| E14                                            | Unspecified diabetes mellitus                        |
| Subtypes of ICD-10 codes E10, E11, E13 and E14 |                                                      |
| E'x'.0                                         | Diabetes mellitus with hyperosmolarity               |
| E'x'.1                                         | Diabetes mellitus with acidosis                      |
| E'x'.2                                         | Diabetes mellitus with kidney complication           |
| E'x'.3                                         | Diabetes mellitus with ophthalmic complication       |
| E'x'.4                                         | Diabetes mellitus with neurological complication     |
| E'x'.5                                         | Diabetes mellitus with circulatory complication      |
| E'x'.6                                         | Diabetes mellitus with others specified complication |
| E'x'.7                                         | Diabetes mellitus with multiple complications        |

Note: 'x' can equal 10, 11, 13 or 14. For example, E10.0 refers to Type 1 diabetes mellitus with hyperosmolarity.

Cases where the principal diagnosis was Impaired glucose regulation (IGR) (ICD-10 AM code E09) or Diabetes mellitus in pregnancy, childbirth, and the puerperium (ICD-10 AM code O24), were not included in the totals for diabetes. IGR was omitted because, although it is a risk factor for diabetes, it is not considered to be a condition in its own right and ICD-10 code O24, which includes gestational diabetes mellitus (GDM) and pre-existing diabetes mellitus in pregnancy, is an obstetrics code. In this case, all expenditure associated with O24 is recorded as obstetrics expenditure rather than diabetes expenditure. See ICD-10 AM coding for further information (WHO 2010). In 2008–09, there were 48,000 hospital separations with either a principal or additional diagnosis of gestational diabetes. GDM-related expenditure is considered separately in the 'Additional expenditure not allocated by health-care sector' section of this report.

## Out-of-hospital medical services and blood glucose lowering medications

Diabetes expenditure estimates for out-of-hospital medical services and blood glucose lowering medications presented in this report are derived using the BEACH survey in conjunction with data from a number of other sources including the Medicare Benefits Schedule (MBS), Pharmaceutical Benefits Scheme, Repatriation Pharmaceutical Benefits Scheme, and script volumes for private and under co-payment drugs. The BEACH data were collected by the Family Medicine Research Centre of the University of Sydney under a previous collaboration with the AIHW.

For out-of-hospital medical services, the BEACH survey data were aggregated over 3 years to estimate the proportion of general practitioner (GP) encounters in which diabetes was a 'problem managed'. This proportion was then applied to the MBS data for the reference year. Based on this method, expenditure can be allocated for GP visits and referrals to medical specialists, pathology and imaging. With the exception of diabetes educators, expenditure for allied health services has not been allocated for diabetes. An independent study assessing the

burden of Type 1 diabetes in Australia estimates expenditure for allied health professionals at 4.8% of direct health-care costs (Colagiuri et al. 2009).

For blood glucose lowering medications, the BEACH survey data were aggregated over 3 years to allocate expenditure on prescription drugs to each disease group based on the problems managed in the GP encounter that related to the prescribing of a particular drug. The Anatomical Therapeutic Chemical Classification System codes were mapped to codes for prescription drugs used in the BEACH survey. Time series comparisons for both out-of-hospital medical services and blood glucose lowering medications should be treated with caution because GP prescription and referral patterns may have varied over time.

Only drugs prescribed specifically for diabetes (namely insulin, oral hypoglycaemic agents and some newer blood glucose lowering medications) are included in the expenditure in this report. The cost of medications prescribed for the management of conditions associated with diabetes, such as high blood pressure, are not included. The DiabCo\$t Australia project estimates that for patients with Type 2 diabetes, insulin and oral hypoglycaemic agents accounted for only 21% of medication costs, with the majority coming from non-diabetes medications such as lipid lowering and blood pressure lowering agents (Colagiuri et al. 2003). In a 2002 study, expenditure for non-blood glucose lowering medications were estimated to be 26% of total direct health-care costs incurred by Australians with Type 2 diabetes (Davis et al. 2005).

# Diabetes expenditure

## Expenditure allocated by health-care sector

From the data available, in 2008–09, diabetes was the 14th most expensive disease in Australia, accounting for 2.3% of total recurrent health-care expenditure for all diseases; that is, \$1,507 million of the \$65,129 million spent for all diseases (Table 2).

### Hospital admitted patient services

The health-care sector with the highest level of diabetes-related expenditure in 2008–09 was hospital admitted patient services (\$647 million), accounting for nearly 43% of total health-care expenditure for diabetes. More than 85,000 separations were provided under hospital admitted patient services, at an average expenditure of just under \$7,600 each.

### Blood glucose lowering medications

Expenditure for blood glucose lowering medications was next highest at \$498 million, accounting for about one-third of total health-care expenditure for diabetes. Nearly 10.6 million prescriptions were dispensed, at an average expenditure of \$47 each.

### Out-of-hospital medical expenses

Out-of-hospital medical expenses accounted for a further \$362 million, under which nearly 8.7 million services were provided, at an average expenditure of \$42 per service.

Expenditure for diabetes is distributed differently to that for all diseases. For example, nearly 43% of total diabetes health-care expenditure was allocated to hospital admitted patient services, proportionally much less than the 59% of all diseases expenditure allocated to this health-care sector. Conversely, 33% of diabetes expenditure was allocated to blood glucose lowering medications compared with the 16% for all diseases. About the same proportion of total expenditure (24%) was allocated for out-of-hospital medical expenses for both diabetes and all diseases (Table 2).

**Table 2: Diabetes and all disease expenditure by health-care sector, Australia, 2008–09**

| Health-care sector                                   | Diabetes     |              | All diseases  |              |
|------------------------------------------------------|--------------|--------------|---------------|--------------|
|                                                      | \$ (million) | Per cent     | \$ (million)  | Per cent     |
| Hospital admitted patient services <sup>(a)(b)</sup> | 647          | 42.9         | 38,675        | 59.4         |
| Out-of-hospital medical expenses                     | 362          | 24.0         | 15,871        | 24.4         |
| Blood glucose lowering medications                   | 498          | 33.1         | 10,583        | 16.2         |
| <b>Total allocated expenditure</b>                   | <b>1,507</b> | <b>100.0</b> | <b>65,129</b> | <b>100.0</b> |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

Source: Disease Expenditure Database, AIHW.

## Additional expenditure not allocated by health-care sector

There is additional health-care expenditure associated with the management of diabetes apart from that classified by disease and health-care sector.

In 2008–09, the Australian Government spent more than \$127 million subsidising blood glucose test strips, syringes, needles and items for use with insulin pumps, supplied through the National Diabetes Services Scheme; \$2.8 million on the National Diabetes Strategy; more than \$4.3 million in Council of Australian Governments (COAG) diabetes grants; nearly \$3 million on both the Diabetes Pilot Program and on diabetes community educators; close to \$10 million on support for diabetes research, and nearly \$500,000 in payments to the Juvenile Diabetes Research Foundation (JDRF) to support the purchase of insulin pumps by low-income earners. (See Glossary for further information about these programs.) In addition, more than \$2 million was spent on out-of-hospital medical expenses and blood glucose lowering medications for gestational diabetes. Together with health sector expenditure allocated to diabetes, these additional expenses brought the total estimated direct expenditure for diabetes in 2008–09 to \$1,660 million (Table 3).

**Table 3: Diabetes expenditure, Australia, 2008–09**

| Area of expenditure                                                      | \$ (million)   |
|--------------------------------------------------------------------------|----------------|
| Health sector <sup>(a)</sup>                                             | 1,507.3        |
| Health sector—gestational diabetes only <sup>(b)</sup>                   | 2.0            |
| Blood glucose test strips, syringes, needles and items for insulin pumps | 127.4          |
| National Diabetes Strategy                                               | 2.8            |
| COAG diabetes grants                                                     | 4.3            |
| Diabetes Pilot Program                                                   | 2.9            |
| Support for diabetes research                                            | 9.8            |
| Diabetes community educators                                             | 2.9            |
| Insulin pumps (JDRF)                                                     | 0.5            |
| <b>Total for 2008–09<sup>(c)</sup></b>                                   | <b>1,659.9</b> |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure on out-of-hospital medical expenses and blood glucose lowering medications only.

(c) Values may not sum to the total due to rounding.

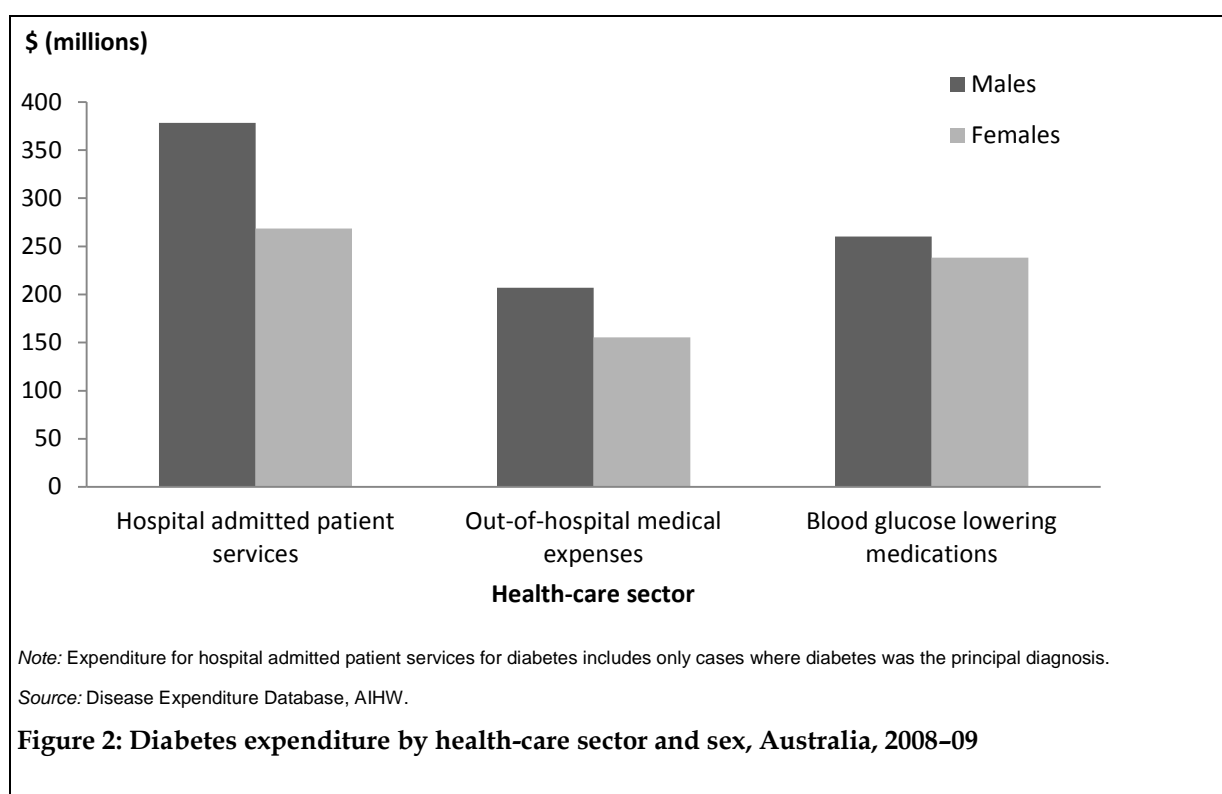
*Note:* Expenditure for gestational diabetes does not include hospital-admitted patient expenditure. This expenditure is attributable to ICD-10 code O24 (Diabetes mellitus in pregnancy).

*Source:* Disease Expenditure Database, AIHW.

## Expenditure by sex

In 2008–09, overall expenditure for the treatment of diabetes was greater for males (\$845 million or 56%) than for females (\$662 million or 44%). This is consistent with the fact that there are more males than females with diabetes (Box 1). Overall expenditure was also higher for males within each health-care sector (Figure 2). The sector where the difference was most marked was hospital admitted patient services, where 58% of diabetes expenditure was for males and 42% for females.

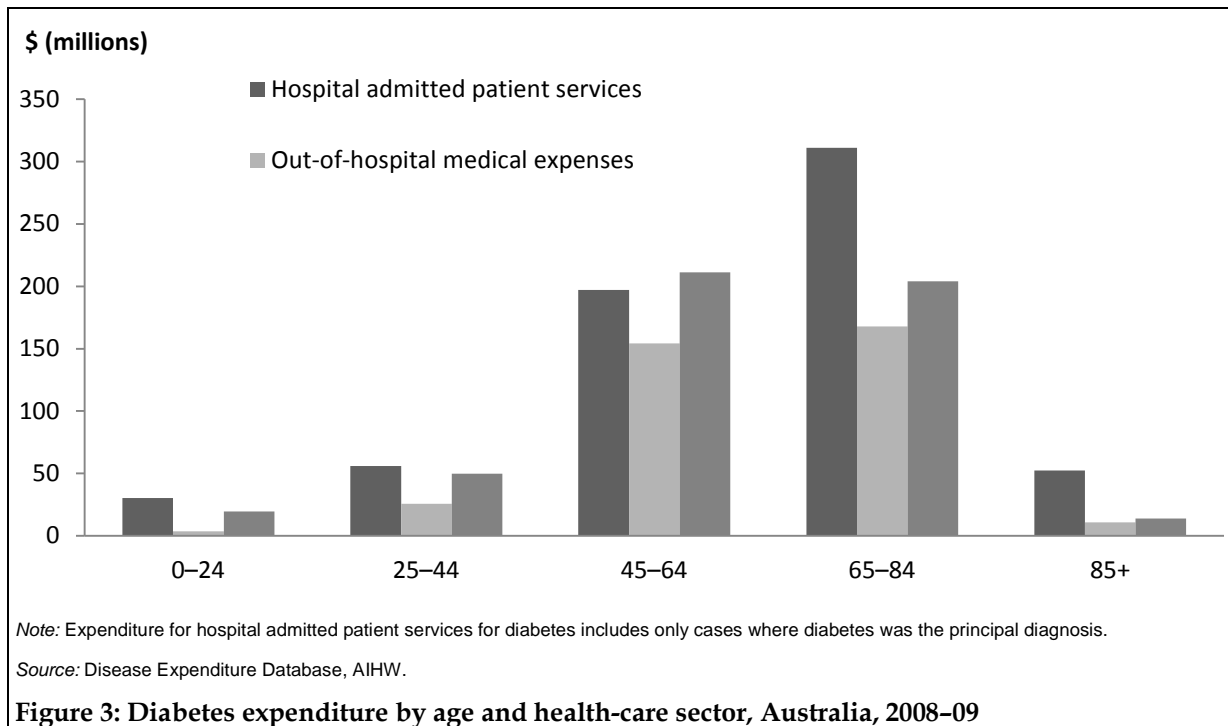
Per separation expenditure for hospital admitted patient services was also higher for males (\$8,197) than for females (\$6,828). However, for the health-care sectors out-of-hospital medical expenses and blood glucose lowering medications, both per service and per prescription expenditure, at between \$41 and \$48, were similar for males and females (See Table B1).



## Expenditure by age

In 2008–09, expenditure for diabetes across all health-care sectors varied considerably between age groups. It was lowest (\$53 million) for people aged 0 to 24 and increased with age from \$132 million for those aged 25–44, to \$563 million for those aged 45–64 and \$683 million for those aged 65 to 84. Expenditure then fell to \$77 million for people aged 85 and over (Table B6). This pattern is consistent with the age distribution of people with diabetes (Box 1). Hospital admitted patient services was the health-care sector with the highest level of expenditure for each age group, except for those aged 45 to 64. In this age group, more was spent on blood glucose lowering medications (\$211 million) than on hospital admitted patient services (\$197 million) (Figure 3). Per service expenditure varied by

age for the health-care sectors hospital admitted patient services and blood glucose lowering medications, but not significantly for out-of-hospital medical expenses.



### Hospital admitted patient services

For hospital admitted patient services, expenditure was lowest at \$4,516 per separation for those aged 0-24, increased to \$6,946 for those aged 25-44 and peaked at \$9,343 for those aged 45-64. It then fell to \$7,008 for 65 to 84 year olds before increasing again to \$8,501 for those aged 85 and over. An overall increase of 88% between the youngest and oldest age groups was recorded.

### Blood glucose lowering medications

In contrast, for blood glucose lowering medications, prescription costs decreased with age from \$118 per prescription for those aged 0-24 to \$83 for 25-44 year olds, and then to \$49 or less for other ages – an overall decrease of 68% between the youngest and oldest age groups. Per capita expenditure showed a similar pattern for blood glucose lowering medications: it was highest for the 0-24 age group (\$1,011 per person), decreased to between \$550 and \$625 per person for those aged 25-84 and was lowest for those aged 85 and over (\$268 per person), an overall decrease of 73%.

Although good quality data describing the types of medicines prescribed for Type 1 and Type 2 diabetes are not available, the overall decrease in per capita expenditure for blood glucose lowering medications with increasing age may be the result of the changing distribution of diabetes types with age. For example, in the 0-24 age group, 93% of all those with diabetes have Type 1 diabetes while for those aged 25-34 it comprises 54% of the total, after which Type 2 diabetes becomes the predominant form (Box 1). The higher levels of expenditure for younger age groups may reflect the fact that in all cases of Type 1 diabetes, insulin, which is relatively more expensive than most other oral blood glucose lowering

agents, is required daily for survival. On the other hand, pharmacological management of Type 2 diabetes may include insulin and/or oral medication. Recent studies found that of those with Type 2 diabetes, only 19–22.5% relied on insulin (Davis et al. 2012; Diabetes Australia 2012), with many patients controlling their diabetes using markedly cheaper oral blood glucose lowering drugs, such as metformin hydrochloride.

## Out-of-hospital medical expenses

Per service expenditure for out-of-hospital medical expenses also decreased with age, falling from \$56 per service for those aged 0–24 to \$49 for the 25–44 age group, and then to \$40 for those aged 85 and over, representing an overall fall of 29% (Table 4). Per capita expenditure, however, showed the opposite overall trend. At \$191 per person, it was lowest for those aged 0–24, before rising to its peak at \$459 for those aged 65–84 and then declining to \$207 per person for those 85 and over.

**Table 4: Average expenditure per encounter with the health system, by health-care sector by age, Australia, 2008–09**

| Health-care sector                                   | 0 to 24 years | 25 to 44 years | 45 to 64 years | 65 to 84 years | 85+ years | All ages     |
|------------------------------------------------------|---------------|----------------|----------------|----------------|-----------|--------------|
|                                                      | \$            |                |                |                |           |              |
| Hospital admitted patient services <sup>(a)(b)</sup> | 4,516         | 7,850          | 9,343          | 7,008          | 8,501     | <b>7,567</b> |
| Out-of-hospital medical expenses                     | 56            | 49             | 43             | 39             | 40        | <b>42</b>    |
| Blood glucose lowering medications                   | 118           | 83             | 48             | 40             | 38        | <b>47</b>    |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

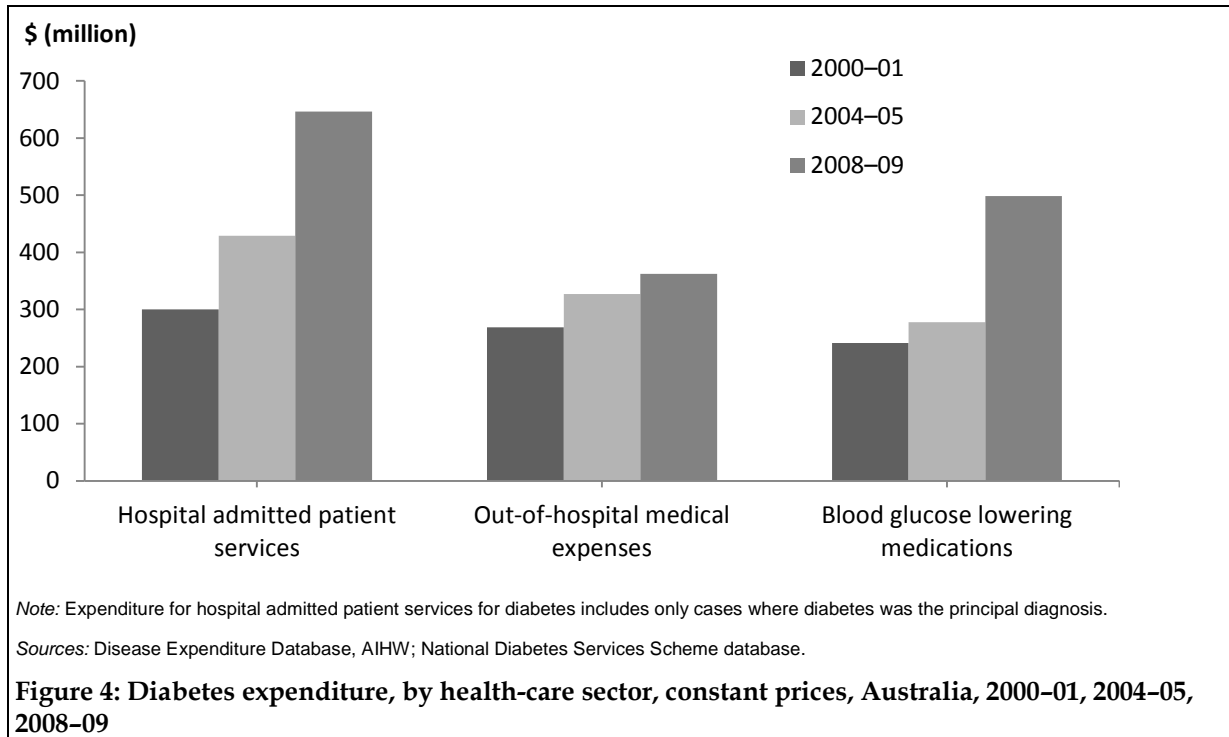
Source: Disease Expenditure Database, AIHW.

## Changes in health-care expenditure over time

After adjusting for inflation within the health system, total expenditure for diabetes increased from \$811 million in 2000–01 to \$1,507 million in 2008–09, representing an average growth of about 10% per year. Total expenditure for diabetes increased from 2.0% to 2.3% of total allocated expenditure for all diseases for 2000–01 to 2008–09 (Table B3).

## Hospital admitted patient services

The largest expenditure increase, by health-care sector, was for hospital admitted patient services, where expenditure increased by 116%, from \$300 million to \$647 million, between 2000–01 and 2008–09 (Figure 4). Expenditure for hospital admitted patient services as a proportion of total expenditure for diabetes increased from 37% to 43% over this period.



Per separation expenditure for hospital admitted patient services was calculated using the number of hospital separations with a principal diagnosis of diabetes as the denominator. Between 2000-01 and 2004-05, per separation expenditure for this sector remained steady at \$6,452 and \$6,341 respectively, before increasing by 19% to \$7,567 in 2008-09 (Figure 5).

## Out-of-hospital medical expenses and blood glucose lowering medications

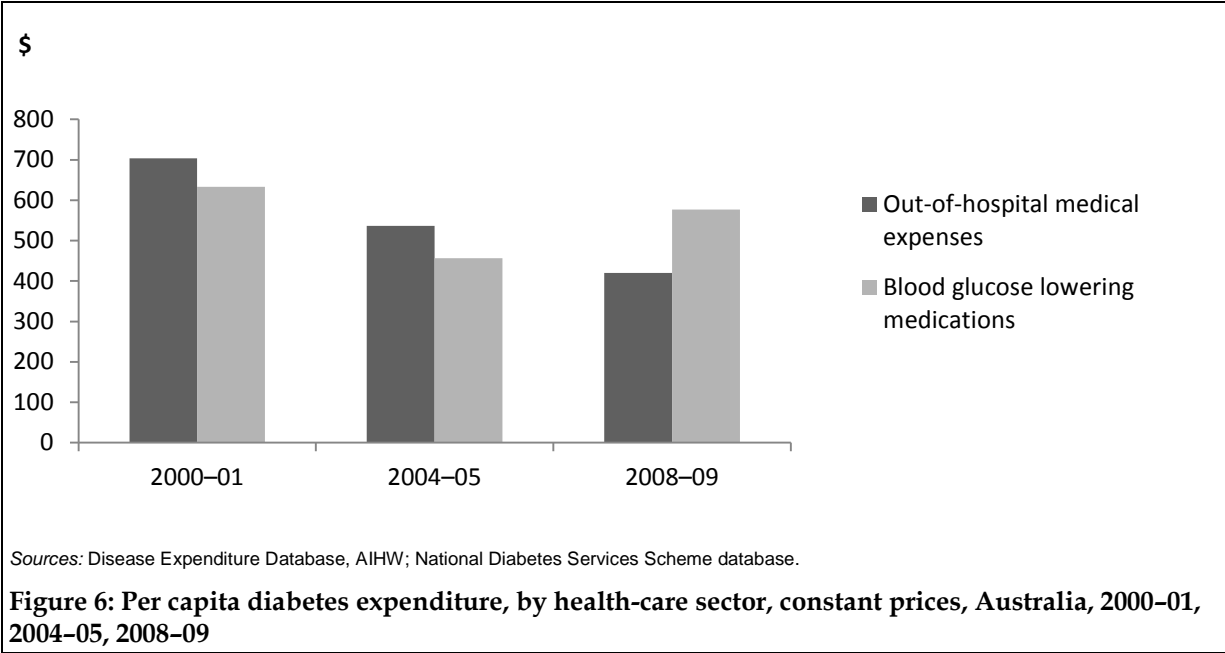
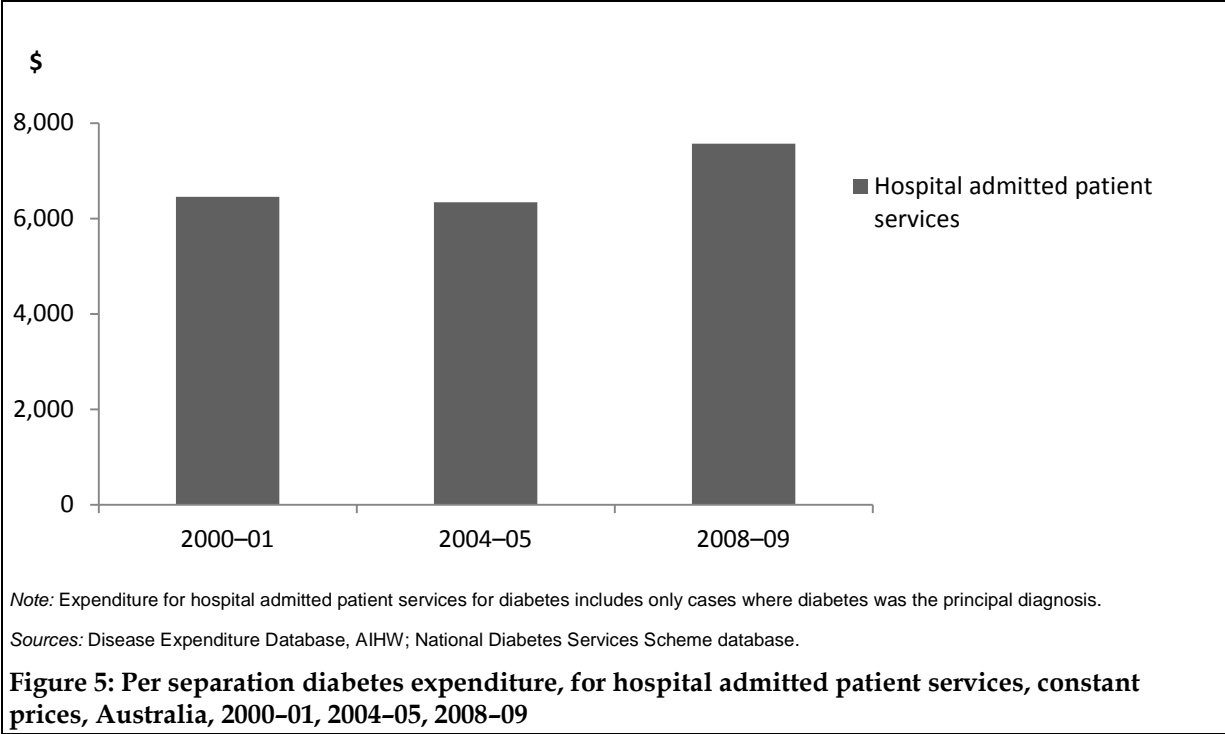
Between 2000-01 and 2008-09, the amount spent on out-of-hospital expenses increased 35%, from \$269 million to \$362 million. Expenditure for blood glucose lowering medications rose 106%, from \$242 million to \$498 million. As a proportion of total expenditure for diabetes, out-of-hospital expenses fell from 33% to 24%, while expenditure for blood glucose lowering medications increased from 30% to 33% over this period.

The proportion of GP encounters at which diabetes was managed also increased over this period, from 2.8 per 100 encounters in 2000-01 to 4.1 per 100 in 2008-09 (Britt et al. 2009). This may partially explain the increase in the amount of expenditure allocated for these two health-care sectors over this period. Expenditure trends for out-of-hospital expenses and blood glucose lowering medications should be treated with caution, however, because they are derived from the BEACH survey of general practitioners and prescribing and referral patterns may have varied over time.

## Per capita expenditure

Despite diabetes expenditure increasing for each health-care sector between 2000-01 and 2008-09, per capita expenditure for out-of-hospital medical expenses and blood glucose lowering medications decreased by 40% and 9% respectively (Figure 6). Per capita expenditure for out-of-hospital services fell from \$704 to \$420 in that period and from \$633 to \$577 for blood glucose lowering medications, including a sharp decrease of 28% for medications between 2000-01 and 2004-05. The denominator used to calculate per capita

expenditure for out-of-hospital medical expenses and blood glucose lowering medications is the total number of registrants in the NDSS. From 2000-01 to 2008-09, the number of registrants increased from 382,185 in 2001 to 862,743 in 2009. This represents an increase of 126% – which is greater than the rate of increase in spending for either health-care sector, resulting in a decline in per capita expenditure. The substantial increase in the number of NDSS registrants may reflect both an increased awareness of diabetes in the community and better ascertainment of the disease.

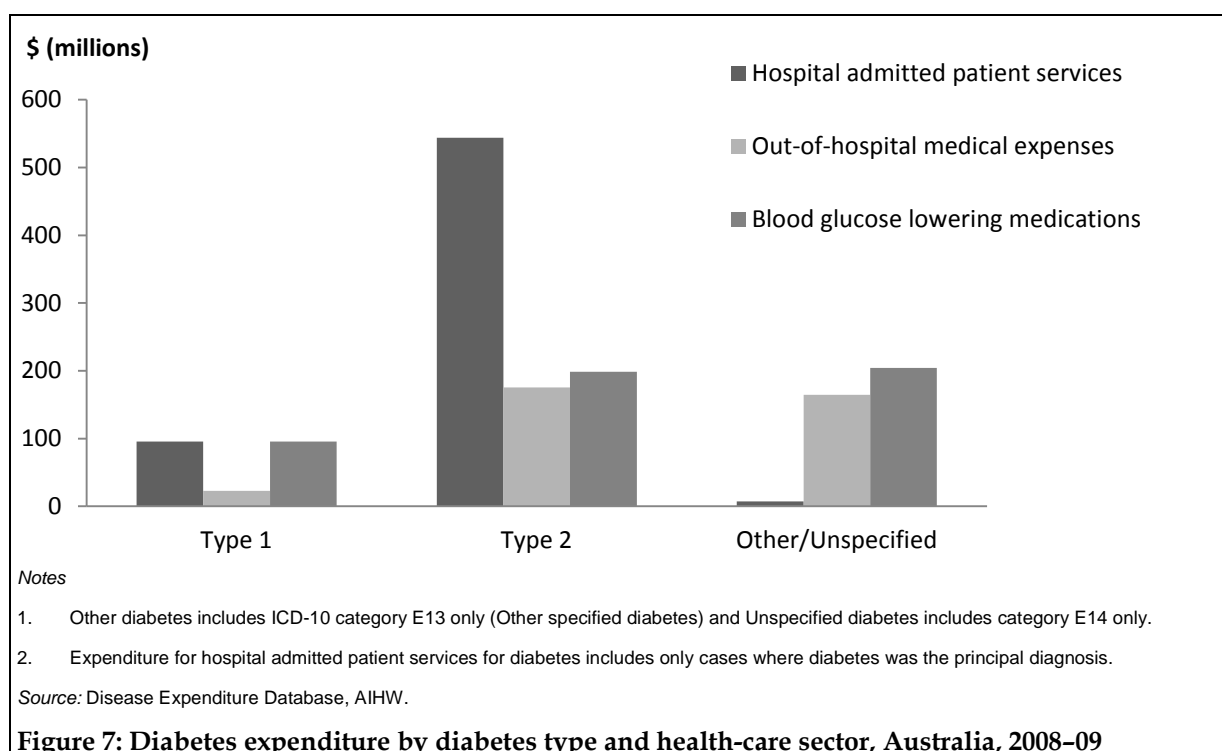


## Expenditure by diabetes type

In 2008–09, Type 2 diabetes accounted for more than 60% of allocated diabetes health-care expenditure and Type 1 diabetes for a little more than 14%. A further 25% was for Other forms of diabetes /Unspecified diabetes type. It is important to note that the type of diabetes was not specified in a large proportion of records for out-of-hospital medical expenses and blood glucose lowering medications and, while it is probable that a majority of the unspecified records would be for Type 2 diabetes, it is not possible to be certain. Further, the latest prevalence data for diabetes in Australia indicate that about 85% of people with diabetes have Type 2 (Box 1), supporting the assertion that a significant proportion of the expenditure allocated for Other or Unspecified diabetes would have been allocated as Type 2 expenditure, had all cases been correctly identified by diabetes type. Therefore, it is likely that Type 2 diabetes accounts for more than the 60% of expenditure mentioned above.

## Hospital admitted patient services

More was spent on hospital admitted patient services for people with Type 2 diabetes (\$544 million) than for any other health-care sector for either Type 1 or Type 2 diabetes (Figure 7). Of total diabetes expenditure for hospital admitted patient services, just over 84% was for Type 2 diabetes, about 15% for Type 1 diabetes and just 1% for Other diabetes/Unspecified diabetes type.



## Out-of-hospital medical expenses and blood glucose lowering medications

The distribution of expenditure by diabetes type is quite different for out-of-hospital medical expenses and blood glucose lowering medications than for hospital admitted patient services. For these two health-care sectors, comparatively smaller proportions of expenditure were allocated for Type 2 diabetes (48% and 40% respectively compared with 84%) and much larger proportions (45% and 41% compared with 1%) for Other diabetes/Unspecified diabetes type (Table 5). As indicated above, expenditure allocated to Other diabetes/Unspecified diabetes type is probably influenced by a lack of specification in medical records and it is likely that expenditure for both out-of-hospital medical expenses and blood glucose lowering medications is an underestimate for Type 2 diabetes and an overestimate for Other/Unspecified diabetes (Table 5).

**Table 5: Expenditure by health-care sector and diabetes type, Australia, 2008–09**

| Health-care sector                                   | Type 1 diabetes | Type 2 diabetes | Other/Unspecified diabetes |
|------------------------------------------------------|-----------------|-----------------|----------------------------|
| Per cent                                             |                 |                 |                            |
| Hospital admitted patient services <sup>(a)(b)</sup> | 14.8            | 84.1            | 1.1                        |
| Out-of-hospital medical expenses                     | 6.3             | 48.4            | 45.4                       |
| Blood glucose lowering medications                   | 19.2            | 39.8            | 41.0                       |
| <b>Total allocated expenditure<sup>(c)</sup></b>     | <b>14.2</b>     | <b>60.9</b>     | <b>24.9</b>                |

(a) Other diabetes includes ICD-10 category E13 only (Other specified diabetes) and Unspecified diabetes includes category E14 only.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

(c) Values may not sum to the total due to rounding.

Sources: Disease Expenditure Database, AIHW; National Diabetes Services Scheme database.

For hospital admitted patient services, the average expenditure per separation was noticeably lower for Type 1 diabetes (\$5,851) than for Type 2 diabetes (\$7,972) or Other diabetes/Unspecified diabetes type (\$8,024). Conversely, for blood glucose lowering medications per prescription expenditure was significantly higher for Type 1 diabetes (\$165 per script) than for Type 2 diabetes (\$36) or Other diabetes/Unspecified diabetes type (\$46). Again, this may reflect the greater cost of insulin compared with most other blood glucose lowering medications. Similarly, for out-of-hospital expenses, per service expenditure was higher for Type 1 diabetes (\$54) than for Type 2 (\$42) or Other diabetes/Unspecified diabetes type (\$40).

# Discussion

The number of people in Australia with diabetes has increased by an estimated 88,100 in the last 5 years, from 898,800 in 2004–05 to 986,900 in 2011–12. Further, a recent study in Victoria suggests that these figures underestimate the size of the problem, with one case of diabetes remaining undiagnosed for every three cases diagnosed (Victorian Department of Health 2012).

Diabetes prevalence has been trending upwards, both in Australia and globally since at least 1980 (Danaei et al. 2011) and projections for the future burden of diabetes, in particular Type 2 diabetes, suggest that by 2030 diabetes will affect 8.4% of the Australian population aged 20 to 79 – up from 7.2% in 2010 (Shaw et al. 2009). Another study suggests that by 2023 diabetes will be the leading cause of disease burden among males, and second only to anxiety and depression among females (Begg et al. 2007).

The increasing prevalence of diabetes in Australia is being driven by an ageing population (among which diabetes prevalence is highest), increases in the number of new cases (incidence) of diabetes (which is being driven primarily by increases in obesity) and decreasing mortality rates among those with diabetes. Immigration from countries with higher diabetes prevalence rates may also have increased diabetes prevalence in Australia (Magliano et al. 2009).

The number of people registering with the National Diabetes Services Scheme has increased considerably since 2000–01, suggesting both an increasing awareness of the disease in the Australian population and its more accurate ascertainment. The increase in the numbers of registrants makes it difficult to determine whether the decreases in per capita expenditure noted for out-of-hospital expenses and blood glucose lowering medications are true decreases or the result of the number of registrants increasing at a greater rate.

It is important to note that the estimates in this report are believed to underestimate the true levels of expenditure for the treatment of diabetes in Australia. The limitations of the data and the methods used are important and have been explained in detail in the Methods section of the report.

Despite these limitations, which prevent a complete picture of diabetes health-care expenditure from being obtained, the latest information is used to show how the 70% of health-care expenditure for diabetes that can be allocated by disease is distributed by age, sex and diabetes type and how overall and per service diabetes expenditure has changed in the last decade.

# Appendix A Data quality statement

## Disease expenditure database 2008–09

### Summary of key data quality issues

- The Disease Expenditure Database contains estimates of expenditure by disease category, age group and sex for each of the following areas of expenditure: admitted patient hospital services, out-of-hospital medical services, prescription pharmaceuticals, optometrical and dental services, community mental health services and public health cancer screening.
- Estimates are derived from combining information from the National Hospital Morbidity Database (NHMD), the National Public Hospitals Establishments Database (NPHEd), the Health expenditure database, the National Hospital Cost Data Collection (NHCCD) and the Bettering the Evaluation and Care of Health (BEACH) survey.
- The database contains a conservative estimate of total expenditure and equates to around 70% of total recurrent health expenditure.

### Description

The Disease Expenditure Database contains estimates of expenditure by disease category, age group and sex for admitted patient hospital services, out-of-hospital medical services, prescription pharmaceuticals, optometrical and dental services, community mental health services and public health cancer screening. Definitions for admitted patient hospital services, out of-hospital medical services and prescription pharmaceuticals are as follows:

Admitted patient hospital costs refer to the cost of services for admitted patients in both public and private acute hospitals and psychiatric hospitals, as well as expenditure on medical services provided to private admitted patients in hospitals.

Out-of-hospital medical expenses refer to the cost for services provided by, or on behalf of, registered medical practitioners that are funded by the Medicare Benefits Schedule (MBS), Department of Veterans' Affairs, compulsory motor vehicle third-party insurance, workers compensation insurance, private health insurance funds, Australian Government premium rebates allocated to medical services, MBS co-payments and other out-of-pocket payments. They also include non-MBS medical services, such as the provision of vaccines for overseas travel, as well as some expenditure by the Australian Government under funding arrangements that are alternatives to the fees for service. They exclude medical services provided to public admitted patients in public hospitals and medical services provided to public patients at outpatient clinics in public hospitals. Also excluded are the costs for medical services provided to private admitted patients in hospitals, which are counted as part of admitted patient costs.

Prescription pharmaceuticals refer to the cost of pharmaceuticals that are listed in the schedule of the pharmaceuticals under the Pharmaceutical Benefits Scheme (PBS) and the Repatriation Pharmaceutical Benefits Scheme (RPBS) for which pharmaceutical benefits have been paid or are payable. Also included are the costs for under copayment prescriptions and private prescriptions. Under copayment prescriptions are those pharmaceuticals listed in the PBS or RPBS, the total costs of which are equal to or less than the statutory patient

contribution for the class of patient concerned, while private prescriptions are those pharmaceuticals dispensed through private prescriptions that do not fulfil the criteria for payment or benefit under the PBS or RPBS.

Estimates are derived from combining information from the National Hospital Morbidity Database (NHMD), the National Public Hospitals Establishments Database (NPHEd), the National Hospital Cost Data Collection (NHCDC) and the Health expenditure database.

Proportions derived from the Bettering the Evaluation and Care of Health (BEACH) survey relating to 2007 to 2009 are also used in compiling the estimates for out-of-hospital medical services and prescription pharmaceuticals. The BEACH data were collected by the Family Medicine Research Centre of the University of Sydney in collaboration with the Australian Institute of Health and Welfare.

It is not possible to allocate all expenditure on health goods and services by disease. Expenditure that was not able to be allocated by disease includes: capital expenditure, non-admitted patient hospital services, over-the-counter drugs, other health practitioner services (except optometry), community health services expenditure (except community mental health), expenditure on public health programs (except cancer screening programs), health administration, health aids and appliances, and patient transport (ambulance).

### **Institutional environment**

The Australian Institute of Health and Welfare (AIHW) is a major national agency set up by the Australian Government under the *Australian Institute of Health and Welfare Act 1987* to provide reliable, regular and relevant information and statistics on Australia's health and welfare. It is an independent statutory authority established in 1987, governed by a management board, and accountable to the Australian Parliament through the Health and Ageing portfolio.

The AIHW aims to improve the health and wellbeing of Australians through better health and welfare information and statistics. It collects and reports information on a wide range of topics and issues, ranging from health and welfare expenditure, hospitals, disease and injury, and mental health, to ageing, homelessness, disability and child protection.

The Institute also plays a role in developing and maintaining national metadata standards. This work contributes to improving the quality and consistency of national health and welfare statistics. The Institute works closely with governments and non-government organisations to achieve greater adherence to these standards in administrative data collections to promote national consistency and comparability of data and reporting.

One of the AIHW's main functions is to work with the states and territories to improve the quality of administrative data and, where possible, to compile national data sets based on data from each jurisdiction, to analyse these datasets and disseminate information and statistics.

The *Australian Institute of Health and Welfare Act 1987*, in conjunction with compliance to the *Privacy Act 1988* (Cwlth), ensures that the data collections managed by the AIHW are kept securely and under the strictest conditions with respect to privacy and confidentiality.

For further information, see the AIHW website <<http://www.aihw.gov.au/>>.

The BEACH survey data 2007–08 and 2008–09 were collected by the Family Medicine Research Centre of the University of Sydney in collaboration with the Australian Institute of

Health and Welfare. Data for the Disease Expenditure Database were derived from data from the NHMD, NPHEd and Health Expenditure Database as well as survey based data.

### **Timeliness**

The reference period for this data set is 2008–09. The Disease Expenditure Database can only be updated once the NHMD, NPHEd, NHCDC and Health Expenditure Databases have all been updated for the relevant financial year, which is currently a minimum of 15 months after the end of the financial year.

The AIHW first published 2008–09 data from the Disease Expenditure Database in *Australia's health 2012* in June 2012.

### **Accessibility**

The AIHW provides a variety of products that draw upon the Disease Expenditure Database 2008–09. Published products currently available on the AIHW website include:

- *Australia's health 2012*
- *Dementia in Australia*
- *Incontinence in Australia: prevalence, experience and cost*

Users can request data not available online or in reports via the Expenditure and Economics Unit on (02) 6244 1119 or via email to <expenditure@aihw.gov.au>. Requests that take longer than half an hour to compile are charged for on a cost-recovery basis.

### **Interpretability**

Supporting information on the quality and use of the Disease Expenditure Database are published in *Health system expenditure on disease and injury in Australia, 2004–05 (technical notes)*, available in hard copy or on the AIHW website.

Most important to note is that the Disease Expenditure Database estimates:

- are a conservative estimate based on around 70% of total recurrent health expenditure
- are only one measure of the size of the disease burden on the community (that is, the 'size of the problem')
- are not the same as loss of health due to disease
- should not be regarded as how much would be saved if a specific disease or all diseases were prevented
- are not an estimate of the total economic impact of diseases in the Australian community. This is because the estimates do not include costs that are not accrued by the health system, such as travel costs of patients, costs associated with the social and economic burden on carers and family, and owing to lost quality and quantity of life.

### **Relevance**

Disease expenditure estimates provide a broad picture of the use of health system resources classified by disease group, as well as a reference source for planners and researchers interested in costs and use patterns for particular disease groups.

The Disease Expenditure Database contains a conservative estimate based on around 70% of total recurrent health expenditure.

It is not possible to allocate all expenditure on health goods and services by disease. Expenditure that was not able to be allocated by disease includes: capital expenditure, non-admitted patient hospital services, over-the-counter drugs, other health practitioner services (except optometry), community health services expenditure (except community mental health), expenditure on public health programs (except cancer screening programs), health administration, health aids and appliances, and patient transport (ambulance).

Readers need to bear in mind that cost-of-illness data only provide estimates of the impact of a disease on health system expenditures. The estimates of the cost of treating and/or preventing a disease cannot be used to indicate the loss of health due to that disease.

Care should be taken not to interpret expenditure associated with disease treatment as simply an estimate of the savings that would result from prevention of disease. Conversion of the opportunity cost – or the benefits forgone – of resources being devoted to disease treatment into expenditure savings involves a number of additional considerations. See, for example, AIHW: Mathers & Penm 1998.

### **Accuracy**

Apart from hospital admitted patient services data, the method for estimating disease expenditure is generally a ‘top-down’ approach where total expenditure across the health system is estimated and then allocated to the relevant conditions. Although this method yields consistency, good coverage, and totals that add up to known expenditures, it is not as sensitive or accurate for any specific disease as a detailed ‘bottom-up’ analysis of actual costs incurred by patients with that disease. In most cases, a bottom up analysis is not possible due to a lack of available data.

Both out-of-hospital medical services and prescription pharmaceuticals expenditure estimates draw upon proportions derived from BEACH surveys relating to 2007 to 2009. In each BEACH survey, the vocationally registered GPs and all general practice registrars who claimed a minimum of 375 general practice A1 Medicare items in the most recently available 3 months make up the population from which a sample is drawn (Britt et al. 2009). GPs are randomly selected from this population and approached for participation in the survey. Each BEACH survey includes a sample of 1,000 recognised practising GPs across the country (about a 6% of all recognised practising GPs) completing details for 100 consecutive GP encounters. Each BEACH survey contains details of about 100,000 encounters between GPs and patients (about a 0.1% sample of all general practice encounters) (Britt et al. 2009). For further information regarding data collection methods in BEACH surveys, refer to the *General practice activity in Australia 2008–09* report (Britt et al. 2009). In light of these sampling methods used, time series comparisons of expenditure estimates for out-of-hospital medical services and prescription pharmaceuticals need to be treated with caution. Refer to the data quality statements for the NHMD, NPHEd and the Health Expenditure Database for further information on the accuracy of the data within these databases.

### **Coherence**

To ensure consistency between the Disease Expenditure Database and associated burden of disease projects, the disease groups used in the 2008–09 disease expenditure estimates were based on the 176 diseases that were published in the Australian burden of disease studies (AIHW: Mathers et al. 1999; Begg et al. 2007). Extra categories were added to provide a more comprehensive list of diseases and the two categories of ‘Symptoms, signs and ill-defined

conditions' and 'Other contact with health services' were included to cover some health service expenditures that cannot be allocated by disease.

The methodologies used to estimate expenditures for admitted patient hospital services have remained unchanged between 2004–05 and 2008–09. Hence, time series comparisons for admitted patient hospital services are possible.

While the methodologies used to estimate expenditures for out-of-hospital medical services and prescription pharmaceuticals have also remained unchanged between 2004–05 and 2008–09, the use of the BEACH survey-based data in the methodologies has meant that time series comparisons for these areas of expenditure should be made with caution.

Comparisons over time for optometrical and dental services, community mental health services and public health cancer screening can be made with more confidence.

### **Implementation date**

6 February 2012

### **Source and reference attributes**

AIHW (Australian Institute of Health and Welfare): Mathers & Penm 1998. Disease costing methodology used in the Disease Costs and Impact Study 1993–94. Cat. no. HWE 7. Canberra: AIHW.

AIHW: Mathers, C et al. 1999. The burden of disease and injury in Australia. Cat. no. PHW 17. Canberra: AIHW.

Begg S, Vos T, Barker B, Stevenson C, Stanley L, Lopez AD 2007. The burden of disease and injury in Australia 2003. AIHW Cat. no. PHE 82. Canberra: AIHW.

Britt H, Miller GC, Charles J, Henderson J, Bayram C, Pan Y et al. 2009. General practice activity in Australia 2008–09. General practice series no. 25. Cat. no. GEP 25. Canberra: AIHW.

# Appendix B

## Statistical tables

**Table B1: Average expenditure per encounter with the health system, by health-care sector by sex, Australia, 2008–09, (\$)**

| Health-care sector <sup>(a)</sup>                 | Males | Females | Persons      |
|---------------------------------------------------|-------|---------|--------------|
| Hospital admitted patient services <sup>(b)</sup> | 8,197 | 6,828   | <b>7,567</b> |
| Out-of-hospital medical expenses                  | 41    | 43      | <b>42</b>    |
| Blood glucose lowering medications                | 46    | 48      | <b>47</b>    |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis

Source: Disease Expenditure Database, AIHW.

**Table B2: Diabetes expenditure by health-care sector by sex, Australia, 2008–09**

| Health-care sector <sup>(a)</sup>                 | Males        |             | Females      |             | Persons      |              |
|---------------------------------------------------|--------------|-------------|--------------|-------------|--------------|--------------|
|                                                   | \$ (million) | %           | \$ (million) | %           | \$ (million) | %            |
| Hospital admitted patient services <sup>(b)</sup> | 378          | 58.5        | 268          | 41.5        | 647          | 100.0        |
| Out-of-hospital medical expenses                  | 207          | 57.1        | 155          | 42.9        | 362          | 100.0        |
| Blood glucose lowering medications                | 260          | 52.2        | 238          | 47.8        | 498          | 100.0        |
| <b>Total allocated expenditure<sup>(c)</sup></b>  | <b>845</b>   | <b>56.1</b> | <b>662</b>   | <b>43.9</b> | <b>1,507</b> | <b>100.0</b> |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

(c) Values may not sum to the total due to rounding.

Source: Disease Expenditure Database, AIHW.

**Table B3: Diabetes expenditure by health-care sector, constant prices, Australia, 2000–01, 2004–05 and 2008–09, (\$ million)**

| Health-care sector                                                             | 2000–01       | 2004–05       | 2008–09       |
|--------------------------------------------------------------------------------|---------------|---------------|---------------|
| <b>Diabetes<sup>(a)</sup></b>                                                  |               |               |               |
| Hospital admitted patient services <sup>(b)</sup>                              | 300           | 429           | 647           |
| Out-of-hospital medical expenses                                               | 269           | 327           | 362           |
| Blood glucose lowering medications                                             | 242           | 278           | 498           |
| <b>Total allocated expenditure on diabetes<sup>(c)</sup></b>                   | <b>811</b>    | <b>1,034</b>  | <b>1,507</b>  |
| <b>All diseases</b>                                                            | <b>40,699</b> | <b>49,757</b> | <b>65,129</b> |
| <b>Diabetes expenditure as a proportion of expenditure on all diseases (%)</b> | <b>2.0</b>    | <b>2.1</b>    | <b>2.3</b>    |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

(c) Values may not sum to the total due to rounding.

Source: Disease Expenditure Database, AIHW.

**Table B4: Diabetes expenditure by health-care sector by diabetes type, Australia, 2008–09**

| Health-care sector <sup>(a)</sup>                 | Type 1       |             | Type 2       |             | Other/Unspecified |             | Total        |              |
|---------------------------------------------------|--------------|-------------|--------------|-------------|-------------------|-------------|--------------|--------------|
|                                                   | \$ (million) | %           | \$ (million) | %           | \$ (million)      | %           | \$ (million) | %            |
| Hospital admitted patient services <sup>(b)</sup> | 96           | 14.8        | 544          | 84.1        | 7                 | 1.1         | 647          | 100.0        |
| Out-of-hospital medical expenses                  | 23           | 6.3         | 175          | 48.4        | 164               | 45.4        | 362          | 100.0        |
| Blood glucose lowering medications                | 96           | 19.2        | 198          | 39.8        | 204               | 41.0        | 498          | 100.0        |
| <b>Total allocated expenditure<sup>(c)</sup></b>  | <b>214</b>   | <b>14.2</b> | <b>918</b>   | <b>60.9</b> | <b>376</b>        | <b>24.9</b> | <b>1,507</b> | <b>100.0</b> |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

(c) Values may not sum to the total due to rounding.

Source: Disease Expenditure Database, AIHW.

**Table B5: Diabetes services by health-care sector by diabetes type, Australia, 2008–09**

| Health-care sector <sup>(a)</sup>                 | Type 1             |            | Type 2             |             | Other/Unspecified  |             | Total              |              |
|---------------------------------------------------|--------------------|------------|--------------------|-------------|--------------------|-------------|--------------------|--------------|
|                                                   | Number of services | %          | Number of services | %           | Number of services | %           | Number of services | %            |
| Hospital admitted patient services <sup>(b)</sup> | 16,300             | 19.1       | 68,200             | 79.8        | 900                | 1.0         | 85,500             | 100.0        |
| Out-of-hospital medical expenses                  | 421,500            | 4.8        | 4,166,500          | 47.9        | 4,105,200          | 47.2        | 8,693,200          | 100.0        |
| Blood glucose lowering medications                | 579,500            | 5.5        | 5,575,400          | 52.6        | 4,443,600          | 41.9        | 10,598,500         | 100.0        |
| <b>Total services<sup>(c)</sup></b>               | <b>1,017,300</b>   | <b>5.2</b> | <b>9,810,100</b>   | <b>50.6</b> | <b>8,549,700</b>   | <b>44.1</b> | <b>19,377,100</b>  | <b>100.0</b> |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

(c) Values may not sum to the total due to rounding.

Source: Disease Expenditure Database, AIHW.

**Table B6: Diabetes expenditure by health-care sector by age, Australia, 2008–09**

| Health-care sector <sup>(a)</sup>                 | 0 to 24 years |            | 25 to 44 years |            | 45 to 64 years |             | 65 to 84 years |             | 85+ years  |            | Total        |              |
|---------------------------------------------------|---------------|------------|----------------|------------|----------------|-------------|----------------|-------------|------------|------------|--------------|--------------|
|                                                   | \$ million    | %          | \$ million     | %          | \$ million     | %           | \$ million     | %           | \$ million | %          | \$ million   | %            |
| Hospital admitted patient services <sup>(b)</sup> | 30            | 4.7        | 56             | 8.7        | 197            | 30.5        | 311            | 48.1        | 52         | 8.1        | 647          | 100.0        |
| Out-of-hospital medical expenses                  | 4             | 1.0        | 26             | 7.1        | 154            | 42.5        | 168            | 46.3        | 11         | 3.0        | 362          | 100.0        |
| Blood glucose lowering medications                | 19            | 3.9        | 50             | 10.0       | 211            | 42.4        | 204            | 40.9        | 14         | 2.8        | 498          | 100.0        |
| <b>Total allocated expenditure<sup>(c)</sup></b>  | <b>53</b>     | <b>3.5</b> | <b>132</b>     | <b>8.7</b> | <b>563</b>     | <b>37.3</b> | <b>683</b>     | <b>45.3</b> | <b>77</b>  | <b>5.1</b> | <b>1,507</b> | <b>100.0</b> |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

(c) Values may not sum to the total due to rounding.

Source: Disease Expenditure Database, AIHW.

**Table B7: Diabetes services by health-care sector by age, 2008–09**

| Health-care sector <sup>(a)</sup>                 | 0 to 24 years  |            | 25 to 44 years   |            | 45 to 64 years   |             | 65 to 84 years   |             | 85+ years      |            | Total             |              |
|---------------------------------------------------|----------------|------------|------------------|------------|------------------|-------------|------------------|-------------|----------------|------------|-------------------|--------------|
|                                                   | Services       | %          | Services         | %          | Services         | %           | Services         | %           | Services       | %          | Services          | %            |
| Hospital admitted patient services <sup>(b)</sup> | 6,697          | 7.8        | 7,142            | 8.4        | 21,108           | 24.7        | 44,360           | 51.9        | 6,155          | 7.2        | 85,462            | 100.0        |
| Out-of-hospital medical expenses                  | 65,286         | 0.8        | 523,143          | 6.0        | 3,556,721        | 40.9        | 4,279,530        | 49.2        | 268,547        | 3.1        | 8,693,227         | 100.0        |
| Blood glucose lowering medications                | 164,524        | 1.6        | 602,468          | 5.7        | 4,406,610        | 41.6        | 5,051,989        | 47.7        | 372,830        | 3.5        | 10,598,421        | 100.0        |
| <b>Total services<sup>(c)</sup></b>               | <b>236,507</b> | <b>1.2</b> | <b>1,132,753</b> | <b>5.8</b> | <b>7,984,438</b> | <b>41.2</b> | <b>9,375,880</b> | <b>48.4</b> | <b>647,532</b> | <b>3.3</b> | <b>19,377,110</b> | <b>100.0</b> |

(a) Includes ICD-10 categories E10, E11, E13, E14. Does not include E09.

(b) Expenditure for hospital admitted patient services for diabetes includes only cases where diabetes was the principal diagnosis.

(c) Values may not sum to the total due to rounding.

Source: Disease Expenditure Database, AIHW.

# Glossary

**additional diagnosis:** An additional diagnosis is a condition or complaint that coexists with the principal diagnosis or arises during an episode of (hospital) care.

**admitted patient:** A patient who undergoes a hospital's formal admission process to receive treatment and/or care. This treatment, and/or care, is provided over a period of time and can occur in hospital and/or in the person's home (for hospital-in-the-home patients).

**Bettering the Evaluation and Care of Health (BEACH):** An ongoing national survey of general practitioners in Australia, conducted by the Australian General Practice Statistics and Classification Centre, at the University of Sydney. It involves a random sample of about 1,000 general practitioners per year, each of whom records the details of 100 consecutive patient encounters.

**constant prices:** Constant price expenditure adjusts current prices for the effects of inflation; that is, it aims to remove the effects of inflation.

**diabetes (diabetes mellitus):** A chronic condition in which the body cannot use its main energy source, the sugar glucose. This is due to either the pancreas not producing enough of the hormone, insulin, or the body being unable to effectively use the insulin produced, or both.

**Diabetes Pilot Program:** An Australian Government program to review and refine the Diabetes Medication Assistance Service – an ongoing cycle of assessment, management and review of patients with Type 2 diabetes.

**Disease Expenditure Database:** The AIHW Disease Expenditure Database contains estimates of expenditure by disease category, age group and sex for admitted patient hospital services, out-of-hospital medical services, prescription pharmaceuticals, optometrical and dental services, community mental health services and public health cancer screening.

**gestational diabetes mellitus:** Diabetes mellitus which begins or is first recognised during pregnancy. Women with gestational diabetes, and their offspring, are at greater risk of developing Type 2 diabetes later in life. Gestational diabetes increases the risk of perinatal morbidity and mortality.

**Juvenile Diabetes Research Foundation (JDRF):** A charitable organisation that supports research into Type 1 diabetes, directed at finding a cure for the disease.

**Medicare Benefits Schedule (MBS):** A Department of Health and Ageing list which is part of the Medicare Benefits Scheme, the aim of which is to provide an entitlement to benefits for medical and hospital services for all Australian residents.

**National Diabetes Services Scheme (NDSS):** The NDSS is an Australian Government initiative that subsidises the supply of insulin syringes, needles, insulin infusion pump consumables and diagnostic reagents (blood and urine testing strips) to people with diabetes who are registered with the scheme. Registration is free. The scheme was established in 1987 and is administered by Diabetes Australia.

**Other types of diabetes:** There are a number of conditions or syndromes that come under this category. They may result from genetic defects, infection or disease, or they may be drug- or chemical-induced diabetes, such as steroid-induced diabetes.

**National Diabetes Strategy:** Endorsed by Australian Health Ministers and recognising diabetes as a National Health Priority Area in Australia, the National Diabetes Strategy aims to contribute to the improvement of the general level of Australia's health by reducing the personal and public burden of diabetes in Australia through the implementation of a number of strategic initiatives.

**Pharmaceutical Benefits Scheme (PBS):** An Australian Government-funded scheme that subsidises the cost of a wide range of pharmaceutical drugs and covers all Australians to help them afford standard medications.

**principal diagnosis:** The diagnosis established after study to be chiefly responsible for occasioning the patient's episode of care in hospital.

**Repatriation Pharmaceutical Benefits Scheme (RPBS):** This scheme provides assistance to eligible veterans (with recognised war, or service-related disabilities) and their dependants for both pharmaceuticals listed on the PBS and a supplementary repatriation list, at the same cost as patients entitled to the concessional payment under the PBS.

**separation:** An episode of care in a hospital. This can refer to either the total stay or a portion of the total stay which ends in change of the type of care.

**Type 1 diabetes:** A form of diabetes marked by a complete lack of insulin and needing insulin replacement for survival. This form of diabetes mostly arises in childhood or in young adults, but it can occur at any age.

**Type 2 diabetes:** The most common form of diabetes, which is characterised by reduced insulin secretion or less effective insulin action. Management options may include lifestyle modification, such as changes in diet along with increased exercise and weight loss, and medications such as oral glucose-lowering drugs and insulin.

**Unspecified diabetes:** Includes those cases where the diabetes type has not been recorded.

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Between 2000–01 and 2008–09, health-care expenditure allocated to diabetes increased by 86% from \$811 million to \$1,507 million.

The health-care sector where the largest increase took place was hospital admitted patients for which expenditure more than doubled in this period. Type 2 diabetes accounted for 60% of diabetes expenditure in 2008–09.