National indicators for monitoring diabetes

Report of the Diabetes Indicators Review Subcommittee of the National Diabetes Data Working Group

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Abbreviations

ABS	Australian Bureau of Statistics
AHMC	Australian Health Minister's Conference
AIHW	Australian Institute of Health and Welfare
ANDIAB	Australian National Diabetes Information Audit and Benchmarking
APDS	Australian Prospective Diabetes Study
APEG	Australasian Paediatric Endocrine Group
AusDiab	Australian Diabetes, Obesity and Lifestyle Study
Aust-HEI	Australian Healthy Eating Index
BMI	body mass index
CATI	computer-assisted telephone interview
DoHA	Department of Health and Ageing
ESKD	end-stage kidney disease
GP	general practitioner
HbA1c	Glycosylated haemoglobin
ICD-10	International Classification of Diseases and Health-related Problems, 10th Revision (used in Australia for mortality data)
ICD-10-AM	International Classification of Diseases and Health-related Problems, 10th Revision, Australian Modification (used in Australia for hospital morbidity data)
IDDM	insulin dependent diabetes mellitus
NADC	National Association of Diabetes Centres
NDDWG	National Diabetes Data Working Group
NDR	National Diabetes Register
NDSG	National Diabetes Strategies Group
NHF	National Heart Foundation
NHMRC	National Health and Medical Research Council
NHPA	National Health Priority Area
NHPC	National Health Performance Committee
NHS	National Health Survey
PIP	Practice Incentives Program
RACGP	Royal Australian College of General Practitioners
RFPS	Risk Factor Prevalence Survey
SF-36	36 item short form questionnaire
SLA	Statistical local area
WHO	World Health Organization

Executive summary

The National Diabetes Data Working Group's Diabetes Indicators Review Subcommittee, under the direction of the National Diabetes Strategies Group (NDSG), has developed a national set of 33 diabetes indicators that address the NDSG's six priorities for diabetes information:

1. Are we preventing or delaying the development of Type 2 diabetes?
2. Is case detection occurring optimally?
3. Is access equitable?
4. Is care (prevention, early detection and management) provided according to guidelines?
5. Are we improving the quality of clinical management for people with diabetes?
6. Are we reducing the death rate and serious health effects of diabetes?

Of the 33 indicators, 11 have been selected as the highest priority and endorsed by the NDSG (Table 1). It is proposed that this recommended set of indicators be considered along with other indicators when an agreed set of national indicators for chronic diseases and associated determinants are developed to guide policy.

The main purpose of this report is to describe the process undertaken by the Subcommittee in developing and setting priorities for the full set of indicators (that is, the 33 indicators), and to provide operational definitions for the recommended set of 11 indicators. Some of the recommended 11 indicators are able to be monitored using currently available data, while others require data development. However, decisions and details about the development and implementation of a data development plan, and the reporting of the indicators, are yet to be determined and are outside of the scope of this report.

Table 1: The recommended priority diabetes indicators

Indicator	Data sources available	Development required
1. Prevalence of Type 2 modifiable diabetes risk factors over time		
1.1 Prevalence of overweight and obesity over time 1.1.1 Prevalence of overweight, but not obese 1.1.2 Prevalence of overweight 1.1.3 Prevalence of obesity	Yes	Development of national health measurement surveys to regularly collect data on measured height, weight and waist circumference.
1.2 Proportion of people not following guidelines for physical activity over time	Yes	Development of national health measurement surveys to regularly collect physical activity data that can be measured against the National Physical Activity Guidelines.
1.3 Proportion of people not following Australian dietary recommendations over time	Yes	Development of a standard definition based on the Australian Healthy Eating Index (Aust-HEI) to measure whether a person is 'not following the Australian Dietary Guidelines'. Development of national surveys that include the regular collection of a food frequency questionnaire and short dietary questions on which to base the Aust-HEI.
2. The proportion of people at risk of Type 2 diabetes who correctly identify that they are at risk and who are taking steps/actions to reduce their risk	No	Evaluation of the quality of this indicator. Development and testing of appropriate questions to measure this indicator. Identification of data sources to collect data for this indicator.
3. The proportion of people at risk of Type 2 diabetes who are being opportunistically screened, and the proportion of those undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines):		
3.1 The proportion of people at risk of Type 2 diabetes who are being opportunistically screened	No	Evaluation of the quality of these indicators.
3.2 The proportion of people at risk of Type 2 diabetes who are undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines).		Development and testing of appropriate questions to measure these indicators. Identification of data sources to collect data for these indicators.

(continued)

Table 1 (continued): The recommended priority diabetes indicators

Indicator	Data sources available	Development required
4. The number and characteristics of diabetes (Type 1, Type 2 and gestational) and at-risk programs, initiatives and services for: • Aboriginal and Torres Strait Islander people • People of culturally and linguistically diverse backgrounds • People of different socioeconomic status • People from different geographic areas	No	Evaluation of the quality of this indicator. Development and testing of appropriate questions to measure this indicator, including development of standard definitions. Identification of data sources to collect data for this indicator.
5. Ability of people to access services (Type 1, Type 2 and gestational diabetes) that are culturally suitable	No	Evaluation of the quality of this indicator. Development and testing of appropriate questions to measure this indicator, including development of standard definitions. Identification of data sources to collect data for this indicator.
6. The number and characteristics of diabetes (Type 1, Type 2 and gestational) guidelines identified	No	Evaluation of the quality of this indicator. Development and testing of appropriate questions to measure this indicator. Identification of data sources to collect data for this indicator.
7. The proportion of people with diabetes mellitus (Type 1, Type 2 and gestational) who have had an annual cycle of care	Yes	Identification of a national data source to collect data for this indicator.
8. The proportion of people with diabetes (Type 1, Type 2 and gestational) who meet guideline targets for: 8.1 HbA1c 8.2 blood pressure 8.3 cholesterol 8.4 weight/body mass index	Yes but not representative of people with diabetes in the general community.	Identification of a national data source to collect data for these indicators.
9. The diabetes-related death rate (includes Type 1, Type 2 and gestational diabetes) over time among: • the general population • Aboriginal and Torres Strait Islander people • people of culturally and linguistically diverse backgrounds • people of different socioeconomic status • people from different geographic areas	Yes	Validation studies to determine the extent to which diabetes is recorded on death certificates for people with diabetes; and to determine the accuracy of classification of type of diabetes on death certificates for people with diabetes. Improvement in Indigenous identification and the identification of people of culturally and linguistically diverse backgrounds on death certificates.

(continued)

Table 1 (continued): The recommended priority diabetes indicators

Indicator	Data sources available	Development required
10. Quality of life of people with diabetes (Type 1, Type 2 and gestational) (measured by standardised questionnaire)	Yes using SF-36.	The use of appropriate and comprehensive quality of life measures in national or large surveys to measure quality of life in people with diabetes.
11. Prevalence and incidence of diabetes (Type 1, Type 2 and gestational), its complications and comorbidities among:		
• The general population		
• Aboriginal and Torres Strait Islander people		
• People of culturally and linguistically diverse backgrounds		
• People of different socioeconomic status		
• People from different geographic areas		
11.1 Prevalence of diabetes (Type 1, Type 2 and gestational) over time	Yes	Development of national health measurement surveys to collect data on the prevalence of measured diabetes status and type for the target populations.
11.2 Incidence of diabetes (Type 1, Type 2 and gestational) over time	Yes - limited	Expansion of the National Diabetes Register (NDR) to include non-insulin treated diabetes.
11.3 Prevalence of cardiovascular disease among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.
11.4 Incidence of cardiovascular disease among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.
11.5 Prevalence of visual loss among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.
11.6 Incidence of visual loss among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.
11.7 Prevalence of end-stage renal disease among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.
11.8 Incidence of end-stage renal disease among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.
11.9 Prevalence of non-traumatic amputation among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.
11.10 Incidence of non-traumatic amputation among people with diabetes over time	Limited	Development of a national data source to collect data for this indicator.

Introduction

Purpose of report

The National Diabetes Data Working Group's Diabetes Indicators Review Subcommittee, under the direction of the National Diabetes Strategies Group (NDSG), has developed a national set of 33 diabetes indicators. Of these indicators, 11 have been selected as the highest priority and endorsed by the NDSG.

The main purpose of this report is to describe the process undertaken by the Subcommittee in developing and setting priorities for the full set of indicators (that is, the 33 indicators), and to provide operational definitions for the recommended set of 11 indicators. The full set of indicators is listed at Appendix A.

Indicators

Health indicators are standardised measures, which can be used by governments, policy makers and service providers to provide standardised and consistent information for:

- establishing benchmarks
- monitoring and comparing the health status of population groups over time
- monitoring and evaluating the effectiveness of health policy, prevention and management strategies.

Attributes of indicators

An indicator should meet some or all of the following criteria developed by the National Health Performance Committee (NHPC 2001):

- be worth measuring
- be measurable for diverse populations
- be understood by people who need to act
- galvanise action
- be relevant to policy and practice
- reflect results of actions when measured over time
- be feasible to collect and report
- comply with national processes of data definitions.

What is an operational definition for an indicator?

An operational definition for an indicator defines what is to be measured and the steps to follow to measure it consistently, reliably and validly over time and by different people (AIHW 2004a). In this report, operational definitions for the recommended diabetes indicators include the following information:

- intent of the indicator
- rationale for measurement
- target population
- numerator and denominator
- available data sources
- presentation and frequency of reporting
- further development required.

The operational definitions in this report also include a section noting issues relating to the quality of the indicator; and the quality and timeliness of the available data sources.

Policy context for diabetes indicator development

In November 2005, the Australian Health Ministers' Conference (AHMC) endorsed a national strategic policy approach to manage and improve chronic disease prevention and care in the Australian population.

The proposed national approach to chronic disease prevention and management comprises three complementary components:

1. the National Chronic Disease Strategy
2. the National Service Improvement Frameworks
3. the Blueprint for Chronic Disease Surveillance.

National Chronic Disease Strategy

The National Chronic Disease Strategy provides an overarching national framework for improving chronic disease prevention and care across Australia (NHPAC 2006a). It is a nationally agreed agenda that aims to encourage coordinated action in response to the growing impact of chronic disease on the health of Australians and the health-care system.

The primary objectives of the National Chronic Disease Strategy are to:

- prevent and/or delay the onset of chronic disease for individuals and population groups
- reduce the progression and complications of chronic disease
- maximise the wellbeing and quality of life of individuals living with chronic disease and their families and carers
- reduce avoidable hospital admissions and health-care procedures
- implement best practice in the prevention, detection and management of chronic disease
- enhance the capacity of the health workforce to meet population demand for chronic disease prevention and care into the future.

National Service Improvement Frameworks

The National Service Improvement Frameworks cover the national health priority chronic conditions of diabetes; heart, stroke and vascular disease; asthma; cancer; and osteoarthritis, rheumatoid arthritis and osteoporosis (NHPAC 2006b). The Frameworks identify opportunities where Australia might most usefully invest to improve prevention and care for these chronic diseases.

The Frameworks aim to encourage the delivery of more person-centered, equitable, timely, effective, affordable and cohesive health-care for all Australians (NHPAC 2006b). In particular, the frameworks are intended to:

- prevent and limit the progression of these chronic conditions
- slow the onset of the complications that can cause severe disabilities and be life threatening
- reduce preventable hospital admissions
- reduce variations in care that appear across different clinicians and health-care services; across people from metropolitan, regional, rural and remote areas; and in the care provided to disadvantaged groups.

The National Service Improvement Framework for Diabetes includes the following critical intervention points:

- for the well community, including those at increased risk of diabetes, to:
  - reduce the risk of diabetes
  - diagnose diabetes early.
- for people with diabetes, to provide the best care and support:
  - during the early stages of the condition
  - in the long term
  - for acute episodes.

The Framework also identifies nine initial priority actions:

1. Provide improved support for comprehensive health promotion efforts in the key area of nutrition, smoking and physical activity.
2. Establish integrated and networked diabetes services to improve continuity of care at each point along the care continuum.
3. Provide improved support for multidisciplinary care in hospitals and the community.
4. Develop agreed diabetes plans at national, state, territory and local levels, as appropriate, to monitor all aspects of diabetes management for the purpose of quality improvement, including performance indicators.
5. Provide evidence-based consumer information about environmental, behavioural and genetic risks of diabetes.
6. Continue to assist primary care workers to offer high-quality assessment of risk, early detection of diabetes, referral to treatment, coordination of treatment and supportive care.
7. Assist people with diabetes to understand and manage their diabetes through national, state, territory and local approaches.
8. Implement and evaluate culturally appropriate programs to improve diabetes prevention and management with special emphasis on the needs of disadvantaged

groups, Aboriginal and Torres Strait Islander peoples, and those from culturally and linguistically diverse backgrounds.

9. Review the evidence, gaps in research and opportunities for action within a specific timeframe, at least every 3 years.

Blueprint for Chronic Disease Surveillance

The Blueprint for Chronic Disease Surveillance is a framework for local and national public health surveillance of preventable chronic disease and the determinants of chronic disease (NPHP 2006). The Blueprint sets out the essential elements of a national surveillance system, describes an Australian Priority Setting Tool for agreeing information priorities and methods, and proposes immediate actions to establish the system.

The Healthy for Life Program

The Healthy for Life Program is an Australian Government initiative aimed at improving the:

- availability of child and maternal health-care
- prevention, early detection and management of chronic disease
- long-term health outcomes for Aboriginal and Torres Strait Islander Australians
- Aboriginal and Torres Strait Islander health workforce (DoHA 2007).

A set of *Healthy for Life* Program performance indicators has been developed by the Office for Aboriginal and Torres Strait Islander Health.

Existing diabetes indicator sets

National Health Priority Areas—diabetes indicators

In 1996, the Australian Health Ministers agreed that diabetes become a National Health Priority Area (NHPA). The NHPA initiative focused public attention and health policy on health conditions that contributed most to the burden of illness in the community, particularly areas where it is possible to reduce that burden through prevention and treatment programs.

A set of priority indicators covering prevention, screening and early intervention, treatment and management of the condition was developed. A complete list of the diabetes indicators, which are described in the 1998 National Health Priority Areas report on diabetes mellitus (CDHAC & AIHW 1999), is provided in Appendix B.

National Health Performance Committee indicators

The National Health Performance Committee (NHPC) indicators provide an overview of the performance of the Australian health system and the potential for improvements in health (NHPC 2004). They cover various dimensions across the three non-hierarchical tiers of the National Health Performance Framework and the Aboriginal and Torres Strait Islander Health Performance Framework: health status and outcomes; determinants of health; and

health system performance. Dimensions within the last tier include effectiveness, appropriateness, accessibility, responsiveness, safety, continuity, capability and sustainability. Of the set of 44 NHPC indicators, the following are relevant to diabetes:

- Management of diabetes—proportion of persons with diabetes mellitus who have received an annual cycle of care within general practice
- Potentially avoidable mortality
- Mortality for NHPA diseases and conditions
- Hospital separation rates for potentially preventable chronic conditions
- Adult smoking
- Physical inactivity
- Overweight and obesity
- High blood pressure.

Benchmark data for these indicators are presented in the National Report on Health Sector Performance Indicators 2003 (NHPC 2004).

Why was a new set of diabetes indicators developed?

The National Diabetes Information Framework proposed by Armstrong et al. (2002) included a draft set of 74 national diabetes performance indicators as a minimum data set relating to key outcomes and health-care interventions. To progress this work and develop a smaller, prioritised set of diabetes indicators, the National Diabetes Strategies Group identified six questions addressing its priorities for diabetes information:

1. Are we preventing or delaying the development of Type 2 diabetes?
2. Is case detection occurring optimally?
3. Is access equitable?
4. Is care (prevention, early detection and management) provided according to guidelines?
5. Are we improving the quality of clinical management for people with diabetes?
6. Are we reducing the death rate and serious health effects of diabetes?

The National Diabetes Data Working Group (NDDWG), through its National Diabetes Indicators Review Subcommittee, was then given responsibility for developing indicators that addressed these six questions and determining priorities for developing a national set of diabetes indicators. The result of this process was a national set of diabetes indicators including a 'Top 11' recommended indicators. These recommended indicators support the Diabetes National Service Improvement Framework and the National Diabetes Strategy, and incorporate the priorities of the NDSG. The steps undertaken in the development of the indicators are briefly described below.

Indicator development process

1. Development of the indicator matrix

The first step undertaken by the Review Subcommittee in developing a national minimum data set was to identify different areas of indicator development for diabetes, including:

- the six questions that covered the NDSG's current priorities for diabetes information
- the stakeholders involved in diabetes management—that is, funder-policy makers; service organisations; health-care practice; and consumers
- the spectrum or setting of diabetes care, including primary, secondary and tertiary care; population health; and infrastructure
- the continuum of diabetes care, including prevention, detection, and management of diabetes and its complications.

The Review Subcommittee of the NDDWG developed a two-dimensional matrix framework that encompassed all of these indicators (see Appendix A for the complete matrix). In doing so, consistency with relevant indicator work being carried out by the National Health Performance Advisory Group and international organisations was taken into account as much as possible.

For each cell of the matrix, the Review Subcommittee developed questions, which were used to determine priorities for developing a national set of diabetes indicators, including information on the indicators' data availability.

2. Indicator assessment

The following data assessment was undertaken for each of the diabetes indicators included in the indicator matrix:

1. Are the data available already - both denominator and numerator?
2. If not, can the data be collected? If yes, how difficult and at what cost?
3. What is, or will be the quality of the data (for example, validity, reliability, completeness)
4. What subgroup categories need to be considered (for example, Type 1 versus Type 2 diabetes; population subgroups such as Aboriginal and Torres Strait Islander peoples, people of culturally and linguistically diverse backgrounds; and so on)? Do the available data have sufficient power for subgroup analysis?
5. How often should the data be collected (that is, frequency for monitoring)?

This assessment was then used to yield the following feasibility options for data availability:

A. Available or feasible at low cost with little development work
B. Feasible, but needs development and some cost
C. Not feasible at present.

3. Indicator prioritisation

The next step involved setting priorities for the indicators in any cell of the matrix where there was more than one indicator in that cell. Following this, the Diabetes Indicators Review Subcommittee chose, by consensus and in a non-prioritised manner, a list of

11 indicators to be recommended to the NDSG as the highest priority indicators for monitoring.

4. Consultation with state and territory jurisdictions

A draft of the indicators matrix was sent to all state and territory jurisdictions in April 2004 for comments. Comments were received from four state jurisdictions—Victoria, Queensland, South Australia and Western Australia. Most of the comments received related to data development issues and the need for a data development plan. All jurisdictions that responded received feedback from the Review Subcommittee.

A list of the jurisdictions consulted is provided in Appendix C.

5. Preliminary consideration by the NDSG

Following the consultation with the jurisdictions, the Diabetes Indicators Review Subcommittee refined the draft set of indicators and selected its non-prioritised list of the top 11 indicators as described above. The revised set of draft indicators and the list of the 11 highest priority indicators were then submitted for consideration to the NDSG's July 2005 meeting. In response, the NDSG asked the Review Subcommittee to consult with consumers about the consumer-specific indicators and to undertake a second round of consultation with the state and territory jurisdictions.

6. Second round of consultation with state and territory jurisdictions

A second consultation was conducted with jurisdictions between September and October 2005. Responses were received from three jurisdictions—South Australia, Western Australia and Tasmania. On the whole, the comments received from these jurisdictions were encouraging. Further, the Review Subcommittee decided that development of the operational definitions would probably address the issues raised.

7. Consumer consultation

Consultation with consumers was undertaken through a forum set up by Diabetes Australia NSW in October 2005. On the whole, the consumers consulted were in agreement with the indicators developed.

A list of the consumers consulted is provided in Appendix C.

8. Endorsement by NDSG

Following the consumer consultation and the second round of state and territory jurisdiction consultation, the Review Subcommittee finalised the draft indicator set and the list of the 11 priority indicators and submitted them for endorsement to the November 2005 meeting of the NDSG. At this meeting, the NDSG endorsed the full indicator set and the 11 recommended priority indicators. The NDSG also authorised the Diabetes Indicators Review Subcommittee secretariat to draft a technical report (that is, this report), that would include:

● the background and context to the indicator development

● the operational definitions for the 11 recommended priority indicators

● the complete indicator matrix.

The recommended priority diabetes indicators

The 11 recommended priority indicators are listed below (with the corresponding matrix indicator number in brackets). Note, the 11 recommended indicators are not numbered by order of priority. Operational definitions for each of these indicators are provided in the next chapter. It should be noted that data are not currently available to measure all of these indicators and, where data are available, not all data sources are complete. Possible data sources will need to be identified and evaluated for many of these indicators and some will require further data development.

1. Prevalence of Type 2 modifiable diabetes risk factors over time (1B.1.1)

    1.1 Prevalence of overweight and obesity over time.

        1.1.1 Prevalence of overweight, but not obese

        1.1.2 Prevalence of overweight

        1.1.3 Prevalence of obesity

    1.2 Proportion of people not following guidelines for physical activity over time.

    1.3 Proportion of people not following Australian dietary recommendations over time.

2. The proportion of people at risk of Type 2 diabetes who correctly identify that they are at risk and who are taking steps/actions to reduce their risk (2C.1.1)

3. The proportion of people at risk of Type 2 diabetes who are being opportunistically screened, and the proportion of those undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines) (2B.1.1)

    3.1 The proportion of people at risk of Type 2 diabetes who are being opportunistically screened.

    3.2 The proportion of people at risk of Type 2 diabetes undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines).

4. The number and characteristics of diabetes (Type 1, Type 2 and gestational) and at-risk programs, initiatives and services for (3A.1.1):
    - Aboriginal and Torres Strait Islander people
    - people of culturally and linguistically diverse backgrounds
    - people of different socioeconomic status
    - people from different geographic areas.

5. Ability for people to access services (Type 1, Type 2 and gestational diabetes) that are culturally suitable (3C.1.1)

6. The number and characteristics of diabetes (Type 1, Type 2 and gestational) guidelines identified (4A.1.1)

7. The proportion of people with diabetes mellitus (Type 1, Type 2 and gestational) who have had an annual cycle of care (4B.1.1)

8. The proportion of people with diabetes (Type 1, Type 2 and gestational) who meet guideline targets for (5B.1.1):

    8.1 HbA1c

    8.2 Blood pressure

    8.3 Cholesterol

    8.4 Weight/body mass index.

9. The diabetes-related death rate (includes Type 1, Type 2 and gestational diabetes) over time among (6B.1.1):

    ● the general population

    ● Aboriginal and Torres Strait Islander people

    ● people of culturally and linguistically diverse backgrounds

    ● people of different socioeconomic status

    ● people from different geographic areas.

10. Quality of life of people with diabetes (Type 1, Type 2 and gestational) (measured by standardised questionnaire) (6C.1.1)

11. Prevalence and incidence of diabetes (Type 1, Type 2 and gestational), its complications and comorbidities over time (6B.2.1) among:

    ● the general population

    ● Aboriginal and Torres Strait Islander people

    ● people of culturally and linguistically diverse backgrounds

    ● people of different socioeconomic status

    ● people from different geographic areas.

    11.1 Prevalence of diabetes (Type 1, Type 2 and gestational) over time

    11.2 Incidence of diabetes (Type 1, Type 2 and gestational) over time

    11.3 Prevalence of cardiovascular disease among people with diabetes over time

    11.4 Incidence of cardiovascular disease among people with diabetes over time

    11.5 Prevalence of visual loss among people with diabetes over time

    11.6 Incidence of visual loss among people with diabetes over time

    11.7 Prevalence of end-stage renal disease among people with diabetes over time

    11.8 Incidence of end-stage renal disease among people with diabetes over time

    11.9 Prevalence of non-traumatic amputation among people with diabetes over time

    11.10 Incidence of non-traumatic amputation among people with diabetes over time.

How do the recommended indicators complement Australian Government initiatives for chronic disease and diabetes?

The recommended diabetes indicators deal with aspects of diabetes across the continuum of care, including prevention, detection, management and complications. The indicators also focus on equitable access for all people who have diabetes or are at risk of diabetes.

Furthermore, the indicators have been developed across three stakeholder settings—health-care organisation, health-care practices and consumers. The framework within which the indicators have been developed is consistent with the themes shared by the Australian Government's National Chronic Disease Strategy, the National Service Improvement Frameworks and the Blueprint for Chronic Disease Surveillance, which include:

- emphasis on health promotion, prevention and monitoring population trends in the risk factors for chronic disease
- supporting integrated service provision and multidisciplinary care
- promoting and supporting self-management within the health system
- progressing mechanisms to improve quality of care
- improving access to chronic disease prevention and care services by Aboriginal and Torres Strait Islander people and other under-serviced population groups.

The recommended set of indicators listed above should be considered along with other indicators when an agreed prioritised set of national indicators for chronic diseases and associated determinants are developed to guide policy.

Operational definitions for the recommended 11 indicators

1. Prevalence of Type 2 modifiable diabetes risk factors over time

Intent

To monitor the trend in the prevalence of Type 2 diabetes risk factors to determine whether we are preventing or delaying the development of Type 2 diabetes.

Rationale

The current National Health and Medical Research Council (NHMRC) guidelines for the primary prevention, case detection and diagnosis of Type 2 diabetes make the following major recommendations for the primary prevention of Type 2 diabetes (NHMRC 2001):

- Regular physical activity is recommended to reduce the risk of Type 2 diabetes.
- Because obesity is associated with an increased risk of Type 2 diabetes, interventions to reduce obesity may reduce the risk of Type 2 diabetes.
- Abdominal obesity is an important indicator of increased risk of Type 2 diabetes in all ethnic groups and should be a particular focus of weight-loss programs.
- Individuals at risk of developing Type 2 diabetes should have dietary intake assessed and should receive individualised dietary advice and continued dietetic support (see definition on page 22).
- Individuals at risk should consume a diet with less than 30% energy as fat and less than 10% energy as saturated fat.
- Diets of low energy density and containing a wide range of carbohydrate foods rich in dietary fibre and of low glycaemic index (cereals, vegetables, legumes and fruits) are recommended to reduce the risk of Type 2 diabetes.

Note, these NHMRC guidelines are expected to be updated by early 2008.

This indicator is a measure of a population at increased risk of developing diabetes and diabetes complications, and is an outcome indicator for disease prevention strategies.

Target population

- People aged 18 years and over

1.1 Prevalence of overweight and obesity over time

Box 1: Measuring overweight and obesity in adults aged 18 years and over using body mass index or waist circumference			
Measure	*Overweight, but not obese*	*Overweight*	*Obese*
Body Mass Index (BMI)[(a)]	*≥ 25 and < 30 kg/m2*	*≥ 25 kg/m2*	*≥ 30 kg/m2*
Waist circumference[(b)]	*Men: ≥ 94 cm and < 102 cm*	*Men: ≥ 94 cm*	*Men: ≥ 102 cm*
	Women: ≥ 80 cm and < 88 cm	*Women: ≥ 80 cm*	*Women: ≥ 88 cm*

(a) Source: WHO 2000

(b) Source: WHO 2000 as described by Han et al. 1995

Numerators

1.1.1   The number of people aged 18 years and over who are overweight, but not obese.

1.1.2   The number of people aged 18 years and over who are overweight.

1.1.3   The number of people aged 18 years and over who are obese

Denominator

Population aged 18 years and over.

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

National measured height and weight

- Australian Bureau of Statistics (ABS) 1995 National Nutrition Survey (ages 2+ years)
- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- National Heart Foundation (NHF) Risk factor Prevalence Surveys 1980, 1983 and 1989 (ages 25–64 years in 1980 and 1983; and 20–69 years in 1989).

National measured waist circumference

- ABS 1995 National Nutrition Survey (ages 2+ years)
- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- NHF Risk factor Prevalence Survey 1989 (ages 20–69 years).

National self-reported height and weight

- ABS National Health Surveys 1989–90, 1995, 2001, 2004–05 (ages 15+ years)
- National Physical Activity Surveys 1997, 1999 and 2000 (ages 18–75 years)
- Australian Longitudinal Study on Women's Health.

Other

- Jurisdictional computer-assisted telephone interviews (CATI) surveys.

Notes

- The Australian Institute of Health and Welfare (AIHW) recommends that measured height and weight data should be used to monitor indicators of body mass in the population where such data are available (AIHW 2003a). BMI is not accurately classified using self-reported information as people tend to overestimate their height and underestimate their weight (Flood et al. 2000; Neidhammer et al. 2000; ABS 1998b; Waters 1993). Therefore, use of self-reported BMI data may underestimate the true prevalence rates of overweight and obesity.

- Data on measured height, weight and waist circumference for adults have not been available at a national level since 1999–2000.

- ABS National Health Surveys are currently conducted every 3 years. The next National Health Survey is planned for 2007–08.

- The World Health Organization (WHO) BMI classification is only suitable for people aged 18 years and over (WHO 2000). Further, the WHO classification for adults may not be suitable for all ethnic groups, who may have equivalent levels of risk at a lower BMI (for example, people from China or Japan) or higher BMI (for example, people from Polynesia) (IDI 2000; WHO 2000).

- There are currently no standard cut-offs for waist circumferences to indicate increased risk of health problems. Current evidence, however, suggests that waist circumferences greater than or equal to 94 cm in men, and greater than or equal to 80 cm in women, indicate increased risk (WHO 2000 as described by Han et al. 1995). Waist circumferences greater than or equal to 102 cm in men, and greater than or equal to 88 cm in women, indicate substantially increased risk.

- The classification for waist circumference may not be suitable for all ethnic groups.

- While the proposed target population for this indicator is people aged 18 years and over, the increasing prevalence of overweight and obesity, and Type 2 diabetes, in younger people may mean that the age limit for the target population should be lowered.

Presentation

Age-standardised percentages of population aged 18 years and over.

Frequency of reporting

Every 1–2 years.

Note: national data are not currently available this frequently.

Further development required

- Development of national health measurement surveys to regularly collect data on measured height, weight and waist circumference.

1.2   Proportion of people not following guidelines for physical activity over time

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Box 2: The National Physical Activity Guidelines for Australians

The National Physical Activity Guidelines for Australians recommend 30 minutes of moderate-intensity physical activity on most (preferably all) days of the week as the minimum requirement for good health (DHAC 1999). This is generally interpreted as a total of at least 150 minutes (2 ½ hours) of moderate activity accrued over at least five separate sessions during the week. Moderate intensity activity is activity that causes a slight, but noticeable, increase in breathing and heart rate for example: brisk walking, digging in the garden or medium-paced cycling.

The guidelines also recommend that for additional health and fitness benefits, 30 minutes or more of vigorous activity on 3–4 days of the week should be added to the minimum recommendation.

Definition of physical inactivity

Physical inactivity is defined as participating in less than 150 minutes of moderate intensity activity per week.

Numerator

The number of people aged 18 years and over who are not following guidelines for physical activity.

Denominator

Population aged 18 years and over.

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

● National Physical Activity Surveys 1997, 1999 and 2000 (ages 18–75 years)
● ABS National Health Surveys 1989–90, 1995, 2001, 2004–05 (ages 15+ years)
● 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
● Exercise, Recreation and Sport Survey (ERASS) (ages 15+ years)
● Australian Longitudinal Study on Women's Health
● Jurisdictional CATI surveys.

Notes

● The AIHW recommends that data from surveys using the Active Australia Survey instrument be used to derive indicators of levels of physical activity, including physical inactivity (AIHW 2003a). Research and testing of instruments that measure physical activity in population groups found that the questions used in the Active Australia Survey exhibited good reliability and acceptable validity and it has been recommended that the Active Australia Survey be adopted for continuing population monitoring of physical activity in Australia (Brown et. al 2002). In addition, the ability to measure

amounts of physical activity, as specified in the National Physical Activity Guidelines for Australians, adds further value to using this instrument.

- ABS National Health Surveys are currently conducted every 3 years. The next National Health Survey is planned for 2007–08.

Presentation

Age-standardised percentages of population age 18 years and over.

Frequency of reporting

Every 1–2 years.

Note: national data are not currently available this frequently.

Further development required

- Development of national health measurement surveys to regularly collect physical activity data that can be measured against the National Physical Activity Guidelines.

1.3 Proportion of people not following Australian dietary recommendations over time

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Box 3: The Australian Dietary Guidelines for adults

The Australian Dietary Guidelines for adults are (NHMRC 2003):

Enjoy a wide variety of nutritious foods

- *Eat plenty of vegetables, legumes and fruits*
- *Eat plenty of cereals (including breads, rice, pasta and noodles), preferably wholegrain*
- *Include lean meat, fish, poultry and/or alternatives*
- *Include milks, yoghurts, cheeses and/or alternatives. Reduced-fat varieties should be chosen, where possible*
- *Drink plenty of water*

and take care to:

- *Limit saturated fat and moderate total fat intake*
- *Choose foods low in salt*
- *Limit your alcohol intake if you choose to drink*
- *Consume only moderate amounts of sugars and foods containing added sugars*

Prevent weight gain: be physically active and eat according to your energy needs

Care for your food: prepare and store it safely

Encourage and support breastfeeding

Definition of not following the Australian Dietary Guidelines

The Australian healthy eating index (Aust-HEI) could be used to define whether a person is 'not following the Australian Dietary Guidelines'. The Aust-HEI is designed to provide a measure of total diet quality based on food choice and whether 'recommended' foods are being chosen (AIHW 2007). The index reflects the Australian Dietary Guidelines and is based on data from a food frequency questionnaire and short dietary questions. Scores for the

Aust-HEI range from 0 to 60, with higher scores indicating a higher quality diet overall; however, there is currently no standard definition or standard cut-off based on the Aust-HEI to measure whether a person is 'not following the Australian Dietary Guidelines'.

Numerator

The number of people aged 18 years and over who are not following the Australian Dietary Guidelines.

Denominator

Population aged 18 years and over.

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

- ABS 1995 National Nutrition Survey (ages 2+ years)
- ABS National Health Surveys 2001 and 2004–05 (ages 12+ years)
- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- 1983 National Dietary Survey of Adults (ages 25–64 years)
- Jurisdictional CATI surveys.

Notes

- As a measure of healthy dietary behaviours, the Aust-HEI has been shown to demonstrate internal consistency and construct validity (AIHW 2007). However, the index has not been validated using longitudinal data on morbidity and mortality outcomes. Furthermore, the Aust-HEI is currently based on data from the 1995 National Nutrition Survey, and it has been recommended that the index should be refined for future use in conjunction with the development of a new food frequency questionnaire (FFQ) that better reflects current food choices (AIHW 2007).

- Detailed information on food and beverage intake has not been available at a national level since 1995. The ABS National Health Surveys only collect information on selected dietary behaviours—the number of serves of fruit and vegetables 'usually' eaten each day; and the type of milk 'usually' consumed.

- Data relating to dietary behaviour and weight should be interpreted with caution as the effect of diet on body weight is complex and occurs over a period of time (AIHW 2004b). For example, a higher consumption of reduced-fat milk among overweight people compared with those of healthy weight may reflect attempts to lose weight. Furthermore, self-reported measures of dietary behaviour do not indicate actual food intake and are subject to inaccurate- or under-reporting of food consumption.

Presentation

Age-standardised percentages of population age 18 years and over.

Frequency of reporting

Every 1–2 years.

Note: national data are not currently available this frequently.

Further development required

- Development of a standard definition based on the Aust-HEI to measure whether a person is 'not following the Australian Dietary Guidelines'.
- Development of national surveys that include the regular collection of a FFQ and short dietary questions on which to base the Aust-HEI.

2. The proportion of people at risk of Type 2 diabetes who correctly identify that they are at risk and who are taking steps/actions to reduce their risk

Intent

To determine whether people at risk of Type 2 diabetes are aware of Type 2 diabetes risk factors and whether they are taking steps/actions to reduce their risk.

Rationale

The current NHMRC guidelines for the primary prevention, case detection and diagnosis of Type 2 diabetes make the following major recommendations for the primary prevention of Type 2 diabetes (NHMRC 2001):

- Regular physical activity is recommended to reduce the risk of Type 2 diabetes.
- Since obesity is associated with an increased risk of Type 2 diabetes, interventions to reduce obesity may reduce the risk of Type 2 diabetes.
- Abdominal obesity is an important indicator of increased risk of Type 2 diabetes in all ethnic groups and should be a particular focus of weight-loss programs.
- Individuals at risk of developing Type 2 diabetes should have dietary intake assessed and should receive individualised dietary advice and continued dietetic support.
- Individuals at risk should consume a diet with less than 30% energy as fat and less than 10% energy as saturated fat.
- Diets of low energy density and containing a wide range of carbohydrate foods rich in dietary fibre and of low glycaemic index (cereals, vegetables, legumes and fruits) are recommended to reduce the risk of Type 2 diabetes.

Note, these NHMRC guidelines are expected to be updated by early 2008.

This indicator is a measure of a population at increased risk of developing diabetes and diabetes complications, and is an outcome indicator for disease prevention strategies.

Target population

People aged 18 years and over who are at risk of Type 2 diabetes.

Definition of 'at risk of undiagnosed Type 2 diabetes'

Under the current NHMRC guidelines for the primary prevention, case detection and diagnosis of Type 2 diabetes, the following population groups are considered to be at high risk of undiagnosed Type 2 diabetes (NHMRC 2001):

- people with impaired glucose tolerance or impaired fasting glucose
- Aboriginal and Torres Strait Islanders aged 35 and over

- certain high-risk non-English speaking background groups aged 35 and over (specifically Pacific Islander people, people from the Indian subcontinent or of Chinese origin)
- people aged 45 and over who have either or both of the following risk factors:
  – Obesity (BMI ≥ 30 kg/m²)
  – Hypertension
- all people with clinical cardiovascular disease (myocardial infarction, angina or stroke)
- women with polycystic ovary syndrome who are obese.

Individuals presenting the following risk factors are also considered to be at high risk of having undiagnosed Type 2 diabetes, but further studies are required in order to evaluate any net clinical or economic benefit of testing these groups:

- women with previous gestational diabetes
- people aged 55 and over
- people aged 45 and over who have a first-degree relative with Type 2 diabetes.

The basic criterion underpinning these guidelines was that a single risk factor—or a combination of risk factors—should identify groups of individuals with a 5% chance of having undiagnosed Type 2 diabetes. However, the guidelines do not preclude the testing of population groups with a lower prevalence of undiagnosed Type 2 diabetes depending on local circumstances.

Note, these NHMRC guidelines are expected to be updated by early 2008.

Numerators

2.1.1 The number of people who are at risk of Type 2 diabetes and are aware of Type 2 diabetes risk factors.

2.1.2 The number of people who are at risk of Type 2 diabetes and are aware of Type 2 diabetes risk factors and are taking steps/actions to reduce their risk.

Denominator

The number of people who are at risk of Type 2 diabetes.

Data sources

No data sources are currently available to collect data for the numerators.

Some population groups at risk of Type 2 diabetes (that is, denominator data) could be identified in the ABS National Health Surveys, 1999–2000 AusDiab, and the state and territory CATI health surveys. However, data sources would need to be developed for other population groups at risk of Type 2 diabetes (such as women with polycystic ovary syndrome who are obese). Further, appropriate questions would need to be developed and tested to collect the data for both numerators.

Notes

Further development is required to determine the quality of this indicator – see below.

Presentation

Percentage of target population.

Frequency of reporting

Every 2–3 years.

Further development required

- Evaluation of the quality of this indicator.
- Development and testing of appropriate questions to measure this indicator.
- Identification of data sources to collect data for this indicator.

3. The proportion of people at risk of Type 2 diabetes who are being opportunistically screened, and the proportion of these undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines)

Intent

To determine whether case detection for Type 2 diabetes is occurring optimally.

Rationale

The current NHMRC guidelines for primary prevention, case detection and diagnosis of Type 2 diabetes recommend that active case detection and diagnosis of Type 2 diabetes should be considered for the following reasons (NHMRC 2001):

- Type 2 diabetes is a serious and costly health problem.
- The natural history of Type 2 diabetes includes an asymptomatic phase, which is not benign and during which it can be diagnosed.
- Early treatment of Type 2 diabetes reduces morbidity from long-term complications.
- Case detection and diagnosis of Type 2 diabetes has a favourable risk-to-benefit ratio.

This indicator is a measure of opportunistic screening and early detection practices for Type 2 diabetes.

Target population

People aged 18 years and over who are at risk of Type 2 diabetes.

Definition of 'at high risk of undiagnosed Type 2 diabetes'

Although the health impact of Type 2 diabetes is significant, its overall prevalence does not justify universal testing of the entire Australian adult population. Rather, opportunistic case detection is recommended for individuals defined to be at risk of undiagnosed Type 2 diabetes (NHMRC 2001). These are:

- people with impaired glucose tolerance or impaired fasting glucose
- Aboriginal and Torres Strait Islanders aged 35 and over
- certain high-risk non-English speaking background groups aged 35 and over (specifically Pacific Islander people, people from the Indian subcontinent or of Chinese origin)
- people aged 45 and over who have either or both of the following risk factors:
  - Obesity (BMI ≥ 30 kg/m^2)
  - Hypertension

- all people with clinical cardiovascular disease (myocardial infarction, angina or stroke)
- women with polycystic ovary syndrome who are obese.

Individuals presenting the following risk factors are also considered to be at high risk of having undiagnosed Type 2, diabetes but further studies are required in order to evaluate any net clinical or economic benefit of testing these groups:

- women with previous gestational diabetes
- people aged 55 and over
- people aged 45 and over who have a first-degree relative with Type 2 diabetes.

The basic criterion underpinning these guidelines was that a single risk factor, or a combination of risk factors, should identify groups of individuals with a 5% chance of having undiagnosed Type 2 diabetes. However, the guidelines do not preclude the testing of population groups with a lower prevalence of undiagnosed Type 2 diabetes, depending on local circumstances.

Note, these NHMRC guidelines are expected to be updated by early 2008.

3.1 The proportion of people at risk of Type 2 diabetes who are being opportunistically screened

Numerator

The number of people aged 18 years and over who are at risk of Type 2 diabetes who are being opportunistically screened.

Denominator

The number of people aged 18 years and over who are at risk of Type 2 diabetes.

Data sources

No data sources are currently available to measure the numerator. Furthermore, appropriate questions would need to be developed and tested to collect these data.

Some population groups at risk of Type 2 diabetes (that is, denominator data) could be identified in the ABS National Health Surveys, AusDiab and the state and territory CATI health surveys. However, data sources would need to be developed for other population groups at risk of Type 2 diabetes (such as women with polycystic ovary syndrome who are obese).

Notes

Further development is required to determine the quality of this indicator—see below.

Presentation

Percentage of target population.

Frequency of reporting

Every 2–3 years.

Further development required

- Evaluation of the quality of this indicator.
- Development and testing of appropriate questions to measure this indicator.
- Identification of data sources to collect data for this indicator.

3.2   The proportion of people at risk of Type 2 diabetes who are undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines)

NHMRC guidelines for the appropriate opportunistic screening for people at risk of Type 2 diabetes

The current NHMRC guidelines for primary prevention, case detection and diagnosis of Type 2 diabetes recommend the following procedures for case detection and diagnostic testing for Type 2 diabetes (NHMRC 2001):

- Measure plasma glucose as the screening test in people with risk factors. This should be performed by a laboratory (rather than with a blood glucose meter) and should preferably be carried out on a fasting sample. However, a random measurement may be used.
- The plasma glucose results should be interpreted as follows:
  - less than 5.5 mmol/L—diabetes unlikely
  - 7.0 mmol/L or more fasting or 11.1 mmol/L or more random—diabetes likely
  - between 5.5 and 6.9 mmol/L fasting or between 5.5 and 11.0 mmol/L random—perform an oral glucose tolerance test
  - the oral glucose tolerance test should be performed and interpreted according to the 1999 WHO criteria.
- A confirmatory test must be performed on a separate day to confirm the diagnosis in all asymptomatic individuals whose results are suggestive of a diagnosis of diabetes.

Periodic testing for undiagnosed Type 2 diabetes is recommended by measuring fasting plasma glucose according to the following schedule:

- each year for people with impaired glucose tolerance (IGT) or impaired fasting glucose (IFG)
- every 3 years for people at high risk (as defined above) with a negative screening blood test
- people with an initial plasma glucose consistent with a diagnosis of diabetes or IGT/IFG, which is not confirmed on subsequent testing, should be retested after 1 year.

All people with identified risk factors for Type 2 diabetes who have a negative screening test are at risk of cardiovascular disease and the future development of Type 2 diabetes, and should be given appropriate advice on risk factor reduction

Note, these NHMRC guidelines are expected to be updated by early 2008.

Numerator

The number of people aged 18 years and over who are at risk of Type 2 diabetes who are undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines).

Denominator

The number of people aged 18 years and over who are at risk of Type 2 diabetes who are being opportunistically screened.

Data sources

No data sources are currently available for measuring either the numerator or the denominator. Further, appropriate questions would need to be developed and tested to collect these data.

Notes

Further development is required to determine the quality of this indicator—see below.

Presentation

Percentage of target population.

Frequency of reporting

Every 2–3 years.

Further development required

- Evaluation of the quality of this indicator.
- Development and testing of appropriate questions to measure this indicator.
- Identification of data sources to collect data for this indicator.

4.   The number and characteristics of diabetes and at-risk programs, initiatives and services

Intent

To determine whether the programs, initiatives and services for people at risk, or with Type 1, Type 2 or gestational diabetes, equitably target and reach:

- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people with different socioeconomic status
- people from different geographic areas.

To ascertain the following characteristics for each program, initiative and service identified:

- What is the focus of the program (for example, risk factor modification, self-management education)?
- What is the target population?
- Does the program follow current evidence-based guidelines?
- Is it ongoing?
- To what extent is it culturally appropriate for all groups within the target population?
- Are there any population groups who are missed or not reached?

Rationale

Certain Australians are at greater risk of diabetes, including Aboriginal and Torres Strait Islander peoples; people born in Southern Europe, Eastern Europe, the Pacific Islands, South-East Asia, China, and the Middle East and North Africa; people from the most socioeconomically disadvantaged areas; and people living in remote areas of Australia (AIHW 2002; AIHW 2003b; AIHW: Dixon & Webbie 2005; ABS 2006a; ABS 2006b).

All people with diabetes are entitled to access high- quality health services regardless of their financial status, cultural background or place of residence (NHMRC 2001: 2).

For people with diabetes from community groups who may have special needs such as people from Aboriginal, Torres Strait Islander or non-English speaking backgrounds, and the elderly, diabetes care should be tailored to enhance access and opportunities for optimal diabetes outcomes (NHMRC 2001:2).

This indicator is a measure of equitable availability of programs, initiatives and services for people at risk of, or with, Type 1, Type 2 or gestational diabetes.

Target populations

- Aboriginal and Torres Strait Islander people with diabetes or at risk of diabetes
- People of culturally and linguistically diverse backgrounds with diabetes or at risk of diabetes
- People with different socioeconomic status with diabetes or at risk of diabetes
- People from different geographic areas with diabetes or at risk of diabetes.

Numerator

Not applicable.

Denominator

Not applicable.

Data sources

No data sources are currently available.

Notes

- Further development is required to determine the quality of this indicator—see below.

Presentation

To be determined following further development.

Frequency of reporting

Every 3–5 years.

Further development required

- Evaluation of the quality of this indicator.
- Development and testing of appropriate questions to measure this indicator, including development of standard definitions for:
    - a 'diabetes program, initiative or service'
    - an 'at-risk program, initiatives or service'
    - 'equitable target and reach'.
- Identification of data sources to collect data for this indicator.

5. Ability for people to access services that are culturally suitable

Intent

To determine whether the services for people with Type 1, Type 2 and gestational diabetes are accessible and presented in a culturally appropriate way.

Rationale

People with diabetes are entitled to access high-quality health services regardless of their financial status, cultural background or place of residence (NHMRC 2001: 2).

For people with diabetes from community groups who may have special needs, such as people from Aboriginal, Torres Strait Islander or non-English speaking backgrounds, and the elderly, diabetes care should be tailored to enhance access and opportunities for optimal diabetes outcomes (NHMRC 2001:2).

Target populations

- Aboriginal and Torres Strait Islander people with Type 1, Type 2 and gestational diabetes.
- People of culturally and linguistically diverse backgrounds with Type 1, Type 2 and gestational diabetes.

Numerator

The number of people in the target populations who are able to access culturally suitable programs

Denominator

The number of people in the target populations

Data sources

No data sources are currently available. It may be possible to collect data for this indicator by including appropriate questions in the ABS National Health Survey (NHS) or jurisdictional CATI surveys.

Notes

- Further development is required to determine the quality of this indicator—see below.
- Collection of data on cultural suitability is difficult, as it is not appropriate to collect this information via telephone surveys because of difficulties such as language barriers in culturally and linguistically diverse groups and inadequate access to telephones in some Indigenous and remote communities. It would be more appropriate to collect this information through focus groups, but these may be time-consuming and expensive.
- There are difficulties in defining what constitutes a 'culturally suitable' service and what constitutes 'ability to access' a service.

Presentation

Percentage of target population.

Frequency of reporting

Every 2–3 years.

Further development required

- Evaluation of the quality of this indicator.
- Development and testing of appropriate questions to measure this indicator, including development of standard definitions for:
  - a 'culturally suitable' service
  - 'ability to access' a service.
- Identification of data sources to collect data for this indicator.

6. The number and characteristics of Type 1, Type 2 and gestational diabetes guidelines identified

Intent

To determine for which aspects of diabetes prevention, early detection and management guidelines already exist; and to determine some or all of the following characteristics for each aspect of diabetes prevention, early detection and management for which guidelines exist:

- Are the guidelines Australian?
- Are they evidence-based?
- Have the guidelines been endorsed? If yes, by whom?
- When were they last updated and are they still considered current?
- Are they written or available in consumer-friendly language?
- Describe the level of dissemination of these guidelines to health-care providers?
- Have the guidelines been implemented/incorporated into diabetes programs/initiatives?
- Are there mechanisms to audit diabetes prevention, early detection and management against the guidelines (in hospitals, diabetes centres and general practice)?

Rationale

This indicator is a measure of the availability of best-practice guidelines for diabetes prevention, early detection and management.

Target population

Not applicable.

Numerator

Not applicable.

Denominator

Not applicable.

Data sources

No data sources are currently available.

Notes

- Further development is required to determine the quality of this indicator—see below.
- This indicator does not provide a measure of the uptake and use of guidelines in preventing, detecting and managing diabetes. However, Indicators 3 and 7 are intended to measure the use of guidelines in preventing, detecting and managing diabetes.

Presentation

To be determined following further development.

Frequency of reporting

Every 3–5 years.

Further development required

- Evaluation of the quality of this indicator.
- Development and testing of appropriate questions to measure this indicator.
- Identification of data sources to collect data for this indicator.

7. The proportion of people with diabetes mellitus who have had an annual cycle of care

Intent

To determine whether the management practices recommended by the guidelines is being provided and received.

Rationale

The provision of an annual cycle of care to patients with diabetes is a component of the National Integrated Diabetes Program Practice Incentives Program.

This indicator is a measure of the clinical management of diabetes according to national guidelines.

Target population

People who have Type 1 or Type 2 diabetes.

Definition of 'an annual cycle of care'

The Medicare Benefits Schedule (DoHA 2006) definition of an annual cycle of care for patients with established diabetes mellitus is described in Box 4. While this definition indicates that the minimum frequency for measuring HbA1c for reimbursement purposes is at least once a year, the required frequency for optimal clinical care is to measure HbA1c at least 6-monthly in adults (NSW Department of Health 1996; RACGP & Diabetes Australia 2006) and every 3 months in children and adolescents (NSW Department of Health 1998).

Numerator

The number of people with Type 1 or Type 2 diabetes who have had an annual cycle of care.

Denominator

The number of people with Type 1 or Type 2 diabetes.

Data sources

The Medicare Benefits Scheme.

Notes

● Since 2001, specific Medicare items have recorded whether a cycle of care for diabetes has been completed for general practices participating in the Practice Incentives Program

(PIP). Data on the number of these items are available disaggregated by age, sex and geographic region.

● Not all general practices participate in the PIP. In 2002, PIP practices covered 78.2% of patients in general practice (NHPC 2004). Further, information based on PIP activity may not pick up activity in Aboriginal Community Controlled Health Services.

Box 4: An annual cycle of care

The minimum requirements of care needed to be assessed to complete a cycle of care for patients with established diabetes mellitus are:

• *Assess diabetes control by measuring HbA1C*	*At least once every year*
• *Ensure that a comprehensive eye examination is carried out**	*At least once every two years*
• *Measure weight and height and calculate BMI***	*At least twice every cycle of care*
• *Measure blood pressure*	*At least twice every cycle of care*
• *Examine feet****	*At least twice every cycle of care*
• *Measure total cholesterol, triglycerides and HDL cholesterol*	*At least once every year*
• *Test for microalbuminuria*	*At least once every year*
• *Provide self-care education*	*Patient education regarding diabetes management*
• *Review diet*	*Reinforce information about appropriate dietary choices*
• *Review levels of physical activity*	*Reinforce information about appropriate levels of physical activity*
• *Check smoking status*	*Encourage cessation of smoking (if relevant)*
• *Review of medication*	*Medication review*

*   *Not required if the patient is blind or does not have both eyes.*

**   *Initial visit: measure height and weight and calculate BMI as part of the initial patient assessment.*

***   *Not required if patient does not have both feet.*

Source: DoHA 2006.

Presentation

Percentage of target population.

Frequency of reporting

Annually.

Further development required

● Development of a standard definition of 'an annual cycle of care' to measure this indicator.

● Identification of a national data source to collect data for this indicator.

8. The proportion of people with diabetes who meet guideline targets for: HbA1c; blood pressure; cholesterol; and weight/BMI

Intent

To determine whether we are improving the quality of clinical management for people with diagnosed Type 1, Type 2 or gestational diabetes.

To determine what proportion of people with diagnosed Type 1, Type 2 or gestational diabetes meet the standards for adequate disease control (as defined in national guidelines) for:

- HbA1c
- blood pressure
- cholesterol
- weight/BMI.

Rationale

This indicator is a measure of the increased risk of developing cardiovascular disease and other associated complications due to poor management of HbA1c levels, blood pressure, cholesterol levels and weight among persons with diabetes.

Target population

People who have diagnosed Type 1, Type 2 or gestational diabetes.

8.1 Proportion of people who meet guideline targets for HbA1c

Guideline targets for HbA1c

Adults

The NSW Health Department Consensus Guidelines for the Clinical Management of Diabetes Mellitus in Adults (NSW Health 1996) include the following targets for HbA1c:

- The normal range for HbA1c is 4–6%.
- To achieve an HbA1c within 1% of the upper limit of normal (that is, ≤ 7%) or achieve control as near to this target as possible without producing unacceptable hypoglycaemia. Caution is required in the older population.
- Action is recommended for any patient with an HbA1c > 2% above upper limit of normal (that is, > 8%).
- Assessment should be carried out every 3–6 months for insulin-treated patients; and every 6–12 months for non-insulin-treated patients.

The Royal Australian College of General Practitioners (RACGP) targets for glycaemic control in Type 2 diabetes (RACGP & Diabetes Australia 2006) are:

Preprandial blood glucose (mmol/L)	Postprandial blood glucose (mmol/L)	Comment
4–6.0	4–7.7	Normoglycaemia. Rarely possible in type 1 diabetes.
6.1–6.9	7.8–11.0	Minimises microvascular problems.
>7.0	>11.1	Associated with micro- and macro-vascular complications. Consider more active treatment.
>8	>20	Generally prompts further and more active treatment.

The RACGP's recommended target for overall glycaemic control is HbA1c less than 7%.

It should be noted that these guidelines for adults are the most recent Australian recommendations, but they will need to be revised in light of the impending release of the NHMRC guidelines for glucose control.

Children and adolescents

The current NHMRC clinical practice guidelines for the management of Type 1 diabetes in children and adolescents (NHMRC 2005) include the following recommendations and principals for HbA1c in children and adolescents:

- HbA1c is the only measure of glycaemic control that has been shown to be associated with long-term complications of diabetes and best reflects glycaemic levels over the preceding 2-3 months.

- The American Diabetes Association recommends measuring the HbA1c at least twice per year in patients who are meeting treatment goals, and more frequently (quarterly) in those whose treatment has changed or who are not meeting glycaemic goals.

- HbA1c results should be available at the time of the clinic visit as this may influence the outcome of the consultation.

- In older children and adolescents the target HbA1c should be less than 7.5%.

- Increased efforts to improve glycaemic control are recommended as fewer than 25% of children and adolescents in NSW had HbA1c levels less than 7.5%.

- In younger children, the HbA1c target may be set a little higher because of the dangers of hypoglycaemia to the developing brain.

- HbA1c values need to be interpreted in the context of blood glucose readings and clinical parameters (for example, a child with a low HbA1c may be experiencing asymptomatic hypoglycaemia).

- Children whose HbA1c is rising or persistently elevated should have all aspects of their diabetes management reassessed.

Numerators

Process

Adults

8.1.1 The number of insulin-treated patients aged 18 years and over having HbA1c measured every 6 months.

8.1.2 The number of non-insulin-treated patients aged 18 years and over having HbA1c measured every 12 months.

Children and adolescents

8.1.3 The number of patients aged younger than 18 years having HbA1c measured every 3 months.

Outcome

Adults

8.1.4 The number of patients aged 18 years and over with an HbA1c within 1% of normal range.

8.1.5 The number of patients aged 18 years and over with an HbA1c within 2% of normal range.

8.1.6 The number of patients aged 18 years and over with an HbA1c within 3% of normal range.

Children and adolescents

8.1.7 The number of patients aged younger than 18 years with an HbA1c less than 7.5%.

Denominators

Process

Adults

8.1.1 The number of insulin-treated patients aged 18 years and over.

8.1.2 The number of non-insulin treated patients aged 18 years and over.

Children and adolescents

8.1.3 The number of patients aged younger than 18 years.

Outcome

Adults

8.1.4–8.1.6 The number of patients aged 18 years and over.

Children and adolescents

8.1.7 The number of patients aged younger than 18 years.

Data sources

The Australian National Diabetes Information Audit and Benchmarking (ANDIAB) collection.

Notes

- No national data sources are currently available to measure this indicator.

- ANDIAB is a collection by the National Association of Diabetes Centres (NADC) that is based on an audit of patients attending a selection of specialist diabetes centres and endocrinologists in private practice. Data were collected over 1-month periods in 1998, 1999, 2000, 2002 and 2004. The target sample is people with diabetes requiring specialist clinical management, in particular those who have had poor control of their diabetes. For this reason the sample does not accurately reflect the conditions of people with diabetes in the general community.

- If appropriate data sources could be identified or developed, consideration might also be given to measuring this indicator for high-risk populations, such as Aboriginal and Torres Strait Islander people and people of culturally and linguistically diverse backgrounds.

Presentation

Percentage of relevant denominator population.

Frequency of reporting

Every 2–3 years.

Further development required

- Identification of a national data source to collect data for this indicator.

8.2 Proportion of people who meet guideline targets for blood pressure

Guideline targets for blood pressure

Adults

The Royal Australian College of General Practitioners (RACGP) target for blood pressure in Type 2 diabetes is for blood pressure to be less than 130/80 mm Hg (RACGP & Diabetes Australia 2006).

The NSW Health Department Consensus Guidelines for the Clinical Management of Diabetes Mellitus in Adults (NSW Health 1996) include the following targets for blood pressure:

Category	Age	Systolic BP (mmHg)	Diastolic BP (mmHg)
Target levels	18–39 yrs	<140	<90
	40–60 yrs	<140–160*	<90
	>60 yrs	<160	<90
Hypertension	18–39 yrs	≥140	≥90
	40–60 yrs	≥ 140–160*	≥90
	>60 yrs	≥160	≥90
Systolic hypertension	18–39 yrs	≥140	<90
	40–60 yrs	≥ 140–160*	<90
	>60 yrs	≥160	<90

* Depending on age and other risk factors

- Assessment should be carried out at every clinical visit.

Children and adolescents

The current NHMRC clinical practice guidelines for the management of Type 1 diabetes in children and adolescents (NHMRC 2005) include the following recommendation for blood pressure in children and adolescents:

- Blood pressure measurements should be recorded at diagnosis and, if normal, annually. Hypertension should be considered to be present if repeated blood pressure levels are greater than the 95th centile for age, gender and height specific normative data based on the ranges defined in the US Task Force on Blood Pressure Control in Children (1987).

Numerators

Process

Adults

8.2.1 The number of patients aged 18 years and over having blood pressure measured at every clinical visit.

Children

8.2.2 The number of patients aged younger than 18 years having blood pressure measured annually.

Outcome

Adults

8.2.3 The number of patients aged 18 years and over with hypertension with blood pressure achieving stated targets.

Children and adolescents

8.2.4 The number of patients aged younger than 18 years with hypertension with blood pressure achieving targets.

Denominators

Process

Adults

8.2.1 The number of patients aged 18 years and over.

Children

8.2.2 The number of patients aged younger than 18 years.

Outcome

Adults

8.2.3 The number of patients aged 18 years and over with hypertension.

Children and adolescents

8.2.4 The number of patients aged younger than 18 years with hypertension.

Data sources

The Australian National Diabetes Information Audit and Benchmarking (ANDIAB) collection.

Notes

● No national data sources are currently available to measure this indicator.

● ANDIAB is a collection undertaken by the National Association of Diabetes Centres (NADC) and is based on an audit of patients attending a selection of specialist diabetes centres and endocrinologists in private practice. Data were collected over 1-month periods in 1998, 1999, 2000, 2002 and 2004. The target sample is people with diabetes requiring specialist clinical management, in particular those who have had poor control of their diabetes. For this reason the sample does not accurately reflect the conditions of people with diabetes in the general community.

● If appropriate data sources could be identified or developed, consideration might also be given to measuring this indicator for high-risk populations, such as Aboriginal and Torres Strait Islander people and people of culturally and linguistically diverse backgrounds.

Presentation

Percentage of relevant denominator population.

Frequency of reporting

Every 2–3 years.

Further development required

- Identification of a national data source to collect data for this indicator.

8.3   Proportion of people who meet guideline targets for cholesterol

Guideline targets for cholesterol

Adults

The Royal Australian College of General Practitioners (RACGP) targets for dyslipidaemia in Type 2 diabetes (RACGP & Diabetes Australia 2006) are:

- Total cholesterol less than 4.0 mmol/L
- Triglycerides less than 1.5 mmol/L
- HDL cholesterol greater than 1.0 mmol/L
- LDL cholesterol less than 2.5 mmol/L

The NSW Health Department Consensus Guidelines for the Clinical Management of Diabetes Mellitus in Adults (NSW Health 1996) include the following targets for lipids:

- To reduce total cholesterol levels to less than 5.5 mmol/L. If pre-existing cardiovascular disease (bypass surgery or myocardial infarction) then aim for levels less than 4.5 mmol/L.
- To reduce triglyceride levels to less than 2.0mmol/L.
- To increase HDL cholesterol levels to more than or equal to 1.0mmol/L.
- Assessment should be carried out:
    - If normal, every 1–2 years
    - if abnormal or on treatment, every 3–6 months.

Children and adolescents

The current NHMRC clinical practice guidelines for the management of Type 1 diabetes in children and adolescents (NHMRC 2005) include the following recommendation for dyslipidaemia in children and adolescents:

- Screening for lipid disorders should begin within 6-12 months of diagnosis of diabetes, and, if normal, should be performed every 5 years in prepubertal children and every second year in pubertal children.

The NSW Health Department Consensus Guidelines for the Clinical Management of Insulin Dependent Diabetes Mellitus in Children and Adolescents (NSW Health Department 1998) include the following targets for lipids:

● Total Cholesterol (random or fasting) to be less than 4.5 mmol/L for children and less than 5.0 mmol/L for adolescents. Action is recommended where total cholesterol is greater than 5.0 mmol/L for children and greater than 5.5 mmol/L for adolescents.

● Triglycerides (random or fasting) to be within normal range. Action is recommended where triglycerides are above or below normal range.

● Assessment should be carried out every 2 years.

Numerators

Process

Adults

8.3.1 The number of patients aged 18 years and over having fasting lipids, including total cholesterol, HDL cholesterol and triglycerides measured every 2 years (if previous levels are normal) or every 6 months (if levels are abnormal or patient on treatment).

Children

8.3.2 The number of patients aged younger than 18 years having fasting lipids, including total cholesterol, HDL cholesterol and triglycerides, measured according to recommended guidelines.

Outcome

Adults

8.3.3 The number of patients aged 18 years and over with total cholesterol levels less than 5.5 mmol/L

8.3.4 The number of patients aged 18 years and over with triglycerides levels less than 2.0 mmol/L

8.3.5 The number of patients aged 18 years and over with HDL cholesterol levels greater than or equal to 1.0 mmol/L.

Children and adolescents

8.3.6 The number of patients aged younger than 18 years with total cholesterol levels within target values.

Denominators

Process

Adults

8.3.1 The number of patients aged 18 years and over.

Children

8.3.2 The number of patients aged younger than 18 years.

Outcome

Adults

8.3.3–8.3.5 The number of patients aged 18 years and over.

Children

8.3.6 The number of patients aged younger than 18 years.

Data sources

The Australian National Diabetes Information Audit and Benchmarking (ANDIAB) collection.

Notes

- No national data sources are currently available to measure this indicator.
- ANDIAB is a collection by the National Association of Diabetes Centres (NADC) that is based on an audit of patients attending a selection of specialist diabetes centres and endocrinologists in private practice. Data were collected over 1-month periods in 1998, 1999, 2000, 2002 and 2004. The target sample is people with diabetes requiring specialist clinical management, in particular those who have had poor control of their diabetes. For this reason the sample does not accurately reflect the conditions of people with diabetes in the general community.
- If appropriate data sources could be identified or developed, consideration might also be given to measuring this indicator for high-risk populations, such as Aboriginal and Torres Strait Islander people and people of culturally and linguistically diverse backgrounds.

Presentation

Percentage of relevant denominator population.

Frequency of reporting

Every 2–3 years.

Further development required

- Identification of a national data source to collect data for this indicator.

8.4   Proportion of people who meet guideline targets for weight/body mass index

Guideline target for weight/body mass index

Adults

The Royal Australian College of General Practitioners (RACGP) target for body mass index in Type 2 diabetes is for BMI to be less than 25 kg/m² where practicable (RACGP & Diabetes Australia 2006).

The NSW Department of Health Consensus Guidelines for the Clinical Management of Diabetes Mellitus in Adults (NSW Health 1996) include the following target for weight:

- To reduce and maintain body mass index (BMI) below 27 kg/m² for men and women. Assessment should be carried out every 3 months or more frequently if on a weight reduction program.

Children and adolescents

The NSW Health Department Consensus Guidelines for the Clinical Management of Insulin Dependent Diabetes Mellitus in Children and Adolescents (NSW Department of Health 1998) include the following target for growth:

- To maintain optimal growth in children with insulin dependent diabetes mellitus (IDDM) and to detect those children who are demonstrating growth failure so that the underlying cause(s) can be determined and corrected. Assessment should be carried out every 3 months.

The current NHMRC clinical practice guidelines for the management of Type 1 diabetes in children and adolescents (NHMRC 2005) include the following recommendation for growth and development in children and adolescents with Type 1 diabetes:

- Monitoring of growth and development and the use of growth charts is a very important part of ongoing care of children and adolescents with Type 1 diabetes.

Numerators

Process

Adults

8.4.1 The number of patients aged 18 years and over having weight measured every 3 months.

Children

8.4.2 The number of patients aged younger than 18 years having height and weight measured every 3 months.

Outcome

Adults

8.4.3 The number of patients aged 18 years and over with BMI below the critical level of 27kg/m².

Children and adolescents

8.4.4 The number of patients aged younger than 18 years with height and weight in normal range.

Denominators

Process

Adults

8.4.1 The number of patients aged 18 years and over.

Children

8.4.2 The number of patients aged younger than 18 years.

Outcome

Adults

8.4.3 The number of patients aged 18 years and over.

Children and adolescents

8.4.4 The number of patients aged younger than 18 years.

Data sources

The Australian National Diabetes Information Audit and Benchmarking (ANDIAB) collection.

Notes

- No national data sources are currently available to measure this indicator.
- ANDIAB is a collection by the National Association of Diabetes Centres (NADC) that is based on an audit of patients attending a selection of specialist diabetes centres and endocrinologists in private practice. Data were collected over 1-month periods in 1998, 1999, 2000, 2002 and 2004. The target sample is people with diabetes requiring specialist clinical management, in particular those who have had poor control of their diabetes. For this reason the sample does not accurately reflect the conditions of people with diabetes in the general community.
- If appropriate data sources could be identified or developed, consideration might also be given to measuring this indicator for high-risk populations, such as Aboriginal and Torres Strait Islander people and people of culturally and linguistically diverse backgrounds.

Presentation

Percentage of relevant denominator population.

Frequency of reporting

Every 2–3 years.

Further development required

- Identification of a national data source to collect data for this indicator.

9.   Diabetes-related death rate over time

Intent

To determine whether we are reducing the death rate and serious health effects of Type 1, Type 2 and gestational diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

Diabetes and its complications are among the leading causes of death, illness and disability in Australia (AIHW: Dixon & Webbie 2005). Diabetes has been one of the top ten underlying causes of death in Australia for a number of years. Complications of diabetes, such as heart disease, stroke and kidney disease, are also common causes of death.

In Australia, over the period 2001–2003 there were 20,908 diabetes-related deaths registered for people aged 25 years or over in Australia; this represents 5.4% of all deaths registered over this period (AIHW: Dixon & Webbie 2005). Diabetes-related death rates for the period 2001–2003 were highest among Aboriginal and Torres Strait Islander people; people born in the South Pacific islands, Southern or South Eastern Europe, Eastern Europe, the Middle East and North Africa; people from the most disadvantaged areas; and people from remote areas.

Definition of a 'diabetes-related death'

> **Box 5: Diabetes-related deaths**
>
> *In order to accurately estimate the number of deaths from diabetes and its common complications, 'diabetes-related deaths' are defined as deaths where (AIHW: Dixon & Webbie 2005):*
>
> - *diabetes is listed as the underlying cause of death*
>
> *or*
>
> - *diabetes is listed as an associated cause of death, where the underlying cause of death was one of:*
>   - *myocardial infarction (heart attack)*
>   - *ischaemic heart disease**
>   - *stroke or sequelae of stroke**
>   - *heart failure**
>   - *sudden death (cardiac arrest)*
>   - *peripheral vascular disease*
>   - *kidney disease*
>   - *hyperglycaemia*
>   - *hypoglycaemia.*
>
> Note: *'Diabetes-related deaths' is based on the definition of 'deaths related to diabetes' used in the United Kingdom Prospective Diabetes Study (UKPDS 1998). The UKPDS definition has been modified by diabetes specialists on the National Diabetes Data Working Group to include ischaemic heart disease, sequelae of stroke and heart failure, and other commonly recognised complications of diabetes.*
> *Not included in the UKPDS definition of deaths related to diabetes.

Target population

People in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

9.1   The number of people in the general population who die from a diabetes-related cause.

9.2   The number of Aboriginal and Torres Strait Islander people who die from a diabetes-related cause.

9.3   The number of people who die from a diabetes-related cause, classified by culturally and linguistically diverse background.

9.4   The number of people who die from a diabetes-related cause, classified by quintile of relative socioeconomic disadvantage.

9.5   The number of people who die from a diabetes-related cause, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

9.1   The Australian estimated resident population.

9.2   The estimated resident population of Aboriginal and Torres Strait Islander people.

9.3   The Australian estimated resident population, classified by culturally and linguistically diverse background.

9.4   The Australian estimated resident population, classified by quintile of relative socioeconomic disadvantage.

9.5   The Australian estimated resident population, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

AIHW National Mortality Database and ABS Estimated Resident Population (ERP) data.

Notes

- Mortality data by cause of death are available annually.

- Diabetes is considerably under-reported on death certificates, and is much more likely to be recorded as an associated cause of death rather than as the underlying cause. Official mortality figures, which are based on the underlying cause of death, considerably underestimate the contribution of diabetes to deaths in Australia. Multiple-cause coding should in part compensate for this under-reporting. Large cohort studies and disease registers linked with the National Death Index may provide more accurate estimates of the impact of diabetes on Australian mortality rates.

- The accuracy of identification of the type of diabetes a person had presents difficulties for those certifying deaths. In ICD-10, diabetes is split into 'insulin-dependent' and 'non-insulin-dependent' diabetes rather than Types 1 and 2. Although the former terms should map directly to the latter, the use of the word 'insulin' may cause confusion and lead to classification based on treatment type rather than disease type. The accuracy of the classification of deceased persons into these two groups of diabetes is uncertain. Data from large cohort studies or disease registers may provide some information on mortality by diabetes type.

Aboriginal and Torres Strait Islander people

- Almost all deaths in Australia are registered. However, the Indigenous status of the deceased is not always recorded, or is recorded correctly. The incompleteness of Indigenous identification means the number of deaths registered as Indigenous is an underestimate of deaths occurring in the Aboriginal and Torres Strait Islander population. In addition, comparison of mortality rates is problematic because of differences in the level of identification by jurisdictions and by geographic area. Changes in identification over time also present difficulties for monitoring trends in Indigenous mortality.

- The Indigenous identifier on the AIHW National Mortality Database is currently only considered usable for deaths registered in the Northern Territory, South Australia, Western Australia and Queensland (AIHW & ABS 2006). Identification of Indigenous status in death records is not of sufficient quality for use in New South Wales, Victoria, Tasmania, or the Australian Capital Territory. This makes it difficult to get accurate national estimates of Indigenous mortality rates, to make comparisons with the non-

Indigenous population, and to examine geographical variation. Trends in Indigenous mortality need to be interpreted with caution as differences may reflect changes in data quality, coverage or collection methods rather than real changes in Indigenous health. The reliability of Indigenous status as reported by another person is also uncertain.

People of culturally and linguistically diverse backgrounds

- Difficulties exist in the definition of 'culturally and linguistically diverse' people. Available data are usually defined based on a person's country of birth, rather than their first or most commonly spoken language, or their cultural background and practices, and therefore may not accurately reflect their real circumstances with respect to cultural diversity. Further, the accuracy of country of birth information when reported by another person may be questionable, or indeed the country of birth may be unknown, and the quality and method of collection of country of birth data may change over time.

- Country of birth of the deceased is recorded in the AIHW National Mortality Database and is encoded using Australian standard classification systems (ABS 1990; ABS 1998c).

- Limitations of the country of birth data are similar to those concerning Indigenous status, in that the accuracy of country of birth information when reported by another person may be questionable, or indeed the country of birth may be unknown. Further, the quality and method of collection of country of birth data, and country boundaries, may change over time, making it difficult to interpret long-term trends.

People of different socioeconomic status

- The Index of Disadvantage can be used to determine socioeconomic status (ABS 2004). This index is one of several socioeconomic indexes derived by the ABS from information collected in the Census of Population and Housing. The Index of Disadvantage is an area-based measure that represents the average level of disadvantage across a geographic area, in this case the SLA. It is derived from social and economic characteristics of the SLA, such as low income, low educational attainment, high levels of public sector housing, high unemployment and jobs in relatively less skilled occupations.

- Individual death records can be classified into quintiles of socioeconomic disadvantage based on the Index of Disadvantage value of the SLA of the deceased person's usual residence. SLAs are grouped into quintiles so that each quintile contained approximately 20% of the total Australian population. Quintile 1 includes the most disadvantaged households and Quintile 5 the least disadvantaged households.

- It is important to note that the Index of Disadvantage is an area-based measure of disadvantage. It will therefore tend to understate the true inequality in health at an individual level.

People from different geographic areas

- In the AIHW National Mortality Database, area of usual residence is recorded at the Statistical Local Area (SLA) level. Since SLA boundaries may change from year to year, concordance files supplied by the ABS should be used to map all data used in this analysis to common SLA boundaries when undertaking trend analysis to ensure that geographical areas are defined consistently over time.

- SLAs are usually classified into one of three major geographical regions—major cities, regional Australia and remote Australia—based on their score on the Accessibility/Remoteness Index of Australia (DoHA and University of Adelaide 1999).

This index is calculated based on how distant a place is by road from urban centres of different sizes, and therefore provides a relative indication of how difficult it might be for residents to access certain services, such as health-care and education.

Presentation

Age-standardised rates per 100,000 population.

Frequency of reporting

Every 1–2 years.

Further development required

- A validation study to determine the extent to which diabetes is recorded on death certificates for people with diabetes.
- A validation study to determine the accuracy of classification of type of diabetes on death certificates for people with diabetes.
- Improvement in Indigenous identification on death certificates, particularly improvement in the reliability of the Indigenous identifier on the AIHW National Mortality Database for deaths registered in New South Wales, Victoria, Tasmania, and the Australian Capital Territory.
- Improvement in the identification of people of culturally and linguistically diverse backgrounds on death certificates.

10. Quality of life of people with diabetes (measured by standardised questionnaire)

Intent

To determine whether a person's quality of life and/or health has been affected by their diabetes.

Rationale

Diabetes has a major impact on life expectancy and quality of life. People with diabetes are less likely to rate their health as excellent, very good or good compared with people without diabetes (AIHW 2002).

Target population

People with Type 1, Type 2 or gestational diabetes.

Numerator

The number of people with Type 1, Type 2 or gestational diabetes who report poor health-related quality of life.

Denominator

The number of people with Type 1, Type 2 or gestational diabetes.

Data sources

The only data sources available are:

- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- ABS 1995 NHS (ages 18+ years).

Notes

- Participants in the 1999–2000 AusDiab completed the SF-36 quality of life questionnaire.
- Around half of all adult respondents in the 1995 NHS were selected as part of the SF-36 sub-sample and were invited to complete the SF-36.
- Other surveys, such as the ABS 2001 and 2004–05 NHSs and jurisdictional CATI health surveys, have only measured quality of life through measures such as general health status, days of reduced activity and psychological distress.

Presentation

Percentage of people with diabetes.

Frequency of reporting

Every 3 years.

Further development required

- The use of appropriate and comprehensive quality of life measures in national or large surveys to measure quality of life in people with diabetes.

11. Prevalence and incidence of diabetes, its complications and comorbidities over time

11.1 Prevalence of diabetes over time

Intent

To monitor the trend in diabetes prevalence among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

This indicator is a measure of the existing burden of Type 1, Type 2 and gestational diabetes.

Target population

People with Type 1, Type 2 or gestational diabetes in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.1.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.1.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.1.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.1.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.1.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.1.1 The Australian estimated resident population.

11.1.2 The estimated resident population of Aboriginal and Torres Strait Islander people.

11.1.3 The Australian estimated resident population classified by culturally and linguistically diverse background.

11.1.4 The Australian estimated resident population classified by quintile of relative socioeconomic disadvantage.

11.1.5 The Australian estimated resident population classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

National—measured or clinically diagnosed diabetes

- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- National Heart Foundation (NHF) Risk Factor Prevalence Survey 1983 (ages 25–64 years)
- Perinatal data collections.

National—self-reported diabetes

- ABS National Health Surveys 1989–90, 1995, 2001, 2004–05 (all ages)
- ABS National Health Aboriginal and Torres Strait Islander Health Surveys 2001 and 2004–05 (all ages)
- NHF Risk factor Prevalence Surveys (1980 and 1989) (ages 25–64 years in 1980; and 20–69 years in 1989)
- Australian Longitudinal Study on Women's Health.

Other

- Jurisdictional CATI surveys.

Notes

- Data on measured diabetes prevalence in adults aged 25 years and over have not been available at a national level since 1999–2000.
- No national data are available on measured diabetes prevalence in adults younger than 25 years or Aboriginal and Torres Strait Islander people.
- Estimates of the prevalence of Type 1 and Type 2 diabetes based on self-reported data may be incorrect as it has been found that many people cannot accurately report the type of diabetes they have (ABS 1997).
- Accurate epidemiological data on Type 1 diabetes in Australia are limited (AIHW 2002). Surveys undertaken to estimate diabetes prevalence in Australia have used a variety of methodologies, including differing diagnostic criteria. As a result, direct comparisons cannot usually be made between studies.

Presentation

Age-standardised percentage of population group.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of national health measurement surveys to collect data on the prevalence of measured diabetes status and type for the target populations.

11.2 Incidence of diabetes over time

Intent

To monitor the trend in the incidence of Type 1, Type 2 and gestational diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

This indicator is a measure of the emerging trends in diabetes.

Target population

People with newly diagnosed Type 1, Type 2 or gestational diabetes in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.2.1 The number of new cases of Type 1, Type 2 or gestational diabetes.

11.2.2 The number of new cases of Type 1, Type 2 or gestational diabetes among Aboriginal and Torres Strait Islander people.

11.2.3 The number of new cases of Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.2.4 The number of new cases of Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.2.5 The number of new cases of Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.2.1   The Australian estimated resident population.

11.2.2   The estimated resident population of Aboriginal and Torres Strait Islander people.

11.2.3   The Australian estimated resident population classified by culturally and linguistically diverse background.

11.2.4   The Australian estimated resident population classified by quintile of relative socioeconomic disadvantage.

11.2.5   The Australian estimated resident population classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

- The National Diabetes Register (NDR)
- Australian Paediatric Endocrine Group registers.

Notes

- The NDR is a register of people with insulin-treated diabetes who began using insulin for their diabetes on or after 1 January 1999. The NDR has two main sources of data:
  - the National Diabetes Services Scheme (NDSS) database, administered by Diabetes Australia
  - the Australasian Paediatric Endocrine Group's (APEG) state and territory databases.
- Until mid 2003, inclusion on the NDR was voluntary, thus the data do not provide total incidence estimates for Type 1 diabetes. Recent changes to the registration process mean that coverage should be almost complete from 2004 onwards. However, the small percentage of people who do not join the NDSS or one of the APEG registers are still unlikely to be included.
- There is currently no way of monitoring the incidence of non-insulin-treated Type 2 diabetes. Incidence is estimated in the Burden of Disease and Injury in Australia study and by Diabetes Australia.

Presentation

Age-standardised rates per 100,000 population.

Frequency of reporting

Every 1–2 years.

Further development required

- Expansion of the NDR to include non-insulin treated diabetes.

11.3 Prevalence of cardiovascular disease among people with diabetes over time

Intent

To monitor the trend in the prevalence of cardiovascular disease among people with diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

People with diabetes are two to four times more likely to develop cardiovascular disease than people without diabetes. Their prognosis following a heart attack or stroke, and their recovery following cardiac procedures, is also not as good as in people without diabetes. The most common forms of cardiovascular disease that occur as complications of diabetes are coronary heart disease (mainly heart attack and angina), stroke and peripheral vascular disease. The risk of developing cardiovascular disease increases when diabetes is present along with one or more other risk factors, such as smoking, physical inactivity, overweight, high blood pressure, or high cholesterol.

This indicator is a measure of the contribution of diabetes to cardiovascular disease and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and cardiovascular disease in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.3.1 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and cardiovascular disease.

11.3.2 The number of Aboriginal and Torres Strait Islander people with diabetes (Type 1, Type 2 or gestational diabetes) and cardiovascular disease.

11.3.3 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and cardiovascular disease, classified by culturally and linguistically diverse background.

11.3.4 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and cardiovascular disease, classified by quintile of relative socioeconomic disadvantage.

11.3.5 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and cardiovascular disease, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.3.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.3.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.3.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.3.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.3.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

- AIHW National Hospital Morbidity Database
- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- Australian National Diabetes Information Audit and Benchmarking (ANDIAB)
- Australian Prospective Diabetes Study (APDS)
- National Divisions Diabetes Program Data Collection Project
- ABS National Health Surveys 1989–90, 1995, 2001 and 2004–05
- jurisdictional CATI surveys.

Notes

- Cardiovascular disease should be reported as:
    - all cardiovascular disease
    - coronary heart disease
    - stroke.
- Data from the AIHW National Hospital Morbidity Database capture severe cases only.
- ANDIAB covers patients requiring specialist clinical management, particularly those with poor control of their diabetes, and so does not reflect the general population of people with diabetes.
- Some prevalence data are available from the National Health Surveys and AusDiab, but these are based on self-reported information and it is uncertain how reliable these estimates are.

Presentation

Age-standardised percentage of population group.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

11.4 Incidence of cardiovascular disease among people with diabetes over time

Intent

To monitor the trend in the incidence of cardiovascular disease among people with Type 1, Type 2 and gestational diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

People with diabetes are two to four times more likely to develop cardiovascular disease than people without diabetes. Their prognosis following a heart attack or stroke, and their recovery following cardiac procedures, is also not as good as in people without diabetes. The most common forms of cardiovascular disease that occur as complications of diabetes are coronary heart disease (mainly heart attack and angina), stroke and peripheral vascular disease. The risk of developing cardiovascular disease increases when diabetes is present along with one or more other risk factors, such as smoking, physical inactivity, overweight, high blood pressure or high cholesterol.

This indicator is a measure of the contribution of diabetes to cardiovascular disease and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and newly diagnosed cardiovascular disease in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.4.1 The number of new cases of cardiovascular disease among people with Type 1, Type 2 or gestational diabetes.

11.4.2 The number of new cases of cardiovascular disease among Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.4.3 The number of new cases of cardiovascular disease among people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.4.4 The number of new cases of cardiovascular disease among people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.4.5 The number of new cases of cardiovascular disease among people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.4.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.4.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.4.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.4.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.4.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

- Australian National Diabetes Information Audit and Benchmarking (ANDIAB)
- Australian Prospective Diabetes Study (APDS)
- National Divisions Diabetes Program Data Collection Project
- National Hospital Morbidity Database (separations for cardiovascular procedures and events)
- Medicare Benefits data (people having CVD procedures such as angiography).

Notes

- Cardiovascular disease should be reported as:
  - all cardiovascular disease
  - coronary heart disease
  - stroke.
- Currently there are no means of determining the national incidence of cardiovascular disease among people with diabetes.
- Currently, data on the incidence of coronary heart disease are calculated using algorithms developed by Jamrozik et al. (2001) for people aged 35–64 years. Similar estimates cannot be made for other types of CVD.
- Data from the AIHW National Hospital Morbidity Database capture severe cases only.
- ANDIAB covers patients requiring specialist clinical management, particularly those with poor control of their diabetes, and so does not reflect the general population of people with diabetes.
- Data linkage between data sources such as Medical Benefits Scheme data and hospital morbidity data might provide a measure of the incidence of cardiovascular disease among people with diabetes, but a methodology would need to be developed and tested.
- The incidence of cardiovascular disease with undiagnosed diabetes, or vice versa, may be high and this will affect the accuracy of self-reported information.

Presentation

Age-standardised rates per 100,000 population.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

11.5 Prevalence of visual loss among people with diabetes over time

Intent

To monitor the trend in the prevalence of visual loss among people with diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

Eye diseases that may arise as complications of diabetes include retinopathy, cataracts and glaucoma. Diabetic retinopathy is the most common cause of blindness in people aged 30–69 years, and cataracts and glaucoma are also major causes of vision impairment among adults. Although age and duration of diabetes are the most important risk factors for developing eye diseases, high blood pressure or cholesterol, smoking and nephropathy (kidney disease) also increase risk.

This indicator is a measure of the contribution of diabetes to eye disease and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and visual loss in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.5.1 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and visual loss.

11.5.2 The number of Aboriginal and Torres Strait Islander people with diabetes (Type 1, Type 2 or gestational diabetes) and visual loss.

11.5.3 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and visual loss, classified by culturally and linguistically diverse background.

11.5.4 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and visual loss, classified by quintile of relative socioeconomic disadvantage.

11.5.5 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and visual loss, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.5.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.5.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.5.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.5.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.5.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

- AIHW National Hospital Morbidity Database
- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- Australian National Diabetes Information Audit and Benchmarking (ANDIAB)
- Australian Prospective Diabetes Study (APDS)
- National Divisions Diabetes Program Data Collection Project
- Queensland Diabetes Management Survey.

Notes

- Currently there are no means of determining the national prevalence of eye complications among people with diabetes. Further, standard methodology would need to be developed to differentiate vision loss caused by diabetes from that caused by other factors.
- Only severe problems will be captured by most of the available data sources. The prevalence of mild eye problems may be high and these will not be captured in hospital or clinic data or by surveys that collect information on end-stage outcomes, such as blindness.
- More general data will be available from AusDiab and the APDS; however, the representativeness of the APDS sample is yet to be determined.

Presentation

Age-standardised percentage of population group.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

11.6 Incidence of visual loss among people with diabetes over time

Intent

To monitor the trend in the incidence of visual loss among people with Type 1, Type 2 and gestational diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

Eye diseases that may arise as complications of diabetes include retinopathy, cataracts and glaucoma. Diabetic retinopathy is the most common cause of blindness in people aged 30–69 years, and cataracts and glaucoma are also major causes of vision impairment among adults. Although age and duration of diabetes are the most important risk factors for developing eye diseases, high blood pressure or cholesterol, smoking and nephropathy (kidney disease) also increase risk.

This indicator is a measure of the contribution of diabetes to eye disease and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and newly diagnosed visual loss in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.6.1 The number of new cases of visual loss among people with Type 1, Type 2 or gestational diabetes.

11.6.2 The number of new cases of visual loss among Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.6.3 The number of new cases of visual loss among people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.6.4 The number of new cases of visual loss among people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.6.5 The number of new cases of visual loss among people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.6.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.6.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.6.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.6.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.6.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

● Australian National Diabetes Information Audit and Benchmarking (ANDIAB)

● Australian Prospective Diabetes Study (APDS)

● National Divisions Diabetes Program Data Collection Project.

Notes

● Currently there are no means of determining the national incidence of eye complications among people with diabetes.

● Only severe problems will be captured by most of the available data sources. The incidence of mild eye problems may be high and these will not be captured in hospital or clinic data or by surveys that collect information on end-stage outcomes, such as blindness.

● More general data will be available from the APDS; however, the representativeness of the APDS sample is yet to be determined.

Presentation

Age-standardised rates per 100,000 population.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

11.7 Prevalence of end-stage kidney disease among people with diabetes over time

Intent

To monitor the trend in the prevalence of end-stage kidney disease among people with diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

Diabetes can affect the kidneys in a number of ways, causing various conditions, the most common of which are nephropathy and end-stage kidney disease (ESKD). ESKD is the final stage of kidney function deterioration, in which dialysis or kidney transplant are necessary for survival. Diabetic nephropathy is the second most common cause of ESKD in Australia (Excell & McDonald 2005). Long duration of diabetes, poor blood glucose control and genetic susceptibility all influence the development and progression of diabetic nephropathy, but risk is also increased by high blood pressure and smoking.

This indicator is a measure of the contribution of diabetes to kidney disease and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and ESKD in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.7.1 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and ESKD.

11.7.2 The number of Aboriginal and Torres Strait Islander people with diabetes (Type 1, Type 2 or gestational diabetes) and ESKD.

11.7.3 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and ESKD, classified by culturally and linguistically diverse background.

11.7.4 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and ESKD, classified by quintile of relative socioeconomic disadvantage.

11.7.5 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and ESKD, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.7.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.7.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.7.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.7.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.7.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW 2006):

- AIHW National Hospital Morbidity Database
- Australian and New Zealand Dialysis and Transplant Registry (ANZDATA)
- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- Australian National Diabetes Information Audit and Benchmarking (ANDIAB)
- Australian Prospective Diabetes Study (APDS)
- National Divisions Diabetes Program Data Collection Project
- Queensland Diabetes Management Survey.

Notes

- Currently there are no means of determining the national prevalence of ESKD among people with diabetes.
- The AusDiab Kidney Study (Mathew 2004), nested within AusDiab and the APDS, should provide some data on chronic kidney disease and its impacts, but it is uncertain how representative this sample will be of Australian people with diabetes.

Presentation

Age-standardised percentage of population group.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

11.8 Incidence of end-stage kidney disease among people with diabetes over time

Intent

To monitor the trend in the incidence of end-stage kidney disease among people with Type 1, Type 2 and gestational diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

Diabetes can affect the kidneys in a number of ways, causing various conditions, the most common of which are nephropathy and end-stage kidney disease (ESKD). ESKD is the final stage of kidney function deterioration, in which dialysis or kidney transplant are necessary for survival. Diabetic nephropathy is the second most common cause of ESKD in Australia (Excell & McDonald 2005). Long duration of diabetes, poor blood glucose control and genetic susceptibility all influence the development and progression of diabetic nephropathy, but risk is also increased by high blood pressure and smoking.

This indicator is a measure of the contribution of diabetes to kidney disease and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and newly diagnosed ESKD in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.8.1 The number of new cases of ESKD among people with Type 1, Type 2 or gestational diabetes.

11.8.2 The number of new cases of ESKD among Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.8.3 The number of new cases of ESKD among people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.8.4 The number of new cases of ESKD among people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.8.5 The number of new cases of ESKD among people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.8.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.8.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.8.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.8.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.8.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

- Australian and New Zealand Dialysis and Transplant Registry (ANZDATA)
- Australian National Diabetes Information Audit and Benchmarking (ANDIAB)
- Australian Prospective Diabetes Study (APDS)
- National Divisions Diabetes Program Data Collection Project.

Notes

- Currently there are no means of determining the national incidence of ESKD among people with diabetes.

Presentation

Age-standardised rates per 100,000 population.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

11.9 Prevalence of non-traumatic amputation among people with diabetes over time

Intent

To monitor the trend in the prevalence of non-traumatic amputation among people with diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

Non-traumatic amputation may occur as a result of severe neuropathy. Neuropathy (nerve damage) is a common complication of diabetes, generally presenting as either peripheral neuropathy (damage to non-central nerves, particularly those in the feet) or autonomic neuropathy (damage to the nerves that control involuntary bodily functions such as heart rate and digestion). Peripheral neuropathy contributes to the development of foot ulcers which, if severe, may require amputation of all or part of the affected limb.

This indicator is a measure of the contribution of diabetes to complications resulting from severe neuropathy and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and non-traumatic amputation in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.9.1 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and non-traumatic amputation.

11.9.2 The number of Aboriginal and Torres Strait Islander people with diabetes (Type 1, Type 2 or gestational diabetes) and non-traumatic amputation.

11.9.3 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and non-traumatic amputation, classified by culturally and linguistically diverse background.

11.9.4 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and non-traumatic amputation, classified by quintile of relative socioeconomic disadvantage.

11.9.5 The number of people with diabetes (Type 1, Type 2 or gestational diabetes) and non-traumatic amputation, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.9.1 The number of people with Type 1, Type 2 or gestational diabetes.

11.9.2 The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.9.3 The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.9.4 The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.9.5 The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

- AIHW National Hospital Morbidity Database
- 1999–2000 Australian Diabetes, Obesity and Lifestyle Study (AusDiab) (ages 25+ years)
- Australian National Diabetes Information Audit and Benchmarking (ANDIAB)
- Australian Prospective Diabetes Study (APDS)
- National Divisions Diabetes Program Data Collection Project
- Queensland Diabetes Management Survey.

Notes

- Currently there are no means of determining the national prevalence of non-traumatic amputation among people with diabetes.
- Hospital admissions for non-traumatic amputation are available from the National Hospital Morbidity Database, but this provides only an estimate of the number of episodes of care and not counts of the number of individuals or estimates of incidence or prevalence.

Presentation

Age-standardised percentage of population group.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

11.10 Incidence of non-traumatic amputation among people with diabetes over time

Intent

To monitor the trend in the incidence of non-traumatic amputation among people with Type 1, Type 2 and gestational diabetes among:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Rationale

Non-traumatic amputation may occur as a result of severe neuropathy. Neuropathy (nerve damage) is a common complication of diabetes, generally presenting as either peripheral neuropathy (damage to non-central nerves, particularly those in the feet) or autonomic neuropathy (damage to the nerves that control involuntary bodily functions such as heart rate and digestion). Peripheral neuropathy contributes to the development of foot ulcers which, if severe, may require amputation of all or part of the affected limb.

This indicator is a measure of the contribution of diabetes to complications resulting from severe neuropathy and is an outcome indicator for diabetes management.

Target population

People with diabetes (Type 1, Type 2 or gestational diabetes) and new non-traumatic amputation in the following population groups:

- the general population
- Aboriginal and Torres Strait Islander people
- people of culturally and linguistically diverse backgrounds
- people of different socioeconomic status
- people from different geographic areas.

Numerators

11.10.1   The number of new cases of non-traumatic amputation among people with Type 1, Type 2 or gestational diabetes.

11.10.2   The number of new cases of non-traumatic amputation among Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.10.3   The number of new cases of non-traumatic amputation among people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.10.4   The number of new cases of non-traumatic amputation among people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.10.5   The number of new cases of non-traumatic amputation among people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Denominators

11.10.1   The number of people with Type 1, Type 2 or gestational diabetes.

11.10.2   The number of Aboriginal and Torres Strait Islander people with Type 1, Type 2 or gestational diabetes.

11.10.3   The number of people with Type 1, Type 2 or gestational diabetes, classified by culturally and linguistically diverse background.

11.10.4   The number of people with Type 1, Type 2 or gestational diabetes, classified by quintile of relative socioeconomic disadvantage.

11.10.5   The number of people with Type 1, Type 2 or gestational diabetes, classified by geographic area (that is, major cities, regional Australia and remote Australia).

Data sources

The following data sources are described in *The National System for Monitoring Diabetes in Australia* (AIHW: Dixon & Webbie 2006):

● AIHW National Hospital Morbidity Database

● Australian National Diabetes Information Audit and Benchmarking (ANDIAB)

● Australian Prospective Diabetes Study (APDS)

● National Divisions Diabetes Program Data Collection Project.

Notes

● Currently there are no means of determining the national incidence of non-traumatic amputation among people with diabetes.

● Hospital admissions for non-traumatic amputation are available from the National Hospital Morbidity Database, but this provides only an estimate of the number of episodes of care and not counts of the number of individuals or estimates of incidence or prevalence.

Presentation

Age-standardised rates per 100,000 population.

Frequency of reporting

Every 1–2 years.

Further development required

- Development of a national data source to collect data for this indicator.

Recommendations

The National Diabetes Data Working Group's Diabetes Indicators Review Subcommittee, under the direction of the National Diabetes Strategies Group (NDSG), has developed a national set of 33 diabetes indicators. Of these indicators, 11 have been selected as the highest priority and endorsed by the NDSG.

The main purpose of this report is to describe the process undertaken by the Subcommittee in developing and setting priorities for the full set of indicators (that is, the 33 indicators), and to provide operational definitions for the recommended set of 11 indicators.

As indicated throughout this report, data are not currently available to measure all of these indicators and, where data are available, not all data sources are complete. Possible data sources will need to be identified and evaluated for many of these indicators and some will require further data development. However, decisions and details about the development and implementation of a data development plan, and the reporting of the indicators, are yet to be determined and are outside of the scope of this report.

Following its deliberations, the National Diabetes Data Working Group's Diabetes Indicators Review Subcommittee recommends that:

- The recommended set of 11 indicators should be considered along with other indicators when an agreed prioritised set of national policy relevant indicators for chronic diseases and associated determinants are developed. In particular, the NDDWG indicators should be mapped to the NHPF and other indicator sets and commonalities identified.

- A data development plan should be developed and implemented.

- The priority is for these indicators to be reported at a national level. Where national data are currently available for any of the priority indicators, these indicators should be reported on by the National Monitoring Centre for Diabetes.

- If diabetes indicators are also reported at other levels, the use of these indicators is encouraged to promote consistency in health information across the country.

Appendix A: Complete indicator matrix

Notes for interpreting the indicator matrix:

At the foot of each indicator is an indicator assessment descriptor, such as [A/B; F3–5; P1]. For each indicator, the key to this assessment descriptor is:

A.   Available or feasible at low cost with little development work.

B.   Feasible, but needs development and some cost.

C.   Not feasible at present.

Note: A/B implies 'Overlap' between A and B

F   The frequency with which the indicator should be collected; for example, F1–2 = every 1–2 years

P   The priority of the indicator wherever there are multiple questions in a column or more than one Indicator proposed for a column question; for example, P1 = first priority; P2 = second priority; and so on. Note: Pn/a= priority not applicable

Note: The cells of the indicator matrix containing the eleven priority indicators are shaded.

	Settings		
Continuum of care (NDSG questions)	Health-care organisation (Funder-policy maker; service organisation)	Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)	Consumers
1. Are we preventing or delaying the development of Type 2 diabetes? **(process)** These indicators relate to Type 2 diabetes.	**Q1** What programs/initiatives exist to prevent Type 2 diabetes or modify the prevalence of Type 2 diabetes risk factors? **1A.1.1 The type of programs and the proportion of the population reached by preventive programs.** [B; F3–5; P1] **1A.1.2 The number of characteristics and quality of programs/initiatives identified to prevent/delay the development of Type 2 diabetes or modify the prevalence of Type 2 diabetes risk factors.** *For each program/initiative identified:* - *Does it follow current evidence-based guidelines?* - *Is it ongoing?* - *What proportion of the at-risk population are offered preventive interventions? Or, if unavailable, what proportion of relevant services offer the preventive interventions?* [A/B; F3–5; P2]	**Q1** What is the trend in the prevalence of Type 2 diabetes risk factors? **1B.1.1 Prevalence of Type 2 modifiable diabetes risk factors over time:** - **overweight; overweight but not obese; obese. Based on: body mass index (BMI); and waist circumference** - **proportion of people not following Australian guidelines for physical activity** - **proportion of people not following Australian dietary recommendations.** [A/B; F1–2; P1]	**Q1** Are consumers aware of Type 2 diabetes risk factors and are they taking steps/actions to reduce their risk? **1C.1.1 The proportion of people at risk of Type 2 diabetes who correctly identify that they are at risk and who are taking steps/actions to reduce their risk.** [B; F2–3; P1]

	Settings		
Continuum of care (NDSG questions)	Health-care organisation (Funder-policy maker; service organisation)	Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)	Consumers
1. Are we preventing or delaying the development of Type 2 diabetes? (process) These indicators relate to Type 2 diabetes.	**Q2** Is there a mechanism for monitoring the incidence of Type 2 diabetes and the prevalence of Type 2 diabetes risk factors? **1A.2.1 The number and characteristics of mechanisms for monitoring the incidence of Type 2 diabetes and the prevalence of Type 2 diabetes risk factors.** *For each mechanism/data source identified:* • *What is the type of mechanism/data source?* • *What is the scope and coverage of data collection?* • *What is the frequency of data collection?* • *Are data collected according to agreed national or international standards?* • *Is the data set routinely analysed and reported on?* **[A/B; F3–5; P3]**	**Q2** What is the trend in the incidence of Type 2 diabetes? **1B.2.1 Incidence rate of Type 2 diabetes over time.** **[B/C; F1–2; P2]**	**Q2** Are consumers aware of evidence-based healthy lifestyle choices? **1C.2.1 The proportion of people at risk of Type 2 diabetes who know what their evidence-based healthy lifestyle options are.** **[B; F2–3; P2]**

(continued)

	Settings		
Continuum of care (NDSG questions)	Health-care organisation (Funder-policy maker; service organisation)	Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)	Consumers
2. Is case detection occurring optimally? **(Screening for diabetes, that is, early detection)** These indicators relate to Type 2 and gestational diabetes.	**Q1** Are systems in place to screen at-risk individuals according to national standards for Type 2 diabetes? **2A.1.1 The proportion of health-care practitioners who have a system in place to opportunistically screen for Type 2 diabetes, and the characteristics of these systems.** **[B; F2-3; Pn/a]** *For each system identified:* • *Does it follow current evidence-based guidelines?* • *Is there a register / recall system?* • *Is it culturally appropriate?* • *Are primary care practices PIP-accredited?*	**Q1** What proportion of those with risk factors for Type 2 diabetes are being screened? **2B.1.1 The proportion of people at risk* of Type 2 diabetes who are being opportunistically screened, and the proportion of these undergoing appropriate opportunistic screening (as defined by current evidence-based guidelines).** ***refer NHMRC screening guidelines (NHMRC 2001)** **[B; F2-3; P1]**	**Q1** Are at-risk people aware of the need for screening for Type 2 diabetes and gestational diabetes? **2C.1.1 The proportion of at-risk people who are aware of the need for Type 2 diabetes and gestational diabetes screening.** **[B; F2-3; P n/a]**
2. Is case detection occurring optimally? **(Screening for diabetes, that is, early detection)** This indicator relates to Type 2 and gestational diabetes.		**Q2** What is the ratio of diagnosed to undiagnosed cases? **2B.2.1 The ratio of diagnosed to undiagnosed cases of Type 2 diabetes.** **[B/C; F3-5; P2]**	

	Settings		
Continuum of care (NDSG questions)	Health-care organisation (Funder-policy maker; service organisation)	Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)	Consumers
3. Is access equitable? These indicators relate to Type 1, Type 2, and gestational diabetes.	**Q1** Do programs/initiatives/services for people at risk, or with diabetes, equitably target and reach: • Aboriginal and Torres Strait Islander people • people of culturally and linguistically diverse backgrounds • people with different socioeconomic status • people from different geographic areas? **3A.1.1 The number and characteristics of diabetes and at-risk programs, initiatives and services for:** • **Aboriginal and Torres Strait Islander people** • **people of culturally and linguistically diverse backgrounds** • **people with different socio-economic status** • **people from different geographic areas.** *For each program/initiative/service identified:* • *What is the focus of the program? (e.g. risk factor modification, self-management education)* • *What is the target population?* • *Does the program follow current evidence-based guidelines?* • *Is it ongoing?* • *To what extent is it culturally appropriate for all groups within the target population?* • *Are there any population groups who are missed or not reached?* **[B; F3–5; Pn/a]**	**Q1** Are Aboriginal and Torres Strait Islander people, people from culturally and linguistically diverse backgrounds, socioeconomically disadvantaged groups and people from diverse geographic areas able to access and use appropriate care (including screening) which is provided according to guidelines? **3B.1.1 The respective representation of Indigenous, culturally and linguistically diverse, socioeconomically disadvantaged, and geographically diverse groups in diabetes, at-risk and screening programs (compared with their estimated representation in the respective community**). **[B; F2–3; P1]**	**Q1** Are services accessible and presented in a culturally appropriate way? **3C.1.1 Ability for people to access services that are culturally suitable.** **[B; F2–3; P1]**

	Settings		
Continuum of care (NDSG questions)	Health-care organisation (Funder-policy maker; service organisation)	Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)	Consumers
3. Is access equitable? These indicators relate to Type 1, Type 2, and gestational diabetes.	**Q2**	Do I have access to appropriate services to refer my patients to for the care of their diabetes? **3B.2.1 The respective number and characteristics of diabetes services available.** *For services that provide care for people with diabetes, what is/are the:* • *type of service?* • *cost to consumers?* • *hours of availability?* • *waiting times?* • *follow up?* • *outreach services?* • *levels of use for different population groups?* **[B; F2–3; P2]**	**Q2 What do I perceive to be the barriers to access—public and private?** **3C.2.1 Self-reported barriers to access to care.** **[B; F2–3; P2]**

	Settings		
Continuum of care (NDSG questions)	**Health-care organisation (Funder-policy maker; service organisation)**	**Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)**	**Consumers**
4. Is care (prevention, early detection and management) provided according to guidelines? **(process)** These indicators relate to Type 1, Type 2, and gestational diabetes.	**Q1** For which aspects of diabetes prevention, early detection and management do guidelines exist? **4A.1.1The number and characteristics of diabetes guidelines identified.** **[A/B; F3–5; P1]** For each aspect of diabetes prevention, early detection and management for which guidelines exist: *Are the guidelines Australian?* *Are they evidence-based?* *Have the guidelines been endorsed? If yes, by whom?* - When were they last updated and are they still considered current? *Are they written or available in consumer-friendly language?* *Describe the level of dissemination of these guidelines to health-care providers?* *Have the guidelines been implemented/incorporated into diabetes programs/initiatives?* *Are there mechanisms to audit diabetes prevention, early detection and management against the guidelines (in hospitals, diabetes centres and general practice)?*	**Q1** Is management recommended by guidelines being provided and received? **4B.1.1 The proportion of people with diabetes mellitus who have had an annual cycle of care (that is, have had recorded):** *1. a foot examination within the last 12 months* *2. an eye exam within the last 2 years* *3. urinary albumin measured in the last year* *4. HbA1c measured in the last 6 months* *5. blood pressure measured in the last 6 months* *6. lipids measured in the last 12 months* *7. weight/BMI measured in the last 6 months.* **[A; F1; P1]**	**Q1** Are consumers aware of evidence-based healthy lifestyle options? **4C.1.1 The proportion of people with diabetes who know what their evidence-based healthy lifestyle options are.** **[B; F3; P1]**

	Settings		
Continuum of care (NDSG questions)	**Health-care organisation (Funder-policy maker; service organisation)**	**Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)**	**Consumers**
4. Is care (prevention, early detection and management) provided according to guidelines? **(process)** These indicators relate to Type 1, Type 2, and gestational diabetes.	**4A.1.2 The proportion of programs to improve prevention, early detection and management that are consistent with guidelines.** **[A/B; F3–5; P2]**	**Q2 Are there systems to prompt for management according to these guidelines?** **4B.2.1 The proportion of GPs with Register / Recall Systems (by Divisions of GPs).** **[A; F1; P2]**	**Q2 Are consumers aware of the existence of guidelines?** **4C.2.1 The proportion of people with diabetes who are aware of the existence of guidelines for management.** **[B; F3; P2]**
5. Are we improving the quality of clinical management for people with diabetes? **(intermediate clinical outcomes, e.g. the percentage with HbA1c < 7.0%, the percentage with well-controlled BP)** These indicators relate to Type 1, Type 2, and gestational diabetes.	**Q1** Are there systems in place to assess quality of clinical management, and are they adequate? **5A.1.1 The adequacy of systems identified to assess quality of clinical management.** *For each system identified:* • *Does it follow current evidence-based guidelines?* • *Is it ongoing?* • *Does it cover identified population groups?* **[B; F2–3; P1]**	**Q1** What proportion of people with diagnosed diabetes meet the standards for adequate disease control (as defined in national guidelines) for: HbA1c; blood pressure; cholesterol; weight (BMI)? **5B.1.1 The proportion of people with diabetes that meet guideline targets for:** • *HbA1c* • *blood pressure* • *cholesterol* • *weight/BMI.* **[A/B; F2–3; Pn/a]**	**Q1** Do I have the knowledge to self-manage my diabetes? **5C.1.1 The proportion of patients who have attended a diabetes educator (for self-management education).** **[B; F2-3; P2]** **5C.1.2** (a) **The proportion of patients who are able to demonstrate that they understand the requirements for adequate self-care.** (b) **The proportion of patients who have a care plan that they and their health professional(s) have developed** **[B; F2–3; P1]**

(continued)

	Settings		
Continuum of care (NDSG questions)	Health-care organisation (Funder-policy maker; service organisation)	Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)	Consumers
5. Are we improving the quality of clinical management for people with diabetes? This indicator relates to Type 1, Type 2, and gestational diabetes.	**Q2** What programs are in place (education, training etc.) to improve the quality of clinical management? **5A.2.1 The number and characteristics of programs identified to improve the quality of clinical management.** *For each program identified:* • *Does it make use of current evidence-based or consensus guidelines (as appropriate)?* • *Is it ongoing?* • *What is the format of the program?* **[B; F2–3; P2]**		

	Settings		
Continuum of care (NDSG questions)	**Health-care organisation (Funder-policy maker; service organisation)**	**Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)**	**Consumers**
6. Are we reducing the death rate and serious health effects of diabetes? **(hard clinical outcomes, e.g. mortality, prevalence and incidence of loss of vision, renal failure)** These indicators relate to Type 1, Type 2, and gestational diabetes.	**Q1** What systems are in place to assess the trends in morbidity and mortality from diabetes and its complications? **6A.1.1 The number and characteristics of existing data sources to assess the trends in morbidity and mortality from diabetes and its complications, and their connectivity.** *For each data source identified:* • *What is the type of data source?* • *What are the scope and coverage of the data collection?* • *What is the frequency of data collection?* • *Are data collected according to agreed national or international standards?* • *Is the data set routinely analysed and reported on?* • *What is the potential connectivity to other data sets?* **[A; F5; Pn/a]**	**Q1** What is the trend in diabetes-related mortality? **6B.1.1 The diabetes-related death rate over time, among:** • **the general population** • **Aboriginal and Torres Strait Islander people** • **people of culturally and linguistically diverse backgrounds** • **people of different socioeconomic status** • **people from different geographic areas.** **[A; F1–2; P1+]**	**Q1** Has my quality of life and/or health been affected by my diabetes? **6C.1.1 Quality of life of people with diabetes (measured by standardised questionnaire).** **[B; F3; P n/a]**

	Settings		
Continuum of care (NDSG questions)	Health-care organisation (Funder-policy maker; service organisation)	Health-care practice (Levels of care—population health, primary, secondary and tertiary care; provider/service organisation)	Consumers
6. Are we reducing the death rate and serious health effects of diabetes? This indicator relates to Type 1, Type 2 and gestational diabetes.		**Q2** What is the trend in diabetes prevalence, incidence, complications and comorbidities (including end-stage complications)? **6B.2.1 Prevalence and incidence of diabetes, its complications and comorbidities over time (by subgroup, as per indicator 4B.1.1):** • **diabetes** • **cardiovascular disease** • **visual loss** • **ESRD** • **non-traumatic amputation.** **[A/B/C; F1–2; P1-]**	
6. Are we reducing the death rate and serious health effects of diabetes? This indicator refers only to Type 1 because the duration of Type 2 is unreliable.		**6B.2.2 *The proportion of people with Type 1 diabetes with complications, by duration of diabetes.*** **[B/C; F1–2; P4]**	
6. Are we reducing the death rate and serious health effects of diabetes? This indicator relates to Type 1, Type 2, and gestational diabetes.		**Q3** What is the life expectancy trend for people with diabetes? **6B.3.1 The diabetes-related life expectancy over time.** **[A/B; F1–2; P3]**	

Appendix B: National Health Priority Areas—diabetes indicators

1. **Disease incidence and prevalence**
    1.1. Prevalence rates for Type 1 and Type 2 diabetes in:
        – the general population
        – the Indigenous population
        – people from culturally and linguistically diverse backgrounds
    1.2. Incidence rates for Type 1 and Type 2 diabetes in:
        – the general population
        – the Indigenous population
        – people from culturally and linguistically diverse backgrounds
    1.3. Gestational diabetes among women aged 20–44 years, by parity.

2. **Risk factors for diabetes and associated complications**
    2.1. Prevalence rates for obesity and overweight (as measured by BMI) among people with Type 2 diabetes and in the general population
    2.2. Rates for non-participation in regular, sustained, moderate aerobic exercise among people with Type 2 diabetes and in the general population
    2.3. Prevalence rates for high blood pressure among people with Type 2 diabetes:
        – ≥ 140 mm Hg systolic and/or 90 mm Hg diastolic and aged less than 60 years
        – ≥ 160 mm Hg systolic and/or 90 mm Hg diastolic and aged 60 years or over and/or
        – those on medication for high blood pressure.
    2.4. Prevalence rates for high levels of lipoproteins among people with Type 1 and Type 2 diabetes:
        – total cholesterol above 5.5 mmol/L
        – high-density lipoproteins below 1.0 mmol/L
    2.5. Prevalence rates for fasting hypertriglyceridaemia among people with Type 1 and Type 2 diabetes.

3. **Diabetes complications**
    3.1. Proportion of people with end-stage renal disease with diabetic nephropathy as a causal factor
    3.2. Incidence rate for eye disease among people with clinically diagnosed diabetes
    3.3. Prevalence rate for foot problems among people with clinically diagnosed diabetes
    3.4. Incidence rates for coronary heart disease and stroke among people with clinically diagnosed diabetes and in the general population.

4. Hospital separations for diabetes complications

4.1. Hospital separation rates for end-stage renal disease as the principal diagnosis with diabetes as an additional diagnosis

4.2. Hospital separation rates for coronary heart disease or stroke as the principal diagnosis with diabetes as an additional diagnosis

4.3. Hospital separation rates for conditions other than end-stage renal disease and coronary heart disease/stroke among people with diabetes as a principal diagnosis or an additional diagnosis.

5. Mortality

5.1. Death rates for diabetes in:

– general population

– Indigenous population

– people from culturally and linguistically diverse backgrounds

5.2. Death rates for coronary heart disease and stroke among people with diabetes in:

– general population

– Indigenous population

– people from culturally and linguistically diverse backgrounds.

6. Health status

6.1. Self-assessed health status of people with and without diabetes

7. Screening and management

7.1. Proportion of people with diabetes tested for glycosylated haemoglobin (HbA1c) level at least every 6 months

7.2. Proportion of pregnant women being tested for gestational diabetes.

Appendix C: List of jurisdictions and consumers consulted

Jurisdictions

New South Wales Department of Health

Department of Human Services, Victoria

Queensland Health

Department of Health, South Australia

Department of Health, Western Australia

Department of Health and Human Services, Tasmania

Australian Capital Territory Department of Health

Department of Health and Community Services, Northern Territory

Consumer representatives

Ms Karen Bect

Mr Trevor Corbell (Diabetes Australia)

Ms Sandra Hall

Mr Garry Horvai

Dr Lilian Jackson (Diabetes Australia)

Mr Cliff Newman

Mr Bruce Williams

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