Diabetes management and the allied health workforce

An overview of workforce mapping techniques and related data issues

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Contents

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Purpose

This paper provides an overview of workforce mapping techniques and related data issues for mapping the need for diabetes services against the availability of the allied health workforce. Its purpose is to inform national policy development in relation to the allied health workforce and services for diabetes management. The paper includes an overview of workforce mapping; a brief description of some state-level projects as examples of relevant work that has been, or is being, undertaken in Australia; and issues and opportunities for projects at a national level.

Mapping projects have the capacity to provide information on the relationship between the need for diabetes services and the availability of the allied health workforce by geographic area. Questions that can be addressed include:

- Is the supply of services adequate for good diabetes management?
- Where is supply matching demand for allied health services?
- What professions and/or locations are over-extended or under-utilised?

Background

Diabetes is a metabolic disease characterised by high blood glucose levels resulting from defects in insulin secretion, insulin action or both (WHO 1999; Dunstan et al. 2001). It contributes to significant illness, disability, poor quality of life and premature mortality, especially if undetected or poorly controlled. Over the course of the disease, diabetes can lead to long-term damage to various parts of the body, especially the heart and blood vessels, eyes, kidneys and nerves. Diabetes also contributes to many pregnancy-related complications both before and after birth, and both for the mother and the baby.

Because diabetes and its complications can affect a number of the body's organs, a multi-disciplinary approach to diabetes management involving various health specialists, including general practitioners, medical specialists and allied health professionals, is common. However, in some circumstances, such as in remote areas, a cross-disciplinary approach where one person is trained to provide services across a number of disciplines is adopted.

Allied health professionals constitute a wide and varied range of health care providers, whose tasks and skills overlap with medical and other health professions. To give some background information about the role of allied health professionals in the care of people with diabetes, a brief definition and job description of four such allied health professions—diabetes educators; dietitians; optometrists; and podiatrists—is provided below.

Diabetes educators

Diabetes educators usually hold a primary health qualification in nursing. The Australian Diabetes Educators Association has a credentialling process to accredit its members as credentialled diabetes educators (ADEA 2001). Diabetes educators provide a planned, educational process. This helps people understand the benefits of good self-management and equips them with the necessary knowledge and skills to implement best-practice self-management. Multi-disciplinary care for people with diabetes often includes diabetes educators. Diabetes educators work in conjunction with other health care providers and may also provide education to them.

Dietitians

Accredited Practising Dietitians provide food and nutrition advice so people can increase their understanding of food and health relationships and make appropriate dietary choices (DAA 2003). Dietitians can take on a therapeutic role and are employed across a wide range of fields in the public and private sectors. Support and advice from a dietitian helps people with diabetes to maintain a healthy weight and control their blood glucose and lipid levels. Weight management is an essential component in controlling diabetes and preventing the development of other medical problems. For example, being overweight can greatly increase the risk of cardiovascular disease in people with diabetes (AIHW 2002).

Optometrists

An optometrist's vocation involves the examination of eyes, and the determination and correction of eye problems, including screening for diabetic retinopathy. Optometrists are frequent providers of retinopathy screening.

Diabetic retinopathy is a disease of the eye, which damages the retina and can progress to blindness if left untreated. The condition can be treated successfully with laser therapy if identified early, however in its early stages diabetic retinopathy can be symptomless. Analyses of the Australian Diabetes, Obesity and Lifestyle Study found that 15.3% of people with diabetes had some form of retinopathy, and prevalence increased with the duration of diabetes (Tapp et al. 2003).

Podiatrists

Podiatrists deal with the prevention, diagnosis, treatment, and rehabilitation of medical and surgical conditions of the feet and lower limbs. People with diabetes are at increased risk of foot problems because high blood glucose levels can lead to peripheral neuropathy (nerve damage) and/or a reduced blood supply (poor circulation or ischaemia) (AIHW 2002). Peripheral neuropathy reduces the ability to feel sensation in extremities, particularly the feet, and people may not recognise their foot discomfort or injury. Unnoticed injuries very often progress to infections or

ulcerations, and in severe cases amputation is necessary. Injuries and infections normally heal with the aid of a good blood supply. A reduced blood supply may inhibit the healing of a foot injury. In 2002, 26% of adult patients attending diabetes centres reported peripheral neuropathy, and 5% had a history of foot ulceration (National Association of Diabetes Centres 2003).

Overview of workforce mapping for diabetes and allied health services

Mapping diabetes and the allied health workforce can show how the supply, availability and use of allied health services varies across geographical areas in relation to differences in prevalence, incidence or other factors. This enables analysis of gaps in the need for allied health services for people with diabetes and the supply or use of those services.

Workforce mapping projects can vary from relatively simplistic to quite complex. Some projects draw geographic maps showing factors such as workforce supply, diabetes levels and consultation rates. Others build mathematical models including relevant variables. These models can do more than simply report two data variables in relation to each other. They can model interactions and impacts over time, and they can also be used to assess the workforce impact of recommended guidelines for diabetes management for a geographic area or population group.

The types of data that can be used in mapping include:

- demographic information;
- diabetes prevalence, incidence and mortality;
- general practitioner referrals to allied health professionals; and
- allied health workforce levels, availability, referrals and consultations.

Appendix A contains a brief description of the major national sources of diabetes, workforce and service use data. It also includes discussion of some limitations of the data when used in mapping projects.

National and state and territory guidelines are useful in setting a context for diabetes and workforce rates and when trying to show efficacy in diabetes management, as they provide a service-level benchmark. However, some projects set their own benchmarks for good diabetes management.

Probably the most critical aspect of any data mapping or modelling project is the availability of data at specific geographic levels. For example if the intention is to draw a map showing prevalence and workforce levels by suburb, then diabetes and health service data must be available for the same area. In practice, the size of the region chosen often depends on the availability of data as well as the merits of a particular regional grouping.

As this paper aims to provide an overview of available information about data issues associated with mapping the need for diabetes services against the availability of the allied health workforce, the following sections include a discussion of the

advantages, disadvantages, assumptions and possible solutions to problems from some state-level projects.

Examples of State projects

Diabetes services in metropolitan South Australia

Diabetes services in metropolitan South Australia was a project undertaken by the Department of Human Services in South Australia to develop a minimum level of service model for diabetes nurse educator, dietitian and podiatry services for people with diabetes (Audit Working Group Sub Committee 2001). It is a good example of what may be possible on a national scale.

The Diabetes Health Priority Area Working Group identified the concept of a 'service model' as a priority. The group constructed a minimum diabetes service model that mapped prevalence and incidence rates for type 1 and type 2 and gestational diabetes in metropolitan areas against existing diabetes specialist nursing, dietetic and podiatry services, to determine gaps in service provision. The model incorporated a multi-disciplinary approach to diabetes management and recognised the importance of timely and appropriate access to specialised allied health services covering diabetes specialist nursing, dietetics and podiatry (see Appendix A for more detail). In order to map the number of existing diabetes allied services, the criteria for determining the number of diabetes full time equivalents (FTE) was dedicated diabetes time per week and a diabetes case load. For example a community health nurse may spend 2 days per week providing diabetes education services (in groups and 1:1), and 3 days per week in general community nursing work. In this example the diabetes FTE time was counted as 0.4 FTE diabetes nurse.

A broad professional consultation was undertaken to reach a consensus in South Australia on the minimum professional consultation time in hours required to provide effective education and treatment for people with diabetes at different points in their condition. Based on this, a standardised minimum number of hours of service was derived for each type of diabetes (Table 1). Numbers of people with diabetes were calculated for each region based on state-wide prevalence and incidence rates. In most cases the state-wide rates were applied (unadjusted) to smaller regions because local rates were not available. Moreover, the rates were based on self-report only and may have been an underestimate.

The South Australian services model enables disparities between the required (or minimum) and the existing number and length of service consultations to be highlighted and thus targeted for action. Appropriate service attendance or consultation hours per person per year are derived through mathematical formulae. The output can help to reorient and prioritise allied health services to, for example, maximise cost effectiveness. The inclusion of incidence rates allows forecasting of allied health service needs. Broken down into contact service hours the model identifies an average of 1.5 hours of Diabetes Nurse Educator per person per year,

1 hour of dietetics and 0.75 hours of podiatry consultation per person per year. The population formula is flexible, with group education being an efficient and suitable use of professional time for some clients, enabling more professional time for the complex and special needs clients.

The formulae used in the model are generic to South Australia and regional differences are not taken into account. Differences in age distribution, ethnic composition and other demographic factors can also affect diabetes prevalence rates across regions. However, while it may be possible to allow for age variations in future models, it may be impractical to allow for variations in other demographic factors. Further, there is no national consensus with respect to the standard minimum number of service hours upon which the South Australian model is based.

Table 1: South Australian minimum hours of service required for allied health services for people with diabetes

	For new diagnoses				For continuing care	
Health provider	**Children/ adolescents**	**Adult insulin users**	**Other adults**	**Gestational**	**Children/ adolescents**	**Adults**
	Hours per person per year[(a)]					
Diabetes nurse educator	20.0	10.0	8.5	10.0	1.0	4.5
Dietitian	7.5	6.0	4.5	3.5	1.5	1.0
Podiatrist	0.75	0.75	0.75	0.75	0.75 for all people every 2 years	
					0.75 for people at high risk every 6 months	
					0.5 by 6 times per year for people undergoing treatment (low grade pathology)	
					0.5 by 8 times per year for people undergoing treatment (high grade pathology)	

(a) Hours of service required: Hours are based on an average; a person with diabetes may not necessarily see a nurse every year, but over a 5 year period it averages out to 1.5 hours per person per year. FTE formula: Accounting for 80% client contact time, 37.5 working hours per week and 42.7 effective working weeks per year.

Sources: Department of Human Services in partnership with the Diabetes Health Priority Area Advisory Group 1999; Audit Working Group Sub Committee 2001.

In practice, it is the health professional who determines the frequency and length of the service occasions in line with agency policy. For example, one-on-one services at 1.5 hours per year may equate to one 30 minute and three 20 minute occasions in one year for an individual. Note that education delivered in groups also frees professional time for more one-on-one service delivery.

Like all projects of this kind, it was necessary to make assumptions for reasons of practicality. As it was not practical to account for all regional variations, in most cases an average was used. However, there is an ongoing review and amendment of the service level formulae in light of emerging evidence. The assumptions underpinning and influencing the formulae are being further developed and clarified. The major assumptions and some limitations are:

- The model does not adjust for geographical age variations in the population. Some areas have a greater number of older people than others and so the allied health requirements differ from areas with a younger population.
- The model assumes a constant high risk across the diabetes population. At present, there is no adjustment in service levels for low risk groups. All people are assumed to require the same level of health service for their diabetes and individual differences are averaged out.
- All people with diabetes seek services locally and have equal opportunity for assessment, education, treatment and follow-up by a qualified diabetes health professional.
- Special needs of special populations such as children, people of non-English speaking background and Aboriginal and Torres Strait Islander peoples are not identified in the model. The South Australian population is treated as if it were homogenous.
- While there is strong evidence for allied health professional intervention in improving diabetes outcomes, there are a lack of data on the amount of care required to achieve these outcomes. However, in the South Australian experience, given the paucity of diabetes allied health service levels and the size of the diabetes population requiring specialist services, providing a professional consensus on minimum service hours per person per year and aiming to achieve it has created the logic, impetus and funding stream to improve both service levels and coordination of services at the regional level of governance.

Service Model Development

The Diabetes Health Priority Area Working Group included the service model in the State's *Strategic Plan for Diabetes in South Australia* (1999) policy document which was revised in 2003.

Despite its limitations, the South Australian services model began first as a 'planning for diabetes services' project and implementation of government policy direction in rural South Australia. The generic service level formula was applied region by region, and informed the population evidence base for the need to build rural diabetes nursing and allied health service capacity. The generic nature of the formula allowed flexibility for regional diabetes stakeholders (Divisions of GP, acute and community health unit managers, health professionals, consumers and Regional Boards) to identify and measure any further gaps based on local needs, regional geography and demographics.

Six of the seven rural regions in South Australia have incorporated the service model into regional diabetes service or business plans since the State's Strategic Plan was published in 1999. This uptake facilitated by a rural 'planning for diabetes services' project involved regional stakeholders leading the development of a 'business case' that coordinated and integrated current services in collaboration, and sought regional funding of new allied services towards minimum levels over time.

Setting the formula in policy helped drive the diabetes services planning project that found all rural regions sitting well below minimum staffing levels. This project resulted in a ten-fold increase towards minimum levels in one region, and an increase to the total rural diabetes specialist nursing and allied health service staff in sustainable positions. These increases in staffing levels are evidence that the project was successful. The rural regions adopted various service model evaluation approaches to monitor the outcomes of their new service models. Population diabetes health outcome monitoring was taken up (i.e. funded) by one of the six regions, and this region has shown improvements in population outcomes over time.

The *Diabetes services in metropolitan South Australia* (Audit Working Group Sub Committee 2001) project was a first step in determining generic staff gaps in metropolitan Adelaide (Appendix A). The diabetes incidence and prevalence rates of 0.8% and 3.8% respectively, used in the model were 1997–1998 rates (Parsons et al. 2000). Data from the 2003 South Australian Health Omnibus Survey show that the self-reported prevalence of diabetes in 2003 was 7.9% (95% CI 6.2–10.0) among people living in country South Australia and 6.5% (95% CI 5.5–7.7) in their metropolitan counterparts (Personal communication—confirmed by Ms Catherine Chittleborough, Senior Epidemiologist, SA Diabetes Clearing House, by email on 2 June 2004). Factoring these increased prevalence rates into the formula significantly increases the minimum FTE requirement.

To establish the potential transferability of the services model and formula application to a metropolitan context, further work is currently being undertaken through the Southern Adelaide Diabetes Project (Southern Diabetes Project), which commenced in January 2003 and will be implemented over two years to 2005. This project aims to build service capacity toward minimum levels and to coordinate service delivery into an agreed regional model with key stakeholders.

The Southern Diabetes Project will evaluate the service models' integration and coordination processes using a qualitative approach (i.e. an interpretive inquiry), together with the establishment of the project's information technology framework, which measures diabetes health outcome indicators and provides sustainable monitoring of regional diabetes population outcomes. The Southern Diabetes Project represents the next phase of development of the services model in South Australia and the beginning of a sustainable system that monitors and analyses population diabetes health outcomes.

Review of allied health in the Loddon Mallee

The Victorian Department of Human Services conducted a review of the allied health services in the Loddon Mallee region (Loddon Mallee Regional Strategic Support Branch 2002). The purpose was to map the allied health system, identify gaps and other issues in service delivery, and collate data on how services operate. Although the project was not specific to diabetes, the allied health services included those involved in diabetes management, such as dietitians and podiatrists.

They surveyed public and private allied health agencies and some of the information they collated included:

- numbers of effective full-time (EFT) positions in each profession;
- which population groups each service targeted;
- the lengths of time allied health positions were vacant;
- workforce turnover rates for each service; and
- information on waiting lists and referrals to obtain information on worker shortage and gaps in service delivery.

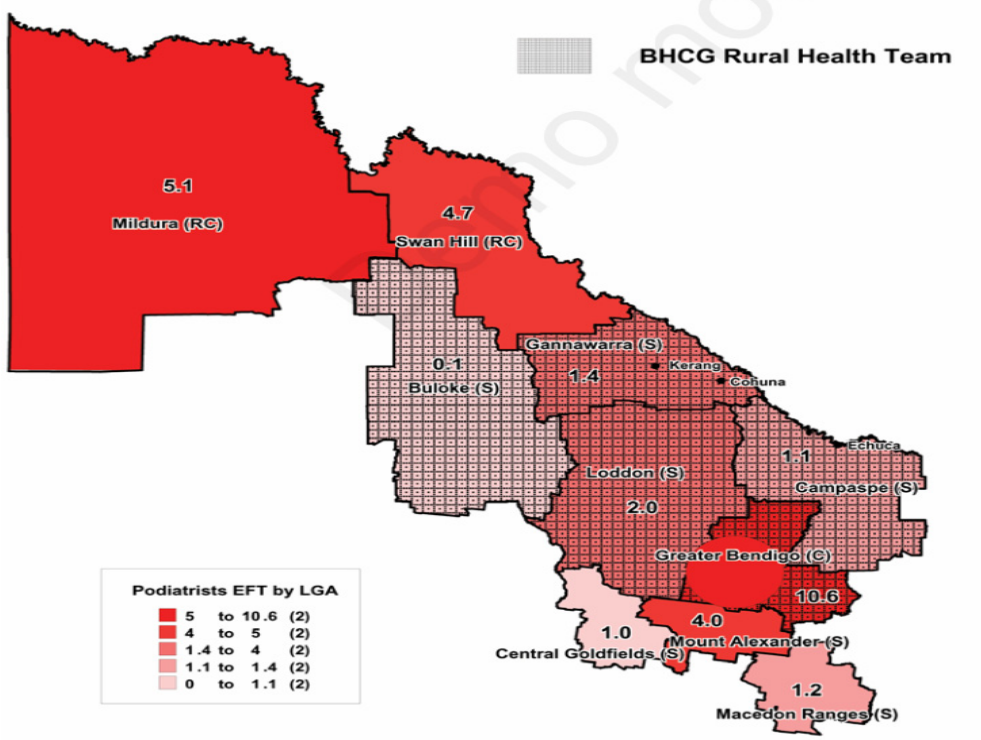

Figure 1: Effective full time podiatrists by local government area, Loddon Mallee region

Notes

1. BHCG—Bendigo Health Care Group (thatched area of map).
2. (2) in legend means that two LGAs in the Loddon Mallee region fall into each EFT range.

Source: Reproduced with permission from Loddon Mallee Regional Strategic Support Branch 2002.

Once analysed, the data were displayed graphically on maps of the region's Local Government Areas (LGAs). An example for podiatrists is shown in Figure 1. It shows that Greater Bendigo, Mildura, Swan Hill and Mount Alexander have relatively high concentrations of podiatry services (10.6, 5.1, 4.7 and 4.0 EFT podiatry positions respectively) compared with other LGAs in the region. However, it should be noted that the numbers of EFT podiatry positions shown include vacant positions. As with

any representation of data, the context has to be set to interpret the information correctly. For example, it would be incorrect to assume that all podiatry services shown in the map deal exclusively with diabetes. Further, taking the population of each LGA into account indicates that Loddon, Mount Alexander and Swan Hill provide the most podiatry services per 1,000 population in the region.

Queensland Standard Care Pathway 2000

The Queensland Standard Care Pathway for the management of diabetes mellitus in adults is "an integrated diabetes management guideline which identifies screening, diagnosis and stabilisation standards, criteria for the quarterly, six monthly and annual review, referral criteria and guidelines for acute management" (GPAC 2000) (see http://www.uq.edu.au/cgpmh/gp-paths/gp-22diabpath.htm). The Pathway is based on a multidisciplinary team approach in which the primary coordinator of care—a general practitioner or Indigenous health worker (that is, a health worker for Indigenous people)—works in consultation with specialist and allied health services.

The Queensland 2000 Diabetes Prevalence and Management Surveys, conducted as part of the Queensland 2000 Chronic Diseases Survey, used Queensland Standard Pathways of Care to determine whether respondents should have visited an ophthalmologist/optometrist, podiatrist, endocrinologist, diabetes educator, dietitian or general practitioner in the previous 12 months. While almost 90% of respondents had visited a general practitioner in the previous 12 months, fewer than 50% of those whose characteristics indicated that they should have attended an optometrist or ophthalmologist, podiatrist, dietitian, or diabetes educator or nurse in the previous 12 months had done so (Table 2). However many people with no apparent need to attend had done so—14–56% depending on the type of health professional.

Table 2: Attendance patterns at various health professionals within the previous 12 months for adults (18+ years) with diabetes, 2000, Queensland

Health professional	Should have attended[(a)] and did		No apparent need [(a)] to attend but did	
	Number	%	Number	%
Optometrist/Ophthalmologist	190	43.7	797	56.2
Podiatrist	334	23.6	653	15.3
Dietitian	847	23.7	140	24.3
Diabetes nurse or educator	741	19.3	246	28.9
Endocrinologist	685	10.2	302	13.6
General practitioner	987	89.7	0	—

(a) Based on guidelines from Diabetes Standard Pathway of Care 2000.

Source: Queensland Health 2002, Table 3.2.7.3.

National issues

It may be possible to conduct similar modelling or mapping projects to those described above, in other states and territories or at a national level. To be useful to health administrators planning diabetes services, projects should produce comparable results and be flexible enough to allow for new data or updated information to be incorporated easily.

Ideally, modelling projects would use agreed service delivery guidelines as a benchmark for adequate diabetes management. However most guidelines are for clinical care and only incorporate brief recommendations relating to allied health service provision. As people with diabetes have different levels of complications and risk, they require different levels and types of service provision. Therefore, the development of service provision guidelines that encompass the needs of all people with diabetes is complex. Service provision guidelines developed by Queensland and South Australia acknowledge these complexities differently but both have led to comprehensive assessments of their respective diabetes-related allied health workforce.

It is important to note that Indigenous communities may require a different approach, particularly for those in remote areas where Aboriginal Health Workers, remote area nurses and GPs (either visiting or resident) provide the majority of primary care to people with diabetes.

Some other issues that may need to be considered in undertaking a modelling project at a national level include:

- cost;
- the availability of reliable data on diabetes levels and allied health services at the required geographic level;
- the ability of the model to incorporate variation in demographic characteristics, risk factors, level of disease and the extent of complications in the population; and
- the regularity and continuity of relevant data collections.

Overseas health workforce modelling studies might also provide ideas for modelling the Australian allied health workforce in relation to diabetes. For example, Rizza et al. (2003) describe an endocrine workforce model that was developed to define the endocrine workforce needs in the United States from 1999 to 2020. The model was based upon supply and demand factors including training and educational trends, retirement and mortality rates for endocrinologists, current demand for endocrinology services, and population effects such as an increase in diabetes prevalence and an ageing population.

National data sources that may be relevant to mapping or modelling diabetes and allied health services data at a national level are described in the next section.

National sources of diabetes, workforce and service use data

Australian Bureau of Statistics National Health Surveys

The 1989–90, 1995 and 2001 National Health Surveys (NHSs), conducted by the Australian Bureau of Statistics (ABS), were designed to obtain national information on the health status of Australians, their use of health services and facilities, and health-related aspects of their lifestyle. The 1989–90 survey collected information from a sample of 54,600 respondents between October 1989 and September 1990. The 1995 survey collected information from a sample of 57,600 people and the 2001 survey collected information from approximately 26,900 respondents.

The surveys collect self-reported diabetes prevalence, health service utilisation information over the last two weeks, and other demographics such as age and sex. Areas covered include urban and rural areas across all States and Territories, and included residents of private dwellings only. Some data from the Northern Territory may not be available due to privacy concerns. Data from individual Statistical Local Areas (SLAs) cannot be released, but if clients wish to specify their own aggregations of SLAs limited data can be provided on that basis. Data for other regions (for example according to categories of the Accessibility and Remoteness Index for Australia) may also be available.

Australian Diabetes, Obesity and Lifestyle Study (AusDiab Study)

The AusDiab Study was conducted in 1999–2000, by the International Diabetes Institute and was partially funded by the then Commonwealth Department of Health and Aged Care. It is the most comprehensive survey to date on the prevalence and impact of diabetes. The survey collected information on self-reported and measured diabetes and cardiovascular risk factors, health knowledge, attitudes, and health services utilisation and practices. The study collected information from 11,247 adults aged 25 years and over throughout Australia (excluding the Australian Capital Territory).

National Diabetes Register

The National Diabetes Register, held at the Australian Institute of Health and Welfare, is a database that holds information about people who use insulin as part of their treatment of diabetes. It includes people who began to use insulin from 1 January 1999. Data for the register are obtained from two main sources: the National Diabetes Services Scheme, administered by Diabetes Australia, and the Australasian Paediatric Endocrine Group State-based registers. At December 2003, the register contained information on about 35,000 people. The register can be used as a source of incidence data for insulin treated diabetes.

Census of Population and Housing

The ABS Census of Population and Housing is conducted every five years and collects data on a broad range of characteristics of Australia and Australians. The Census questionnaire includes questions on occupation and this is used to count professional and other workers in Australia.

The Census is designed to collect data on a wide range of topics but does not provide extensive detail on diabetes-related health professionals. The health workforce relevant to diabetes, as collected by the Census, could over-represent the actual diabetes management workforce in two ways. First, Census data are not specific to professionals working with diabetes, but include other health professionals who may rarely treat people with diabetes. Second, data are presented as numbers of professionals rather than full time equivalent (FTE) staff. For example people who work part-time are counted the same as full-time workers. A further limitation of the Census for use in describing the diabetes management workforce is that it doesn't include the occupation of diabetes educators. Instead, diabetes educators are most probably coded to their primary specialisation or as a general nurse educator.

National Labour Force Surveys

The Australian Institute of Health and Welfare (AIHW), in conjunction with jurisdictional health departments and registration bodies, conduct labour force surveys for medical practitioners annually, nurses biannually, and tri-annually for dentists, pharmacists, podiatrists, physiotherapists, occupational therapists and psychologists. Most jurisdictions have statutory authorities (created by legislation) that hold compulsory registers of practising professionals such as podiatrists and optometrists. Although special interests are not usually listed, these boards provide a full count of those practising and some basic demographic details.

The Labour Force Survey questionnaires are posted to workers with their registration renewal documents. This method of data collection more accurately indicates the active workforce rather than people who are qualified and self-identify as an allied health professional but are not practising (which is what happens in the ABS Census). Generally, response rates are high (approximately 75%) and the results are weighted to the entire population of professionals held by the boards.

A major limitation of these surveys as data sources for diabetes allied health workforce data is that usually there is no indication of a specialisation identified. Although some podiatrists and nurses specialise in working with people with diabetes, this may not be apparent from the survey data. This is partly addressed in the 2003 Nursing Survey that identifies nurses working in the area of health education/disease management. However, details of the areas such as diabetes are not included.

Health Insurance Commission data

The Health Insurance Commission collects service utilisation data through the payment of Medicare and other benefits schedules. For example optometrists and ophthalmologists may register for diabetic retinopathy screening rebates, and these data could be used to assess how many people are screened for diabetic retinopathy and how often. The MBS includes financial incentives for general practitioners to complete a recommended annual cycle of care for patients with diabetes. Each component from the annual cycle of care (for example, a foot examination) has an item number, which could be tracked to measure diabetes management.

Bettering the Evaluation And Care of Health

The Bettering the Evaluation And Care of Health (BEACH) surveys randomly select samples of general practitioners (GPs) and obtain data on 100 consecutive doctor-patient encounters for each GP. The data include the problem(s) treated and referral(s) to other professionals.

A random sample of GPs who claimed at least 375 general practice Medicare items of service in the previous three months is regularly drawn from the Health Insurance Commission data by the General Practice Branch of the Australian Government Department of Health and Ageing. Each participating GP completes details about 100 consecutive patient encounters on structured encounter forms and provides information about themselves and their practice.

Referrals to allied health professionals provide a good source of health utilisation data. However, low levels of health services in some geographic areas may affect the numbers of referrals from GPs to other health professionals.

1999 Survey of Aboriginal Medical Services Diabetes Services in Western Australia

While not a national survey, information about the 1999 Survey of Aboriginal Medical Services Diabetes Services in Western Australia is included here as a relevant source of data for Indigenous people. The survey collected information on diabetes-related activity from most of the Aboriginal Medical Services (AMS) in the state (Office of Aboriginal Health 1999). These data included AMS access to dietitian, podiatry, diabetes education and optometry services.

Conclusion

The paper is intended to inform policy development in relation to the allied health workforce and services for diabetes management. It provides an overview of existing mapping and benchmarking work being undertaken at a state level for diabetes and allied health services. It also discusses some of the issues involved in undertaking a similar exercise at a national level and provides a description of relevant national

data sources. The variety of data and information sources reviewed reflects the broad range of health services involved in recommended diabetes care.

The models and data described assist in understanding not only the demand and supply discrepancies but raise issues in relation to appropriate use and management of the workforce. These also highlight the need for consistent and valuable data collections across jurisdictions.

Gaps exist in national data sources on the allied health workforce for diabetes. Although there are national data on the number of allied health professionals in Australia, the number of professionals with a specific interest or role in treating people with diabetes is harder to determine.

One of the potential uses for data and information about diabetes and the related health workforce is to model diabetes service delivery systems. A national service delivery model where diabetes-related health workforce numbers are mapped to diabetes prevalence could assist in the planning of diabetes services.

Appendix A: South Australian model of minimum service provision

Introduction

South Australia has developed a generic minimum level of service model for diabetes specialist nursing, dietetics and podiatry services for people with diabetes (Audit Working Group Sub Committee 2001). Two formulas were developed for benchmarking the minimum number of full time equivalent (FTE) health professionals required in metropolitan regions of South Australia—one based on average hours per person per year of service provision (Box 1); and the other on occasions of service per year.

Model based on average hours per person per year of service provision

Box 1: Minimum FTE allied health professionals, by hours per person per year

1. *Based on population estimates, the expected number of new diabetes patients and the current number of people with diabetes in South Australia were originally calculated using an estimated yearly incidence rate of 0.8% and prevalence rate of 3.8% (Parsons et al. 2000). These variables can be adjusted to incorporate current incidence and prevalence rates.*
2. *Minimum hours of service per person per year for people with diabetes (see Table 1) were used together with guidelines for service use at diagnosis, and for ongoing care, by type of diabetes to estimate the total hours of service required per year for diabetes nurse educator, dietitian and podiatry services in each of the four metropolitan regions.*
3. *Twenty per cent was added to the total hours per year of service required to allow for non-contact time incidentals such as travel and professional development.*

FTE formula

Accounting for 80% client contact time, total hours were converted to benchmark levels of full time equivalent health professionals based on an assumption of 42.7 effective working weeks per year (given 10 days sick leave, 10 public holidays, 4 weeks annual leave, 1.3 weeks long service leave) and 37.5 working hours per week.

Assumptions made in calculating required FTE

Diabetes nursing

Initial contact

Type 1:	all see a diabetes educator, i.e. 14% of people with diabetes (Parsons et al. 2000)
Type 2:	all see a diabetes educator, i.e. 86% of people with diabetes (Parsons et al. 2000)

Gestational:	all see a diabetes educator, i.e. 2.5% of pregnant women in 1995–1997 (Parsons et al. 2000)
Ongoing contact	
Type 1:	all see a diabetes educator once every 5–10 years, i.e. 14% of people with diabetes (Parsons et al. 2000)
Type 2 starting insulin:	all see a diabetes educator, i.e. 7% of people with diabetes (estimate from United Kingdom Prospective Diabetes Study data on sulphonylurea failure, 1999—see Holmwood & Philips 1999)
Type 2 other:	all people with specific education issues (e.g. medication change or monitoring or travel) see a diabetes educator, i.e. 3% of people with diabetes (estimate from Queen Elizabeth Hospital, Diabetes Centre, 1999)

Dietitian

Initial contact	
Type 1:	all see a dietitian, i.e. 14% of people with diabetes (Parsons et al. 2000)
Type 2:	all people with BMI > 30 kg/m^2 see a dietitian, i.e. 30% of people with diabetes (Parsons et al. 2000)
Type 2 other:	all people with specific nutritional issues (e.g. coeliac disease) see a dietitian, i.e. 5% of people with diabetes (estimate from Queen Elizabeth Hospital, Diabetes Centre, 1999)
Gestational:	all see a dietitian, i.e. 2.5% of pregnant women in 1995–1997 (Parsons et al. 2000)
Ongoing contact	
Type 1:	all see a dietitian once every 5–10 years, i.e. 14% of people with diabetes (Parsons et al. 2000)
Type 2 starting insulin:	all see a dietitian, i.e. 7% of people with diabetes (estimate from United Kingdom Prospective Diabetes Study data on sulphonylurea failure, 1999—see Holmwood & Philips 1999)
Type 2 other:	all people with specific education issues (e.g. medication change or monitoring or travel) see a dietitian, i.e. 3% of people with diabetes (estimate from Queen Elizabeth Hospital, Diabetes Centre, 1999)

Podiatry

Ongoing and initial contact

People with diabetes based on risk:

- (10%), At risk, moderate dysfunction (vibration units (vu) of 3.76–4.86) (South Australian Diabetes Study—see Phillips et al. 1998)
- (48%), High risk feet, severe dysfunction (vu of > 4.86) (two or more risk factors: peripheral vascular disease (pressure indices >0.9), abnormal foot structure, past history of ulcer)

Of this high risk group:

- (5%), Low grade pathology (e.g. abnormal nails, past history of ulcer, evidence of pressure—callus corns etc)
- (2%), High grade pathology (eg existing ulcer)

Note: Moderate dysfunction was defined as 4.5–6.6 standard deviation units from the norm, which is equivalent to 3.76–4.86 vu. Using the South Australian Diabetes Study data, 10% of people with diabetes had moderate dysfunction.

Calculation of required FTE—Examples based on the formula for Southern Metropolitan Region, Adelaide

Population numbers on which calculations are based

- Total Population (based on 1998 Estimated resident population (ERP)) = 318,115
- Total Adult Population, 18 years and over (1998 ERP) = 241,980
- Number of births = 3,682 (based on data from the Pregnancy Outcomes Unit, SA Department of Human Services, 1997)
- Expected number of new patients aged 18+ years based on an incidence rate of 0.8% = 1,935.8
- Expected number of people aged 18+ years with diabetes based on a prevalence rate of 3.8% = 9,195.2

Table A1: Estimated Diabetes Nursing FTE required for people with diabetes aged 18 years and over

Category	Per cent of people with diabetes to be seen by diabetes educator	Number of people	Number of hours[(a)]	Total
Newly diagnosed				
Type 1	14%	271.0	10.0	2,710.2
Type 2	86%	1664.8	8.5	14,151.0
Gestational	2.5%	92.1	10.0	920.5
Ongoing education				
Type 1	14%	1287.3	1.5	1,931.0
Type 2 – on insulin	7%	643.7	1.5	965.5
Type 2 – other	3%	275.9	1.5	413.8
Sub total				*21,092.0*
20% primary prevention, professional development, travel etc				4,218.4
Total Hours				**25,310.3**
FTE @ 37.5 and 42.7				**15.8**

Note: Total FTE = 25,310.3/(37.5*42.7) = 15.8.

(a) See Table 1.

Table A2: Estimated Dietetics FTE required

Category	Per cent of people with diabetes to be seen by dietitian	Number of people	Number of hours[(a)]	Total
Newly diagnosed				
Type 1	14%	271.0	6.0	1,626.1
Type 2 – BMI > 30 kg/m^2	30%	580.8	4.5	2,613.4
Type 2 – other	5%	96.8	4.5	435.6
Gestational	2.5%	92.1	4.5	414.2
Ongoing education				
Type 1	14%	1287.3	1.0	1,287.3
Type 2 – on insulin	7%	643.7	1.0	643.7
Type 2 – other	3%	275.9	1.0	275.9
Sub total				*7,296.2*
20% primary prevention, professional development, travel etc				1,459.2
Total Hours				**8,755.4**
FTE @ 37.5 and 42.7				**5.5**

Note: Total FTE =8,755.4/(37.5*42.7) = 5.5.

(a) See Table 1.

Table A3: Estimated Podiatry FTE required

Category	Per cent of people with diabetes to be seen by podiatrist	Number of people	Number of hours[(a)]	Total
Newly diagnosed & ongoing				
At risk	10%	919.5	1.0	919.5
High risk	48%	4413.7	1.5	6,620.6
Path (low)	5%	459.8	3.0	1,379.3
Path (high)	2%	183.9	4.0	735.6
Sub total				*9,655.0*
20% primary prevention, professional development, travel etc				1,931.0
Total Hours				**11,586.0**
FTE @ 37.5 and 42.7				**7.2**

Note: Total FTE = 11,586.0/(37.5*42.7) = 7.2.

(a) See Table 1.

Actual FTEs were identified from a service level audit and were compared to benchmark levels to identify gaps in service provision. For example, in the Southern Metropolitan area, there were 5.9 diabetes educator FTEs but the numbers and needs of people with diabetes in that area indicated that 15.8 FTEs were needed (Table A4). This represents a gap in service provision of 9.9 FTEs.

Table A4: Service level gap of full time diabetes nursing and allied health equivalents based on minimum service hours per person (18+ years) per year, Southern Metropolitan Region, June 2000

Region	Diabetes educators	Podiatry	Dietetics
Flinders Medical centre	2.5	2.0	0.8
Repatriation Hospital	1.6	0.6	0.6
Norlunga Health Service	0.7	0.9	0.2
Inner Southern CHS	0.6	0.5	0.4
RDNS	0.5	n.a	n.a
Southern Division of GP	Pre GP visit access only	None	none
Southern Domiciliary Care	n/a	Nil specified	n/a
Total of existing service	**5.9**	**4.0**	**2.0**
Minimum service level (based on existing population)	**15.8**	**7.2**	**5.5**
Service level gap	**9.9**	**3.2**	**3.5**

Source: Audit Working Group Sub Committee 2001.

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