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Health Networks Branch
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Western Australia

Diabetes in Western
Australia:
Prevalence and services
in 2012

Final Report

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Disclaimers

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This report has been prepared as outlined in the Scope Section. The services provided in connection with this engagement comprise an advisory engagement which is not subject to Australian Auditing Standards or Australian Standards on Review or Assurance Engagements, and consequently no opinions or conclusions intended to convey assurance have been expressed.

The findings in this report are based on a qualitative study and the reported results reflect a perception of the Western Australian Department of Health but only to the extent of the sample surveyed, being the Western Australian Department of Health's approved representative sample of management, personnel and external stakeholders. Any projection to the wider management and personnel is subject to the level of bias in the method of sample selection.

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Executive summary

Diabetes is one of the most common health conditions and one of the top 10 causes of death in Australia.¹ It is estimated that over 114,000 Western Australians have some form of diabetes; however given the extent of undetected diabetes in the community, the true rate may be double this figure. Diabetes mellitus is therefore one of Western Australia's (WA) most significant health issues. Diabetes can lead to a range of complications, impacting on both individuals and the health system. However, there is considerable scope for reducing these impacts through appropriate targeting of health promotion, early intervention and management (including self-management).

A broad range of service providers, services and organisations are involved in the provision of diabetes related care. Management of diabetes is delivered in primary and community health, outpatient, emergency department and inpatient settings by public, private and non government providers. While some providers such as endocrinologists and diabetes educators are diabetes specialists, others such as general practitioners, general physicians, dietitians and podiatrists provide diabetes care as part of a generalist role. Service availability varies considerably by locality, and a person with diabetes' access to care may differ according to diabetes type, complexity and their place of residence. This variability makes the planning, delivery and monitoring of diabetes services a challenging process.

Given its prevalence, diabetes is one of the priority areas in the Western Australian Department of Health's (the Department) *Chronic Health Conditions Framework 2011-2016*. In order to obtain a better understanding of current service delivery environment and inform implementation planning for the Framework, a review of current services was commissioned. This report presents a picture of diabetes prevalence and diabetes services in Western Australia as at December 2012. The recommendations made are for consideration by the Western Australia Department of Health and its partners in future services planning.

Project scope

The Department and the WA Diabetes and Endocrinology Health Network engaged KPMG to undertake a review of WA diabetes services. The review took place between June and December 2012.

¹ AIHW 2011. Diabetes prevalence in Australia: detailed estimates for 2007-08. Diabetes series no. 17. Cat. no. CVD 56. Canberra: AIHW. Accessed 14 May 2012 at www.aihw.gov.au/publication-detail/?id=10737419311.



This review aimed to:

- establish a baseline understanding of diabetes prevalence and service provision in WA
- inform future policy and planning for diabetes services in WA
- inform development of a state-wide diabetes services plan.

The review focussed on major public, private and non government services which are provided to people with existing type 1, type 2 and gestational diabetes mellitus (GDM). Analysis of diabetes prevalence and service delivery was undertaken at the WA health region and health district levels.

Approach

The review involved:

- mapping current diabetes services across the continuum of care in WA
- identifying gaps in diabetes services in WA
- identifying cost-effective diabetes service and system improvements in WA within the scope of existing health budgets and capability
- making recommendations for implementing the service and system improvements identified.

Eighty face-to-face and teleconference consultations were held with over 100 stakeholders from each of the WA health regions, covering various organisations, service settings and professions. An Expert Advisory Group was convened to provide advice on the review approach and findings. The review examined a range of data to assess diabetes prevalence and service delivery in general practice, community health, non admitted (outpatient), emergency department and inpatient settings. Maps of diabetes services located in each WA health region were produced using information drawn from a range of information sources.

Key themes and findings

The review found that WA has a multifaceted diabetes care system in which a person's access to care varies considerably according to diabetes type and complexity and by service type, setting and location. While care is provided in both inpatient and non admitted settings, the overwhelming majority of care is provided by outpatient, community and primary health care services. The diabetes care system is loosely organised with referral pathways that are often ad hoc and relationship based.



Service availability differs significantly by region. Diabetes specialist services are concentrated in the Perth metropolitan area, with tertiary level services all located in inner metropolitan suburbs. For people with complex diabetes, access to specialist services is greatest for inner metropolitan suburbs, and becomes increasingly limited the further a person's home is from the Perth central business district (CBD). Consequently many people living in outer metropolitan suburbs, as well as most rural and remote communities, are required to travel to Perth or access a visiting specialist service at a regional centre. Most of those with less complex diabetes can access a range of community based providers close to home, but many still encounter access barriers where generalist providers are less experienced or confident in treating diabetes or simply are not there.

While there are similar approaches to service provision in the two metropolitan regions, the approach to care in WA Country regions differ according to local settings. Given the challenges of service delivery in rural and remote Australia, stakeholders emphasised the importance of generalist health services working with support from specialist services to deliver care locally. Country health regions require the flexibility to adapt service delivery to regional characteristics such as population density, workforce availability and turnover, and Aboriginal populations. However, the review identified opportunities for strengthening and formalising relationships between regional and specialist services, particularly the tertiary hospitals, for provision of support such as consultancy advice and education and training.

The extent of variation around diabetes service delivery presents a challenge for people with diabetes and care providers alike. Consumers of diabetes services often experience a degree of confusion in identifying both initial and next steps in their diabetes management as entry points into the care system vary and service access will vary according to diabetes type and complexity as well as the location. The multitude of providers, services, programs and funders – which encompass public, private and nongovernment settings and which change over time – make diabetes service planning difficult. As a result, both service gaps and duplication (e.g. relating to consumer service, education and information options) are present in the current service system.

Regional analysis

Statewide services

Statewide services such as the Child and Adolescent Health Service (CAHS) and Women and Newborns Health Service (WNHS) are based in Perth's inner metropolitan suburbs. For people with diabetes living outside of Perth or a



regional centre, access to diabetes paediatric or pregnancy related care is likely to be limited, with that person required to travel to access care.

CAHS appears to be a well resourced service which works with a cohort that has fewer complications than other services. This enables it to provide a good foundation for young people diagnosed with diabetes to manage their diabetes; however once young people transition into adult services the same level of care is not able to be maintained. While based at PMH in Perth's CBD area, the service also provides regular outreach clinics to a number of outer metropolitan and regional centres.

WNHS supports women with the most complex pregnancies in the state. Compared to other WA health regions / services, its activity levels in relation to diabetes in pregnancy appear to be low; however this is likely to reflect both limited demand for this type of service and coding of its activity to other health issues. WNHS provides very little outreach care.

While there are access issues relating to both services, they routinely provide telehealth support to other health professionals located around WA. Given their respective roles, both Services should be considered priorities for development of a diabetes telehealth strategy.

Metropolitan regions

The North Metropolitan Health Service (NMHS) and South Metropolitan Health Service (SMHS) regions are able to offer much higher levels of access to diabetes services than country regions. As the major population centres, these regions recorded significantly higher numbers of all types of service than their country counterparts. The metropolitan regions are able to offer the full range of services and service providers delivering diabetes related care, including tertiary and secondary level hospitals and diabetes clinics, community health centres, public health units, primary health care, private and non government organisation (NGO) providers.

Despite the range of service options, access varies depending on where a person with diabetes lives. At present, tertiary level diabetes clinics and services are all based in inner metropolitan areas, which in turn raise access barriers for people with complex diabetes – those most in need of care – living in outer metropolitan suburbs. This review has been unable to provide a detailed analysis of waiting times across metropolitan diabetes services; however available information indicates that while urgent referrals are usually seen within one to two weeks, non urgent referrals may take as long as 10 to 12 months to be seen. Given the current and projected shortages of endocrinologists, diabetes educators and other related providers, strategies are required to ensure the most efficient use of these resources is achieved.



Secondary hospitals, community health centres and primary health care providers located in outer metropolitan areas are consequently important services, and there is a need to build their capacity to deliver care closer to patients' home. Capacity building needs to be accompanied by more clearly defined referral pathways as well as improved visibility of diabetes capable services, tertiary service support, and access to specialists for advice when required.

While NMHS and SMHS provide coordination and planning around the delivery of public health services, it is more difficult to influence the delivery of private and NGO services. The establishment of Medicare Locals provides a mechanism for improving service planning and coordination, as well as strengthening local level networks between services. There is also a need to more closely consider the role of Diabetes WA in the delivery of diabetes education given the number of public health services also delivering this function.

Rural regions

The South West, Great Southern, Wheatbelt and Midwest regions offer more limited access to diabetes services than metropolitan regions. These locations lack permanent endocrinology services and have only small numbers of diabetes educators. Workforce shortages and ageing present ongoing challenges for these regions. The resources that are available are typically located in regional centres, with people with diabetes often required to travel to either these locations or Perth to receive care.

Given the lack of local specialists, there is a reliance on visiting services to support people with more complex diabetes. It is notable that visiting services are funded under different programs, leading to a fragmented approach that is likely unsustainable in the long term. There is a need to develop a more sustainable platform for the provision of specialist care, supported by telehealth services.

Population health teams are key providers in their regions, particularly in the Wheatbelt and Midwest regions. While access to general practices appears to be reasonable to good for the South West and Great Southern regions, the Wheatbelt and Midwest regions experience lower levels of access. Former general practice networks and Silver Chain were also identified as important organisations which are delivering allied health services.

Remote regions

The Goldfields, Pilbara and Kimberley regions are characterised by both very limited access to diabetes focussed services and high levels of diabetes



prevalence and complexity. These regions have notably high rates of ED presentations and inpatient separations, and lower rates of outpatient and community service delivery.

Given the lack of private primary health care providers, population health teams, Aboriginal medical services and former general practice networks are critical service providers. These are supplemented visiting specialist teams, but as for the rural regions they are fragmented and infrequent. Given the lack of access to specialist services, stakeholders have emphasised the importance of generalist health services which offer local understanding and ongoing access. Stakeholders also emphasised the need for increasing the capacity and provision of support to these providers through education and training as well as access to specialists for tele-consultancy support.

Recommendations

In considering the review's recommendations, the context in which diabetes services are delivered and this review has been undertaken must be understood. These considerations are briefly outlined below.

At present, it is difficult to access comprehensive, consistent and accurate data relating to diabetes service delivery. Diabetes service activity is recorded in a number of data collections, which are at various stages of development, operate under different approaches to data management and have varying levels of compliance at the service level. Furthermore, while it has been possible to collate data at the health region level, it has not been possible within the scope of this review to undertake more detailed analysis at the health district level. In particular, data constraints have limited the ability of the review to undertake detailed analysis of diabetes prevalence and service delivery by diabetes type. These impediments present significant barriers when undertaking statewide diabetes service planning.

Despite the data limitations, it is clear that access to diabetes services varies considerably according to a person with diabetes' location of residence, especially for those with complex care requirements. The analysis of service availability located in Section 5 of this report indicates that people living in the two metropolitan regions consistently have better access to all forms of diabetes services than residents of rural and remote regions. In noting access issues, it is important to acknowledge the challenges of delivering diabetes care in a state with a single major metropolitan centre, limited number of regional centres, and many small communities separated by large distances. WA's geography and population size also presents challenges in terms of workforce recruitment and retention.

Given these constraints, a well integrated and coordinated diabetes system in which diabetes specialist and general health providers work collaboratively to



provide timely care is required. There are a number of features which are desirable for achieving a more integrated system, including improved access to multidisciplinary teams (particularly in rural and remote regions), clear and effective referral pathways, well defined roles and responsibilities, and strengthened links between specialist and generalist providers. Similarly, formalised relationships between tertiary services and their outer metropolitan, rural and remote counterparts may be beneficial in terms of improving access to care for people with diabetes as well as access to specialist advice and education and training for other care providers. Use of tools such as guidelines, benchmarks, protocols, decision support tools and service directories may also assist in achieving these outcomes.

There is also scope for improving the planning of diabetes services across WA which takes into consideration organisations and providers working in the full range of care settings; i.e. public, private and non government; primary, secondary and tertiary; metropolitan, rural and remote. Undertaking such a comprehensive approach will require strong dialogue between planners in the central Department divisions and its health regions to ensure local drivers of care are well understood. Statewide planning would need to focus on improving access to all forms of care through building local capacity and improving service integration. In doing so, it will be important to retain the benefits of local flexibility to address region-specific environments while improving the central Department visibility and understanding of system needs.

Recommendations for implementing the service and system improvements in diabetes are have been grouped under four broad themes:

- consistency and quality of care
- access and equity
- policy and planning
- specific population groups.

Recommendations relating to each theme are outlined over page.



Themes and recommendations

1. Consistency and quality of care

- 1.1. Promote person centred models of care, self management and health literacy.
- 1.2. Clearly define and communicate roles and responsibilities of diabetes services and providers.
- 1.3. Establish clear referral pathways, processes and protocols to support shared care and improve the referral and transition of people with diabetes between care settings.
- 1.4. Promote consistent approaches to care through development / identification of guidelines, benchmarks, protocols, decision support tools and other relevant resources.
- 1.5. Strengthen existing, or develop new, formal networks between tertiary diabetes clinics and regional services.
- 1.6. Build capacity in the secondary, community and primary health care settings.
- 1.7. Identify strategies to strengthen communication between providers and services across care settings.

2. Access and equity

- 2.1. Undertake diabetes specific workforce planning to address identified shortages and ageing, especially with regard to endocrinologists and credentialed diabetes educators.
- 2.2. Consider the allocation of diabetes resources across geographic and service settings, including the location of tertiary / specialist teams.
- 2.3. Consider the role of statewide organisations such as Diabetes WA in the provision of diabetes education and information services.
- 2.4. Develop a statewide telehealth strategy for diabetes services.
- 2.5. Develop a sustainable and coordinated program for visiting specialist diabetes services to rural and remote communities.
- 2.6. Establish and promote after hours diabetes services and education to groups which typically have limited access to business hours services.



Themes and recommendations

- 2.7. Work with the Australian Government to improve design of MBS chronic disease item numbers, particularly those relating to allied health providers.

3. Policy and planning

- 3.1. Consider the establishment of statewide and regional forums to assist with the planning and monitoring of diabetes services.
- 3.2. Undertake diabetes service demand modelling to determine future needs for diabetes services, and the types and levels of services required.
- 3.3. Improve the quality and accessibility of diabetes related data collections.

4. Specific population groups

4.1. *People with type 1 diabetes*

Increase the availability and accessibility of specialist diabetes services through redistribution of resources, provision outreach services and / or use of patient transport and care coordinator services.

4.2. *People with type 2 diabetes*

Build the capacity and skills of primary and secondary care providers to manage more complex type 2 diabetes. Improve the access of these to specialist providers for the provision of advice when required.

4.3. *People with gestational diabetes*

Improve the capacity of King Edward Memorial Hospital to provide outreach and tele-consultancy support to regional and remote services. Build the capacity and skills of primary and secondary care providers to manage more GDM.

4.4. *Young people with diabetes*

Identify mechanisms and best practice support for young people with diabetes transitioning to adult services. Improve the capacity of Princess Margaret Hospital to provide outreach and tele-consultancy support to regional and remote services

4.5. *Aboriginal people with diabetes*

Promote the development of the Aboriginal health workforce. Improve the capacity of Aboriginal health workers, general practitioners, outreach



Themes and recommendations

workers, care coordinators and other providers working with Aboriginal people to provide diabetes care.

Promote the delivery of culturally appropriate care by all health care providers.



1 Background

The scope, method and identified limitations of the Western Australian diabetes services review are outlined below.

1.1 Engagement scope

The Western Australian Department of Health (the Department) and the WA Diabetes and Endocrinology Health Network engaged KPMG to undertake a review of WA diabetes services. The review took place between June and December 2012.

This review aimed to:

- establish a baseline understanding of diabetes prevalence and service provision in WA
- inform future policy and planning for WA diabetes services
- inform development of a state-wide diabetes services plan.

The review involved:

- mapping current diabetes services across the continuum of care in WA
- identifying gaps in diabetes services in WA
- identifying cost-effective diabetes service and system improvements in WA within the scope of existing health budgets and capability
- making recommendations for implementing the service and system improvements identified.

Major diabetes services delivered by any provider aimed at the management of diabetes and its chronic complications were included in the assessment.² For the purposes of the review, 'major diabetes services' was interpreted as those employing diabetes specific health care providers³ and / or health care providers who spend the majority of their time providing diabetes related care⁴. However, given country WA services operate on a different model to the metropolitan context, key generalist health services in these regions were also considered. Individual general practices, while important for diabetes care, have not been identified but access to general practice in WA has been addressed in

² Services which are primarily focussed on prevention of diabetes were out of scope for this review.

³ e.g. Endocrinologists, general physicians with a diabetes special interest, diabetes educators

⁴ e.g. Dietitians and podiatrists.



the review. WA Department of Health, Commonwealth, non government and privately funded services have all been considered within scope of the review.

Analysis of diabetes prevalence and service delivery has been undertaken at the WA health region and health district levels.

Consideration of the effectiveness of the current Diabetes Model of Care and the development of a new Diabetes Model of Care for WA were out of scope for this review.

1.2 Project methodology

The review involved four key activities:

- stakeholder consultations
- data review
- consultation with an Expert Advisory Group
- production of maps indicating identified diabetes services in each WA health region.

These activities are described below.

1.2.1 Stakeholder consultations

The review involved 80 face-to-face and teleconference consultations with over 100 stakeholders from each of the WA health regions, covering various organisations, service settings and professions. Consultations were performed between July and October 2012 and were undertaken face-to-face (where possible) or via teleconference (particularly for rural and remote consultations). The interviews were semi-structured, but discussions varied according to location, service type, provider and settings.

Consultations targeted diabetes specific service providers including endocrinologists, general physicians with a diabetes special interest, diabetes educators, dietitians and podiatrists, as well as general health service providers in regional settings such as general physicians, nurses, chronic disease coordinators and general practitioners. Stakeholders working at the diabetes outpatient clinics at each of the major tertiary institutions were engaged, as well as at the state's three high risk foot clinics. WA Country Health Service (WACHS) Population Health Directors for each of the Country regions were consulted, as well as a number of Department employees working in policy and planning positions. Consultations were also undertaken with NGO service providers active throughout the state including Diabetes WA, Silver Chain, the Royal Flying Doctor Service, the majority of WA Medicare Local and a number



of general practice networks. A list of stakeholders consulted is located at Appendix B.

1.2.2 Data analysis method and limitations

The review examined a range of data to establish diabetes prevalence and service related activity. Available data relating to diabetes prevalence and service provision by Department of Health managed services were sought from the Department. Data relating to non-Department services, particularly general practice, were sourced from publicly available data collections.

A range of factors impacting on the accuracy and quality of available data must be considered when interpreting the data included in this report. In particular, each data set is impacted by:

- changing practices in relation to recording and coding of service activity over time, which differ by data set
- use of local data information management systems in some regions instead of statewide systems
- variability at the individual service provider, service and regional levels in terms of adherence to recording and coding of service activity
- use of data from a mix of calendar and financial years.

All data must therefore be regarded as estimates only. Furthermore, it is not possible to undertake trend analysis to identify changes in service activity over time as this cannot be separated from the impacts of changing data coding and recording behaviours. Consequently, KPMG analysis of data is focussed on the 2011 calendar year.

Key data sets examined by this review and any limitations relating that data are described below.

WA health regions and health districts concordances

A concordance file matching WA Health Services, Regions and Districts to relevant statistical local areas (SLAs) and postcodes was provided by the Department. This file was used to enable relevant data and identified health services to be mapped to related health regions and districts.

WA population

Estimated resident population (ERP) data by SLA were sourced from the Australian Bureau of Statistics (ABS) 2011 Census and used this to compile



ERP estimates for the entire population and Aboriginal population for each WA health region. The data sources used were:

For total population: *3235.0 Population by Age and Sex, Regions of Australia*. Australian Bureau of Statistics; Canberra: 31 August 2012

For Aboriginal population: *Local Government Areas (2011 Boundaries) (UR) by Sex (SEXP) and Indigenous Status (INGP). Counting: Persons, Place of Usual Residence*. Data source: 2011 Census of Population and Housing. Australian Bureau of Statistics; Canberra: 2012.

Diabetes prevalence

Persons aged 15 years and older

An estimate of diabetes prevalence in WA, by diabetes type and health region, was provided by the Department's Epidemiology Branch. The data source provided and used for this review⁵ was:

Prevalence of diabetes in Western Australian adults WA Health and Wellbeing Surveillance System. Health Survey Unit, Epidemiology Branch, Department of Health, WA. Provided to KPMG on 3 October 2012.

Limitations in relation to the diabetes prevalence information provided, as advised by the Department's Epidemiology Branch, are:

- the information was sourced from the WA Health and Wellbeing Surveillance System (HWSS) from January 2010 to December 2011. The HWSS is an ongoing data collection interviewing over 6,000 people each year using a Computer Assisted Telephone Interview approach
- the HWSS estimates diabetes prevalence for WA residents aged 16 years and older; i.e. children and adolescents aged 0 to 15 years are not included in the results
- households are selected from the 2008/09 White Pages by a stratified random process, with over-sampling representative to the population in rural and remote areas
- data can be considered representative of the population but will not be representative of small or specific groups such as Aboriginal people or people from non-English speaking backgrounds
- respondents are asked to self-report on a range of questions on indicators related to health and wellbeing, including chronic health conditions, lifestyle risk factors, protective factors and sociodemographics

⁵ Given the difficulty in accurately identifying diabetes prevalence for small population groups such as Aboriginal people with diabetes as well as people with type 1 and GDM, alternative estimates of diabetes prevalence will be sourced and included when this report is finalised.



- respondents were asked if they had ever been diagnosed with diabetes by a doctor. Respondents that indicated a diagnosis of diabetes were then asked to specify the type they were diagnosed with. The options presented in this report are type 1 diabetes, type 2 diabetes and gestational diabetes. It should be noted that females who reported gestational diabetes were also asked if they had ever been diagnosed with any other type of diabetes⁶
- the 2010/11 prevalence data are weighted to compensate for oversampling in the remote and rural areas of WA and then adjusted to the age and sex distribution of the WA population using the 2010 ERP
- data relating to diabetes prevalence are provided by calendar year.

In particular, care must be taken when considering results relating to small population groups; e.g. for gestational diabetes as well as areas with a high proportion of Aboriginal people such as the Kimberley and Pilbara regions.

Persons aged 0 to 14 years

As children and adolescents aged 0 to 14 years were not provided as part of the WA Health and Wellbeing Surveillance System data, estimates of diabetes prevalence for this cohort were calculated separately by KPMG. The data sources used for these calculations were:

Prevalence of Type 1 diabetes in Australian children, 2008. Diabetes series no.15. Cat. no. CVD 54. Australian Institute of Health and Welfare: Canberra; 2011

3235.0 Population by Age and Sex, Regions of Australia. Australian Bureau of Statistics; Canberra: 31 August 2012.

Diabetes prevalence estimates for persons aged 0 to 14 years were calculated by applying national prevalence estimates to WA ERP estimates for the 0 to 14 age cohort. Limitations in relation to this approach include that:

- available diabetes estimates are for type 1 diabetes only; i.e. estimates of type 2 diabetes and secondary or 'other' diabetes types are not included in the data calculated
- results from the ABS National Health Survey (released 29 October 2012)⁷ estimate type 2 diabetes prevalence for 0 to 14 year olds as 0.0 per cent
- a national diabetes prevalence rates has been applied to ERP data; i.e. region specific prevalence rates are not available.

⁶ *Prevalence of diabetes in Western Australian adults WA Health and Wellbeing Surveillance System.* Health Survey Unit, Epidemiology Branch, Department of Health, WA. Provided to KPMG on 3 October 2012

⁷ 4364.0.55.001 - *Australian Health Survey: First Results, 2011-12.* Australian Bureau of Statistics; Canberra: 29 October 2012. Accessed 30 October 2012 at www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4364.0.55.001Main+Features12011-12?OpenDocument.



Aboriginal persons (all ages)

Estimates of diabetes prevalence amongst the WA Aboriginal population were calculated by KPMG using the following sources:

Prevalence of diabetes. Australian Institute of Health and Welfare, based on analysis of the Australian Bureau of Statistics National Health Survey 1995, 2001, 2004/05 and 2007/08 (reissue), the ABS National Health Survey – Indigenous Supplement 2001 and the National Aboriginal and Torres Strait Islander Health Survey 2004/05. Accessed 10 October 2012 at www.aihw.gov.au/diabetes-indicators/prevalence/.

Diabetes prevalence rates specific to the WA health regions or WA are not available. Therefore, a national diabetes prevalence rate (all types) of 12.7 per cent for all Aboriginal Australians was identified from this source and applied to estimated Aboriginal resident population rates for WA to calculate the estimated number of Aboriginal people with diabetes in WA. However, as diabetes prevalence among Aboriginal people is likely to vary by region and group, this method provides a crude measure of diabetes prevalence only.

Inpatient separations

Data relating to inpatient separations where diabetes is the primary source of admission were provided by the Department's Performance Activity & Quality Division. Diabetes types were defined as follows:

- type 1: separations with a principal diagnosis code of E10 or O24.0 (ICD 10)
- type 2: separations with a principal diagnosis code of E11, O24.1 (ICD 10)
- gestational: separations with a principal diagnosis code of O24.4 (ICD 10)
- other or secondary: separations with a principal diagnosis code of E13, E14, O24.2, O24.3 and O24.9 (ICD 10).

Data relating to inpatient separations where diabetes was not the primary reason for admission, but diabetes related care was provided while that person was admitted, were not able to be considered by this review. Given the frequency with which people with diabetes are admitted under alternative coding, there is likely a significant amount of inpatient activity associated with diabetes which is not captured in the available data set.

The data source provided and used for this review was:

Diabetes inpatient activity by calendar year, diabetes type, residential health region and hospital: 2007 to 2011. WA Hospital Morbidity Data System. Inpatient Data Collections, Performance Activity & Quality Division, Department of Health, WA. Provided to KPMG on 10 October 2012.



Limitations relating to the diabetes inpatient separations information provided, as advised by the Department's Performance Activity & Quality Division, are:

- the inpatient data measures inpatient separation counts, not person counts; i.e. the data does not measure unique individuals. An individual may have multiple separations within the requested time period. It is therefore possible that an individual may present to more than one hospital, present with different principal diagnoses, change age group or change residence / live in multiple health regions. It is likely that an individual will be counted more than once
- separations exclude unqualified (healthy) newborns, boarders, posthumous organ procurements, aged care residents, and funding hospital (duplicate) cases
- patients' health region of residence was based on residential postcode; where the residential address was unknown health region of residence was listed as 'Other'
- separations where the person's residential state is not WA were excluded
- to protect patient confidentiality, the Department is required to suppress cell counts of less than five inpatient separations. To minimise the number of suppressed counts, inpatient separations which measure age and Indigenous status were not requested. For the purposes of calculating total patient separations:
 - suppressed counts were treated as equivalent to zero separations and as such represent a lower boundary estimate of total diabetes related separations. Lower boundary estimates are most likely to impact separations relating to type 1 and GDM and / or regions with small populations
 - if suppressed counts were considered to be equivalent to four separations, it is estimated the higher boundary estimate would be approximately 116 more separations recorded for WA in 2011⁸
- changes in coding of diabetes related inpatient separations have impacted the information recorded in recent years. Specifically:
 - there have been changes in clinical coding practice in recent years, which are reflected in the data provided. In July 2010, where there was an admission for diabetes relating to an obstetric or ophthalmic condition, the admission would no longer be coded for diabetes as the principal diagnosis
 - for example, if a patient had diabetes mellitus with an ophthalmic complication, prior to 2010 this would have been coded as E11.39 (Type

⁸ Based on 29 cells of suppressed separation counts.



2 diabetes mellitus with other specified ophthalmic complication). However after July 2010, the ophthalmic condition (e.g. cataract) would only be coded as the principal diagnosis, and not the diabetes. Therefore there is a decrease in 2010 calendar year diabetes figures, and a significant decrease in 2011.

Data relating to diabetes inpatient separations are provided by calendar year.

Non admitted occasions of service

Non admitted data collection

Data relating to non admitted occasions of service for diabetes care was provided by the Department's Performance Activity & Quality Division. Specifically, data were requested which would measure provision of diabetes related occasions of service in non-inpatient settings including diabetes outpatient clinics. The data provided indicates the service name, service and clinic types, appointment date and year, patient postcode of residence, Indigenous status, whether the service was completed / involved a 'did not attend' (DNA), and the data collections the data were sourced from.

The data source provided and used for this review was:

Diabetes non admitted patient activity by calendar year, clinic and organisational unit type, residential health region and clinic: 2003-2012. Non Admitted Data Collections, Performance Activity & Quality Division, Department of Health, WA. Provided to KPMG on 10 October 2012

WA Country Health Service Ambulatory and Other Domiciliary (AOD) Occasions of Service. WA Country Health Service. Provided to KPMG on 4 September 2012.

Limitations relating to the diabetes non admitted data collection provided, as advised by the Department Performance Activity & Quality Division, are:

- the WA non admitted patient data collection is a new data set that is still currently under development. Data documentation and the meta data forms feeding into the collection are still under development, with all health services managed by the Department yet to consistently and accurately record and code non admitted service activity. Although there are a range of initiatives to improve data capture underway across Department services, these are still in progress. This data collection is formally known as the Non-admitted patient activity & wait list (NAPAAWL) data collection
- three data systems feed into the NAPAAWL data collection:
 - The Open Patient Administration System (TOPAS) system records patient demographics and details of all patient contact with public metropolitan hospitals and the South West Health Campus at Bunbury,



for both outpatient and inpatient services. Each metropolitan hospital and the South West Health Campus runs its own copy of TOPAS, and submits data to the Department for compilation. This data system captures face-to-face patient contact only; i.e. travel and administrative work are not recorded

- the Allied Health Services (AHS) system records details of hospital-based allied health occasions of service. Only AHS services which are identified as an outpatient service are included in the non admitted data collection. When diabetes related occasions of service are entered into AHS, they should also be linked to the TOPAS record; however, only about half of AHS entries are linked to TOPAS and hence some data may not be included in this collection. Coding of activity under AHS varies by each health service
- the HCARE / Ambulatory and Other Domiciliary (AOD) system, used by all public country health services (69 hospital and community based services) except the South West Health Campus. A total of 38 copies of HCARE serve the country hospitals, typically with small regional clusters sharing a single instance. Practices for coding of activity under HCARE vary significantly by region and health service. A number of services and regions also make use of alternative data collection systems such as HCARE / OCS and HCARE / CH modules as well as MMex, Communicare and Share instead of HCARE / AOD. Therefore, the Performance Activity & Quality Division estimates as much as 50 per cent of Country health services activity is not currently available to this data collection
- TOPAS, AHS and HCARE recorded outpatient occasions of service for diabetes related care have been included in the non admitted patient data provided for this review. It should be noted that:
 - the data selected for this review by the Performance Activity & Quality Division were sourced from NAPAAWL using clinic codes (not health issues (HI) codes); i.e. activity from hospital based diabetes clinics were included. HI codes are not yet used for the NAPAAWL data collection. Data relating to metropolitan based community health services are not included in this collection. This data collection therefore differs from the Ambulatory and Other Domiciliary (AOD) data collection (discussed below), which makes use of HI codes
 - HCARE / AOD data is included in the NAPAAWL data collection. Where data is sourced from the NAPAAWL (using diabetes clinic coding) and HCARE / AOD (using health issue coding) data collections, occasions of service will be recorded for some patients under both collections. Potential double counting is estimated to be no more than 600 occasions of service



- there may also be some duplication in the recording of diabetes related occasions of service across the three data systems. For example, an occasion of service delivered by doctor employed by the Princess Margaret Hospital for Children (PMH) is provided as an outreach service in Narrogin would be recorded under TOPAS. If a nurse employed by Narrogin Hospital assisted the doctor with the same occasion of service this would be recorded under HCARE. However, it is not expected that there is significant duplication between the three data systems
- due to variations in coding practices at the service provider level, occasions of service relating to both diabetes and other endocrine disorders are included in the reported data
- group education occasions of service are recorded as a single event, but will support multiple individuals with diabetes. It is not known whether group education sessions are consistently recorded in the NAPAOWL data collection
- changes in practices relating to the recording of non admitted occasions of service have also impacted the information reported. In particular, the Department has focussed efforts in the last two years on getting more clinics to electronically capture their service related activity (i.e. occasions of service). Therefore increases in recorded non-admitted occasions of service will in part be influenced by improved reporting
- data relating to diabetes outpatient occasions of service are provided by calendar year.

HCARE / Ambulatory and Other Domiciliary (AOD) data collection

In order to access additional data relating to outpatients occasions of service delivered in WA country hospitals, the HCARE / Ambulatory and Other Domiciliary (AOD) data collection was obtained from WACHS. The AOD Data Collection System is based on the HCARE system and records information relating to services delivered by WACHS service providers from the inpatient, outpatient and community settings. While there is likely to be some overlap between HCARE data recorded in the non admitted data collection and the AOD data collection, the latter records substantially more occasions of service for WA country hospitals.

Limitations relating to the AOD data collection provided, as advised by WACHS, are:

- there are currently no standard business rules for coding activity into the AOD collection, and services are often delayed in entering data
- occasions of service for a range of diabetes related activities are included in the collection, including for pre-diabetes care and non-direct patient care.



Therefore reported data has been filtered to remove any activity that does not relate to direct patient care for people with diagnosed diabetes

- a number of services and regions use alternative data systems such as MMex, Communicare and Share
- it is likely that WACHS services billing to the MBS under the 19(2) exemption agreement do not record their activity in the AOD collection, and so this activity is not captured in data available to this review⁹
- data relating to AOD outpatient occasions of service are provided by financial year.

Consequently, coding of activity recorded in the collection varies substantially by individual service provider, service and region. Coding also varies over time, with recent efforts focussed on improving recording and coding of activity at time counterbalanced by staff turnover (and the need to educate new providers in using the system). Considerable caution is therefore required in interpreting AOD related data.

Treatment of non admitted and AOD data collections

In order to maximise data collection from non inpatient settings across all WA hospitals and health services, the following steps were undertaken:

1. For the non admitted diabetes data collection
 - Occasions of care relating to metropolitan health services was sourced from the TOPAS and AHS data collections. Data were available for the following services only:
 - CAHS: PMH
 - WNHS: King Edward Memorial Hospital For Women (KEMH)
 - NMHS: Osborne Park Hospital (OPH), Sir Charles Gairdner Hospital (SCGH), Swan District Hospital (SDH)
 - SMHS: Bentley Health Service (BHS), Bentley Older Adult Mental Health,¹⁰ Fremantle Hospital and Health Service (FHHS), Rockingham General Hospital (RGH), Royal Perth Hospital (RPH).

⁹ Designated 19(2) exemption sites in WA are as follows: Exmouth Health Service; Fitzroy Crossing Health Service; Carnarvon Hospital; Laverton District Hospital; Leonora District Hospital; Meekatharra Hospital; Norseman District Hospital; Plantagenet – Cranbrook Health Service; Ravensthorpe Health Centre; Shark Bay Nursing Post; Warmun Health Clinic; Derby Hospital; Wyndham District Hospital; Onslow Hospital; Kununurra District Hospital; Halls Creek Hospital. Note: Not all of these are not yet billing under the MBS, or billing all eligible services delivered Accessed 15 October 2012 at www.ruralhealthaustralia.gov.au/internet/rha/publishing.nsf/Content/COAG_Improving_Access_to_Primary_Care_Services_in_Rural_and_Remote_areas-s19_2_Exemptions_Initiative.

¹⁰ Note: While the Bentley Older Adult Mental Health unit belongs to the broader Bentley Health Service, diabetes activity at this unit has been coded separately.



Data relating to community health services were requested but are not currently available as part of the diabetes non admitted data collection provided by the Department.

- Occasions of care relating to country health services were sourced from the HCARE / AOD data collections for the years 2009 to 2011. Data were available for the following services only:
 - South West: Donnybrook Hospital
 - Great Southern: Albany Hospital, Katanning Hospital
 - Wheatbelt: Northam Hospital, Wagin Hospital, Wongan Hills Hospital
 - Midwest: Carnarvon Hospital, Exmouth Hospital, Geraldton Hospital
 - Goldfields: Esperance Hospital
 - Pilbara: Port Hedland Hospital
 - Kimberley: Broome Hospital, Derby Hospital

Data relating to other WA country hospitals and health services were requested but are not currently available as part of the diabetes non admitted data collection provided by the Department.

2. For the AOD data collection

- Data were filtered to identify occasions of service coded to diabetes related care, and further filtered to remove activity coded to 'inpatient' care, for the years and retain data coded as 'continuing care', 'primary health' and 'outpatient'. It has been assumed that all retained data relates to care provided in non-inpatient settings. Data were available for 74 of 151 identified WA country health services (i.e. hospitals, community health centres / services, nursing posts and multipurpose services); however even where services were included in the data collection, most services had data omitted for some years or very low counts, indicating some records are not included in the data collection.
- No data were available for the 2008/09 year; therefore this year has been omitted from the composite non admitted data collection described below.



3. To calculate a composite non admitted data collection

- Data sources from the non admitted and AOD data collections were combined. Data from AOD financial years were added to non admitted calendar years; e.g. 2009/10 data were added to 2009.
- In order to account for double counting, health services with activity recorded under both data collections were manually identified and the larger record has been included in the composite non admitted data collection (i.e. the lower number omitted)
- Data were available for 83 of 173 identified public health services. As with the AOD collection, even where services were included in the data collection, most services had data omitted for some years or very low counts, indicating omitted records. The services for which data were available are outlined below. Services which recorded less than 50 occasions of service for 2010/11 are marked with an asterisk (*), indicating some are likely to be under-reporting diabetes related occasions of services:
 - **CAHS:** Princess Margaret Hospital For Children
 - **WNHS:** King Edward Memorial Hospital For Women
 - **NMHS:** Osborne Park Hospital, Sir Charles Gairdner Hospital, Swan District Hospital
 - **SMHS:** Bentley Health Service, Bentley Older Adult Mental Health, Fremantle Hospital, Rockingham General Hospital, Royal Perth Hospital.
 - **South West:** Augusta Hospital*, Boyup Brook Soldiers Memorial*, Bridgetown Hospital*, Bunbury Community Health Centre, Busselton Hospital, Collie Hospital, Donnybrook Hospital, Harvey Hospital, Nannup Hospital*, Pemberton Hospital*, Warren Hospital
 - **Great Southern:** Albany Hospital, Bremer Bay Health Centre*, Denmark Hospital*, Gnowangerup Hospital*, Jerramungup Nursing Post*, Katanning Hospital, Kojonup Hospital*, Plantagenet Hospital*
 - **Wheatbelt:** Beverley Hospital*, Boddington Hospital*, Bruce Rock Memorial Hospital, Dalwallinu Hospital*, Dumbleyung Memorial Hospital*, Goomalling Hospital*, Jurien Bay Health Centre*, Kellerberrin Memorial Hospital*, Kondinin Hospital, Kununoppin Hospital*, Lake Grace Hospital*, Merredin Hospital, Moora Hospital, Mukinbudin Nursing Post*, Narembreen Memorial Hospital*, Narrogin Hospital, Northam Hospital, Pingelly Hospital*, Quairading Hospital*, Southern Cross Hospital*, Wagin Hospital, Wongan Hills Hospital*, Wyalkatchem-Koorda And District*, York Hospital*



- **Midwest:** Burringurrah Nursing Post, Carnarvon Hospital, Coral Bay Nursing Post*, Cue Nursing Post*, Dongara Multi-Purpose Health Centre, Exmouth Hospital, Geraldton Hospital, Kalbarri Health Centre, Meekatharra Hospital, Morawa Hospital*, Mount Magnet Nursing Post*, North Midlands Hospital*, Northampton Hospital*, Yalgoo Nursing Post*
- **Goldfields:** Esperance Hospital, Kalgoorlie Hospital, Ravensthorpe Hospital*
- **Pilbara:** Hedland Health Campus, Newman Hospital*, Nickol Bay Hospital, Onslow Hospital, Paraburdoo Hospital*, Roebourne Hospital*, Wickham Hospital*
- **Kimberley:** Broome Hospital, Derby Hospital*, Fitzroy Crossing Hospital*, Halls Creek Hospital*, Kununurra Hospital*, Wyndham Hospital.

Community health occasions of service

HCARE CMS data collection

Data relating to community health occasions of service for diabetes care was provided by the Department's Health Information Network (HIN). This collection includes activity delivered by community health services

The data provided indicates the service location, primary health issue, service provided, service result, Indigenous status and whether the service was a group session.

The data source provided and used for this review was:

HCARE CMS data collection, 2007-2011. Health Information Network, Department of Health, WA. Provided to KPMG on 21 November 2012.

Limitations relating to the diabetes HCARE CMS data collection include:

- the specific community health service / centre or public / population health unit responsible delivering community health services are not identifiable. Therefore occasions of service cannot be linked to individual services or units
- occasions of service for a range of diabetes related activities are included in the collection, including for pre-diabetes care and non-direct patient care. Therefore reported data has been filtered to remove any activity that does not relate to direct patient care for people with diagnosed diabetes
- occasions of service delivered within the NMHS and SMHS regions are reported under a single 'metro' region. These occasions of service have been manually reviewed by KPMG and allocated to either NMHS or SMHS



based on the location at which the service was delivered. However, a number of occasions of service included in the data collection have been entered without identifying the location at which the service was delivered (e.g. coded to 'Telephone'). For these occasions of service, 50 per cent were allocated to NMHS and 50 per cent were allocated to SMHS

- while group sessions are identifiable, these include a mixture of pre-diabetes health promotion-type sessions as well as group education sessions for people with diagnosed diabetes
- the majority of podiatry care for people with diabetes is not included in this data collection, as these types of occasion of service are more unlikely to be allocated diabetes as the primary issue for which the service was delivered
- data relating to diabetes community health occasions of service are provided by calendar year.

Medicare services

Estimates of general practitioner (GP) related diabetes services are also considered in this report. These estimates are based on information sourced from three publications:

- GP services (MBS and DVA). *GP Social Health Atlas of Australia: Western Australia, 2012*. Public Health Information Development Unit (PHIDU), University of Adelaide. Accessed by KPMG 4 September 2012 at www.publichealth.gov.au/data/a-social-health-atlas-of-australia_-2011.html
- *All Medicare by Broad Type of Service (BTOS) processed from January 2008 to December 2011*. Medicare Australia. Accessed by KPMG 2 October 2012 at www.medicareaustralia.gov.au/statistics/mbs_group.shtml
- *General Practice Activity in Australia 2010/11*. General practice series no.29. Britt H, Miller GC, Charles J, Henderson J, Bayram C, Pan Y, Valenti L, Harrison C, O'Halloran J, Zhang C, Fahridin S. Sydney: Sydney University Press, 2011.

Statistics relating to the MBS are available from the Commonwealth via the Medicare Australia website; however these are only provided at a statewide level. However, SLA level data on GP Medicare Benefits Schedule (MBS) and Department of Veteran Affairs (DVA) billing for the 2009/10 financial year have been produced by PHIDU as part of its *Social Health Atlas of Australia* release. These data have been sourced and collated by KPMG to match the WA health regions, and hence provide a broad indication of access to general practice across the state.

In order to calculate an estimate of how much GP activity in WA is diabetes related, the following calculations have been made:



- **total GP activity 2009/10:** GP MBS and DVA billing data for 2009/10 have been sourced from the Social Health Atlas 2012 and collated to match the WA health regions
- **estimated diabetes related GP activity, 2009/10:** An estimate of the proportion of GP activity which is diabetes related has been sourced from *General Practice Activity in Australia 2010-11*, which reported that in 2010/11 4.0 in every 100 GP encounters involved management of diabetes (non gestational). General Practice Activity in Australia data are sourced from an annual survey of 1,000 general practice s from across Australia. This estimate has been applied to the total GP services identified as per step 1 above
- **estimated diabetes related GP activity, 2007/08 to 2010/11:** Total GP MBS billing activity for the financial years 2007/08 to 2010/11 has been sourced from Medicare Australia. KPMG calculated the average annual growth in activity over this time period, being 2.5 per cent per annum. The annual change in total GP activity, as measured by MBS billing, has been applied to the estimated diabetes related GP activity, 2009/10, as calculated under step 2 above to produce estimates for 2007/08, 2008/09 and 2010/11.

This method provides a broad estimate of diabetes related GP activity only. The approach outlined above enables region specific data to be calculated, and captures GP activity regardless of which MBS item numbers are used to record diabetes related activity (e.g. includes standard consultations and chronic disease care item numbers). However, it is acknowledged that service provision and billing behaviour vary by GP and practice, with factors such as population size and density, general practice size, GP skills, training and confidence all influencing diabetes related service provision.

Comprehensive Medicare data relating to diabetes support provided by allied health providers and practice nurses located within a general practice setting are not available by WA health region, and are therefore not included in the review.

Data relating to MBS services are provided by financial year.

Unmeasured activity

In addition to the data limitations discussed above, data relating to a range of diabetes services were not available for analysis within this review. This includes data relating to:

- inpatient services delivered from the outpatient care setting (e.g. internal consultancy)
- metropolitan community based health programs (e.g. Moorditj Djena)
- private specialists, optometrists, podiatrists and allied health providers



- general practice nurses
- NGO services (e.g. Diabetes WA, Medicare Locals, general practice networks, Royal Flying Doctor Service and Silver Chain)
- comorbidities where diabetes is not the primary diagnosis; e.g. renal failure, cardiovascular disease.

Data have not been collected when not available for the required timeframes (2008 to 2011) and available to be allocated to the nine WA health regions.

1.2.3 Diabetes service map development

Maps of diabetes services located in each WA health region were produced by KPMG. Information relating to the services was obtained from the following sources:

- concordance file for WA health services, regions and districts, Department of Health, WA
- for public hospitals, community health services / centres, nursing posts and multi-purpose services: Consumer Health Directory, Department of Health, WA¹¹
- for PMH outreach clinics: stakeholder interviews with PMH personnel
- for Aboriginal medical services: Aboriginal Health Council of Western Australia website¹²
- for Moorditj Djena locations: NMHS Public Health and Ambulatory Care Unit
- for credentialed diabetes educator locations: Australian Diabetes Educators Association¹³
- for Silver Chain service locations: stakeholder interview with Silver Chain personnel and Silver Chain WA website¹⁴
- for outreach service locations: Rural Health West
- for Medicare Local and GP network locations: organisational websites.¹⁵

For WA metropolitan health regions, services which provide diabetes specific services are identified. For WA country health regions, given the lack of

¹¹ Accessed 10 October 2012 at www.health.wa.gov.au/services/category.cfm?Topic_ID=2#top.

¹² Accessed 10 October 2012 at www.ahcwa.org.au/index.php/members/member-locations.

¹³ Accessed 10 October 2012 at www.adea.com.au/main/diabeteseducators/credentialeddiabeteseducators.

¹⁴ Accessed 10 October 2012 at www.silverchain.org.au/wa.

¹⁵ Accessed 10 October 2012 via www.amlalliance.com.au/about-us/medicare-local/find-your-local-medicare-office.



diabetes specific services and the importance of general health services in these areas, both diabetes specific and general health services are identified.



2 Diabetes in Western Australia

Diabetes is one of the most common health conditions and one of the top 10 causes of death in Australia.¹⁶ Approximately 970,000 Australians are currently diagnosed with diabetes and it is estimated that this represents only 50 per cent of the true figure; a total of about 1.8 million people.¹⁷ The burden of diabetes is not distributed equally across society. Between 2001 and 2003, diabetes-related mortality in the most disadvantaged areas of Australia was 82 per cent higher than in the least disadvantaged areas¹⁸ and the prevalence of diabetes amongst the Aboriginal population is estimated to be over three times the rate of non-Indigenous people.

If poorly managed, diabetes can lead to a range of complications, impacting on both individuals and the health system. There is considerable scope for reducing these impacts through appropriate targeting of health promotion, early intervention and management (including self management).

Diabetes mellitus is one of Western Australia's most significant health issues. Each day, approximately 30 people are diagnosed with diabetes in WA.¹⁹

This chapter will provide a brief overview of the diabetes in WA, the policy context and service structures in place to manage the associated chronic and acute conditions.

2.1 Types of diabetes

Diabetes mellitus is a group of metabolic diseases in which a person has high levels of glucose in their blood stream due to either a lack of insulin or a resistance to the effect of insulin, a hormone that causes cells in the liver, skeletal muscles and fat tissues to take up glucose from the blood. Persistently high blood glucose levels can result in a number of complications, including:

- microangiopathy (damage to small blood vessels and capillaries) in the retina and kidneys, resulting in blindness and renal failure

¹⁶ AIHW 2011. Diabetes prevalence in Australia: detailed estimates for 2007-08. Diabetes series no. 17. Cat. no. CVD 56. Canberra: AIHW. Accessed 14 May 2012 at www.aihw.gov.au/publication-detail/?id=10737419311.

¹⁷ Diabetes Australia, 2010

¹⁸ Australian Institute of Health and Welfare (2005) Diabetes Related Deaths in Australia 2001-2003 AIHW Bulletin Issue 32 December 2005

¹⁹ Barr E, Cameron A, Shaw J, Zimmet P (2005) The Australian Diabetes, Obesity and Lifestyle Study (AusDiab) - Five year follow up: Western Australian Results. International Diabetes Institute, Melbourne



- atherosclerosis in arteries in the heart, legs and brain, leading to cardiovascular disease and lower limb amputation.

The four main types of diabetes mellitus are:

- type 1 diabetes
- type 2 diabetes
- gestational diabetes mellitus
- other or secondary diabetes (which may occur as a result of other conditions or syndromes).

Information sourced from the National Diabetes Register suggests that approximately 77 per cent of people with diabetes have type 2, 12 per cent have GDM, 10 per cent have type 1 and one per cent have an 'other' type of diabetes.²⁰

2.1.1 Type 1 diabetes

Type 1 diabetes is a result of an individual's inability to produce insulin, as the beta cells in the pancreas that produce insulin are destroyed by the body's immune system. This condition is most frequently diagnosed during childhood and young adulthood but can occur at any age. Type 1 diabetes is managed through daily insulin injections and regular finger-prick blood glucose tests. The incidence of type 1 diabetes is increasing at approximately three per cent per annum.²¹

2.1.2 Type 2 diabetes

The most common form of diabetes is type 2.²² Type 2 diabetes is a result of an individual's resistance to the action of insulin and may be combined with a relative insulin deficiency due to progressive failure of the pancreatic cells. Type 2 diabetes usually occurs in middle aged and elderly people, but is becoming more common in younger adults, adolescents and children, particularly in Aboriginal populations. The risk of acquiring type 2 diabetes is increased by abdominal obesity and an inherited predisposition.

Type 2 diabetes and diabetic complications are often asymptomatic, making early diagnosis difficult. In Aboriginal and other high risk, remote and under-resourced groups, diabetes can remain undiagnosed until advanced

²⁰ Australian Institute of Health and Welfare. *Incidence of insulin-treated diabetes in Australia 2000–2009*. Accessed 16 October 2012 at www.aihw.gov.au/diabetes/incidence/.

²¹ Haynes A, Bower C, Bulsara MK et al 2004. Continued increase in the incidence of childhood type 1 diabetes in a population-based Australian sample (1985–2002). *Diabetologia* 47: 866–870

²² Endocrine Health Network. *Diabetes Model of Care*, January 2008.



complications develop. Type 2 diabetes is managed through lifestyle changes such as, diet, exercise, weight loss and cessation of smoking. Glucose levels can also be influenced by medication and people with type 2 diabetes often also take medication to lower blood pressure and cholesterol.

Since 1996 the prevalence of type 2 diabetes has doubled.²³ However, a significant number of people with type 2 diabetes remain undiagnosed. This may be as high as 50 per cent.²⁴

2.1.3 Gestational diabetes mellitus

Gestational diabetes mellitus (GDM) occurs in women that exhibit high blood glucose levels due to hormonal changes during pregnancy. Susceptibility to gestational diabetes is enhanced by genetic factors and abdominal obesity. Within Australia approximately 18,000 women each year develop GDM, affecting around five per cent of all births.²⁵ Incidence rates in Aboriginal and Asian populations are quoted to be as high as nine per cent of all pregnancies²⁶.

GDM increases a women's risk of acquiring type 2 diabetes. 50 per cent of women with GDM will go on to develop type 2 diabetes and their children have a higher risk of diabetes, obesity and hypertension. Women with existing type 1 and type 2 diabetes also often need specialised care and services during pregnancy.

2.1.4 Other or secondary diabetes

Other or secondary forms of diabetes mellitus include:

- monogenic diabetes
- congenital diabetes due to genetic defects of insulin secretion
- cystic fibrosis-related diabetes
- steroid diabetes induced by high doses of glucocorticoids.

These forms of diabetes were not included within the scope of this review.

²³ Diabetes Australia. *National Priorities for Turning Around the Diabetes Epidemic 2007 – 2008*. Canberra: 2007.

²⁴ Endocrine Health Network. *Diabetes Model of Care*, January 2008.

²⁵ Diabetes Australia 2010 National Health Priorities

²⁶ Women and Newborn Health Service, King Edwards Memorial Hospital – Section B3: Guidelines for obstetrics and midwifery – Medical disorders associated with pregnancy.



2.2 WA health policy context for diabetes service provision

There are a number of evidence-based models of care and policy frameworks that guide service delivery and development for diabetes care across WA. These include the *WA Health Clinical Services Framework 2010-2020*²⁷ that provides a strategic planning framework for the provision of endocrinology services across the state to 2020. The *WA Chronic Health Conditions Framework 2011-2016*²⁸ was developed by the chronic conditions health networks in WA to provide an overarching guide to the care and management of chronic conditions within WA, including diabetes. The *Diabetes Model of Care*²⁹ provides a more detailed framework for coordinated diabetes prevention and management services.

Other complementary policies and strategies include the *WA Health Promotion Strategic Framework*³⁰; the *WA Primary Health Care Strategy*³¹; the *Chronic Conditions Self-Management Framework 2011-15*³² and the *Cardiovascular and Diabetes and Endocrine Health Networks: Model of Care for the High risk foot*.³³

2.2.1 WA Health Clinical Services Framework 2010-2020

In 2004, the *A Healthy Future for Western Australians* report (commonly known as the Reid Report),³⁴ laid out recommendations to enable WA to respond to challenges within the health system such as the ageing population, rising chronic disease rates, workforce pressures and increasing costs of delivering health care.

The *WA Clinical Services Framework 2005-2015* was one of the key documents to emerge from this review, which was devised to provide the WA Government with a strategic planning framework for the development and provision of health

²⁷ Department of Health, WA, *WA Health Clinical Services Framework 2010-2020*.

²⁸ Department of Health, WA, *WA Chronic Health Conditions Framework 2011-16*, December 2011.

²⁹ Department of Health, Endocrine Health Network, *Diabetes Model of Care*, Perth: Health Networks Branch, Department of Health, WA; January 2008

³⁰ Department of Health, WA, *Western Australian Strategic Framework 2012-2016* (Draft for consultation), April 2012

³¹ Department of Health, WA, Primary Care Health Network, *WA Primary Health Care Strategy*, December 2011

³² Department of Health, WA, *WA Chronic Conditions Self-Management Strategic Framework 2011-15*,

³³ Department of Health, WA, *Cardiovascular and Diabetes and Endocrine Health Networks, Model of Care for the High Risk Foot*. Perth: Health Networks Branch, Department of Health, Western Australia; 2010

³⁴ The Final Report of the Health Reform Committee, 2004, *A Healthy Future for Western Australians*, March 2004



care services across the Perth metropolitan health regions. More specifically, the Framework identified what types of services and the level of these services for each of the metropolitan hospitals.

The Framework is based on up-to-date demographic data and projections of future service needs, and is regularly updated by the Department based on re-evaluation of the service framework components and their interdependencies. It has since been updated to become the *Clinical Services Framework 2010-20* (CSF 2010-20), with a subsequent update to this document released in September 2012. It includes information on services and service levels at Western Australia's country hospitals and health facilities.

The CSF 2010 acts as the long-term clinical planning document for the Department for both strategic statewide planning and developing localised clinical service plans.

Endocrinology services

Within the CFS 2010, the role delineation matrix provides a guide to service planning across the health service continuum and outlines what the Department aims to achieve over the short, medium and long term. Services are defined by their level of complexity with Level 1 services being the least complex and Level 6 services being the most complex. An overview of the service levels is provided under Table 1.

Endocrinology services are allocated a rating of Level 3 to 6. The CSF outlines the current and future provision and spread of these services across WA.

Table 1: Description of endocrinology services by level of complexity

Description of services by Level			
Level 3	Level 4	Level 5	Level 6
<ul style="list-style-type: none">• GP inpatient care• 24 hour cover by an RN• outpatient care by visiting general physician or telehealth• access to some allied health services	As for level 3 plus: <ul style="list-style-type: none">• inpatient care by resident general physician• outpatient consultation by visiting endocrinologist• diabetes education service and integrated hospital / community diabetes	As for level 4 plus: <ul style="list-style-type: none">• inpatient care by resident endocrinologist• registrar / RMO• regional referral role• access to specialist SRN• diabetes education service and integrated hospital / community	As for level 5 plus: <ul style="list-style-type: none">• full range of endocrinology department and emergency care• state-wide referral role• undergraduate and postgraduate teaching role• research role



Description of services by Level			
Level 3	Level 4	Level 5	Level 6
	management service <ul style="list-style-type: none"> • specialist RN • access to designated allied health services • some allied health undergraduate education 	diabetes management service <ul style="list-style-type: none"> • some undergraduate teaching and possibly research role • links to level 5 rehabilitation services • emergency care available from on-call specialist • access to specialised allied health services 	

Source: CSF 2010-20



2.2.2 WA Chronic Health Conditions Framework 2011-16

The *WA Chronic Health Conditions Framework 2011–2016* was developed by the chronic conditions health networks in WA to provide an overarching guide to the care and management of chronic conditions within WA, including diabetes. It brings together the commonalities across the current condition-specific models of care developed by the WA chronic conditions health networks, such as the Diabetic Model of care.

The Models of Care are designed to provide an evidence-based framework to ensure “people get the right care, at the right time, by the right team in the right place” and have been developed for a range of disease types and service needs.

Given the large number of chronic condition models of care that have been developed (including the Diabetes Model of Care described below), the Chronic Health Conditions Framework aims to simplify their implementation, with minimal duplication. The Framework also provides an avenue for managing consumers affected by more than one chronic condition through integration and coordination several health services to deal with co-morbidities.

It outlines principles of effective prevention and management of chronic health conditions which are:

- integration and service coordination
- interdisciplinary care planning and case management
- evidence based and consumer centred care
- health literacy and self-management for chronic health conditions.

Based on these guiding principles, the Framework describes, priority areas for action and recommendations to improve service delivery for consumers with chronic health conditions and achieve service delivery improvements. The service components across the continuum of care common to chronic conditions described in the models of care are outlined under Table 2 over page.



Table 2: Service components across the continuum of care common to chronic conditions described in the models of care

Chronic conditions models of care	Continuum of care					
	Well Population	At risk population	Early detection and diagnosis	Chronic conditions management: stable	Chronic conditions management: Acute	End of life
Objective	Prevent movement to the at-risk stage	Prevent progression to established chronic condition	Prevent or delay progression of disease and minimise complications and co-morbidities	Support self-management, minimise acute episodes and hospitalisation, prevent deterioration in health	Support self-management, minimise acute episodes and hospitalisation, prevent deterioration in health	Ensure informed planning and decision-making with safe and high-quality end-of-life planning and care
Right care, Right time, Right team, Right place						

Source: WA Chronic Health Conditions Framework 2011-16

2.2.3 Diabetes and Endocrine Health Network and the Diabetes Model of Care

Another important response to the Reid Report was the establishment of the WA Health Networks to “connect – share – improve” health service delivery statewide. WA Health Networks are open to anyone with an interest in improving health in WA, including consumers, doctors, nurses, midwives, allied health professionals, carers and policy makers. Around 2,500 people across Western Australia are currently involved in networks. The major functions of Health Networks are to plan and develop:

- evidence based policy and practice
- statewide clinical governance
- transformational leadership and engagement
- strategic partnerships
- evaluation and monitoring systems.

The Diabetes and Endocrine Health Network provides leadership in relation to planning and delivery of diabetes services in WA.



In 2008, the network released the Diabetes Model of Care for WA. The Diabetes Model of Care recognises the current gaps in service provision and provides a framework for comprehensive, accessible and efficient provision of coordinated diabetes prevention and management services. The model of care aims to ensure that “diabetes services are optimally configured to:

- prevent and delay the onset of diabetes
- prevent and slow progression of diabetic complications, especially heart disease, renal failure, impaired vision and lower limb amputations
- improve the quality of life of people who have diabetes
- reduce inequities in diabetes service provision, particularly for aboriginal people and other disadvantaged groups.”³⁵

The Diabetes Model of Care seeks to both enhance service delivery across the continuum of care, from self-management of diabetes to acute specialist services and improved service coordination. It breaks the management and prevention of diabetes into five stages mirroring the chronic conditions service components:

1. community awareness and prevention
2. prevention and early diagnosis in high- risk groups
3. optimal initial and long term management
4. early detection and optimal management of complications
5. coordinated prevention and management of acute episodes.

At each of these stages the model of care then outlines the role of service providers in providing health promotion services, GP-coordinated multidisciplinary prevention and management, including targeted programs for high risk and vulnerable groups and specialist team services.

Roles and responsibilities of the diabetes workforce

The broad roles and responsibilities relating to diabetes service provision, as described under the Diabetes Model of Care, are outlined below.

A diverse range of specialists are required for the treatment and management of diabetes, with the provision and level of care changing according to the geographic setting. For rural and remote patients there are issues associated with a limited access to trained personnel and specialist practitioners.

The Diabetes Model of Care defines the roles and responsibilities at each of the components of care:

³⁵ Department of Health, Endocrine Health Network, Diabetes Model of Care, January 2008



- health promotion
- GP-coordinated multidisciplinary prevention and management, including targeted programs for high risk and vulnerable groups
- specialist team services.

The roles and workforce associated with each component are outlined in Table 3.

Table 3: Workforce roles and responsibilities under the Diabetes Model of Care

Field	Role	Workforce
Health promotion	<ul style="list-style-type: none"> • Promotion of healthy environment and lifestyle • Awareness of diabetes and associated risks and complications • Importance of early diagnosis and detection • Provision of consumer education 	<ul style="list-style-type: none"> • Public health practitioners • Health promotion officers • Diabetes educators • Registered nurses • Dietitians • Pharmacists • Podiatrists • Accredited exercise physiologists
GP – coordinated multidisciplinary prevention and management, including targeted programs for high risk and vulnerable groups	<ul style="list-style-type: none"> • Awareness and patient information • Promotion of healthy lifestyle • Coordination of community based risk reduction activities: diet exercise, weight loss • Targeted programs and services for high risk, vulnerable groups • Targeted diabetes detection programs • Initial assessment and treatment • Personal plan, targets for weight, exercise, BP, lipids, smoking cessation • Self-management education and support • Specialist referral of complex, difficult cases • Regular and targeted complications screening and monitoring • Accessible general and specialist podiatry 	<ul style="list-style-type: none"> • General practitioners • Nurse practitioners • Practice nurses • Diabetes educators • Accredited practising dietitians • Podiatrists • Aboriginal health workers • Accredited exercise physiologists • Physiotherapists • Pharmacists



Field	Role	Workforce
		<ul style="list-style-type: none">• Optometrists
Specialist team services	<ul style="list-style-type: none">• Assessment of complex cases and intensified treatment• Complications screening and monitoring• Insulin stabilisation• Paediatric services• Pregnancy services• Outreach services• Service planning, coordination• Research• Intensified diabetes treatment, cardiovascular risk reduction• Inpatient diabetes management• Management of advanced complications	<ul style="list-style-type: none">• Endocrinologist• Credentialed diabetes educators• Nurse practitioners• Dietitians• Podiatrists• Ophthalmologists• Optometrists• Bariatric surgeons• Cardiologists• Nephrologists• Vascular and orthopaedic surgeons• Psychologists• Social Workers

Source: Adapted from the Diabetes Model of Care, WA Diabetes and Endocrine Health Network

Diabetes specialists

Diabetes is treated by different diabetes specialist and generalist providers, working either solo or as part of multidisciplinary teams. The following list describes the roles of the health care providers who are most frequently involved in providing services to people with diabetes:

Endocrinologists and general physicians with a diabetes special interest

Endocrinologists are medical practitioners specialising in assisting people with hormone imbalances and problems and related endocrine disorders. Endocrinologists undertake three years of advanced training after four years in basic physician training. Conditions that can be treated by endocrinologists include diabetes, pituitary and adrenal disease; gonadal disorders and infertility; neuroendocrine conditions; benign and malignant glandular tumours; disorders of growth; genetic and congenital glandular dysfunction; lipid and nutritional abnormalities; menopausal disorders; and osteoporosis and metabolic bone disease. Endocrinologists' role typically involves the diagnosis, treatment and management of endocrine disorders in patients, diagnostic and laboratory



analysis, and research.³⁶ Given their specialised diabetes knowledge, endocrinologists often lead diabetes related care, particularly for people with complex diabetes such as type 1 or insulin dependent type 2.

There are currently 31 endocrinologists in WA (all are Perth based), with numbers expected to fall to 27 in 2016 before rising to 29 by 2021. 10 of these endocrinologists are providing paediatric services. 14 work in purely public positions, three work in purely private positions and 14 work in both public and private settings.³⁷ The Diabetes Model of Care recognises the need to increase the attractiveness of endocrinology due to the risk that the current shortage will be exacerbated by the increasing need for these services as the prevalence of diabetes increases.

General physicians with a diabetes special interest are medical practitioners who have not obtained an additional qualification to practice as an endocrinologist, but have developed diabetes expertise through participation in education and training and practical experience. The number of general physicians with a diabetes special interest in WA was not available to this review.

Diabetes educators

Diabetes educators assist people with and at risk of diabetes, their families and carers gain the information, knowledge, skills, motivation and confidence they need to manage their condition and make decisions about their care and treatment. Diabetes educators combine clinical care with providing diabetes specific information and knowledge, self-management education and support. They are predominantly involved in type 2 diabetes care and may also teach and supervise insulin administration.

Diabetes educators have a primary health qualification (predominantly in nursing and dietetics) and have undertaken additional diabetes related training. Credentialed diabetes educators (CDEs) already hold a professional health care qualification and have completed a post graduate certificate in diabetes education and care that has been accredited by the Australia Diabetes Educators Association (ADEA). Before gaining recognition as a CDE, they must complete a set minimum of clinical practice in diabetes education, participate in mentoring partnership registered with the ADEA and have a referee report addressing the criteria of the National Core Competencies for Credentialed Diabetes Educators.

³⁶ Specialist Workforce Capacity Program: Discussion Paper – Endocrinology, April 2012. Version 1.01 (Draft).

Department of Health, Western Australia: 04 April 2012. Provided to KPMG by the Health Networks Branch 26 October 2012.

³⁷ Ibid.



It was estimated that in WA there are 156 diabetes educators (from various primary disciplines), of which 84 are credentialled diabetes educators (also from various disciplines).³⁸ Diabetes educators are employed by WA health services, Population / Public Health Units, Medicare Locals, general practice networks, private health providers and NGOs.

Accredited Practising Dietitians

Accredited Practising Dietitians (APDs) are university-trained providers with the knowledge, skills and competency to provide expert nutrition and dietary advice for people with diabetes. Medical nutrition therapy is a clinical intervention which builds on general nutrition education to achieve improved clinical and health outcomes through nutrition assessment, nutrition prescription, knowledge and skills development and behavioural counselling. Some dietitians have also completed the Graduate Certificate or Diploma in Diabetes Education to become CDEs.

Podiatrists

Podiatrists are responsible for the prevention, early detection and management of acute and chronic foot ulceration and other diabetes related foot problems such as Charcot Arthropathy. They are also responsible for foot care and footwear education. Podiatrists in private practice also provide preventative diabetic foot care, assessment and education via either MBS³⁹ or private funding. Medicare funded services are limited and often insufficient for diabetes patients with a history of problems.

There are currently 380 registered podiatrists in Western Australia⁴⁰; stakeholders estimated around 33 FTE podiatrists⁴¹ working in the public system.

Other important health providers

The following section provides an overview of other important health providers who are involved in the provision of care and treatment of people with diabetes.

General practitioners

GPs provide a primary source of care for people with diabetes. Most patients with type 2 diabetes are managed in the community by general practitioners with variable input from allied health professions.

³⁸ Advised to KPMG by the NMHS PHAC, based on ADEA WA advice.

³⁹ Under the Chronic Disease Management item numbers (Items 721 to 732) and Individual Allied Health Services (Items 10950 to 10970) for Chronic Disease Management.

⁴⁰ Information provided by Australian Health Practitioner Regulation Agency via email, 19 October 2012.

⁴¹ Stakeholders estimated the number of people (not FTE) to be 70 providers.



Across WA, there were 1,496 full workforce equivalent (FWE) general practitioners working across 573 general practices.⁴² Of these practices, 446 are based within the NMHS and SMHS regions. An overview of GP numbers in WA by general practice network boundary⁴³ is located under Appendix C.

General physicians

A general physician is a medical practitioner who specialises in internal medicine. They are doctors who have completed an extra eight years or more of training after their initial university medical training.⁴⁴ General physicians who do not necessarily have a speciality in diabetes provide a level of care to people with diabetes in an inpatient and outpatient setting. In particular, care might be provided by a general physician where the service does not have access to an endocrinologist or physician who has developed a special interest in diabetes.

Ophthalmologists and optometrists

Some form of diabetic retinopathy is present in between 25 and 44 per cent of people with diabetes at any point in time. All people with diabetes are at risk of developing retinopathy, with duration of the disease being the strongest factor determining DR prevalence.⁴⁵ Under the Diabetes Model of Care, it is advised that all diabetic patients are screened twice a year for early detection and management of diabetic retinopathy and other eye problems.

Given their expertise in eye diseases, ophthalmologists play an important role in both screening and treating complications arising from unmanaged diabetes. This includes reviewing retinal scans taken by local health providers using specialised cameras. Optometrists and other trained medical examiners also undertake screening for diabetic retinopathy.

Practice nurses

Practice nurses work within general practices, with approximately 40-50 per cent of Australian general practices employ practice nurses. Practice nurses have a role providing patient education and assisting in patient assessment, working for and behalf of the general practitioner.

Aboriginal health workers

⁴² Workforce data for the 2010-11 period is provided by the Australian Government Department of Health and Ageing. Data reflect Division boundaries based on 2006 ABS Collection Districts as at 1st July 2010. FWE is reported in place of Fulltime Equivalence (FTE) as the former is considered to be a more accurate measure (and is preferred by Department of Health and Ageing). For a definition of FTE and FWE please see: www.phcris.org.au/fastfacts/index.php.

⁴³ GP numbers are for the 2009/10 period, which is the most recent data available by boundaries which are comparable to the WA health regions. Data is presented according to general practice network boundaries, which while not directly aligned with current WA health region provide the best available fit.

⁴⁴ Royal Australian College of Physicians website. Accessed 19 November 2012 at www.racp.edu.au/index.cfm?objectid=D7FAA1D5-09B4-E1FD-5DE5E361F1A9C56E.

⁴⁵ Mitchell P, Foran S, Wong T, Chua B, Patel I, Ojaimi E and Foran J. *Guidelines for the Management of Diabetic Retinopathy*. National Health and Medical Research Council; Canberra: 2008.



Aboriginal health workers work in a variety of roles in primary health care services, and are particularly prominent in Aboriginal medical services. Aboriginal health workers assist in the provision of culturally safe and appropriate health care to Aboriginal people, and are recognised for their ability act as a medium between Aboriginal and non Aboriginal people. This role can include community engagement and explaining complex health information in a culturally appropriate manner, as well as assisting non Aboriginal health care providers to modify their approach to working with Aboriginal people.

Recent investment in Aboriginal health has seen an expansion of this workforce, along with outreach and community engagement workers as well as care coordinators focussed on Aboriginal health.

Psychologists and social workers

Psychologists and social workers have a role to assist people with diabetes to adjustment to and effectively manage their diabetes. Psychosocial support can also involve assisting people with the often complex social and cultural environments which have contributed to development of their diabetes as well as hindering their ability to manage it once established. In diabetes settings, psychologists and social workers may work with both people with diabetes and their families, and are therefore utilised most by the PMH diabetes clinic.

Physiotherapists

Physiotherapists have a number of roles in the care of people with diabetes including health promotion, prevention of disease development in at risk groups and rehabilitation of patients with diabetes and co-morbidities.

Accredited exercise physiologists

Accredited exercise physiologists deliver clinical exercise interventions for the management of diabetes and other chronic diseases and have a role in prevention through providing exercise interventions to individuals at risk of developing diabetes.

Pharmacy

Pharmacists support diabetes management through the dispensation of medications and products, provision of education and support people with diabetes to manage their condition. This role may include education relating to correct medications use, side effects and impacts on blood sugar control, insulin and its delivery, glucometers, hypoglycaemia management, diet and lifestyle. Pharmacists may also provide informal referrals to other health professionals and undertake screening for diabetes and comorbidities such as hypertension and hypercholesterolaemia.

Pharmacists are instrumental in supporting the National Diabetes Support Scheme (NDSS). Pharmacies comprise approximately 450 of the 520 NDSS Access Points in WA. Key services provided by NDSS Access Points include:



- provision of diabetes related products to NDSS Registrants, and maintaining a supply to meet both the anticipated and actual demand for products from Registrants
- receiving new registrations for the NDSS and submitting them to Diabetes Australia
- providing Registrants with accurate and appropriate information and professional advice on diabetes and effective self-management, referrals to appropriate health professionals, and advice on the appropriate use of products
- distributing NDSS material to Registrants.⁴⁶

Organisation of state funded diabetes services under WA Department of Health structures

Diabetes services in WA are delivered by a mixture of government and non-government services. WA Government funded and delivered services are managed under the following Department of Health structures:

- Statewide health services:
 - Child and Adolescent Health Service
 - Women and Newborn's Health Service
 - WoundsWest
- Metropolitan health services
 - North Metropolitan Health Service
 - South Metropolitan Health Service
- WA Country Health Services
 - Southern Country Health Service
 - South West
 - Great Southern
 - Wheatbelt
 - Northern and Remote Country Health Service
 - Midwest
 - Goldfields

⁴⁶ National Diabetes Support Scheme website. Accessed 8 November 2012 at www.ndss.com.au/en/Access_Points/What-is-an-Access-Point/.

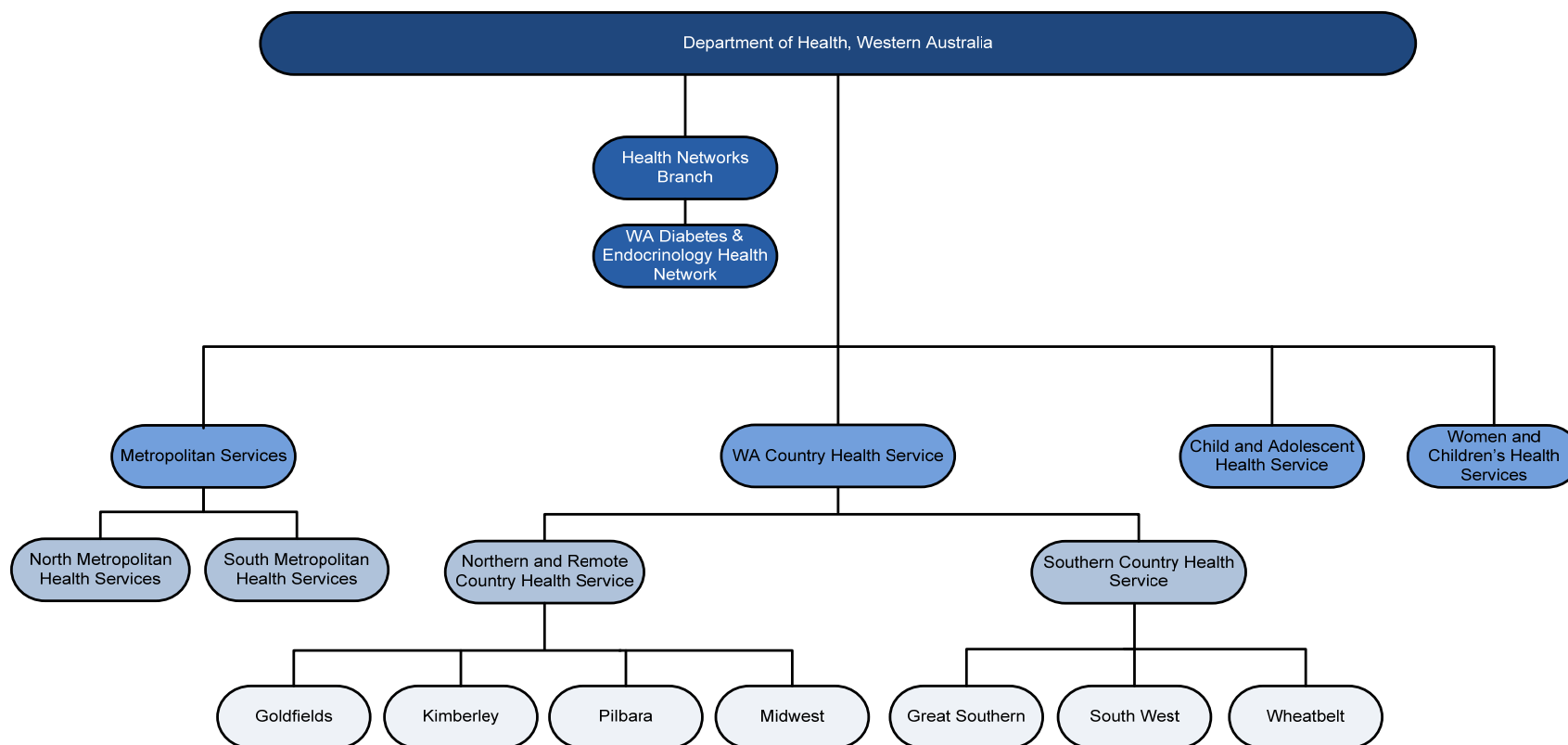


- Pilbara
- Kimberley.

Figure 1 (see next page) provides an overview of the Department structures as they relate to diabetes service provision.



Figure 1: WA Department of Health diabetes services structure



Source: KPMG



Metropolitan services

The metropolitan region is divided into two sub regions: NMHS and SMHS. Each provides diabetes related services at both hospital and community based locations.

NMHS provides tertiary hospital services from SCGH and SMHS from RPH and FHHS. Typical diabetes services at these facilities include assessment, ongoing diabetes management, insulin initiation and stabilisation, pump initiation and management, diabetes education, screening for complications and high risk foot care. Care is focussed on people with type 1 and type 2 diabetes, although GDM may also be managed. Services are delivered through a mix of one-on-one appointments and group education. The tertiary services also manage other endocrine disorders.

The following table describes the level of endocrinology services provided by each hospital within the Perth Metropolitan area for the period 2007/08 and 2014/15 under the *Clinical Services Framework 2010-2020*.

Table 4: Level of endocrinology services across SMHS and NMHS as per the Clinical Services Framework 2010-20

Region	Hospital	Type of Hospital	Level of Service 2007/08	Level of Service 2014/15
SMHS	Fiona Stanley Hospital	Tertiary	-	6
	Royal Perth Hospital	Tertiary	6	6
	Royal Perth Hospital Shenton Park Campus	Tertiary	-	-
	Fremantle Hospital and Health Service ⁴⁷	Tertiary	6	4
	Rockingham Hospital	General	3	4
	Bentley Health Service ⁴⁸	Specialist	-	3
	Armada Hospital	General	3	4
	Peel Health Campus	General	3	3
NMHS	Sir Charles Gairdner Hospital	Tertiary	6	6
	Swan District Hospital	General	3	4
	Osborne Park Hospital	Specialist	4	3
	Kalamunda Hospital	Community	3	-

⁴⁷ Includes services for management of gestational diabetes via Fremantle Diabetes Service. Services will be downgraded as Fiona Stanley Hospital opens in 2014.

⁴⁸ Includes services for gestational diabetes. Feedback from the Bentley Health Service (BHS) indicated that it has been operating as a level 4 service, and while listed as a level 3 service for 2014/15 service descriptions better match that of a level 4 service.



Region	Hospital	Type of Hospital	Level of Service 2007/08	Level of Service 2014/15
	Joondalup Health Campus	General	4	5

Source: Clinical Services Framework 2010-20

WA Country Health Service

WACHS provides a range of services across the diabetic spectrum for patients in rural and remote locations. From 1 July 2012, WACHS services have been reorganised to sit under the Northern and Remote Country Health Service and Southern Country Health Service.

The Northern and Remote Country Health Service includes the following regions:

- Goldfields
- Kimberley
- Pilbara
- Midwest.

The Southern Country Health Service includes the following regions:

- Great Southern
- South West
- Wheatbelt.

Table 5 describes the level of endocrinology services provided by each region for the period 2007/08 and 2014/15 under the Clinical Services Framework for WACHS.

Table 5: Regional endocrinology services provided under the WACHS Hospital Services Framework for Regional Resource Centres

Region	Hospital	Level of Service 2007/08	Level of Service 2014/15
Northern and Remote Country Health Service			
Goldfields	Kalgoorlie	4	4
Goldfields	Esperance	3	3
Kimberley	Broome	3	4
Kimberley	Derby	3	3
Kimberley	Kununurra	3	3
Pilbara	Port Hedland	3	4
Pilbara	Newman	3	3
Pilbara	Nickol Bay	3	3



Region	Hospital	Level of Service 2007/08	Level of Service 2014/15
Midwest	Geraldton	4	4
Midwest	Carnarvon	3	3
Southern Country Health Service			
Great Southern	Albany	4	4
Great Southern	Katanning	3	3
Southwest	Bunbury	4	4
Southwest	Busselton	3	3
Southwest	Margaret River	3	3
Southwest	Collie	3	3
Southwest	Warren	3	3
Wheatbelt	Northam	3	3
Wheatbelt	Merredin	3	3
Wheatbelt	Narrogin	3	3
Wheatbelt	Moora	3	3

Source: Clinical Services Framework 2010-2020

Child and Adolescent Health Services

Specialist management of types I and II diabetes for young people (aged 16 years and under) is facilitated through CAHS. PMH is the tertiary hospital within CAHS and provides both inpatient and outpatient care. PMH also holds regional endocrinology and diabetes clinics at Albany, Bunbury, Esperance, Geraldton, Joondalup, Kalgoorlie, Karratha, Midland, Narrogin, Northam and Rockingham.

Women and Newborn's Health Services

Women and Newborn's Health Services for all of WA are managed through KEMH. The KEMH diabetes service provides a variety of resources, clinics, education and information sessions for women and their families including:

- counselling and education on pre-conception and after birth care
- pregnancy care
- ambulatory stabilisation of insulin use.

Table 6 describes the level of endocrinology services provided by PMH and KEMH for the period 2007/08 and 2014/15 under the Clinical Services Framework 2010-20.



Table 6: Statewide endocrinology services provided by PMH and KEMH under the Clinical Services Framework 2010-20

Region	Hospital	Type of Hospital	Level of Service 2007/08	Level of Service 2014/15
Statewide	KEMH ⁴⁹	Tertiary	5	5
	PMH ⁵⁰	Tertiary	6	6
	Graylands		-	-

Source: Clinical Services Framework 2010-20

⁴⁹ KEMH provides comprehensive services for management of gestational diabetes and type 1 and 2 diabetes in pregnancy.

⁵⁰ The Department of Endocrinology and Diabetes at PMH provides outreach program at multiple regional sites. It also provides long-term, high quality care for children and most adolescents with type 1 diabetes as well as services for children with type 2 diabetes.



3 Results

This chapter presents data collected during this review relating to diabetes in Western Australia. The data presented includes:

- population size
- diabetes prevalence
- inpatient service activity
- outpatient service activity
- general practice activity.

This chapter also presents key themes relating to the stakeholder consultations.

3.1 Data results

Data tables relating to the figures below are included under Appendix D.

Given issues with data quality relating to diabetes prevalence and service delivery, the discussion of data limitations located under Section 1.2.2 of this report should be read in full before reviewing the data provided below.

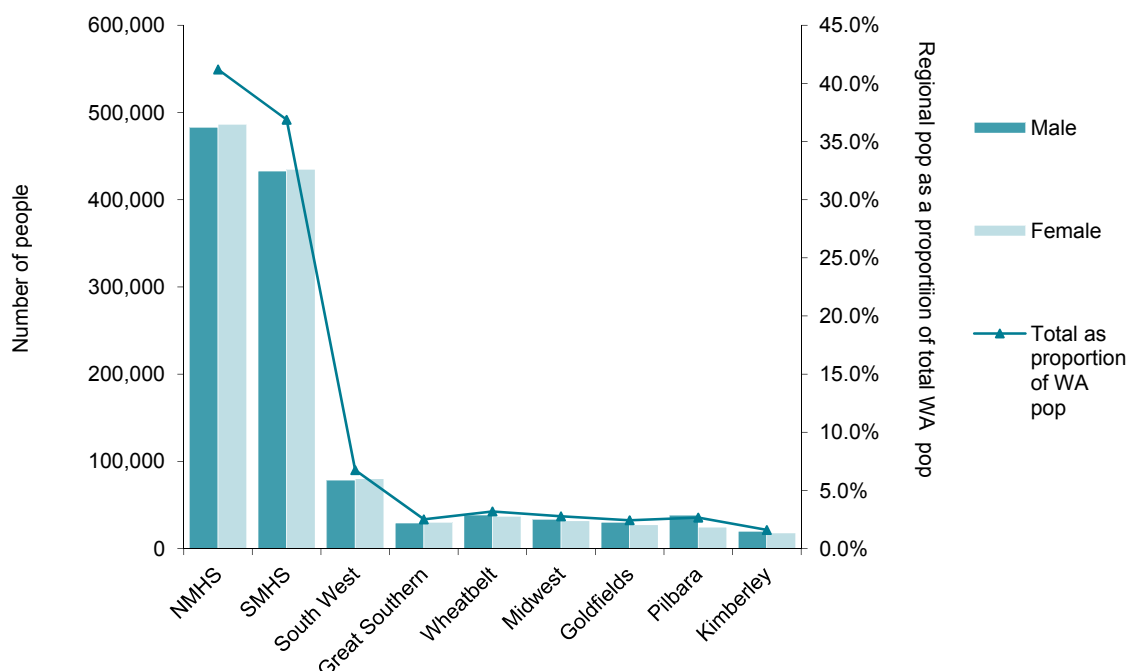
3.1.1 Population size

Total population

As demonstrated under Figure 2, almost 80 per cent of the WA population is located in the two metropolitan areas, NMHS and SMHS. Of the country health regions, the South West has the largest (almost seven per cent) and the Kimberley has the smallest (less than two per cent) of the state's population. Sixty three per cent of the population in the Pilbara is male; males also outnumber females in the Goldfields, Kimberley, Wheatbelt and Midwest regions.



Figure 2: WA estimated resident population, all ages, by region, 2011



Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012)

Aboriginal population

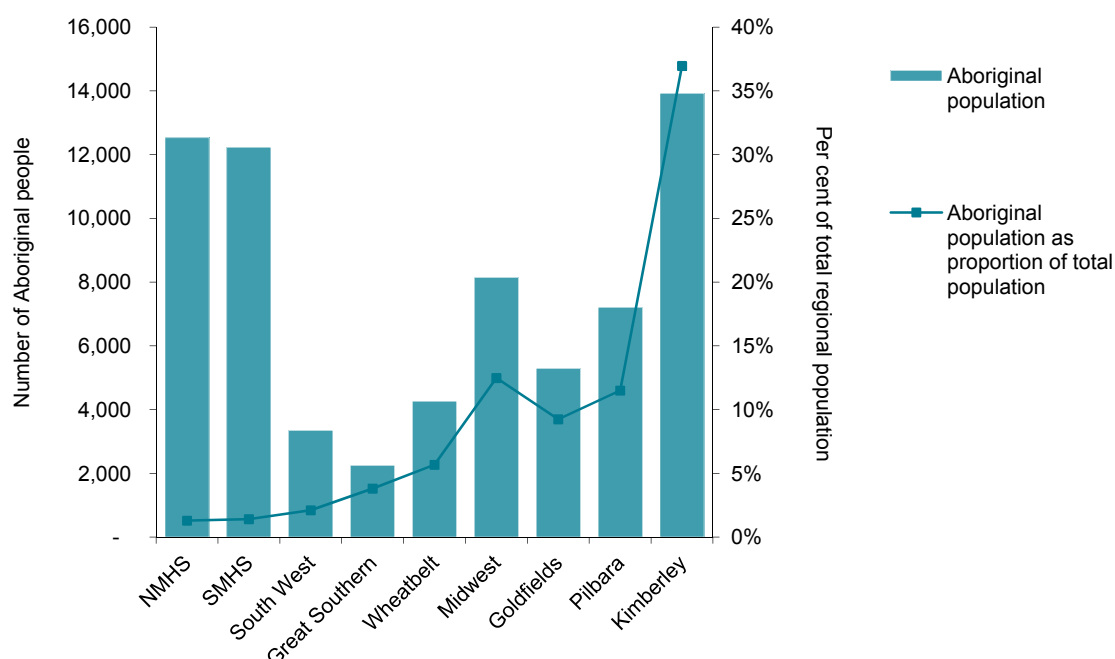
As demonstrated under Figure 3, the Kimberley, NMHS and SMHS regions have the largest number of Aboriginal residents. The Great Southern and South West regions have the smallest number of Aboriginal residents.

The Kimberley region also has the highest proportion of Aboriginal residents (37 per cent), followed by the Midwest (13 per cent), Pilbara (12 per cent) and Goldfields (9 per cent) regions. NMHS and SMHS regions (both less than 2 per cent) have the lowest proportions of Aboriginal residents.

However, the size of the Aboriginal resident population may be under-estimated due to the difficulties in accurately measuring this population.



Figure 3: WA estimated Aboriginal resident population, all ages, by region, 2011



Source: KPMG calculation based on ABS 2011 Census (2012)

3.1.2 Prevalence of diabetes in Western Australia

Estimates of diabetes prevalence in WA for the total and Aboriginal populations are discussed below.

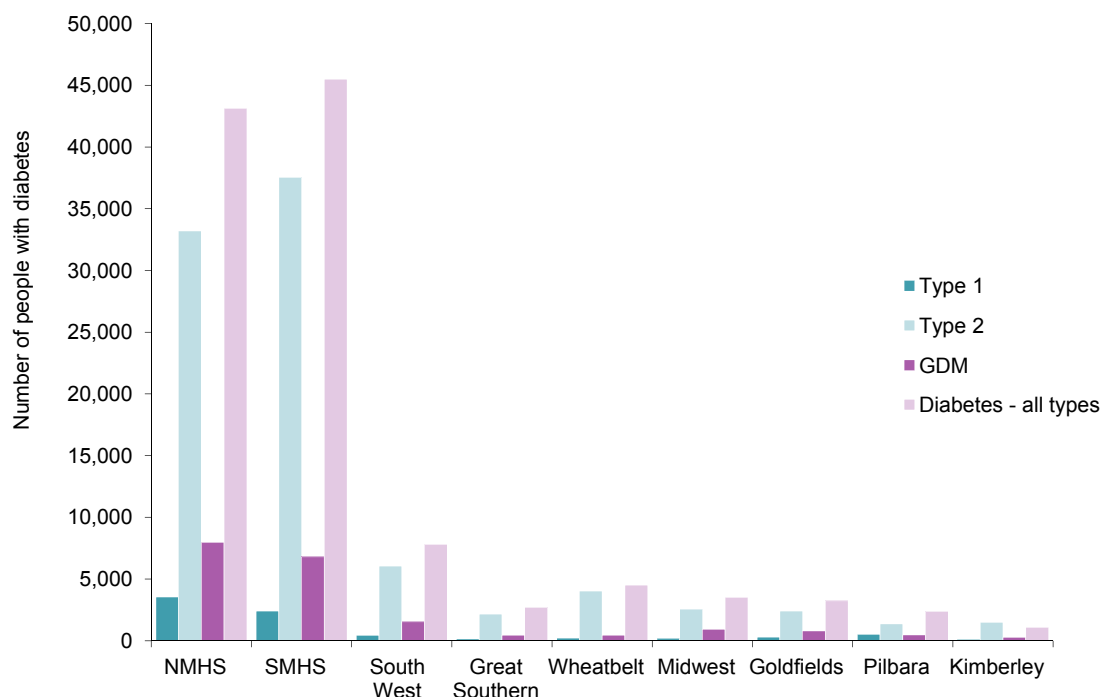
Total population estimates

Persons aged 15 years and older

Prevalence estimates prepared by the WA Health Epidemiology Branch indicate 113,936 adults aged 16 years and over (6.3 per cent) have ever been diagnosed with any type of diabetes. As demonstrated under Figure 4, the majority of people living with diabetes in WA are located in the SMHS and NMHS regions, with type 2 diabetes being the most common type.



Figure 4: Estimated diabetes prevalence, 15 years and older, by type and region, 2011

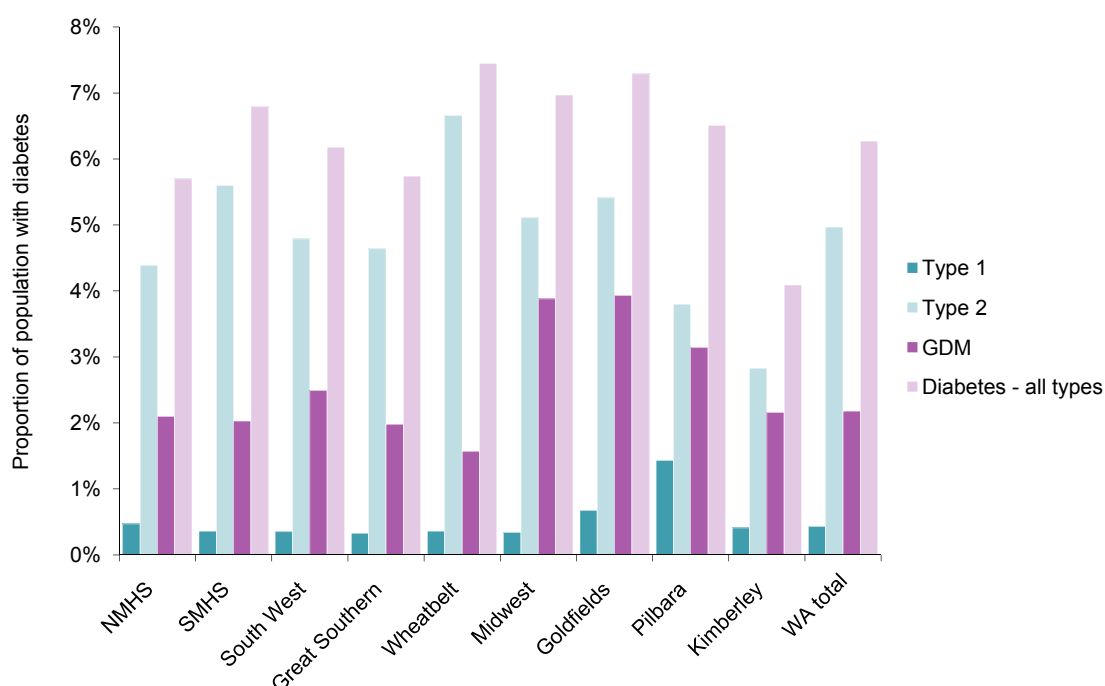


Source: *Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012)*

The highest prevalence rates were reported for the Wheatbelt (7.5 per cent) and Goldfields (7.3 per cent) regions (see Figure 5). Although the lowest prevalence rate was reported for the Kimberley region (4.1 per cent), this was significantly lower than the WA estimates and is considered to be significantly different (based on confidence intervals included in the WA Health Epidemiology Branch report).



Figure 5: Estimated proportion of population with diabetes, by type, 15 years and older, by type and region, 2011



Source: Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012)

Persons aged 0 to 14 years

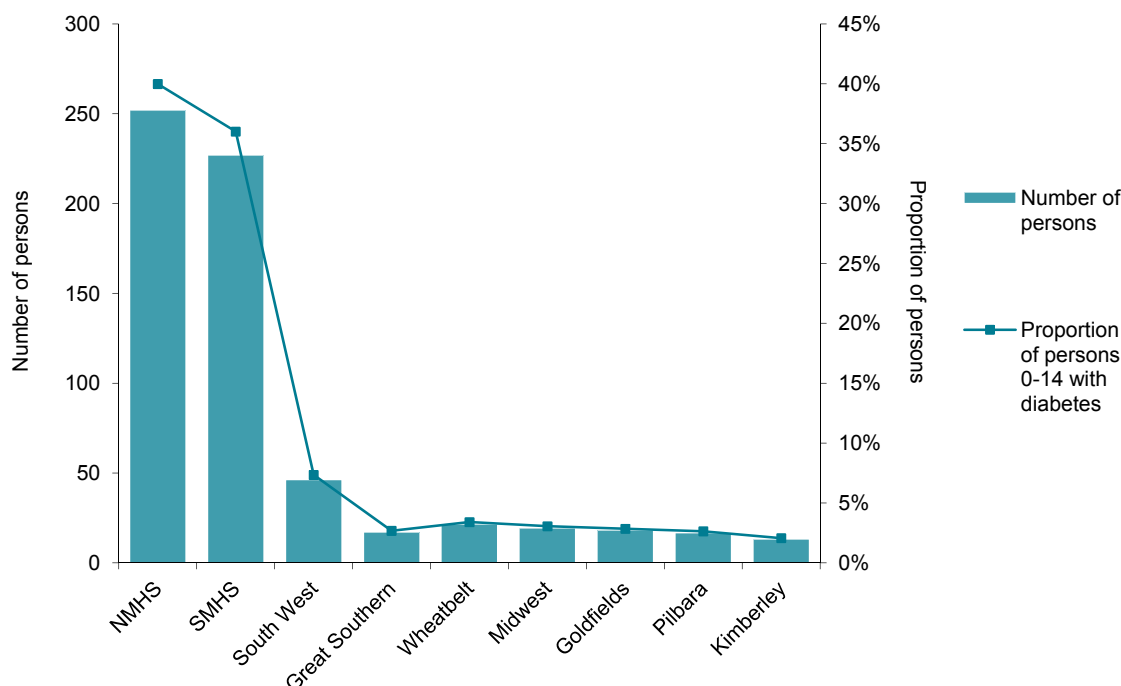
As children and adolescents aged 0 to 14 years were not included in the WA Health and Wellbeing Surveillance System data, estimates of diabetes prevalence for this cohort were calculated separately (see Figure 6). These estimates indicate there are around 630 persons aged 0 to 14 years with diabetes (type 1 only) in WA, with almost 80 per cent located in the Perth metropolitan regions.

However, information provided by the Princess Margaret Hospital (during stakeholder consultations) indicates this figure is an underestimate. Data provided by PMH Diabetes and Endocrinology Clinic indicates this service supports around 1,000 children per year, about 75 per cent of which have diabetes. PMH information also indicates the service treats about 100 children with type 2 diabetes each year.⁵¹

⁵¹ PMH information, provided to KPMG by Professor Tim Jones, 25 July 2012.



Figure 6: Estimated diabetes prevalence, all types, 0 to 14 years, by region, 2011



Source: KPMG calculation based on *Prevalence of Type 1 diabetes in Australian children, 2008*, AIHW (2011) and ERP, ABS (2011)

Alternative diabetes prevalence estimates

Alternative diabetes prevalence estimates were derived based on national age specific diabetes prevalence rates reported by the ABS for the *Australian Health Survey: First Results, 2011-12*.⁵² Diabetes prevalence rates were applied to estimated resident population statistics for each of the WA health regions for all age cohorts. According to this method, there were 89,378 people with diabetes (all types) in WA during 2011. This estimate presents a lower end estimate of diabetes prevalence.

See Appendix E for more detailed results and information.

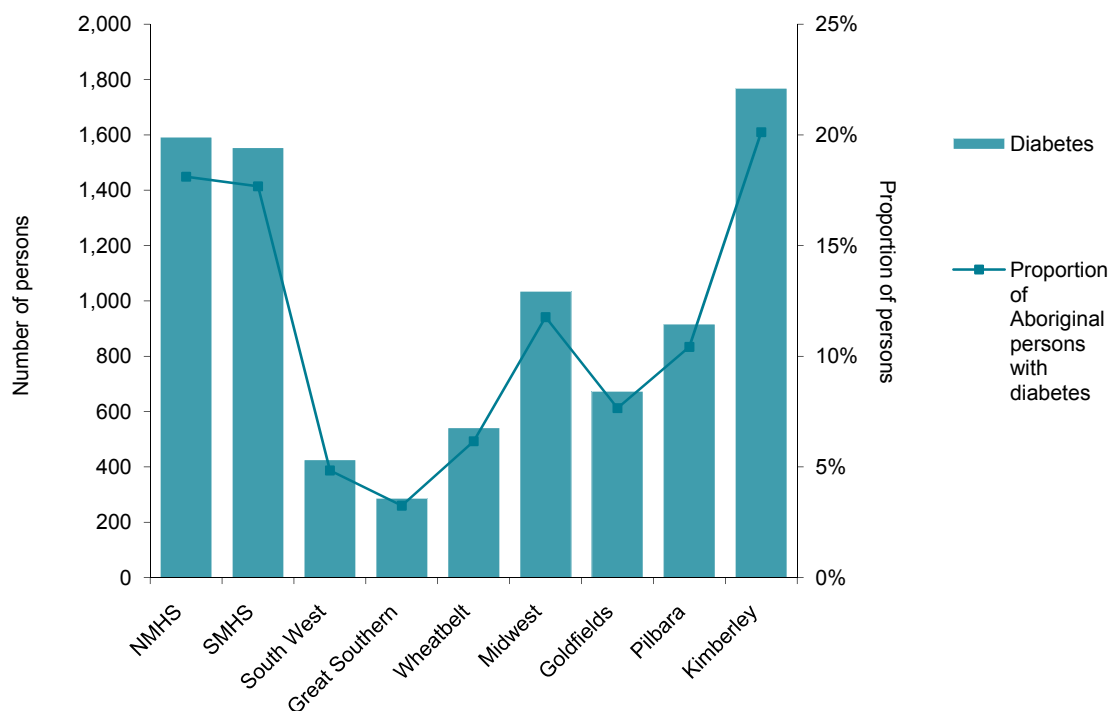
⁵² 4364.0.55.001 - *Australian Health Survey: First Results, 2011-12*. Australian Bureau of Statistics; Canberra: 29 October 2012. Accessed 30 October 2012 at www.abs.gov.au/AUSSTATS/abs@.nsf/Lookup/4364.0.55.001Main+Features12011-12?OpenDocument.



Prevalence estimates for the Aboriginal population

As demonstrated under Figure 7, the estimated number of Aboriginal people with diabetes in WA is highest in the Kimberley, SMHS and NMHS regions, and lowest in the Great Southern and South West regions. However, these estimates of diabetes prevalence are based on an assumption that the diabetes (all types) prevalence rates for Aboriginal and Torres Strait Islander people is 12.7 per cent throughout all of WA. Anecdotal information from stakeholders interviewed during this review suggests Aboriginal diabetes prevalence rates are higher in areas such as the Kimberley, Pilbara and Goldfields regions.

Figure 7: Estimated number and proportion of Aboriginal people with diabetes in WA, all types, 15 years and older, by region, 2011



Source: KPMG calculation based on AIHW analysis of ATSI prevalence rates and ABS 2011 Census

3.1.3 Diabetes service provision

Available data relating to provision of diabetes services in the inpatient, non admitted (i.e. outpatient and community health) and general practice settings are outlined below.

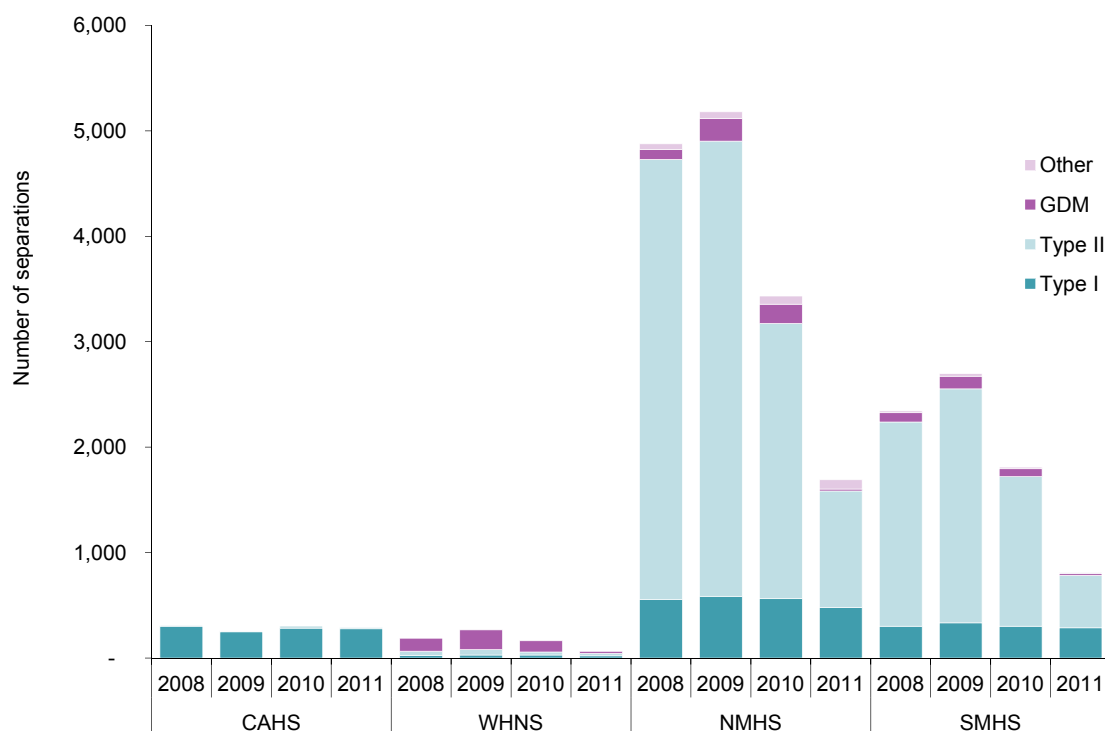


Inpatient separations

The data presented under Figure 8 and Figure 9 indicate inpatient separations for diabetes have fallen between 2009 and 2011. However, changes to coding of diabetes related separations are considered likely to account for this fall. It should also be noted that inpatient separations for admissions where diabetes was not the primary reason for admission (for coding purposes) but diabetes related care was provided were not recorded in this data set.

In 2011, the NMHS and SMHS regions recorded the largest number of inpatient separations, followed by CAHS and the South West region. The Great Southern region recorded the lowest number of inpatient separations. All regions recorded separations relating to type 1 diabetes, all except CAHS recorded separations relating to type 2 diabetes, and all regions except the Great Southern and Wheatbelt regions recorded inpatient separations relating to GDM.

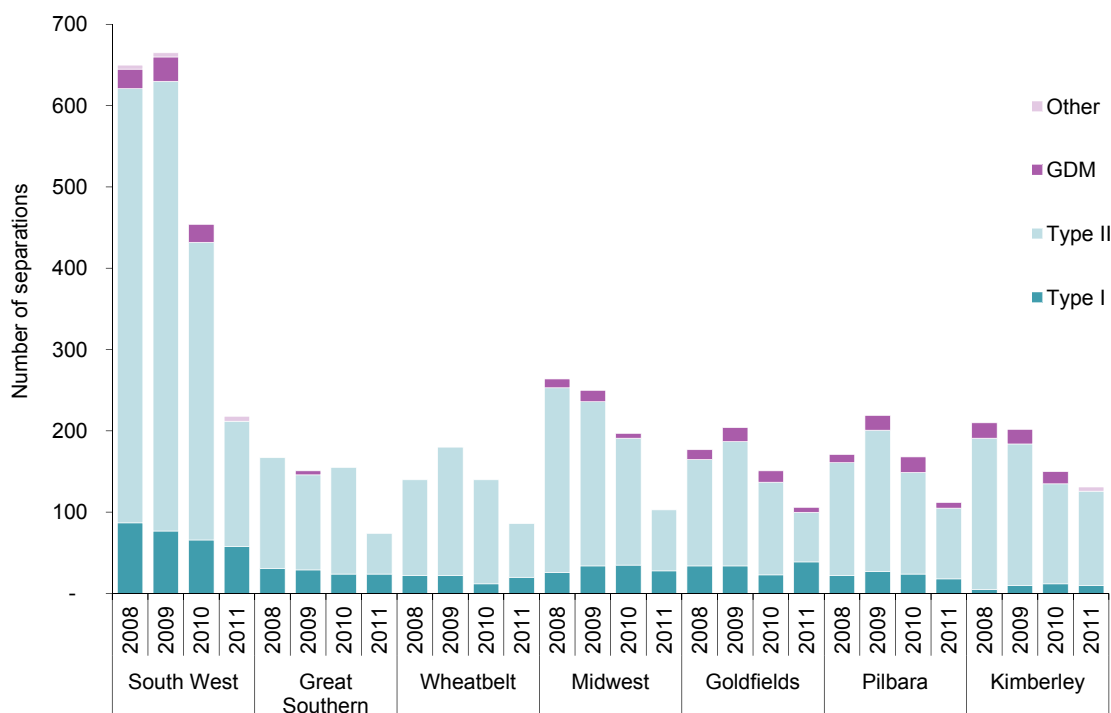
Figure 8: Inpatient separations by metropolitan health region and diabetes type, 2008 to 2011



Source: WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012)



Figure 9: Inpatient separations by country health region and diabetes type, 2008 to 2011



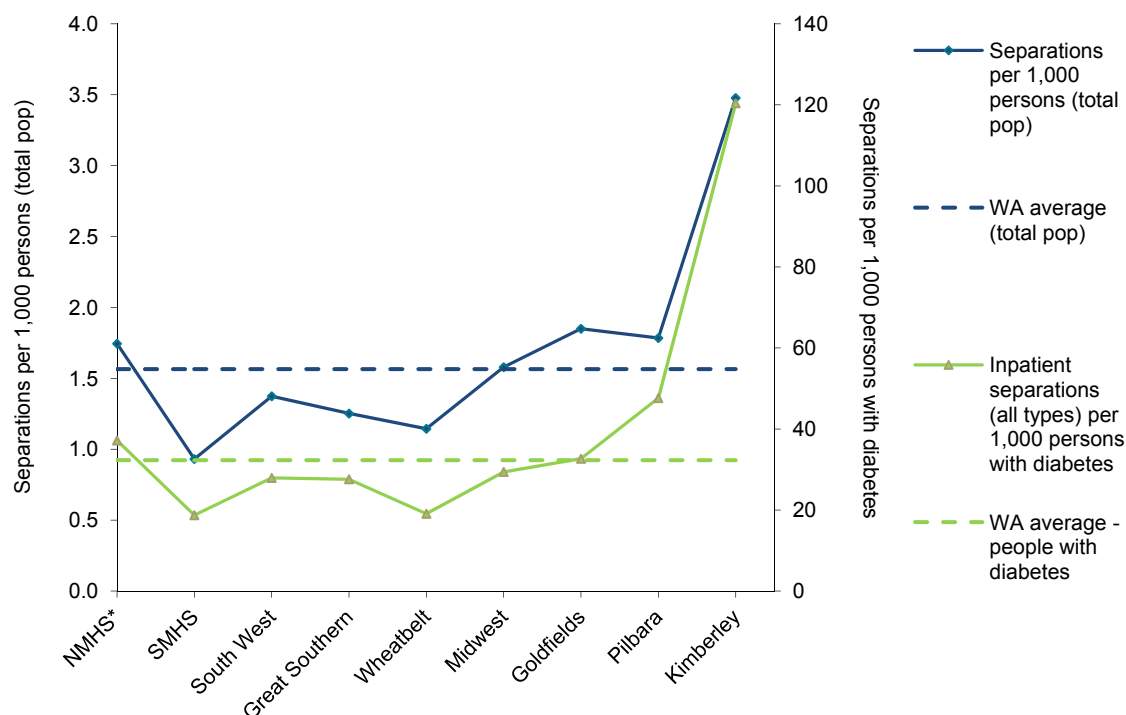
Source: WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012)

The available data indicates that inpatient separations per 1,000 persons (total population) were substantially higher in the Kimberley region compared to other WA health regions, and lowest in the SMHS and Wheatbelt regions (see Figure 10). The Pilbara, Goldfields and NMHS regions also recorded levels of inpatient separations above the WA average. Caution is required in interpreting these statistics, with possible explanations for higher rates of inpatient separations including greater acuity of diabetes presentations, differing coding practices and reduced access to outpatient and community based care.

Caution is required in interpreting data relating to inpatient separations per 1,000 persons with diabetes for the Kimberley region, as the underestimates for people with diabetes in this region (based on the HWSS results) will consequently lead to an over-emphasis in these results.



Figure 10: Inpatient separations, all types, per 1,000 persons, by region, 2011



* Excludes CAHS & WNHS data. WA averages include CAHS & WNHS data

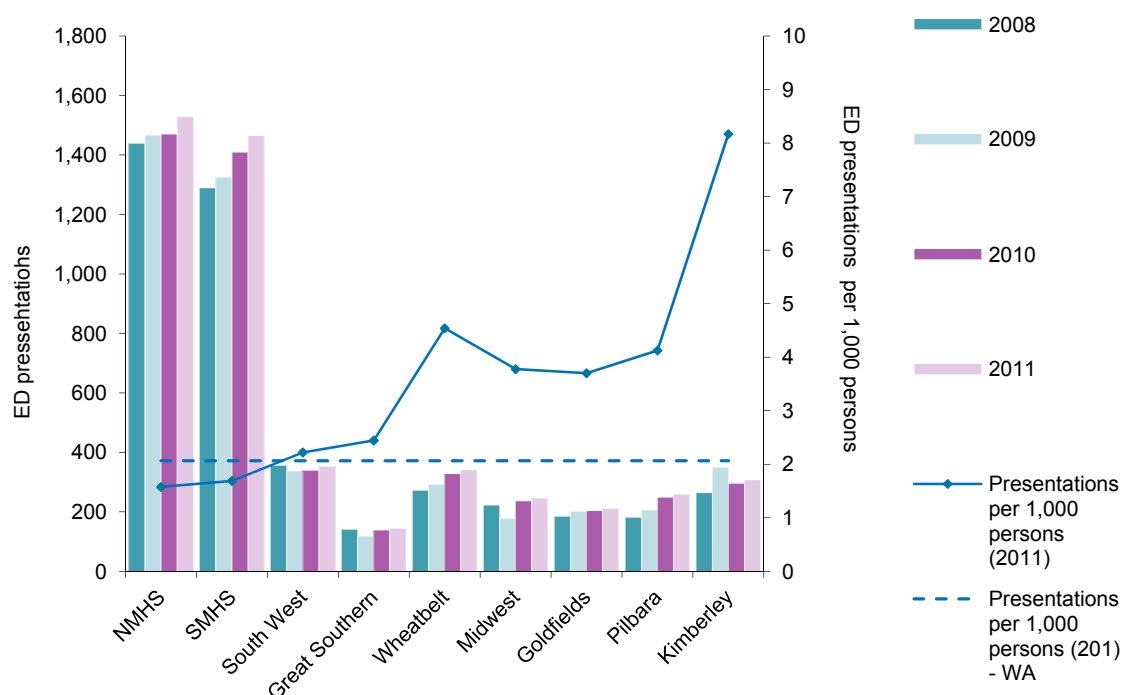
Source: KPMG calculation based on WA Hospital Morbidity Data System, Performance Activity & Quality Division and ERP, ABS

Emergency department presentations

The data presented under Figure 11 indicate emergency department (ED) presentations for endocrine, nutritional and metabolic diseases and disorders vary by region. For the period 2007 to 2010, the Kimberley region recorded significantly higher rates of presentations per 1,000 persons than any other region – over four times the state average. The Wheatbelt, Goldfields, Pilbara, Midwest and Great Southern regions also recorded presentation rates at significantly higher rates than the WA average.



Figure 11: Emergency department presentations for endocrine, nutritional and metabolic diseases and disorders, by region, 2007 to 2010



Source: Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances. Health status report on Endocrine, nutritional and metabolic diseases and disorders ED attendances for WA Health Regions. Epidemiology Branch (PHI) in collaboration with the Cooperative Research Centre for Spatial Information (CRC-SI). Generated using data from the WA Emergency Department Data Collection. Accessed Tuesday, 27 November 2012.

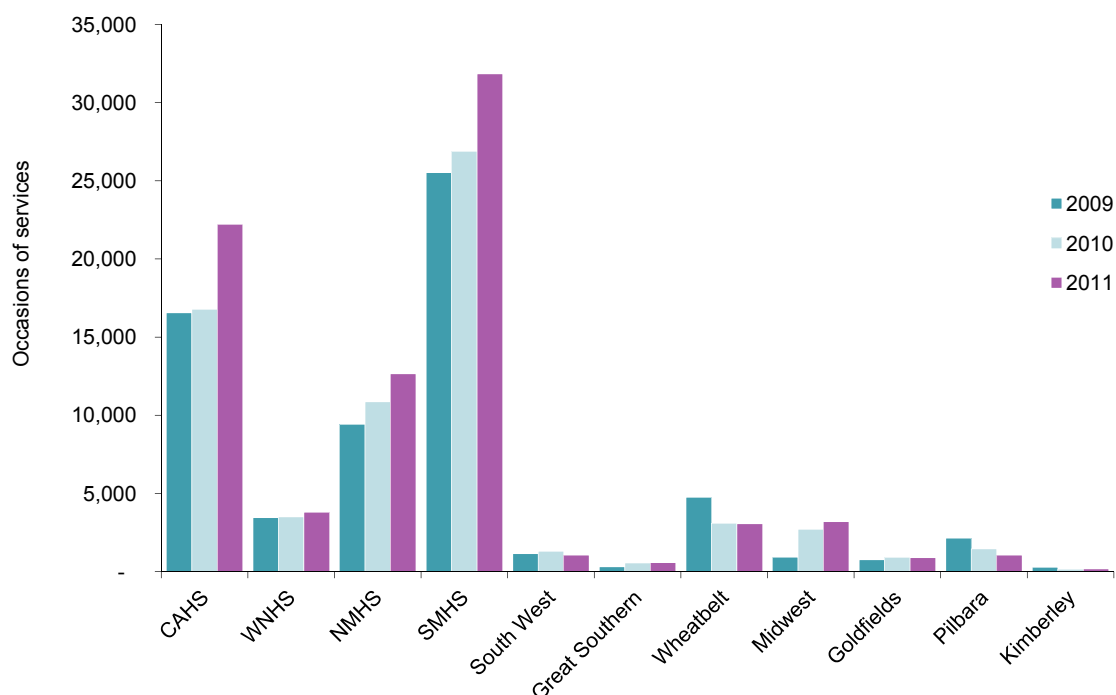
Non admitted occasions of service

Figure 12 presents a composite of available data sourced from the non admitted and AOD data collections. The available data relating to non admitted occasions of service suggest the largest number were delivered in SMHS, followed by CAHS and then NMHS. All metropolitan regions recorded rises in non admitted occasions of service, although these changes in part reflect improved data recording practices.

However, caution is required in interpreting non admitted occasions of service due to the large amount of uncaptured data relating to health services located in all WA country regions. Data custodians also reported that SCGH is likely to be under-reporting non admitted patient activity.



Figure 12: Composite of non admitted occasions of services by region and location of service, 2008 to 2011

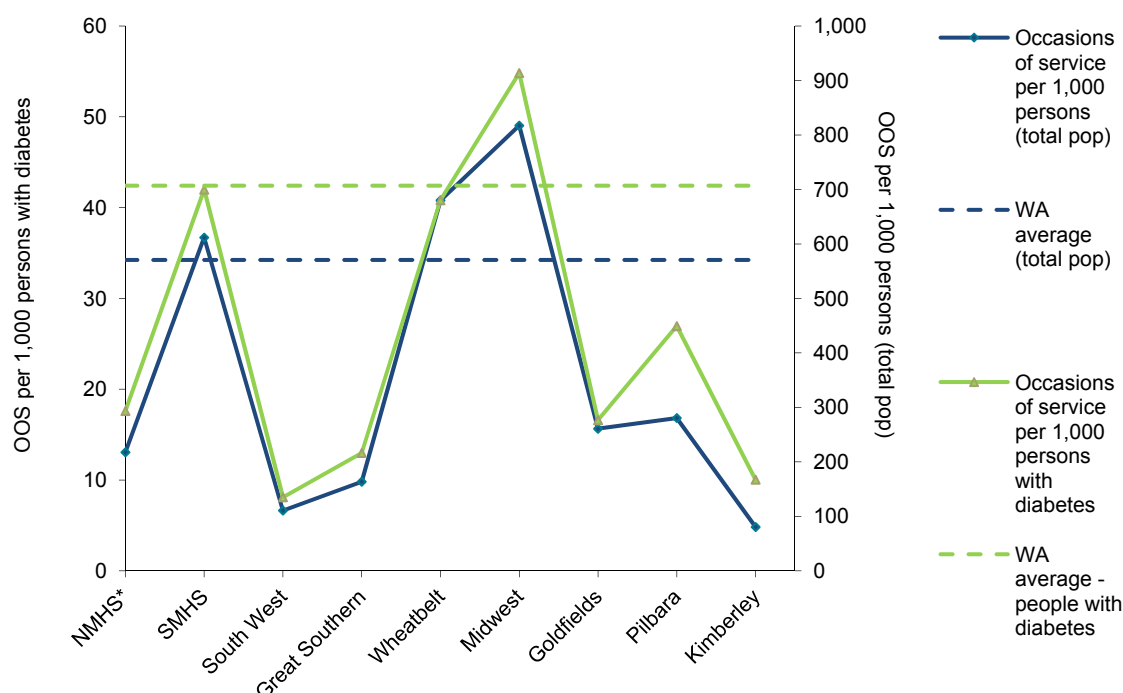


Source: KPMG calculation based on the Diabetes non admitted data collection, Performance Activity & Quality Division, and AOD data collection, WACHS

Figure 13 presents the composite of non admitted occasions of service per 1,000 persons for 2011 and the same data on a per 1,000 persons with diabetes basis. The available data suggests the largest number of services per person were provided in the Midwest, Wheatbelt and SMHS regions, and substantially lower numbers of services per person were provided in the Kimberley, South West, Great Southern, NMHS, Goldfields and Pilbara regions.



Figure 13: Non-admitted (composite) occasions of service, all types, per 1,000 persons (total population vs persons with diabetes), by region, 2011



* Excludes CAHS & WNHS data. WA averages include CAHS & WNHS data

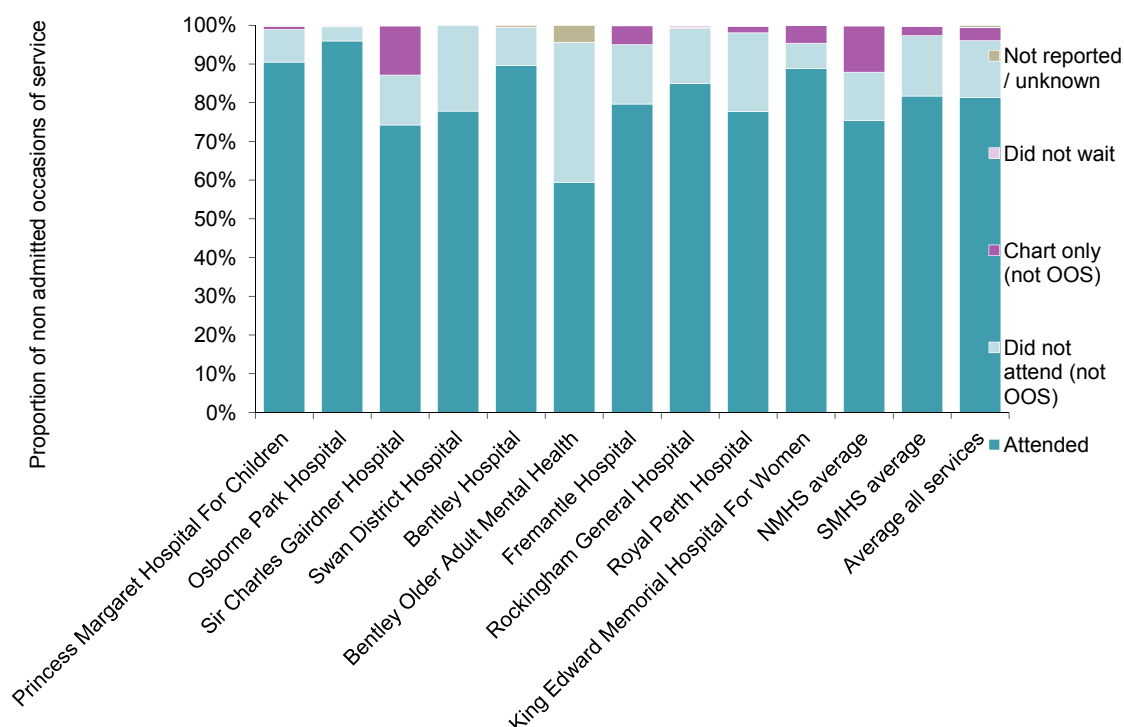
Source: KPMG calculation based on Diabetes non admitted data collection, Performance Activity & Quality Division, AOD data collection, WACHS, and ERP 2011, ABS

Figure 14 presents the outcomes of non admitted occasions of service for metropolitan hospitals between 2008 and 2011. In terms of:

- attended services
 - the highest rates were recorded by the OPH, PMH and BHS
- did not attend (DNA) rates:
 - the highest rates were recorded by the Bentley Older Adult Mental Health service, SDH and SCGH
 - the average DNA rate recorded for metropolitan hospitals in 2011 was 14.7 per cent.



Figure 14: Outcomes of non admitted occasions of service, metropolitan hospitals, 2008 to 2011



Source: KPMG calculation based on Diabetes non admitted data collection, Performance Activity & Quality Division

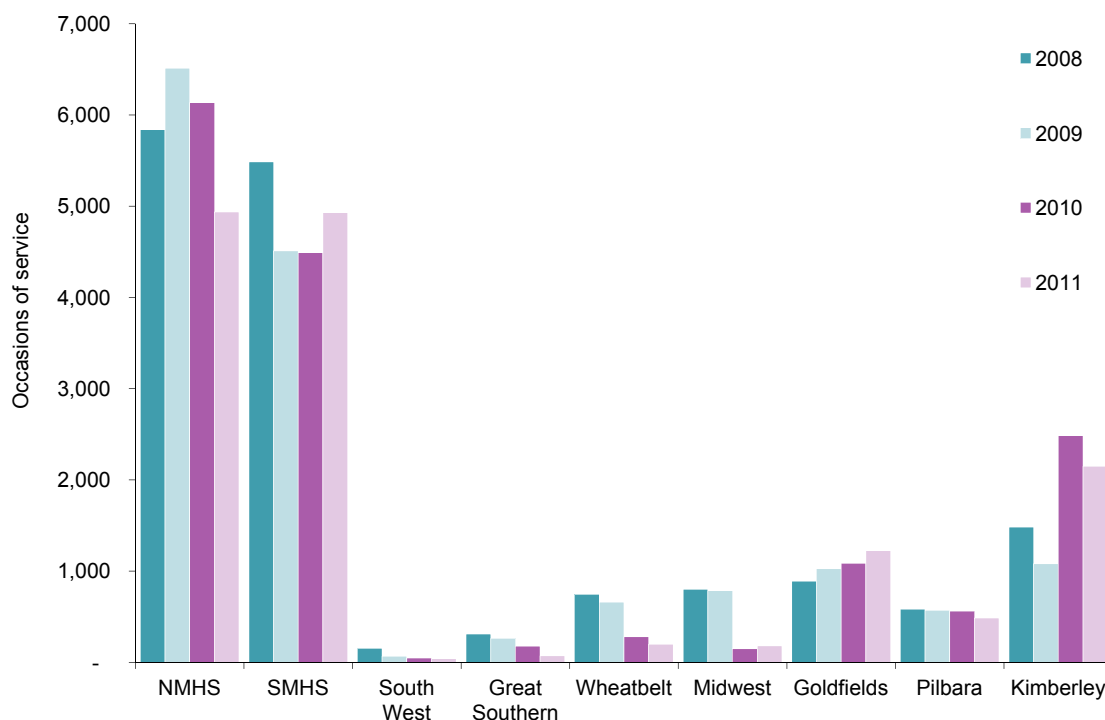
Community health services

Figure 15 presents community health occasions of service. The available data suggest the largest number were delivered in SMHS and NMHS⁵³, and the lowest number delivered in the South West, Great Southern and Midwest regions.

⁵³ The NMHS Public Health & Ambulatory Care unit advised that a drop in services between 2010 and 2011 related to staff shortages and program changes.



Figure 15: Community health occasions of services by region and location of service, 2008 to 2011

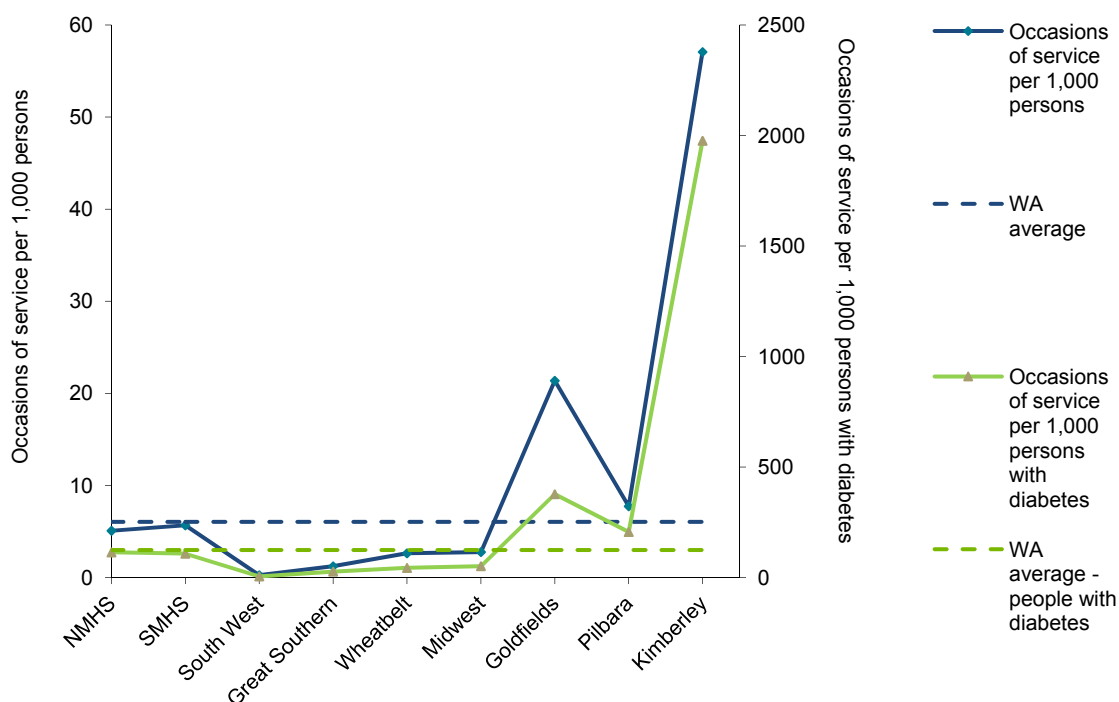


Source: KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network

Figure 16 presents the composite of non admitted occasions of service per 1,000 persons for 2011 only. The available data suggests the largest number of services per person were provided in the Kimberley and Goldfields regions, and the smallest number of services per person were provided in the South West, Great Southern, Wheatbelt and Midwest regions.



Figure 16: Community health occasions of service for diabetes treatment and management, all types, per 1,000 persons), by region, 2011



Source: KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network

General practice services

Estimates of diabetes related GP services are indicative only, as these are based on the assumption that four in every 100 GP encounters involves diabetes.⁵⁴ These estimates assume that all GPs provide the same level of activity, regardless of location, practice size or focus. Estimates for 2007/08, 2008/09 and 2010/11 are synthetic projections based on growth in total MBS funded GP services over the same period,⁵⁵ which has been applied to available data from the 2009/10 financial year.

It is notable that access to general practice is poorer in WA than in all other Australian states. MBS billing data indicates that in 2011, Western Australians

⁵⁴ See *General Practice Activity in Australia 2010/11*. General practice series no.29. Britt H, Miller GC, Charles J, Henderson J, Bayram C, Pan Y, Valenti L, Harrison C, O'Halloran J, Zhang C, Fahridin S. Sydney: Sydney University Press, 2011.

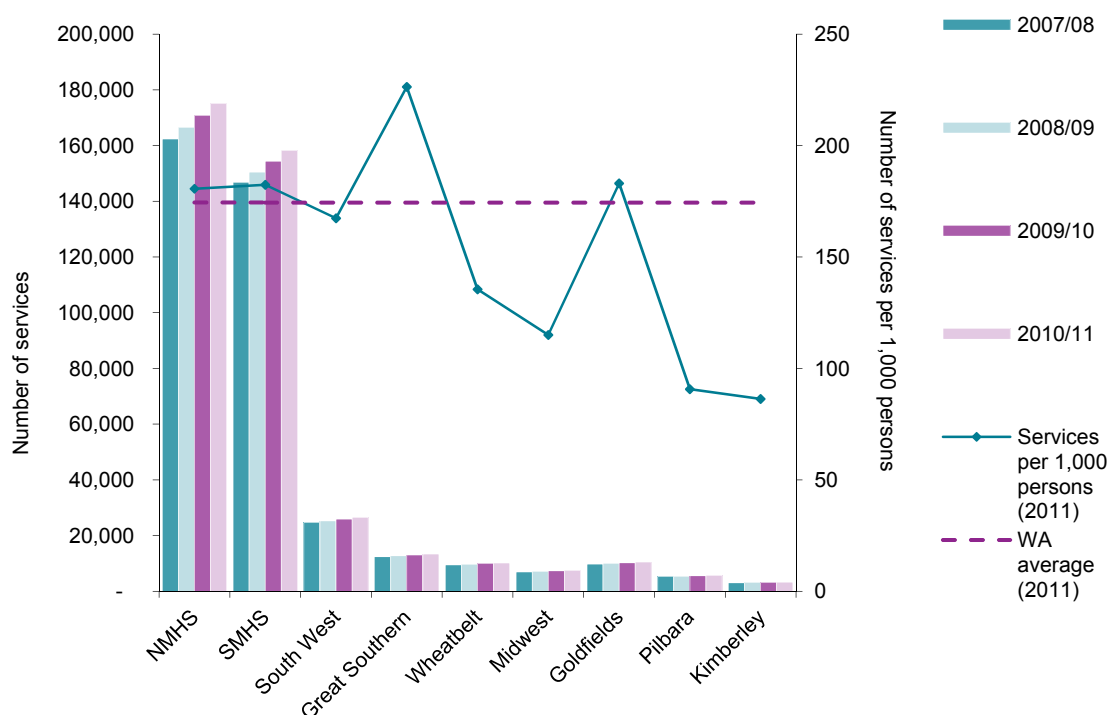
⁵⁵ See *All Medicare by Broad Type of Service (BTOS) processed from January 2008 to December 2011*. Medicare Australia. Accessed by KPMG 2 October 2012 at www.medicareaustralia.gov.au/statistics/mbs_group.shtml.



received 4.5 GP services per person, compared to an Australian average of 5.7 GP services per person. Only the Australian Capital Territory and Northern Territory recorded lower rates. See Appendix D.3.5 for further information.

As outlined under Figure 17, it is estimated that a total of 410,308 diabetes related GP services were provided during 2010/11, with the bulk of this provided in the NMHS and SMHS regions. This data indicates that, relative to other WA health regions, access to diabetes related care in general practice is greatest in the Great Southern, SMHS, NMHS and Goldfields regions, and poorest in the Kimberley, Pilbara and Wheatbelt regions.

Figure 17: Estimated total diabetes related GP services provided under MBS and DVA, by region, 2011



Source: KPMG calculation based on Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data

Private allied health providers

Private allied health providers, particularly diabetes educators, dietitians and podiatrists, also provide diabetes related services under MBS funding. These services are provided on referral from a GP as part of a GP management plan, and typically involve up to five occasions of service per person with diabetes per year. The relevant item numbers are known as Individual Allied Health Services (Items 10950 to 10970) for Chronic Disease Management, which cover a range



of chronic conditions including diabetes. The item numbers and eligible allied health providers are outlined below.

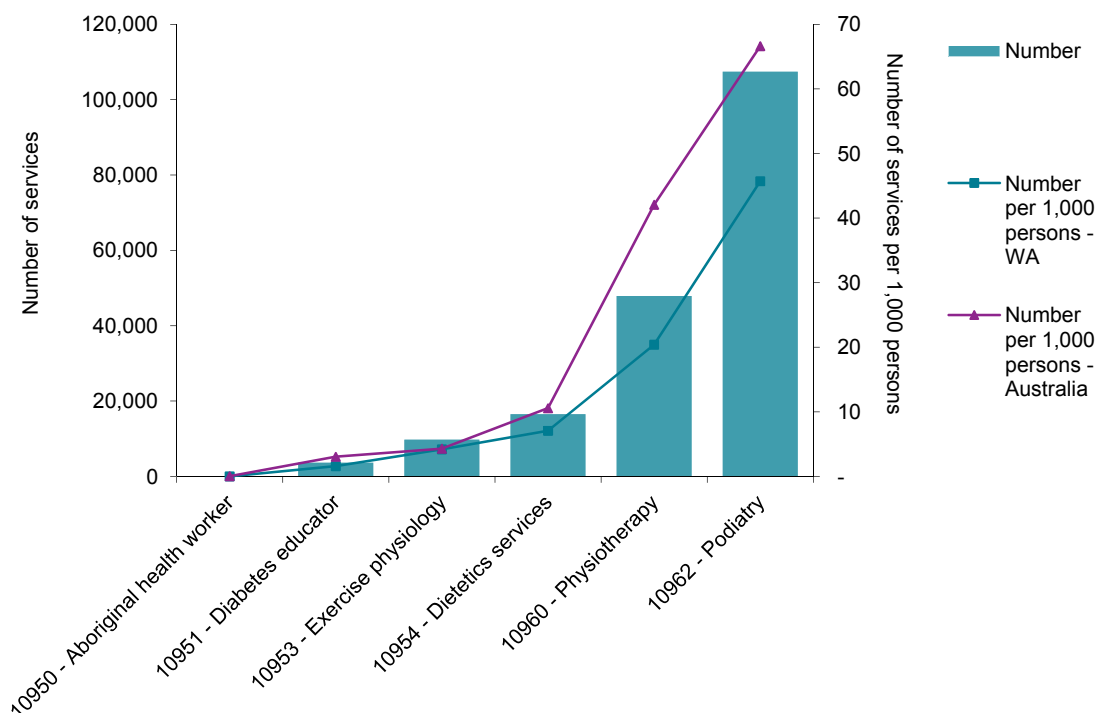
10950 - Aboriginal health worker	10960 - Physiotherapy
10951 - Diabetes educator	10962 - Podiatry
10952 - Audiology	10964 - Chiropractic service
10953 - Exercise physiology	10966 - Osteopathy
10954 - Dietetics services	10968 - Psychology
10956 - Mental health service	10970 - Speech pathology
10958 – Occupational therapy	

The number of services provided under these item numbers is presented below. Figure 18 indicates that the number of MBS funded private allied health services per 1,000 persons delivered in WA is lower than the Australian totals. Figure 19 indicates there was little to no growth in service provision for diabetes educator, dietetics and exercise physiology services, limited growth for physiotherapist services, and substantial growth in podiatry services between 2008 and 2011. During 2011, 3,733 services were provided by private diabetes educators in 2011, compared to 9,867 exercise physiology, 16,601 dietetics, 47,987 physiotherapy and 107,526 podiatry services in WA. This indicates that MBS funded private diabetes education services are not extensively accessed by people with diabetes (less than 2 services per 1,000 persons with diabetes).

In reviewing these statistics, it should be noted however that the proportion of services are diabetes related (particularly for key professions such as dietitians and podiatrists), and region specific information is not known.



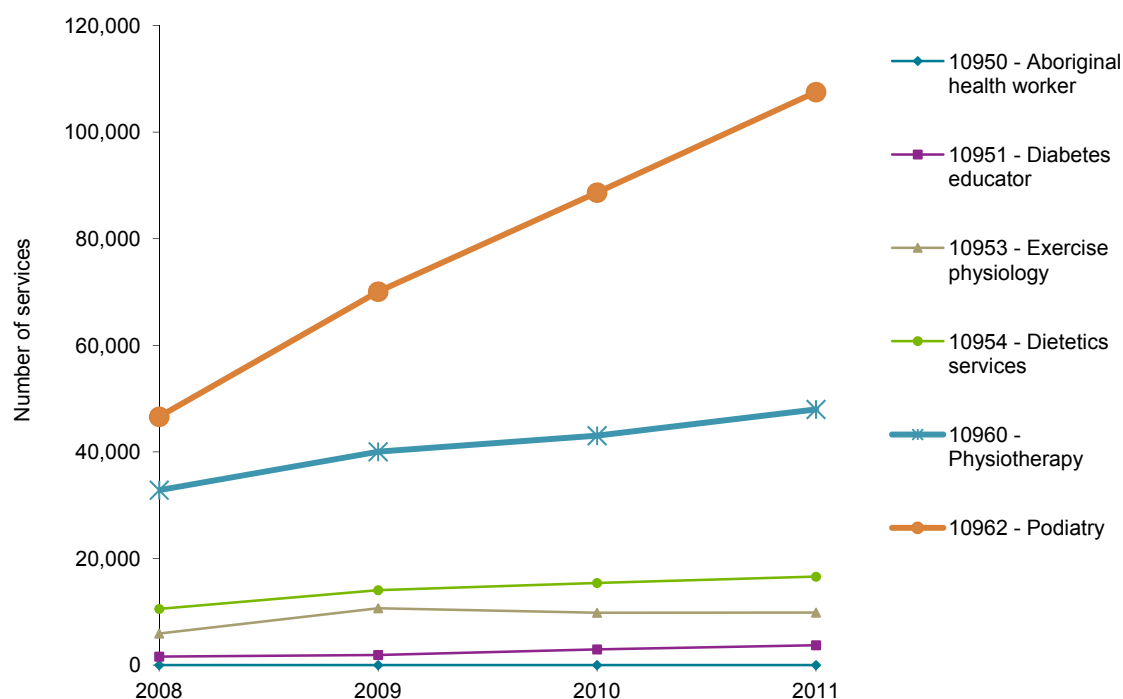
Figure 18: Selected chronic disease management services provided by private allied health providers under the MBS in WA and Australia, 2011



Source: KPMG calculation based on Medicare Australia data



Figure 19: Growth in selected chronic disease management services provided by private allied health providers under the MBS in WA, 2008 to 2011



Source: KPMG calculation based on Medicare Australia data



3.2 Key themes of the stakeholder consultations

As outlined under Section 1.2.1 of this report, consultations with 80 stakeholders from across the state and the diabetes care continuum were undertaken. Key themes arising from these interviews which are common to multiple care or geographic settings are summarised below. More detailed information relating to specific health regions is provided under Section 4: Regional Analysis.

The stakeholders interviewed for this project described a diabetes care system that varies significantly according to diabetes type and complexity and by service type, setting and location. While care is provided in both inpatient and non admitted settings, the overwhelming majority of care is provided by outpatient, community and primary health care services. The focus on inpatient care is on managing an acute event to enable that person to be discharged, while outpatient services are engaged in long-term chronic disease management which includes medication management, education, behaviour change, monitoring and screening for complications.

The diabetes care system is loosely organised with referral pathways that are often ad hoc and relationship based. While there are similar approaches to service provision in the two metropolitan regions (NMHS and SMHS), the approach to care in WA Country regions is more variable reflecting the diversity of the regions and challenges of service delivery in rural and remote Australia. The advantages of this approach include that planners have the flexibility to adapt to regional characteristics such as population density, workforce availability and turnover, and Aboriginal populations. Disadvantages of this approach include the lack of formalised relationships between regional and specialist services, particularly the tertiary hospitals, for provision of support such as consultancy advice and education and training.

The extent of variation around diabetes service delivery, not least relating to variable access and shifting responsibilities for leading care, presents a challenge for people with diabetes and care providers alike. Consumers of diabetes services often experience a degree of confusion in identifying both initial and next steps in their diabetes management as entry points into the care system vary and service access will vary according to diabetes type and complexity as well as the location. The multitude of providers, services, programs and funders – which encompass public, private and non government settings and which change over time – make diabetes service planning difficult. As a result, both service gaps and duplication (e.g. relating to consumer service, education and information options) are present in the current service system.



3.2.1 Diabetes prevalence and demand for services

Outpatient and community based care are estimated to form over 90 per cent of all diabetes related service activity. Care was described as becoming increasingly complex and specialised for complicated diabetes, in part driven by rapid and frequent advances in medications management within diabetes.

The focus of care for people with all forms of diabetes is on:

- those who are newly diagnosed and consequently require more intensive support to stabilise their diabetes, provide education and build their self management capacity
- have developed complications and / or comorbidities
- those requiring acute interventions.

A number of stakeholders commented that there is potential to improve the prevention of complications in people with existing diabetes through improved screening practices; e.g. in inpatient and primary health care settings. Long-term benefits can be achieved for people with diabetes and to the health system through earlier identification and intervention in relation to emerging complications.

Type 1 diabetes care was described as being usually specialist led due to the inherent complexity and instability of the disease. It requires more frequent and intensive care, with endocrinologists, general physicians with a diabetes special interest, diabetes educators, dietitians and podiatrists being key resources and supports.

Type 2 diabetes care accounts for the majority of service activity and prevalence rates are increasing at a faster rate than for type 1 diabetes. Management of type 2 diabetes is generally less complicated than type 1, and hence care is often GP led, supported by diabetes educators, dietitians and podiatrists. Specialists may become involved in complex care provision (usually relating to poor diabetes management and insulin initiation) for a period of time, or may assume leadership over the long term.

Gestational diabetes mellitus occurs during pregnancy and requires rapid and intensive care to quickly bring blood glucose levels to target levels. Care usually ceases shortly after delivery, with rescreening at three months and 12 months, unless GDM develops into type 2 diabetes. Care is usually obstetrician or GP led, supported by endocrinologist or general physicians, diabetes educators and midwives. Stakeholders raised concerns that changes to guidelines for GDM which lower the threshold for diagnosis will have major impact on demand for services.

Stakeholders commonly reported that community knowledge and understanding of diabetes its management and its long term implications in terms of developing complications is limited, particularly for many Aboriginal people. It



was also reported that many, particularly young, people disengage from services as they can see no initial impact from poorly managed diabetes. As a result, many people have poor control over their diabetes and in time develop complications and comorbidities requiring further service access. This indicates a need for both more general community education about diabetes (i.e. health promotion) as well as provision of targeted diabetes education matched to a person's readiness for change.

Stakeholders also reported that the requirement for operators of heavy machinery to undergo a specialist medical examination prior to expiration of their licence has led to increased demand for specialist services. This policy change is particularly impacting regional areas where access to specialists is very limited, with local or visiting specialists being requested to complete medical examinations at the expense of standard diabetes consultations.

The complexity of diabetes tends to increase with both age and the length of time a person has the disease. Stakeholders therefore raised concerns that the anticipated ageing and population growth together with earlier incidence of type 2 diabetes will result in significant increase in demand for services in coming years.

3.2.2 Services across the care continuum

Tertiary specialist services are targeted towards people with complex diabetes, with people with less complex diabetes managed by primary or secondary health care providers where possible. Tertiary services have most capacity to deliver multidisciplinary care (to those eligible for their services) that includes the range of specialities⁵⁶ required for complex and comorbid conditions, and are more likely to offer some (but minimal) psychosocial support. The tertiary services also provide consultancy support to other health services as well as other care settings within the same hospital. Referrals are received from all of the primary, secondary and tertiary care settings. Some stakeholders reported a tendency for tertiary specialist services to retain patients rather than referring them back to their usual care provider. PMH and KEMH are the only hospitals to conduct diabetes outreach clinics in other metropolitan and regional locations.⁵⁷

Diabetes clinics based at secondary hospitals (e.g. Armadale, Osborne Park and Bentley Hospitals) usually manage a combination of people with complex and less complex diabetes. These services are more limited in their ability to provide multidisciplinary and one-on-one care. Many stakeholders working in

⁵⁶ e.g. Diabetes education, psychology, podiatry, ophthalmology, nephrology, cardiovascular, infectious diseases, pathology.

⁵⁷ See Sections 4.1.1 and 0 for further information.



these settings emphasised a focus on group education sessions and building the capacity of people with diabetes to self manage their condition.

Private specialists play a relatively small role in the service system. Stakeholders noted they see a broad range of patients with a mix complexity, but were more likely to support better controlled, higher socio-economic status and more motivated people with diabetes. Private specialists were also reported as generally not having the same levels of access to on-site multidisciplinary teams as public providers, and hence are more likely to be managing patients under shared care arrangements with GPs and private allied health.

Care provision by primary health care services, particularly from GPs, is generally focussed on people with type 2 diabetes and GDM, with most GPs seeing too little type 1 diabetes to become experienced in this area. It should be noted that WA has a lower GP to population ratio than most other Australian states, with availability of GPs decreasing by remoteness. The level of involvement of GPs in diabetes management was described by the majority of stakeholders as being variable – i.e. while many GPs are competent and active in managing type 2 and gestational diabetes, many prefer to refer people with diabetes on to specialist services. Specialist services commented that some referrals could be improved with provision of more information relating to the individual involved.

Rural GPs are considered more likely to take on a leadership role than those in metropolitan areas. Concerns were raised that international medical graduates often lack training in diabetes management, but are more likely to practice in outer metropolitan or country regions (in order to obtain Australian registration) where access to alternative services is lower. Stakeholders reported a need for more education and training around issues such as insulin management, screening for complications (e.g. foot screening) and wound management.

People with diabetes moving between service settings often experience siloed care; i.e. they may access services in different settings but these often work in parallel rather than as shared care or collaborative services. Communication across service settings was described as limited and often delayed; e.g. specialist services will issue a summary report to a person's GP following a review but direct verbal contact appears to be rare.

Access to care in all areas is impacted by service location, the cost of care (e.g. specialist or GP appointments, medication, medical devices, travel, etc) and the availability of providers. The transition of young people into adult services was also described as difficult to support, with many reported to disengage for a period of time and become 'invisible' to the care system.



3.2.3 Access and system structures

The most important factor impacting the availability of diabetes services is geographic location.

For people with complex diabetes, access to specialist services is greatest for inner metropolitan suburbs, and becomes increasingly limited the further a person's home is from the Perth central business district (CBD). Diabetes specialist services, particularly the tertiary diabetes outpatient and high risk foot clinics, are concentrated in the metropolitan area, with the state's five tertiary hospitals located within 15 kilometres of each other. Most people living outside of the CBD are required to travel to Perth or access a visiting specialist service at a regional centre; however, the frequency of outreach services varies from one to 12 times per year.

Detailed information about waiting lists was not collected by the review. When asked stakeholders reported most people requiring an urgent appointment can access care within two to four weeks, while those requiring non-urgent care will be required to wait anywhere between six weeks and 12 months (depending on urgency, demand and service capacity). However, waiting lists may be lowered by the removal of people who do not attend a booked appointment (i.e. 'DNAs'). The average DNA rate for non admitted services delivered by metropolitan hospitals for 2011 was 14.7 per cent of recorded occasions of service. To access the service, the person must obtain a new referral from their GP.

For people with less complex diabetes, there is more likely to be better access to secondary and primary health care services close to home, but this access can be dependent on capability and capacity of local providers. WA country health regions reported very low numbers of diabetes educators, dietitians and podiatrists, which are concentrated in regional centres such as Albany, Geraldton and Broome.

Primary health care providers also commented on the limitations of MBS funded care, which funds five allied health provider appointments per annum. These appointments are often split between multiple providers.⁵⁸ This funding structure has required allied health providers to structure their services around brief interventions rather than engaging in long-term chronic disease management and supporting behaviour change. This system also limits providers' ability to provide frequent reviews, which are often required for at-risk patients. For providers in rural and remote areas, MBS funding does not cover additional service costs such as travel time (which can be extensive) and coordination of appointments.

⁵⁸ For example, a GP may refer a person with type 2 diabetes for two diabetes educator appointments, two podiatry appointments and one dietitian appointment.



Where diabetes services exist, diabetes care is predominantly delivered during traditional office hours. This limits access for those in employment and is believed to impact males in particular. Stakeholders also reported that while the diabetes care system works well for motivated, organised individuals with private income it frequently does not work well for marginalised people (e.g. those on lower incomes, with lower levels of education attainment, living in remote communities, who are Aboriginal or from a culturally and linguistically diverse background).

Metropolitan stakeholders reported that caps on recruitment by public services are limiting their ability to expand with increasing demand, most specifically for endocrinologists. Conversely, country stakeholders reported significant workforce shortages, with long-term vacancies identified for a number of WA country health regions. Recruitment was described as particularly difficult where positions are less than one full time equivalent (FTE) worker and where large amounts of travel are required.

3.2.4 Rural and remote diabetes care

Rural and remote stakeholders were keen to emphasise the importance of an approach to diabetes care that is suitable to their environment. WA country health regions are characterised by low population density, large distances between towns and services, and workforce constraints including high turnover rates and recruitment difficulties. Some rural regions have populations with a significantly higher proportion of Aboriginal people than the metropolitan regions, resulting in elevated type 2 and gestational diabetes rates and increased need for Aboriginal specific health services.

These constraints require use of a generalist but locally based health workforce to provide the majority of diabetes related care. The strength of this approach is that local health providers are able to establish more effective relationships with patients over the long term, and are available to provide opportunistic interventions when people with diabetes access health services. Opportunistic interventions are particularly important for engaging with many Aboriginal people who are highly mobile, attend health services at a range of locations, and are often irregular in their attendance at appointments (see the discussion in the next chapter for further discussion).

Local health services are supplemented by visiting specialists (consisting of medical and allied health providers) and access to consultancy support from metropolitan based services. Differing opinions were expressed by stakeholders regarding the usefulness of visiting specialists, with some raising concerns that such services are too infrequent, are often unable to establish an effective relationship with the person with diabetes. It was also noted that visiting services are currently funded under time-limited programs such as the Commonwealth's Rural Primary Services Program (RPSP), Medical Specialists



Outreach Assistance Program (MSOAP) and Indigenous Chronic Disease Package (ICDP),⁵⁹ and are therefore inherently less sustainable than routine services.

Furthermore, stakeholders reported a need for better coordination of visiting services to align these with both local providers and other visiting outreach teams. For example, one stakeholder described a scenario where a visiting Perth based specialist team attended a remote town on the same day as regionally based allied health providers, with all providers attempting to connect with the same people with diabetes. Others expressed the view that visiting specialist services have the potential to work well when linked to local services to enable development of on-the-ground skills and take advantage of local service coordinators and outreach workers.

Stakeholders commented on the importance of establishing person controlled electronic health records (PCEHRs) to enable communication of information across care settings. This is particularly important in regional areas where multiple organisations are involved in provision of care for individual patients and there is a high degree of population mobility (especially for Aboriginal people with diabetes who may be accessing care across a range of settings). However, depending on what model of PCEHRs emerges, there are risks relating to their use that will need to be managed to ensure appropriate providers are able to access accurate health information in a timely manner.

Use of telehealth services was reported as gradually increasing, with the Department in the process of finalising a strategic plan for development of statewide telehealth services. The plan will outline the role of telehealth services in WA and their use in clinician to patient care, in emergency care, in education and training, and in the storage and transmission of health information. There was strong agreement from stakeholders that a more coordinated and planned approach to tele-consultancy and telehealth services is required. However, support provided via tele-consultancy and telehealth services must be appropriate to and demonstrate and understanding of local settings; i.e. individuals providing advice must be able to demonstrate an understanding of culturally appropriate care and the challenges of remote practice.

3.2.5 Aboriginal diabetes care

As with rural and remote service provision, stakeholders emphasised that the service delivery model for Aboriginal populations is often very different to that of the general community. It is well known that Aboriginal health outcomes are significantly poorer than for the broader community, and diabetes together with related conditions such as renal failure are prevalent at rates substantially

⁵⁹ See section 4.4 of this report for an overview of the Rural Primary Services Program, ICDP and MSOAP.



above those of the general population. Aboriginal people are also over-represented in hospital admissions. For some communities, basic needs such as housing, nutrition, safety must be met, alcohol and drugs misuse addressed, and economic participation enabled before more complex issues such as diabetes can be successfully managed. The Pilbara, inland Kimberley, Goldfields regions were identified as key areas for Aboriginal diabetes care.

There is a need to deliver services that are culturally appropriate and reflective of local languages and low literacy levels. Many Aboriginal people have limited understanding of the implications of unmanaged diabetes and experience difficulty in following complex information relating to medications and diabetes education. Aboriginal medical services, Aboriginal health workers and Aboriginal specific tools and information resources are therefore invaluable for engaging and communicating with Aboriginal people. Screening for complications (e.g. retinal and foot screening) is particularly important given the high rates of complications in this population.

Aboriginal people were described as being highly mobile across communities, regions and services, making planned service provision difficult. Other cultural commitments, such as ceremonies, funerals and community events frequently result in missed appointments. Use of opportunistic interventions, community engagement, liaison and outreach workers are also useful for engaging with these communities.

For Aboriginal women with GDM, the provision of care in the local community was considered preferable to removing a woman from her family and support network to Perth for delivery at KEMH. Consequently, regions such as the Kimberley, Pilbara and Midwest are managing diabetes in pregnancy locally as often as possible.

A range of programs and services are relevant to Aboriginal diabetes care, including:

- for all regions, Aboriginal medical services
- for WA country health regions, ICDP and MSOAP services (funded through Closing The Gap)
- for metropolitan health regions, Moorditj Djena diabetes and podiatry service (funded through Closing The Gap).

3.2.6 Diabetes workforce

Issues raised by stakeholders relating to specific diabetes providers are briefly discussed below.



Medical specialists

There is currently a shortage of endocrinologists within WA as well as general physicians who have developed a special interest in diabetes. WA has one of the lowest ratios of medical practitioner to population in Australia. There are currently 31 endocrinologists in WA (all are Perth based), with numbers expected to fall to 27 in 2016 before rising to 29 by 2021. An assessment of the endocrinology Specialist to Population Ratio (SPR) prepared by the WA Department of Health has shown that the WA SPR is 1.3 endocrinologists per 100,000 persons, compared to the Australian SPR of 2.2 endocrinologists per 100,000 persons. As a result of this analysis, endocrinology has been identified as being at an overall critical risk of workforce shortages across the between 2012 and 2021. Key issues relating to this workforce were identified as:

- a lack of endocrinologist consultants, increasing demand for services, and static consultant position numbers
- a lack of public sector positions and a lack of full time positions at the Royal Perth and Fremantle hospitals, linked to problems employing trainees upon graduation due to lack of available new public sessions
- changing models of care, which are resulting in high and increasing rates of outpatient activity, pressures relating to providing inpatient consultancy services, and demand for outpatient multidisciplinary endocrinology teams.⁶⁰

There are currently three training positions (one each at SCGH, RPH and FHHS).

Diabetes educators

Diabetes educators are considered a key resource for the management of diabetes. However, shortages of these providers have been reported across the state. While endocrinologists and general physicians with a diabetes special interest are concentrated in the metropolitan area, diabetes educators are better distributed around the state.

Stakeholders differentiated between credentialled diabetes educators (CDEs, being better qualified providers), diabetes nurse educators (who are able to take a more active role in medications management) and non credentialled educators.

⁶⁰ Specialist Workforce Capacity Program: Discussion Paper – Endocrinology, April 2012. Version 1.01 (Draft).

Department of Health, Western Australia: 04 April 2012. Provided to KPMG by the Health Networks Branch 26 October 2012.



It was estimated that there are 156 diabetes educators (from various primary disciplines) and 84 credentialed diabetes educators (also from various disciplines) in WA.⁶¹ At present, barriers to development of more diabetes educators include the cost and length of training, the need for access to supervision during training, a lack of public sector positions (particularly for new graduates), and ongoing continuing professional development (CPD) requirements for maintaining status as a CDE. Furthermore, stakeholders reported concerns regarding ageing of this workforce plus high turnover rates. Stakeholders called for planning to be undertaken to ensure adequate supply of diabetes educators and improve access to education and training (including for the development of intermediary and advanced skills).

Podiatry

Podiatry was identified as an important component of diabetes care due to the role of podiatrists in the identification, prevention and management of high-risk foot complications including foot ulcers. Podiatrists can help prevent more serious foot complications such as ulceration, infection and amputation in patients with diabetes through regular neurovascular foot assessment, appropriate preventative foot care, education and appropriate and early referral to other specialists (e.g. vascular surgeons, high-risk foot clinics). People with active high risk foot complications, such as ulceration, infection or Charcot Arthropathy, require frequent podiatry review, with visits every one to six weeks or more frequently depending on severity of their condition. These patients will typically be involved with a secondary or tertiary high risk foot clinic for many months or years depending on severity of their foot complications. Patients are often transitioned to a lower acuity setting once their problem is resolved or stabilised. Once foot complications are established, podiatry care becomes a lifelong requirement.

National Health and Medical Research Council (NHMRC) approved guidelines, *Prevention, Identification and Management of Foot Complications in Diabetes*,⁶² recommend that for people stratified as having:

- low-risk feet (where no risk factors or previous foot complications have been identified), foot examination should occur annually
- intermediate-risk or high-risk feet (without current foot ulceration), foot examination should occur at least every 3 to 6 months.

⁶¹ Advised to KPMG by the NMHS Public Health & Ambulatory Care Unit, based on ADEA WA information.

⁶² *National Evidence-Based Guideline on Prevention, Identification and Management of Foot Complications in Diabetes (Part of the Guidelines on Management of Type 2 Diabetes) 2011*. Melbourne Australia



The guidelines recommend that people with newly diagnosed diabetes be screened and allocated a risk rating which indicates the urgency and level of care required. However, stakeholders reported that currently there is limited proactive screening of diabetic feet across all settings in the health system (e.g. inpatient, primary health care, private podiatrists and GP clinics), due to workforce limitations as well as a lack of knowledge and skill among the generalist workforce.

There is currently a workforce shortage of podiatrists within WA. Stakeholders estimated there are around 70 podiatrists working in public health services, with a further 310 working for other employers. The majority of routine podiatry care happens in private practice, but management of complex diabetes related conditions tends to be referred to more specialised podiatrists at tertiary, secondary and community clinics.

Stakeholders raised concerns that the current MBS items numbers available to private podiatrists for diabetes related foot care do not match a common model of care. As described above, current MBS item numbers fund up to five sessions with an allied health provider on referral from the GP. However, given the frequency of podiatry appointments can be high, the MBS item numbers are effectively channelling low risk patients to private podiatry or restricting private podiatry care to less intensive activity such as toe nail clipping or screening reviews.

The high risk foot clinics located at RPH, SCGH and FHHS are therefore considered to be important services for the diabetes network. Services at secondary hospitals and community clinics are equally important. Stakeholders noted that high risk foot clinics are considerably more effective when operated as multidisciplinary clinics and called for the re-establishment of a multidisciplinary foot ulcer clinic at SCGH as a priority, as well as consideration of establishment of similar clinics at secondary hospital or community based sites in the future. Stakeholders also commented on the importance of effective and capable secondary services to enable less complex patients to be managed outside of the tertiary setting. Availability of podiatry services at secondary hospitals and community health services was described as limited and in need of further review. The network of secondary services linked to the FHHS Podiatry Clinic was cited as an example of an effective model where capacity has been built over time to enable to multidisciplinary high risk foot clinic to focus on the most acute and complex patients. Overtime, the high risk foot care clinic has become more streamlined and coordinated by better defining and communicating its purpose, patient eligibility etc, as well as connecting with related services.

Both RPH and SCGH provide graduate podiatry placements (one position per hospital per 12 month period) which offer hospital based (0.6 FTE) and community based (0.4 FTE with the NMHS Ambulatory Care Diabetes program) experience.



As with other health providers, podiatry services are mainly located in the Perth metropolitan area, with limited numbers located in regional centres such as Bunbury, Albany, Kalgoorlie, Geraldton, Port Hedland and Broome. Podiatrists based in regional centres often take on region wide roles and travel extensively to remote communities to provide outreach services. Other outreach services are provided under the MSOAP and (ICDP) programs.

Patient education should be considered a part of the podiatrist's role. With experience and education, many patients can learn to recognise signs of problems (e.g. infection) and will contact their podiatry service or seek other medical input when require.

3.2.7 Non government services

A number of NGOs play a role in diabetes service provision, including:

- Diabetes WA
- Rural Health West
- Silver Chain
- Medicare Locals and general practice networks
- Royal Flying Doctor Service.

Information relating to these services is provided under Section 4.4.



4 Regional analysis

Information relating to diabetes service provision for each Department of health region is presented below. The regions profiled are:

- Children and Adolescent Health Service
- Women and Newborn's Health Service
- North Metropolitan Health Service
- South Metropolitan Health Service
- South West
- Great Southern
- Wheatbelt
- Midwest
- Goldfields
- Pilbara
- Kimberley.

A list of services and locations identified during this review and profiled on the region maps is located at Appendix F.

4.1 Statewide services

4.1.1 Children and Adolescent Health Service

Overview

The CAHS is a statewide service providing paediatric service to young people across WA. It is estimated that there are 450,880 persons aged 0 to 14 years in WA, who comprise 19 per cent of the total population. Although Epidemiology Branch diabetes prevalence estimates for 0 to 16 year olds are not available, CAHS has indicated there are approximately 880 children with type 1 diabetes.

Complete estimates of diabetes in this population are not available, but available information indicates there are between 450 and 650 children (0-14 years) with type 1 diabetes.



The key service of CAHS for diabetes care is the PMH. The Child and Adolescent Community Health and Child and Adolescent Mental Health Service are also included within CAHS.

PMH is a 220-bed tertiary hospital that provides approximately 250,000 patient services each year.⁶³ PMH has an Endocrinology and Diabetes Department which provides inpatient and outpatient (including outreach clinics at seven locations) services to children and adolescents aged 16 years and under with type 1 and type 2 diabetes, as well as other endocrine disorders. Care providers reported that diabetes related care forms about 75 per cent of the Department's activity, and around of 80 per cent of this activity is type 1 diabetes related.

PMH offers a multidisciplinary service that includes paediatric endocrinologists, a nurse practitioner, diabetes educators, dietitians, social workers and a psychologist. Care and support extend beyond the young person with diabetes to family, schools and other health care providers.

Key statistics relating to CAHS are outlined below.

Table 7: Estimated resident population, 0 to 14 years, WA, 2011

	Number	Proportion of state (s) (per cent)
ERP (0-14 years)	450,880	19.2% (s)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012)

Table 8: Diabetes prevalence, WA, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	629	n.a.	n.a.	629	n.a.
All children (per cent)	0.3%	n.a.	n.a.	0.3%	n.a.

Source: KPMG calculation based on Prevalence of Type 1 diabetes in Australian children, 2008, AIHW (2011) and ERP, ABS (2011)

⁶³ See PMH website, accessed 8 October 2012 at www.pmh.health.wa.gov.au/general/about_us/index.htm.



Table 9: Estimated diabetes related service activity, CAHS, 2009 to 2011

	2009	2010	2011	Rate per 1,000 children aged 0-14
Inpatient separations⁶⁴	261	303	289	0.6
Non admitted occasions of service	16,553	16,774	22,205	49.2
Total services	16,814	17,077	22,494	49.9

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS.

Table 10: Princess Margaret Hospital profile

Princess Margaret Hospital for Children					Tertiary hospital: Public		
Endocrinology and Diabetes Department							
Treatment focus	Statewide service for children and adolescents with diabetes covering ages 0-16 years, providing inpatient and outpatient care for T1 and complex T2: <ul style="list-style-type: none">T1 care focuses on stabilisation through education, five day inpatient care, provision of three month reviews, pump education, complication screening (microvascular, macrovascular, psychological), transition to adult servicesT2 care focuses on outpatient education, family and community engagement.						
	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	5 ⁶⁵	≤1	4	≤2		≤2	≤2

⁶⁴ Includes data coded to diabetes only; excludes data coded to endocrinology.

⁶⁵ 4.0 FTE endocrinologist paediatricians and 1.0 FTE junior med



Princess Margaret Hospital for Children		Tertiary hospital: Public
Clinics and sessions	<p>8:30am to 4:30pm, 5 days a week</p> <p>Diabetes clinics (mix of one-on-one and group sessions) held</p> <ul style="list-style-type: none"> Monday morning – T1 newly diagnosed, T2 nurse practitioner led clinic Tuesday, Thursday, Friday mornings – 0 to 13 years Tuesday, Thursday, Friday afternoons – 13 to 16 years <p>Outreach clinics</p> <ul style="list-style-type: none"> Fortnightly – Joondalup and Rockingham Bi-monthly – Bunbury Quarterly – Albany, Geraldton, Kalgoorlie, Karratha, Midland, Narrogin and Northam Bi-annual - Esperance 	
Key points	<p>Approx 1,000 ongoing patients, with 120 new patient per year</p> <p>T1 over 80 per cent of diabetes related activity. Diabetes accounts for 75 per cent of total activity of the clinic</p> <p>New patients aged 16 and over are not accepted</p> <p>PMH also provides education and support to families, schools and other services (e.g. telehealth), not just the young person. Email and telephone consultation with nursing, medical and dietetic staff is a major component of the PMH Endocrinology and Diabetes Department's activity</p> <p>Increased use of technology has increased time of consultations as well as consultation rates</p> <p>Working with culturally and linguistically diverse (CALD) families adds additional challenge due to language and cultural differences</p> <p>Transition to adult services typically occurs between 14 and 16 years. Transition involves letter summary of patient status and history to new service. Transition strategies vary according to the accepting tertiary hospital; this process is particularly challenging for rurally based patients</p> <p>Concerns raised that increased incidence of childhood diabetes and increased complexity of management will present resourcing problems. Stakeholders also identified high dropout rates as adolescents reach young adulthood as an issue.</p> <p>Stakeholders identified as priorities:</p> <ul style="list-style-type: none"> increased psycho-social support increased dietetic support proactive screening for complications improved management of life transitions improved GP and community education about the signs and symptoms of diabetes onset. 	



4.1.2 Women and Newborn's Health Service

Overview

The WNHS is a statewide service providing care for women and infants across WA. It is estimated that there are 499,608 women aged 15 to 44 years in WA, who comprise 43 per cent of the female population.

The key service of WNHS for diabetes care is the KEMH, based in Subiaco, Perth. BreastScreen WA, Genetic Services of Western Australia, Gynaecological Cancer Service, Sexual Assault Resource Centre, Statewide Obstetric Support Unit, WA Cervical Cancer Prevention Program, Women's Health Policy and Projects and the WA Perinatal Mental Health Unit also make up the WNHS.

KEMH is a tertiary maternity hospital that oversees over 6,000 complex pregnancies each year.⁶⁶ KEMH hosts a diabetes service which provides outpatient care for women with type 1, type 2 and gestational diabetes during pregnancy. The diabetes service receives around 800-1,000 referrals per year, with approximately 20 per cent relating to types I and II and 80 per cent relate to gestational diabetes. Diabetes care is also provided to women admitted into the inpatient setting for a range of gynaecological procedures including child birth. Following the completion of the pregnancy, women with ongoing diabetes are transitioned to a usual care provider (e.g. diabetes specialist service or GP) after six weeks.

The KEMH diabetes service offers a multidisciplinary team that includes general physicians, obstetricians, a nurse practitioner, diabetes educators, dietitians and midwives. Due to the risks of harm to the unborn child and mother, diabetes in pregnancy requires rapid and fairly intensive intervention to stabilise the diabetes; therefore diabetes related care during pregnancy is generally more frequent than in other service settings.

Women from regional areas with more complex diabetes and / or pregnancies are often brought to KEMH from 36 weeks until birth. Many however prefer to access care locally, with areas such as the Pilbara and Kimberley health regions aiming to providing diabetes in pregnancy related care from local services with tele-consultancy support from KEMH.

Key statistics relating to WNHS are outlined over page.

⁶⁶ See KEMH website, accessed 8 October 2012 at
http://kemh.health.wa.gov.au/general/about_us/index.htm.



Table 11: Estimated resident population, 0 to 14 years, WA, 2011

	Number	Proportion of state (s) (per cent)
Female ERP (15-44 years)	499,608	21.2% (s)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012)

Table 12: Estimated diabetes related service activity, WNHS, 2009 to 2011

	2009	2010	2011	Rate per 1,000 woman aged 15-44
Inpatient separations ⁶⁷	267	163	63	0.1
Non admitted occasions of service	3,457	3,503	3,799	7.6
Total services	3,724	3,666	3,862	7.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS.

Table 13: King Edward Memorial Hospital profile

King Edward Memorial Hospital for Women and Newborns					Tertiary hospital: Public		
Diabetes service							
Treatment focus	Statewide service for women and newborns experiencing complex pregnancies, including complex diabetes in pregnancy for women with T1, T2 and GDM. The service provides inpatient and outpatient care including management of diabetes and the pregnancy, pre-pregnancy counselling for women with existing diabetes, and diabetes related care for women admitted as inpatients for other procedures (e.g. gynaecological) Inpatient and outpatient care						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	3 ⁶⁸	≤1	3 ⁶⁹	≤1			

⁶⁷ Includes data coded to diabetes only; excludes data coded to endocrinology.

⁶⁸ 1 FTE general physician, 1 FTE registrar (under supervision of general physician)



King Edward Memorial Hospital for Women and Newborns		Tertiary hospital: Public
Clinics and sessions	<p>Three combined diabetes / obstetrics clinics per week</p> <ul style="list-style-type: none"> • Tuesday and Wednesday mornings – women with T1 and T2 (high risk) • Thursday afternoon – women with GDM (high risk), nurse practitioner led <p>4 GDM education classes offered per week (3 English speaking, 1 interpreter) Tele-consultancy service</p>	
Key points	<p>KEMH receives around 800-1,000 diabetes related referrals per year, with the number of referrals increasing over time. Approximately 20 per cent of referrals are related to T1 and T2 and 80 per cent relate to GDM</p> <p>Significant concern regarding the impacts of changes to the glucose tolerance test for diabetes, which are expected to increase the number of referrals to KEMH by 3,000 women per year</p> <p>Diabetes in pregnancy requires rapid intervention and frequent contact. KEMH care is provided for the duration of the pregnancy; following birth diabetes care is quickly transitioned to usual diabetes care providers. However, many women fall through the gaps during transition to other services</p> <p>Minimal waitlists given the need to see women within 1-2 weeks of receiving a referral</p> <p>KEMH patients frequently present with very complex health and social issues</p> <p>Referrals received from specialist clinics, GPs and antenatal services. Most women with T1 are referred to KEMH. Many pregnant women with uncomplicated diabetes receive care locally</p> <p>Differing access for women with regional / remote areas of WA to KEMH - most with GDM or T2 deliver locally, while women with T1 typically come to KEMH around 36 weeks for delivery. Some regional areas (e.g. Geraldton, Port Hedland, Broome) manage diabetes in pregnancy locally</p> <p>KEMH also provides:</p> <ul style="list-style-type: none"> • weekly telehealth services provided for health professionals and women living in rural and remote settings. Effective in reducing need for women to travel to KEMH • support and advice provided for health professionals in metropolitan hospitals • regular workshops and study days are provided for all health professionals including university based midwifery and other students by the diabetes educators and dietitians • a formal quarterly outreach service to the Ngaanyatjarra Lands east of Kalgoorlie, under MSOAP. <p>Secondary services have limited or no expertise to manage women with diabetes in pregnancy, increasing pressure on KEMH to manage women who could be better managed closer to home</p> <p>Increased diabetes education for other pregnancy related care providers, increased diabetes educators and psycho social support at KEMH, and</p>	

⁶⁹ Diabetes educators are also registered nurses and midwives.



King Edward Memorial Hospital for Women and Newborns	Tertiary hospital: Public
	proactive pregnancy counselling for women with diabetes identified as priorities



4.1.3 WoundsWest

WoundsWest provides specialist advice to patients with foot wounds arising from diabetes and also supports clinical staff in the management of these patients. WoundsWest is a statewide service with a primary focus on supporting Department of Health facilities (both metropolitan and country based).

WoundsWest sits within the NMHS governance structure, under the Public Health and Ambulatory Care unit. WoundsWest provides advice on patients with wounds from diabetes to public health services, GPs, Aboriginal Medical Services (AMS') and Residential Aged Care Facilities (RACFs) via remote consultation.

The majority of WoundsWest clinical service provision is provided as a telehealth service delivering remote consultation and advice to support clinicians in remote and rural areas of WA to manage patients with wounds within their local health service. This includes contact and collaboration with AMS' to provide advice and support relating to the prevention and management of wounds. WoundsWest use a web based ICT program using secure e-health records to facilitate exchange of clinical information. The service is operated by ≤ 4 FTE Registered Nurses and a ≤ 1 FTE nurse practitioner.



4.2 Metropolitan regions

4.2.1 North Metropolitan Health Service

Overview

The main locations within the NMHS health region include the Perth CBD, Osborne Park, Joondalup, Swan Valley and Midlands. In terms of population size, NMHS is the largest health region in WA with over 969,100 people. Although the proportion of residents identifying as Aboriginal is lower than the state average, NMHS has the second largest Aboriginal population in WA, being over 12,000 people. Available data indicate diabetes prevalence is lower than the state average.

The region includes some of WA's most affluent areas, particularly its inner metropolitan suburbs, but also includes more disadvantaged communities located in outer metropolitan suburbs to the east and north east. NMHS' northern suburbs were described as relatively new, fast growing and under-served. Stakeholders consulted reported limited service availability north of Osborne Park; under-servicing was also reported for the north eastern suburbs.

The main diabetes specific services identified during this review are:

- Sir Charles Gairdner Hospital
- Joondalup Health Campus
- Princess Margaret Hospital - Diabetes Outreach Clinic, Joondalup
- Swan District Health Campus
- Osborne Park Hospital
- NMHS Public Health & Ambulatory Care Diabetes Team
- Moorditj Djena.⁷⁰

PMH and KEMH are also located within the NMHS geographic catchment.

Other important services include private providers such specialists, general practices, dietitians and podiatrists, as well as the Perth North Metro Medicare Local and Perth Central & East Metro Medicare Local. It is estimated there were approximately 707 full workforce equivalent (FWE) GPs (43 per cent of WA GPs) working from 242 practices in 2010. The FWE GP to population ratio was

⁷⁰ Moorditj Djena is a mobile diabetes and podiatry service for Aboriginal people operating in NMHS and SMHS. See page 103 for an overview of the Moorditj Djena service.



1,355, compared to a state average of 1,496. Access to GPs is more limited in the northern suburbs.⁷¹

Key statistics relating to the NMHS are outlined below.

Table 14: Estimated resident population, NMHS, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	969,100	41.2% (s)
Aboriginal ERP	12,531	1.3% (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 15: Diabetes prevalence, NMHS, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	252	n.a.	n.a.	252	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	3,555	33,202	7,956	43,110	1,591
All adults (per cent)	0.5	4.4	2.1	5.7	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)

⁷¹ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



Table 16: Estimated diabetes related service activity, NMHS, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	4,877	5,180	3,433	1,691	1.7
ED presentations	1,439	1,467	1,470	1,528	1.6
Community health occasions of service	5,841	6,513	6,136	4,938	5.1
Non admitted occasions of service	n.a.	9,411	10,861	12,653	13.1
GP services	162,358	166,521	170,790	175,060	180.6
Total diabetes services counted	174,515	189,092	192,690	195,871	202.1

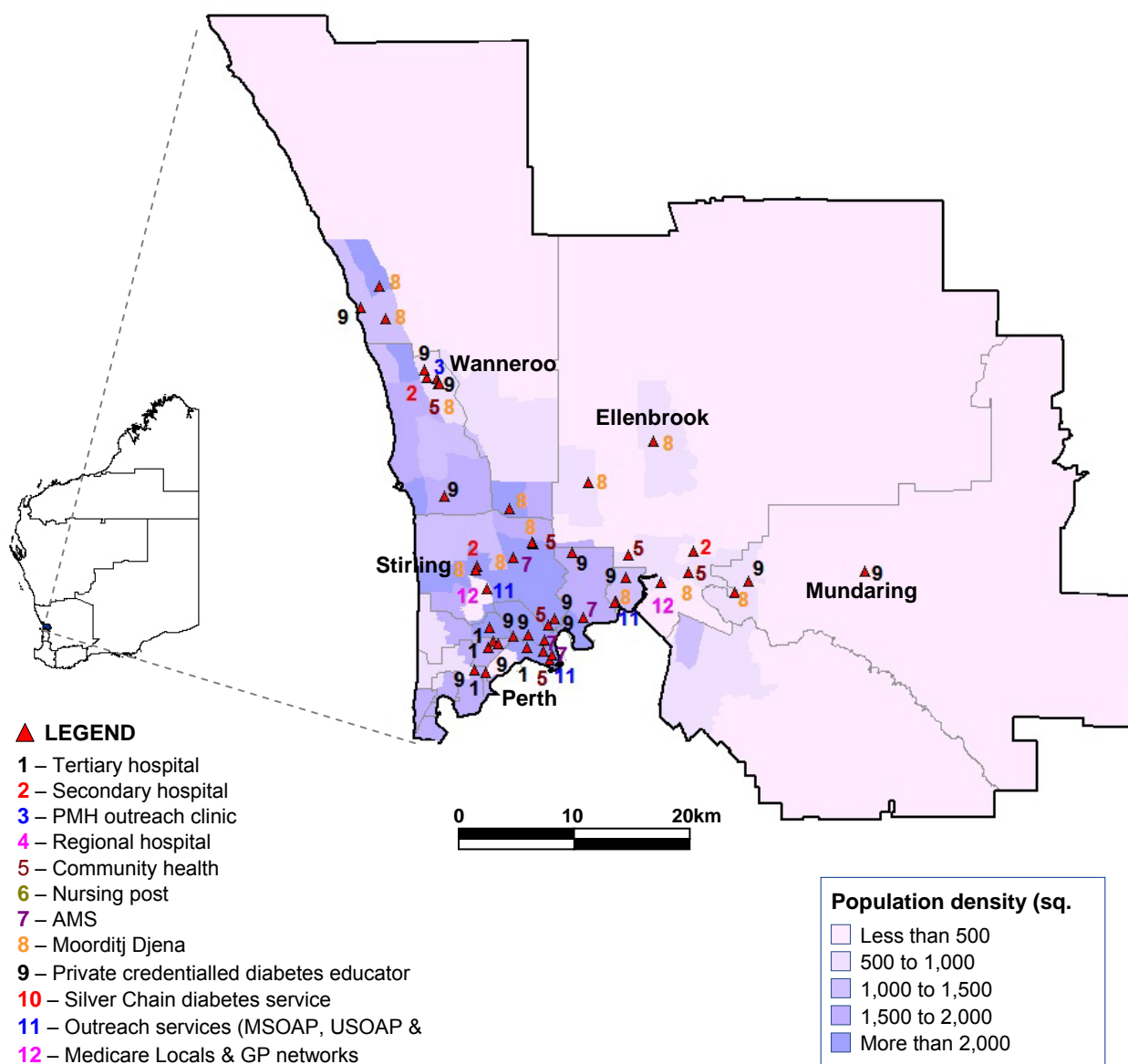
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012).



Map 1: NMHS diabetes services

NORTH METROPOLITAN

health region





Health districts

The health districts which form the NMHS are Bayswater-Bassendean, Joondalup, Kalamunda, Oceanic, Stirling Coastal, Stirling SEC, Valley & Hills and Wanneroo.

Bayswater-Bassendean

Diabetes specific services delivered in this district include:

- visiting NMHS Public Health & Ambulatory Care Diabetes Team (diabetes education and podiatry) services provided at Lockridge
- visiting Moorditj Djena services provided weekly at Ashfield, in conjunction with Street Doctor visits
- visiting endocrinology (four times a year) and cardiology (four times a year) provided by the Perth Central And East Metro Medicare Local, under USOAP
- diabetes educator services provided by two private credentialled diabetes educators (located in Bedford and Noranda).

The Lockridge Community Health Centre is the only health infrastructure identified for this district.

Joondalup

Table 17: Joondalup Hospital profile

Joondalup Hospital					Secondary hospital: Public / Private		
Treatment focus	Mainly T2 Inpatient care						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psych-ologist
	≤1		≤1				
Clinics and sessions	Inpatient treatment of people with diabetes Private endocrinologist and general physician Inpatient diabetes education						



Joondalup Hospital		Secondary hospital: Public / Private
Key points	<p>No diabetes outpatient clinic, limited ability for active management of diabetes Service gap between Joondalup and the metro area (SCGH / Osborne Park). The NMHS Public Health & Ambulatory Care Diabetes Team are seeking to address this by:</p> <ul style="list-style-type: none"> • providing access to a multidisciplinary team of specialists who would service Joondalup on a regular basis • establishing a permanent community base in Mirrabooka (there is a plot of land available but this is long-term) <p>Limited GP services available locally also No podiatry service</p>	

Table 18: NMHS Joondalup Diabetes Service profile

NMHS Joondalup Diabetes Service				Community health clinic: Public		
Treatment focus	T2 diabetes education and podiatry service					
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Physio
			≤1	≤1	≤1	≤1
Clinics and sessions	Monday to Friday, 8:30am to 5:00pm Individual and group education programs					
Key points	<p>This service, operated by the NMHS Public Health & Ambulatory Care Diabetes Team, provides multidisciplinary care for people with type 2 diabetes. The service is currently predominately focussed on newly diagnosed clients, and includes podiatry services for people with diabetes and those with high risk foot problems.</p> <p>The service is under review and is intended to be scope to take on a sub-acute focus</p> <p>The team based at this service also provides visiting services to Osborne Park, Mirrabooka (0.5 day per month by a diabetes educator and dietitian) and Nedlands.</p> <p>Podiatry services are provided by a recent graduate.</p>					

Other services delivered in the Joondalup Health District include:

- Moorditj Djena clinics (by appointment and walk in) provided at:
 - Mirrabooka (weekly)
 - Nollamara (weekly)
 - Balga (monthly)



- Girrawheen (monthly)
- the Vario Health and Wellness Institute, Edith Cowan University
- diabetes educator services provided by three private credentialled diabetes educators (two located in Joondalup and one located in Kingsley).

Vario Health and Wellness Institute, Edith Cowan University

The Vario Health and Wellness Institute at Edith Cowan University is a commercial entity that provides a cross-disciplinary alliance of research and health care. The Institute delivers the Vario Wellness Clinic, which provides a range of services, including a diabetes program called Diabetes Wellness Program. The program delivers Medicare funded services using the Chronic Disease Management item numbers to provide allied health services on referral from GPs. People with diabetes receive five appointments, consisting of two appointments with a dietitian and three appointments with an accredited exercise physiologist. Follow this, clients are invited to attend a group session (cost is \$18 per session, with a Medicare funded subsidy). Clients may also be referred to the clinic's Living Longer, Living Stronger Program. The Vario Wellness Clinic reported it provides approximately 1,500 to 2,000 people service to with type 2 diabetes per annum.

Kalamunda

No diabetes specific services identified. The Kalamunda Hospital Campus and Kalamunda Community Health Office are the only identified health infrastructure for this district.

Oceanic

Table 19: Sir Charles Gairdner Hospital profile

Sir Charles Gairdner Hospital					Tertiary hospital: Public		
Diabetes Clinic, Endocrinology and Diabetes Department							
Treatment focus	T2 (40-50per cent), complex TII Inpatient and outpatient care						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psych-ologist
	≤2 ⁷²		3				

⁷² Includes endocrinologists only, consisting of 6 consultants. In addition, 2 registrars and 1 resident were also identified as working at this diabetes service.



Sir Charles Gairdner Hospital		Tertiary hospital: Public
Clinics and sessions	7 consultant sessions Monday – Thursday Weekly rapid access clinic (registrar managed), approx 4 appointments per clinic 3 monthly adolescent to adult transition clinic, supported by transition coordinator	
Key points	Responsible for 6 inpatient beds with admission via ED Approx 1 week waiting time for urgent care Endocrinology and Diabetes Department manages a range of endocrine disorders including bone and calcium; pituitary and adrenal; thyroid; reproductive endocrinology and general endocrinology	
High Risk Foot Clinic		
Treatment focus	Diabetic podiatry service for the high risk foot	
Clinics and sessions	By outpatient or inpatient referral no specific clinic Monday to Friday (8am - 4pm), morning and afternoon sessions, with no specific allocation to diabetes Approx 65 per cent of activity is outpatient; 35 per cent inpatient	
Key points	≤3 FTE podiatrists working at this clinic. High risk wound clinic no longer operating due to resourcing constraints Inability to offer multidisciplinary clinic less efficient model due to need to separately access specialist input Limited resourcing to engage in proactive screening, patient education and provider education No direct GP referral possible. Limited referrals received from external services No admitting rights; admission via ED or consultant	

Other diabetes services delivered in the Oceanic Health District include the:

- diabetes educator services provided by four private credentialled diabetes educators (located in Leederville, Nedlands, Subiaco and Wembley)
- visiting NMHS Public Health & Ambulatory Care Diabetes Team (diabetes education and podiatry) services provided at:
 - Nedlands (one day every six weeks by a graduate podiatrist based at SCGH)
 - North Perth – Italo Australian Welfare and Cultural Centre (two days per week by a health worker assisting the Italian community)
 - East Perth – Rod Evans Senior Citizens Centre (one day per fortnight provided by a podiatrist).



Stirling Coastal

No services identified. The Mercy Family and Community Services facility is the only identified health infrastructure in this district.

Stirling SEC

Table 20: Osborne Park Hospital profile

Osborne Park Hospital					Secondary hospital: Public		
Treatment focus	Outpatient care, uncomplicated T2 and GDM						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	≤1		≤1		≤1		
Clinics and sessions	Outpatient diabetes education and dietitian service GDM diabetes education group classes						
Key points	Referrals received from general practices in NMHS region General podiatry service available covering inpatients and outpatients. This service provides preventative care (e.g. routine care, education and assessment) for people with low, medium and high risk diabetes; people with complex chronic wounds requiring multidisciplinary management are referred to a tertiary service						

Other services delivered in the Stirling SEC health district include:

- visiting NMHS Public Health & Ambulatory Care Diabetes Team (diabetes education and podiatry) services provided at Mirrabooka Child and Adolescent Health Service (0.5 days per month provided by a diabetes educator and dietitian)
- visiting Moorditj Djena services provided at:
 - Mirrabooka, Derbarl Yerrigan (clinic, weekly)
 - Nollamara (clinic, weekly)
 - Stirling Dialysis, (van, once every three weeks).



Valley & Hills

Table 21: Swan District Health Campus

Swan District Health Campus					Secondary hospital		
Treatment focus	T1, complex T2 and GDM Inpatient and outpatient care						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	≤1		≤1	≤1	≤1		
Clinics and sessions	One session (0.5 day) per week for diabetes appointments hosted by general physician, registrar and diabetes educator 1 day per week (Thursday) <ul style="list-style-type: none">• Gestational Diabetes Group mornings• Diabetic clinic afternoons (approx 12-15 patients per session)						
Key points	Care led by general physician with diabetes special interest Average of 3-4 new and 7-9 regular patients seen per week Diabetes education provided in the inpatient, outpatient, antenatal clinic and paediatric settings Insufficient capacity for intensive education and diabetes management (e.g. around insulin initiation) after specialist assessment – limits ability to refer patients back to general practice for ongoing management Podiatry service in Swan Kalamunda covering inpatients and outpatients. This service provides preventative care (e.g. routine care, education and assessment) for people with low, medium and high risk diabetes; people with complex chronic wounds requiring multidisciplinary management are referred to a tertiary service Inpatient: treatment of patients with acute complications, e.g. patients with diabetic ketoacidosis hyperosmolar non-ketotic state.						

Table 22: NMHS Midland Diabetes Service profile

NMHS Midland Diabetes Service				Community health clinic: Public		
Treatment focus	T2 diabetes education and podiatry service					
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Health worker
			≤2	≤1	≤2	≤1
Clinics and sessions	Monday to Friday, 8:30am to 5:00pm Individual and group education programs					



NMHS Midland Diabetes Service		Community health clinic: Public
Key points	<p>This service, operated by the NMHS Public Health & Ambulatory Care Diabetes Team, provides multidisciplinary care for people with type 2 diabetes.</p> <p>The service is under review and is intended to be scope to take on a sub-acute focus</p> <p>The team based at this service also provides visiting services to:</p> <ul style="list-style-type: none">• Lockridge: 5 days per week (3 days diabetes educator, 5 days podiatry, 1 day dietitian)• Midland: 3 days per week (health worker assisting the Italian community)• North Perth: 2 days per week (health worker assisting the Italian community).	

Wanneroo

Visiting Moorditj Djena services are provided at:

- Clarkson (van, monthly)
- Merriwa (van, monthly).

No other services identified.

Primary health care services

In addition to local general practice services, primary health care services active in the region include the:

- NMHS Public Health & Ambulatory Care Diabetes Team, which provides diabetes education, dietitian and podiatry services at East Perth (Rod Evans Senior Citizens Centre), Joondalup, Lockridge, Mirrabooka (Child and Adolescent Health Service), Midland and North Perth (Italo Australian Welfare and Cultural Centre)
- Perth North Metropolitan Medicare Local, which is implementing a diabetes care coordination program on behalf of the NMHS
- Perth Central and East Metropolitan Medicare Local, which is the process of establishing a diabetes care coordination program on behalf of the NMHS
- Vario Health and Wellness Institute.

Aboriginal health

Identified Aboriginal health services include:

- Derbarl Yerrigan Aboriginal Health Service, which hosts visiting endocrinology, nephrology, cardiology and geriatrics specialists services



under the Indigenous Chronic Disease Program. Derbarl Yerrigan also makes referrals to the Moorditj Djena Program

- Moorditj Djena services.

Moorditj Djena

Moorditj Djena, meaning “strong feet” is a mobile multidisciplinary podiatry and diabetes education program for Aboriginal and Torres Strait Islander people living in the Perth metropolitan area. The program is funded under the "Closing The Gap" initiative. Key partners include the NMHS, SMHS and Derbarl Yerrigan.

Table 23: Moorditj Djena Program in NMHS

NMHS Moorditj Djena Program				Community health program: Public		
Treatment focus	Aboriginal and Torres Strait Islander people with T2					
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Aboriginal health worker
			≤1		≤2	≤2
Clinics and sessions	<p>Weekly clinics delivered at Ashfield and Joondalup 12 six-hour sessions are delivered per week. Locations may vary depending on need.</p> <p>Clients are offered a mix of booked and walk in appointments. Other locations serviced by Moorditj Djena teams are:</p> <ul style="list-style-type: none">• Ashfield (clinic, weekly)• Balga (clinic, monthly)• Clarkson (van, monthly)• Cullacabardee (van, monthly)• Ellenbrook (van, monthly)• Girrawheen, Kookaburra Club (van, monthly)• Joondalup (clinic, weekly)• Koongamia (van, monthly)• Merriwa (van, monthly)• Midland (clinic, weekly)• Mirrabooka (clinic, weekly)• Nollamara (van, weekly).					



NMHS Moorditj Djena Program		Community health program: Public
Key points	<p>Funded under the Closing The Gap initiative until June 2013</p> <p>Moorditj Djena provides the following services:</p> <ul style="list-style-type: none">• foot and diabetes screening and assessment• clinical management for high-risk clients• prevention and risk reduction• healthy lifestyle promotion and education• self management training• referrals to other services as appropriate• annual recalls and follow-up• patient support and advocacy• care coordination. <p>Services are provided by a multidisciplinary team which includes Aboriginal health workers (≤ 3 FTE), diabetes educators (≤ 2 FTE) and podiatrists (≤ 4 FTE). Clients are offered a mix of booked and walk in appointments. 12 six hour sessions are delivered per week.</p>	



4.2.2 South Metropolitan Health Service

Overview

The main locations within the SMHS region include the Perth CBD, Fremantle, Bentley, Armadale, Rockingham and Peel areas. Available data indicate that diabetes prevalence is higher than the state average. The SMHS region is a key population and diabetes growth area. In terms of population, it is the second largest health region and holds a diverse population of over 867,371 people. As with NMHS, although the proportion of residents identifying as Aboriginal is lower than the state average, SMHS has the third largest number of Aboriginal people in WA, being over 12,000 people. Available data indicate that diabetes prevalence is above the state average.

The region encompasses inner and outer metropolitan suburbs and consists of five health districts. Higher proportions of Aboriginal and people from a lower socio economic status background were reported for the south-eastern and southern suburbs. SMHS' southern suburbs, located in the Rockingham-Kwinana and Peel Health districts, have been identified as experiencing substantial population growth in recent years, putting pressure on local services.

The main diabetes specific service providers identified during this review are:

- Royal Perth Hospital
- Fremantle Hospital and Health Service
- Bentley Health Service
- Rockingham General Hospital
- Princess Margaret Hospital – Rockingham Diabetes Outreach Clinic
- Armadale Health Service
- Hilton Community Health Centre.

The Fiona Stanley Hospital is due to commence operations in 2014/15. This facility will provide a Level 6 endocrinology service as well as a 'Diabetes In Pregnancy' service for SMHS, which is expected to reduce demand on KEMH.

Other important service providers include private providers such specialists, general practices, dietitians and podiatrists, as well as the Bentley-Armadale Medicare Local, Fremantle Medicare Local and Perth South Coastal Medicare Local. It is estimated there were approximately 651 FWE GPs (40 per cent of



WA GPs) working from 204 practices in 2010. The FWE GP to population ratio was 1,395, compared to a state average of 1,496.⁷³

Key statistics relating to SMHS are outlined over page.

Table 24: Estimated resident population, SMHS, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	867,371	36.9 (s)
Aboriginal ERP	12,231	1.4 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 25: Diabetes prevalence, SMHS, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	227	n.a.	n.a.	227	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	2,412	37,523	6,800	45,497	12,231
All adults (per cent)	0.4	5.6	2.0	6.8	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)

⁷³ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



Table 26: Estimated diabetes related service activity, SMHS, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	2,343	2,697	1,810	808	0.9
ED presentations	1,289	1,326	1,409	1,465	1.7
Community health occasions of service	5,486	4,511	4,491	4,930	5.7
Non admitted occasions of service	n.a.	25,522	26,882	31,840	36.7
GP services	146,732	150,494	154,353	158,212	182.4
Total diabetes services counted	155,850	184,550	188,945	197,255	227.4

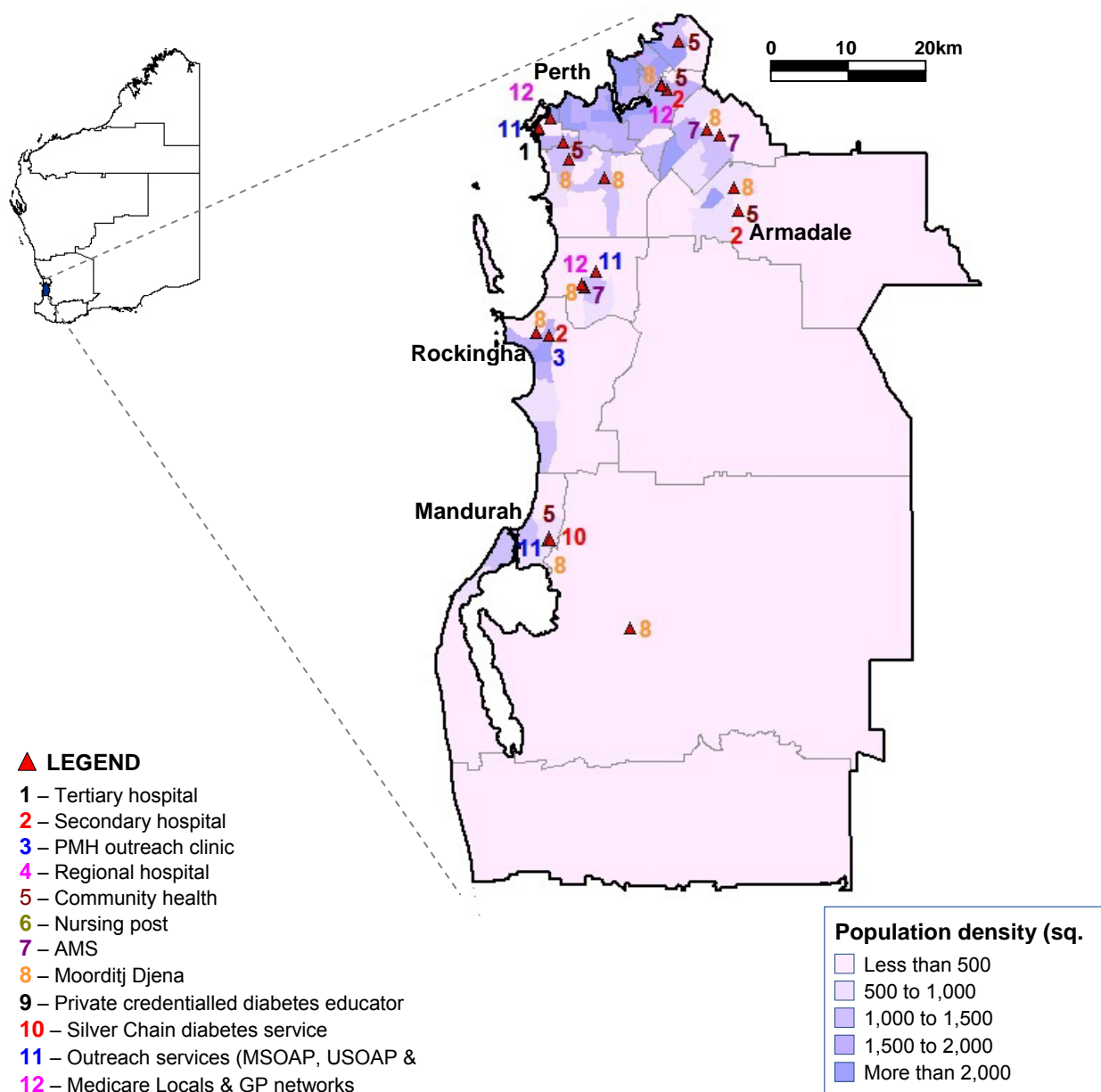
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012).



Map 2: SMHS diabetes services

SOUTH METROPOLITAN

health region





Health districts

The health districts which form SMHS are Armadale, Bentley, Fremantle, Peel and Rockingham-Kwinana.

Table 27: Royal Perth Hospital profile

Royal Perth Hospital ⁷⁴					Tertiary hospital: Public		
RPH Diabetes and Endocrinology Clinic							
Treatment focus	T1, complex T2 (approx 65 per cent of care) Inpatient and outpatient care						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	≤2	-	≤5	≤2	≤2 ⁷⁵		≤1
Clinics and sessions	9-3pm, Monday to Friday, 2 sessions per day, 6 patients per session (2 new, 4 old) T1, T2, pre-diabetes, newly diagnosed Includes group education & one on one appointments						
Key points	Referrals received from NMHS (55 per cent), SMHS (35 per cent) and Country WA (10 per cent) Approx 80-90 referrals per month No young adult transition clinic Waiting list: Urgent 1-2 weeks; non-urgent 3 to >6 months. Approx 300 people Average waiting list for people with non-urgent cases is over 6 months						
Multi-disciplinary High Risk Foot Clinic							
Treatment focus	Active foot ulceration, mainly diabetes related (around 80 per cent)						
Clinics and sessions	8:30am-4:30pm 1 day per week (Tuesdays): new patient assessment clinic from 8.30am-12.00pm, multi-disciplinary team clinic 2:00pm-4.30pm treating up to 10 patients						
Key points	Podiatry led, multidisciplinary team Works closely with Diabetes Clinic, vascular department, Hospital In The Home and Silver Chain Those with active wounds return around every 2-6 weeks or as required Waiting list: Urgent 2-4 weeks; non-urgent 6-8 weeks. At limit. Significant demand preventing provision of clinical support to country services						

⁷⁴ Although geographically located within the NMHS catchment, RPH is a SMHS operated service.

⁷⁵ While there are ≤5 FTE podiatrists, they are mainly providing general podiatry care; around 2 FTE are involved in regular diabetes care.



Armadale

Table 28: Armadale Community Health and Development Centre

Armadale Community Health and Development Centre					Community health centre: Public		
Treatment focus	T2 (60-90 per cent) and GDM. Diabetes education, dietetics and podiatry. GP referral required.						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	≤1 ⁷⁶		≤1	≤1	≤1		
Clinics and sessions	Diabetes education sessions: <ul style="list-style-type: none">• Initiation to insulin – 2 week program – every 2 weeks Mondays• Gestational Diabetes – 2 week program – every Wed Am• Introduction to Diabetes – 2hour program – once fortnight• Living with diabetes – 7 week program – 10 groups year – Tues pm and Fri AM						
Key points	Community care only Around 40-50 regular patients Receives 700 -750 new referrals for T2 and GDM per year Delivers around 100 – 120 visits per month for the diabetes educator General physician led. Outpatients with T2 seen as private patients Complex patients referred to FHHS. No endocrinology service at present Public podiatry role at the Centre is split between adult and child / adolescent services. No public podiatry at the Armadale Hospital						

Bentley

Table 29: Bentley Health Service profile

Bentley Health Service					Secondary hospital: Public		
Treatment focus	GDM, T2, minimal T1						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
			≤2	≤1	≤1		

⁷⁶ General physician with a diabetes special interest providing private outpatient sessions for type 2 diabetes.



Bentley Health Service		Secondary hospital: Public
Clinics and sessions	Inpatient service Individual appointments Outpatient education - Living with Diabetes for T2 (morning, afternoon and evening classes offered on an eight week cycle), GDM group clinic, Journey of Living with Diabetes ⁷⁷ Insulin initiation and stabilisation Podiatry service	
Key points	Visiting endocrinologist half day per month Complex patient mainly referred to Fremantle Increasingly complex patient profile as access to tertiary services becoming more difficult High proportion of CALD people in the region (especially Asian and Indian background) Waitlist non urgent approx 4 weeks. Urgent patient prioritised and seen sooner in place of cancellation or during staff admin time DNA rate of 22 per cent (July-Sept 2012)	

The Bentley – Armadale Medicare Local employs a diabetes educator and two dietitians. Its catchment covers the Bentley and Armadale health districts.

Fremantle

Table 30: Fremantle Hospital & Health Service

Fremantle Hospital & Health Service					Tertiary hospital: Public		
FHHS Endocrinology and Diabetes Clinic							
Treatment focus	T1, complex T2, those requiring pumps						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	≤2		≤2	≤1	≤2		≤1
Clinics and sessions	Inpatient and outpatient care 2 days a week (Monday and Thursday) Monday 2 clinics am / pm (6 patients per session – 2 new, 4 existing) Thursday 1 inpatient referral round and 1 MDT foot clinic (8 patients) Weekly transition clinic for 17-25 yr olds						

⁷⁷ A modified version of the Living With Diabetes program for the Aboriginal community, provided by an Aboriginal health worker engaged by the Bentley Population Health Unit.



Fremantle Hospital & Health Service					Tertiary hospital: Public		
Key points	Inpatient: 10-15 requests per week (both type 1 and 2) for diabetes education No waiting list for urgent referrals. Waiting list for non-urgent referrals is 1.5 to 3 months.						
FHHS Diabetes Education Unit							
Treatment focus	T1, complex T2, continuous subcutaneous insulin (CSII) pump therapy						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
			≤4 ⁷⁸				
Clinics and sessions	Inpatient and outpatient care Five days a week (Monday to Friday, 8:30am to 4:30pm) Individual consults and group sessions Groups sessions: SMaRT1e and pump programs						
Key points	Nurse led clinic except for weekly MDT transition clinic on Monday afternoon 15 to 20 inpatient referrals per week No waiting list for urgent referrals. Waiting list for non-urgent referrals is approx 4 weeks People with T2 and GDM are referred to the Hilton Community Care Centre (which belongs to the FHHS).						
High Risk Foot Clinic							
Treatment focus	Those at risk of amputation (i.e. diabetic neuropathy, ulceration and / or infection)						
Clinics and sessions	1 day a fortnight (Thursday) Ulcer care, diabetic / renal foot assessments, arthritis foot care, community aids & equipment (CAEP) referral						
Key points	Vascular led, multidisciplinary team Mainly outpatient care Well established but informal referral pathways Aboriginal people are referred on to the Moorditj Djena Teams (mobile) – sits under the NMHS & SMHS public health units. Aboriginal people may receive care from Fremantle and then reconnected with Moorditj Djena as appropriate No waitlist – urgent patients seen as soon as possible						

⁷⁸ Includes a 1.0 FTE clinical nursing manager who also manages the service out at Hilton.



Table 31: Hilton Community Care Centre

Hilton Community Care Centre					Community health centre: Public		
Treatment focus	T2, GDM, impaired glucose tolerance						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
			≤1	≤1			
Clinics and sessions	Outpatient only Monday to Friday 9am to 3pm Individual and group education sessions Group education for T2 diabetes, gestational diabetes and IGT Individual consultations for CALD, elderly, special needs Referrals from GPs, clients and allied health accepted.						
Key points	Part of the FHHS group. Receives referrals mainly from Fremantle and Kaleeya Hospitals Hilton Community Care Centre model seeks to empower the person with diabetes Hilton delivers evening group education sessions with Diabetes WA support - Journey of Living With Diabetes.						

Peel

Table 32: Peel Health Campus

Peel Health Campus					Secondary hospital: Private		
Treatment focus	T1, complex T2						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	≤1						
Clinics and sessions	Hosts a visiting endocrinology service provided under the Integrated Diabetes and Endocrinology Service (IDES) initiative, coordinated by RHW.						



Rockingham-Kwinana

Table 33: Rockingham General Hospital

Rockingham General Hospital					Secondary hospital: Public		
Treatment focus	T1, complex T2, GDM Includes Rockingham General Hospital, various GP surgeries and Kwinana Community Health Centre Type of Services: Individual community diabetes education, T2 groups, GDM, insulin initiation and stabilisation, community podiatry, community dietetics, home visits. GP or self-referral.						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psychologist
	≤1 ⁷⁹	≤1	≤4 ⁸⁰	≤1		≤1	
Clinics and sessions	Monday - Friday General diabetes, T1, T2, GDM, newly diagnosed, insulin and pump, rapid access, SmarT1E and Living With Diabetes education, Aboriginal, group and individual General podiatry services available Hosts quarterly PMH outreach clinics						
Key points	Mainly outpatient with some inpatient care Emerging as important diabetes clinic in a fast growing, high need area Promotes self management of diabetes, and referral to community service or general practitioners with a management plan Referrals mainly from Rockingham area, also some from South West No access to clinical psychology or social work If endocrinology service to Mandurah ceases, this would place pressure on Rockingham waiting lists Waiting lists <ul style="list-style-type: none">• Rapid access clinic – up to two weeks• General diabetes services – 10 months.						

The Perth South Coastal Medicare Local and Silver Chain co-fund a diabetes educator position, who delivers the Peel Diabetes Clinic.

Primary health care services

Primary health care services identified as providing diabetes specific services in the SMHS region are outlined below.

⁷⁹ Consists of 0.5 FTE permanent plus 0.4 FTE non-recurrent funding endocrinology positions.

⁸⁰ Consists of 2.5 FTE Diabetes Educators plus 1.0 FTE allocated to a special inpatient project for a further 12 months.



Organisation	Key services / programs
Bentley Armadale Medicare Local	Metro Healthy Lifestyles Chronic Disease Self Management Employs a diabetes educator and two dietitians
Fremantle Medicare Local	Metro Healthy Lifestyles Chronic Disease Self Management Aboriginal T2 diabetes care at Fremantle and Kwinana St Doctor
Perth South Coastal Medicare Local	Metro Healthy Lifestyles: 2 diabetes educators w T2 focus 2 Aboriginal medical services at Kwinana and Mandurah Rockingham GP Super Clinic (in planning stage)
Silver Chain	Peel Diabetes Clinic, Mandurah

Aboriginal health

Identified Aboriginal health services include:

- Moorditch Curlongga, Maddington
- SMHS Public Health Unit, delivering diabetes education services for Aboriginal people under the Journey of Living with Diabetes Program
- Moorditj Djena.

Table 34: Moorditj Djena Program in SMHS

SMHS Moorditj Djena Program				Community health program: Public		
Treatment focus	Aboriginal and Torres Strait Islander people with T2					
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Aboriginal health worker
			≤1		≤2	≤1



SMHS Moorditj Djena Program		Community health program: Public
Clinics and sessions	<p>Weekly clinics delivered at Kelmscott, Bentley, Maddington, Mandurah and Pinjarra.</p> <p>12 six-hour sessions are delivered per week</p> <p>Clients are offered a mix of booked and walk in appointments.</p> <p>Other locations serviced by Moorditj Djena teams are:</p> <ul style="list-style-type: none"> • Kelmscott (clinic, weekly) • Bentley – Armadale Medicare Local, Bentley (clinic, weekly) • Ottey Centre (van, fortnightly) • Maddington, Derbarl Yerrigan (clinic, weekly) • Kwinana, Moorditj Koort, Medina (van, fortnightly) • Burdiya, Hamilton Hill (van, fortnightly) • Nidjalla Waangan Mia, Mandurah (clinic, weekly) • Pinjarra, Murray District Hospital, (clinic, monthly) • Babbingar Mia, Rockingham (van, weekly). 	
Key points	<p>Funded under the Closing The Gap initiative until June 2013</p> <p>Moorditj Djena provides the following services:</p> <ul style="list-style-type: none"> • foot and diabetes screening and assessment • clinical management for high-risk clients • prevention and risk reduction • healthy lifestyle promotion and education • self management training • referrals to other services as appropriate • annual recalls and follow-up • patient support and advocacy • care coordination. <p>Services are provided by a multidisciplinary team which includes Aboriginal health workers (≤1 FTE), diabetes educators (≤1 FTE) and podiatrists (≤2 FTE). Clients are offered a mix of booked and walk in appointments. 12 six hour sessions are delivered per week.</p>	

Outreach services

Identified outreach services include:

- PMH diabetes outreach clinic at Rockingham General Hospital
- USOAP
 - Fremantle - Endocrinology, South Metropolitan Health Unit



- Kwinana - Endocrinology, Perth South Coastal Medicare Local
- Mandurah – Endocrinology, Perth South Coastal Medicare Local
- IDES endocrinology services at Peel Health Campus. Between March and November 2012 84 sessions (approximately ten per month) were delivered and 712 people with diabetes were seen at the Peel Health Campus.



4.3 WA country regions

4.3.1 South West

Overview

The main towns within the South West health region are Bunbury, Bridgetown, Busselton, Collie, Manjimup and Margaret River. The South West has the largest population of the country regions, with over 158,615 people. Bunbury is the regional centre. As a major tourist destination, health services in the region must also support large numbers of visitors particularly during school holidays and summer months. Available data indicate that diabetes prevalence is lower than the WA average.

Over 3,300 or 2.7 per cent of the population identify as Aboriginal. From 1998 to 2007, the mortality rate due to diabetes for Aboriginal people living in the South West, Great Southern and Wheatbelt regions was 10.4 times higher than that of the total WA population.⁸¹

Diabetes services in the South West are mainly based in Bunbury, with limited access in surrounding towns such as Busselton, Margaret River and Collie. There are no endocrinologists or general physicians with a diabetes special interest⁸² permanently located in the South West, with some residents needing to travel to Perth to access specialist care. Dietitian and podiatry services provided by WACHS are available in each district; however these are very limited for some locations. A number of private podiatrists are also located in the region.

The South West Population Health Unit is currently exploring partnerships with Diabetes WA for delivery of diabetes education sessions, and Silver Chain for delivery of a telehealth service that includes remote monitoring, proactive nurse management and coaching over telephone for people referred via inpatient settings. However, these services are yet to be realised.

The main diabetes specific service providers identified during this review are:

- WACHS hospital and primary health care services, which employs diabetes educators, dietitians and podiatrists⁸³

⁸¹ Crouchley K and Carlose N. *Aboriginal Health Profile, South West Health Region, 2012*. Aboriginal Health Improvement Unit, WACHS: 2012.

⁸² Six general physicians were reported to be based in the region, predominantly providing inpatient care at South West Health Campus or private outpatient sessions.

⁸³ WACHS dietitians and podiatrists are generalist providers who see people with diabetes as well as with other health issues.



- Koombana Health Network,⁸⁴ which delivers a ≤ 1 FTE diabetes education service
- Silver Chain, which provides diabetes educator services to Busselton and Collie
- St John of God Bunbury, delivers a ≤ 1 FTE diabetes education service
- South West Aboriginal Medical Service, which delivers a ≤ 1 FTE diabetes education service
- PMH diabetes outreach clinic delivered at the South West Health Campus
- a visiting endocrinologist and general physician on a monthly basis at Margaret River
- private allied health providers, including private podiatrists, working in a number of South West towns.

Other important service providers include local general practices. It is estimated there were approximately 57 FWE GPs (three per cent of WA GPs) working from 19 practices in 2010. The FWE GP to population ratio was 1,482, compared to a state average of 1,496.⁸⁵

Table 35: South West diabetes service provider workforce profile (FTE)

Service	Nurse prtnr	DE / DNE	Dietitian	Podiatry
WACHS	≤ 1 ⁸⁶	≤ 2	≤ 7	≤ 2
Koombana Health Network		≤ 1		
Silver Chain		≤ 2		
South West Aboriginal Medical Service		≤ 1		
St John of God Bunbury		≤ 1		
Total	≤ 1	≤ 7	≤ 7	≤ 2

Source: KPMG based on stakeholder consultations

Key statistics relating to the South West are outlined below.

⁸⁴ Formerly the Greater Bunbury Division of General Practice.

⁸⁵ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.

⁸⁶ Note: This provider is working in a generalist health practitioner role. It is likely that nurse practitioner services will also be established at Collie and Manjimup in the near future.



Table 36: Estimated resident population, South West, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	158,615	6.7 (s)
Aboriginal ERP	3,349	2.1 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 37: Diabetes prevalence, South West, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	46	n.a.	n.a.	46	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	442	6,046	1,545	7,800	425
All adults (per cent)	0.4	4.8	2.5	6.2	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)



Table 38: Estimated diabetes related service activity, South West, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	650	665	454	218	1.4
ED presentations	356	338	339	352	2.2
Community health occasions of service	154	68	48	42	0.3
Non admitted occasions of service	n.a.	1,153	1,303	1,054	6.6
GP services	24,625	25,256	25,904	26,552	167.4
Total diabetes services counted	25,785	27,480	28,048	28,218	177.9

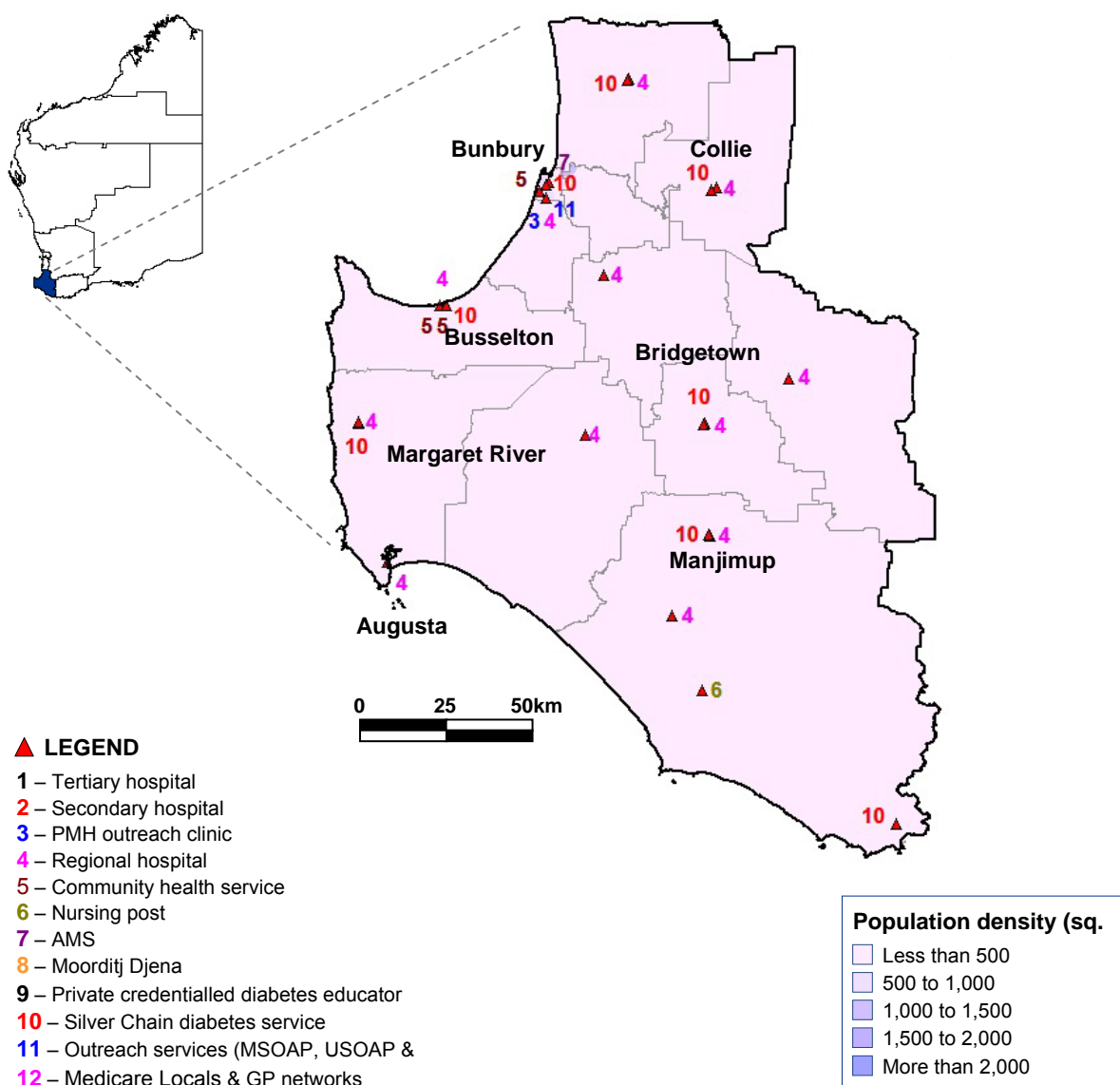
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012).



Map 3: South West diabetes and related services

SOUTH WEST

health region





Health districts

The health districts which form the South West are Bunbury, Naturaliste, Leeuwin, Leschenault, Warren-Blackwood, and Wellington.

Bunbury

The regional centre of Bunbury forms this health district. Key diabetes services in the district include the:

- South West Health Campus (see profile below)
- Koombana Health Network, which employs a ≤ 1 FTE diabetes education service
- St John of God Bunbury, which employs a ≤ 1 FTE diabetes educator (joint funded by PMH)
- South West Aboriginal Medical Service, which employs a ≤ 1 FTE diabetes educator
- visiting ophthalmology service delivered under USOAP.

Table 39: South West Health Campus profile

South West Health Campus			Secondary hospital: Public		
Treatment focus	Inpatient and outpatient, T2, limited T1 and GDM				
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry
			≤2	≤5	≤1
Clinics and sessions	Outpatient appointments four days a week with a diabetes educator, focussed on people with more complex diabetes Group education sessions on: <ul style="list-style-type: none">• Living with Diabetes• Newly diagnosed T2• Patients with impaired glucose• Insulin delivery group – ‘Learning to live with insulin’.				



South West Health Campus		Secondary hospital: Public
Key points	<p>Provides ≤ 1 FTE diabetes educator for inpatients as a five day a week service. This includes 0.2 FTE diabetes education time to support a general physician at a High Risk Antenatal Clinic for women >20 weeks of pregnancy. Support provided from KEMH also. GDM support in the South West has been identified as very limited. Approximately half of babies born in the South West are delivered at South West Health Campus</p> <p>Hosts a ≤ 1 FTE diabetes educator employed by the South West Population Health Unit in the outpatient setting</p> <p>Hosts visiting PMH diabetes outreach clinics provided on a monthly basis</p> <p>No inpatient podiatry services available</p> <p>Waiting lists for outpatient appointments are approximately 1 month, and 1-2 months for group education</p>	

Naturaliste

The town of Busselton forms this health district. The only diabetes services identified for this district is the Silver Chain diabetes education service.

Leeuwin

The main towns in Leeuwin are Augusta and Margaret River. Diabetes services identified for this district were a visiting endocrinologist and general physician (once a month), as well as diabetes educator services delivered at a local general practice.

Leschenault

The main towns in Leschenault are Australind, Brunswick Junction and Harvey. No diabetes services were identified for this district; however the district is in close proximity to Bunbury.

Warren-Blackwood

The main towns in Warren-Blackwood are Boyup Brook, Bridgetown, Manjimup, Northcliffe, Pemberton and Nannup. No diabetes specific services were identified for this district. A Silver Chain diabetes education position based at Manjimup is currently unfilled. Other health services relevant to the district include the Boyup Brook Soldiers Memorial, Bridgetown, Nannup, Pemberton and Warren Hospitals.

Wellington

The main towns in Wellington are Donnybrook and Collie. Key diabetes services in the district include the provision of four hours of diabetes education service to Donnybrook each fortnight and provision of a Silver Chain diabetes



service at Collie. A general practice located in Collie also offers diabetes educator services one day per week.

Primary health care services

As described above, key primary health care services are provided by local general practices, the Koombana Health Network and Silver Chain.

Aboriginal health

The only identified Aboriginal health services are provided by the South West Aboriginal Medical Service.

Outreach services

As described above, outreach services are provided by PMH at Bunbury and Outreach Eyes Services (ophthalmology).



4.3.2 Great Southern

Overview

The main towns within the Great Southern health region are Albany and Katanning. In terms of population size, Great Southern is the third smallest health region in WA with over 59,077 people. Available data indicate diabetes prevalence is lower than the state average, although local stakeholder report 250 people with newly diagnosed diabetes are registered each year.

Over 2,200 or 3.8 per cent of the population identify as Aboriginal. From 1998 to 2007, the mortality rate due to diabetes for Aboriginal people living in the South West, Great Southern and Wheatbelt regions were 10.4 times higher than that of the total WA population.⁸⁷

The region must cope with rural isolation, low population density, a lack of public transport and an ageing population. Workforce shortages are a major concern for local service providers, with shortages reported for all service provider types and especially for diabetes educators. Given this isolation, local service providers work collaboratively and are well coordinated. Diabetes services are provided mainly from Albany and Katanning.

People with complex diabetes, particularly type I, access care from either visiting specialists under MSOAP, receive care from a local provider (e.g. GP or diabetes educator) supported by telehealth consultations from Perth based specialists, or are required to travel to Perth. Stakeholders identified a need for more diabetes education, public podiatry and preventative health services, as well as more service options delivered from Katanning.

The main diabetes specific service providers identified during this review are:

- Albany Hospital
- Amity Health (Albany based), which:
 - delivers DESMOND group education sessions for people with T2 diabetes (pilot program, delivered in partnership with Diabetes WA)
 - employs 2 FTE dietitians under the Rural Primary Health Service program
 - hosts visiting specialists under the Integrated Diabetes and Endocrinology Service (IDES) and MSOAP models

⁸⁷ Crouchley K and Carlose N. *Aboriginal Health Profile, South West Health Region, 2012*. Aboriginal Health Improvement Unit, WACHS: 2012.



- provides chronic disease management services under Closing The Gap (CTG), including outreach workers and use of brokerage funds to assist with appointments and device related costs
- Great Southern Aboriginal Health Service, which delivers diabetes education services at Albany and Katanning
- PMH, which delivers an outreach clinic in Albany
- a private diabetes educator, working from local general practices. The diabetes educator receives telehealth and outreach support from a number of specialist services including the visiting endocrinologist, PMH and KEMH. However, the diabetes educator is nearing retirement and looking to reduce their working time.

The region's overall diabetes service provider FTE profile (excluding visiting services) is outlined below.

Table 40: Great Southern diabetes service provider workforce profile (FTE)

Service	Nurse prtnr	DE / DNE	Dietitian	Podiatry
WACHS		≤1		
Amity Health			≤2	
Great Southern Aboriginal Health Service		≤1		
Silver Chain				
Private		≤1	≤3	≤2
Total		≤3	≤5	≤2

Source: KPMG based on stakeholder consultations

Other important service providers include local general practices, dietitians and podiatrists and Silver Chain which delivers services in Albany (nursing) and Katanning (nurse practitioner). It is estimated there were approximately 63 FWE GPs (4 per cent of WA GPs) working from 23 practices in 2010. The FWE GP to population ratio was 1,311, compared to a state average of 1,496.⁸⁸

Key statistics relating to Great Southern are outlined below.

⁸⁸ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



Table 41: Estimated resident population, Great Southern, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	59,077	2.5 (s)
Aboriginal ERP	2,249	3.8 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 42: Diabetes prevalence, Great Southern, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	17	n.a.	n.a.	17	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	154	2,167	455	2,681	286
All adults (per cent)	0.3	4.6	2.0	5.7	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)



Table 43: Estimated diabetes related service activity, Great Southern, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	167	151	155	74	1.3
ED presentations	141	119	139	145	2.4
Community health occasions of service	311	263	178	73	1.2
Non admitted occasions of service	n.a.	306	556	580	9.8
GP services	12,402	12,720	13,046	13,372	226.3
Total diabetes services counted	13,021	13,559	14,074	14,243	241.1

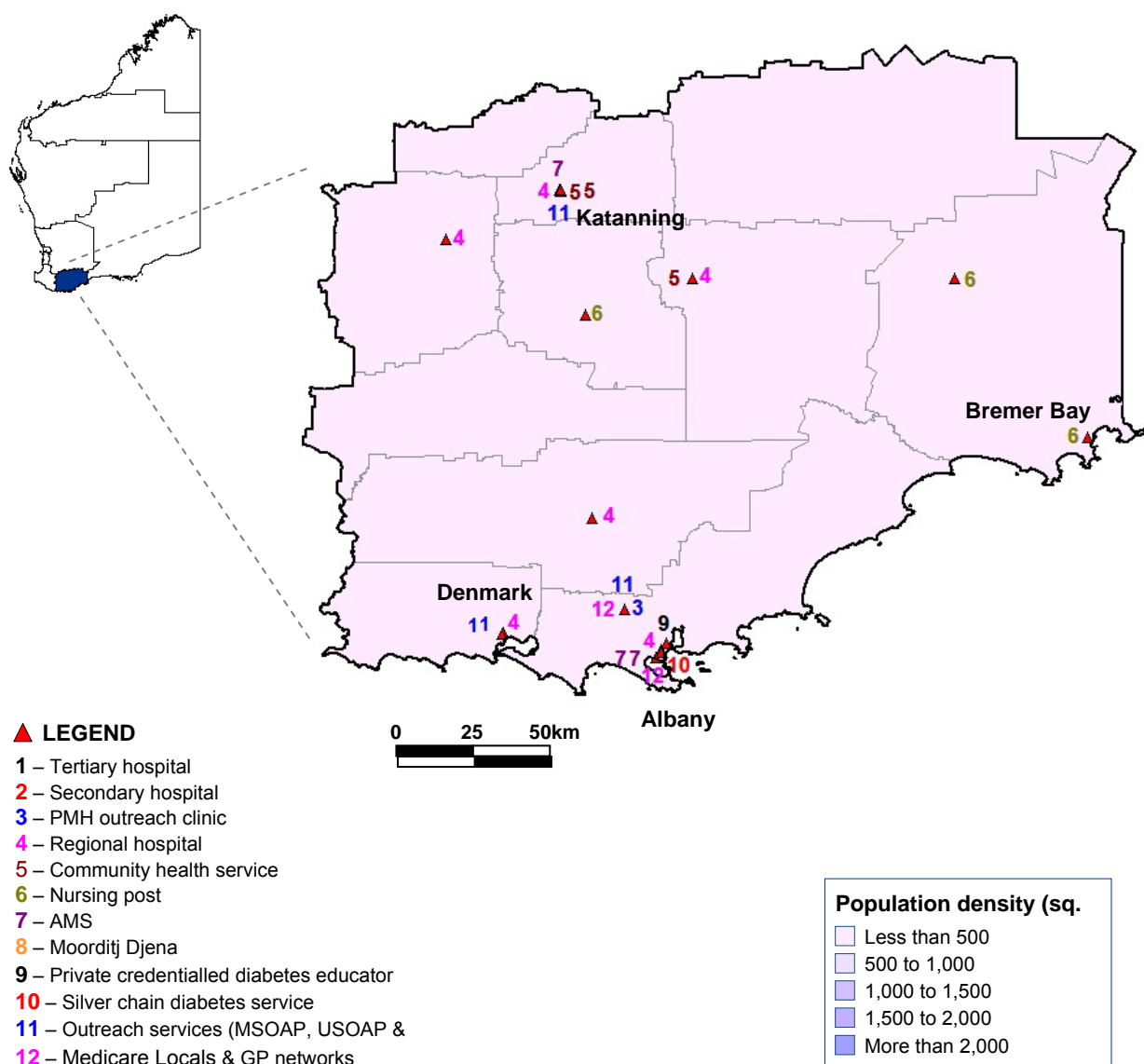
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012).



Map 4: Great Southern diabetes and related services

GREAT SOUTHERN

health region





Health districts

The health districts which form the Great Southern region are Central Great Southern and Lower Great Southern.

Central Great Southern

The main towns in Central Great Southern are Katanning, Gnowangerup, Kojonup and Tambellup. Key diabetes related services in this district are provided from Katanning by:

- WACHS, which employs
 - ≤1 FTE diabetes educator
 - ≤1 FTE diabetes educator (currently on maternity leave). Group education on diabetes are currently provided by a chronic disease nurse working for the Great Southern Population Health Unit
- Amity Health, whose dietitian provides a Katanning based service one day a fortnight
- Great Southern Aboriginal Health Service Katanning clinic.

Other local health services active in the district include the:

- Katanning, Gnowangerup and Kojonup Hospitals
- Katanning Child Health Service and Community Health Service
- Silver Chain nurse practitioner (Katanning)
- Gnowangerup Community Health Centre
- Tambellup Nursing Post
- Great Southern Aboriginal Health Service (Katanning).

Lower Great Southern

The main towns in the Lower Great Southern District are Albany, Bremer Bay, Denmark, Jerramungup, Mount Barker and Ravensthorpe. Key diabetes related services in this district are provided from Albany by:

- Albany Hospital, which delivers diabetes education, dietitian and podiatry services
- Amity Health, which
 - provides dietitian services



- hosts adult endocrinology specialist services⁸⁹ under the IDES initiative and paediatric endocrinology, ophthalmology, cardiology, paediatric cardiology and vascular surgery specialist outreach services provided under MSOAP
- PMH, which delivers an outreach clinic in Albany four times a year
- a private diabetes educator, who provides services to people with type 1, type 2 and GDM on referral from each of the eleven GP practices in the region:
 - Hillside Family Practice, Albany, Aberdeen Medical Centre, Albany, Dr Worthley's Surgery, Albany, Albany Medical Centre, Albany, The Surgery, Albany, Southern Regional Medical Group, Albany, Pioneer Health, Albany, and Plantagenet Medical Group, Mount Barker.

Referrals are also received from:

- Denmark Medical Centre, Denmark, Dr Jane James' Surgery, Denmark and Jerramungup Surgery, Jerramungup
- Great Southern Aboriginal Health Service (Albany clinic).

Other local health services active in the district include the:

- Denmark and Plantagenet Hospitals
- Bremer Bay, Denmark, Ravensthorpe and Jerramungup Health Centres / Services
- Southern Aboriginal Corporation.

Table 44: Albany Hospital profile

Albany Hospital				Secondary hospital	
Treatment focus	Inpatient diabetes				
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry
			≤1 ⁹⁰	≤2 ⁹¹	≤1
Clinics and sessions	N/A				

⁸⁹ Provided 2 days every 4-6 weeks.

⁹⁰ Mainly inpatient focussed.

⁹¹ Not diabetes specific roles.



Albany Hospital		Secondary hospital
Key points	Diabetes education mainly inpatient focussed Dietitian services are not diabetes specific Diabetes care also provided by local general physicians, podiatrists and clinical nurse consultant Diabetes outpatient care is very limited Podiatrist provides outreach services to Bremer Bay, Denmark, Gnowangerup, Jerramungup, Katanning, Kojoonup and Mt Barker.	

Primary health care services

As described above, key primary health care services are provided by local general practices, Amity Health and Silver Chain. The South West WA Medicare Local has been recently established but is not delivering or commissioning any diabetes services at present.

Aboriginal health

Identified Aboriginal health services include the:

- Great Southern Aboriginal Health Service, which employs a chronic disease nurse at each of Albany (also trained as a diabetes educator) and Katanning
- visiting ophthalmology service provided at Albany.

Outreach services

Identified outreach services include:

- Albany
 - diabetes outreach clinic provided by PMH
 - endocrinology services (two days every four to six weeks), hosted by Amity Health, under the IDES initiative. Between February and October 2012 42 sessions (six per month) were delivered and 230 people with diabetes were seen
 - paediatric endocrinology (four times a year), ophthalmology (three to ten times a year), cardiology, paediatric cardiology and vascular surgery (four to six times a year) specialist outreach services, hosted by Amity Health, under MSOAP.



4.3.3 Wheatbelt

The main towns within the Wheatbelt health region are Northam, Narrogin, Merredin and Moora. The Wheatbelt has the second largest population of the country regions with over 75,117 people, but is notable for lacking a regional centre. Available data indicate diabetes prevalence is the highest in WA.

Over 4,200 or 5.7 per cent of the population identify as Aboriginal. From 1998 to 2007, the mortality rate due to diabetes for Aboriginal people living in the South West, Great Southern and Wheatbelt regions was 10.4 times higher than that of the total WA population.⁹²

As the region forms an arc around the Perth metropolitan area, many residents are within driving distance of the tertiary specialist services. Consequently, many people with complex diabetes (particularly type I) travel to Perth for their care, while those with less complex diabetes receive care from mainly local primary health care providers working for either WACHS, NGO or private services. Despite its proximity to Perth, the Wheatbelt is impacted by workforce shortages, with stakeholders interviewed reporting a need for more diabetes educators, high workforce turnover and at times competition for diabetes resources. The Wheatbelt has about ten diabetes educators in the region; however the majority of them act as diabetes educator secondary to other duties such as a dietitian or nursing role. It was also reported that the majority of podiatry care is provided by visiting services.

The main diabetes specific service providers identified during this review are:

- WACHS hospital and primary health care services, which include diabetes educator, dietitian, podiatry and Noongar Boodja Aboriginal diabetes clinics
- Silver Chain, which provides diabetes educator and nurse practitioner services to a number of communities
- Wheatbelt GP Network, which provides diabetes educator, dietitian and podiatry services to a number of communities
- visiting specialist teams under PMH, MSOAP and ICDP which visit Merredin, Narrogin, Northam and Moora.

Other important service providers include local general practices. It is estimated there were approximately 31 full workforce equivalent (FWE) GPs (two per cent of WA GPs) working from 24 practices in 2010. The FWE GP to population ratio was 1,644, compared to a state average of 1,496.⁹³

⁹² Crouchley K and Carlose N. *Aboriginal Health Profile, South West Health Region, 2012*. Aboriginal Health Improvement Unit, WACHS: 2012.

⁹³ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). As these estimates relate to the Wheatbelt GP Network boundary, these



The region's overall diabetes service provider FTE profile (excluding visiting services) is outlined below.

Table 45: Wheatbelt diabetes service provider workforce profile (FTE)

Service	Nurse ptrnr	DE / DNE	Dietitian	Podiatry
WACHS		≤2	≤5	2
WA GP Network		≤1	2	≤1
Silver Chain	≤5	≤4		
Private		≤2		≤1
Total	≤5	≤9	≤7	≤4

Source: KPMG based on stakeholder consultations

Key statistics relating to the Wheatbelt are outlined below.

Table 46: Estimated resident population, Wheatbelt, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	75,117	3.2 (s)
Aboriginal ERP	4,262	5.7 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 47: Diabetes prevalence, Wheatbelt, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	21	n.a.	n.a.	21	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	218	4,027	451	4,505	541
All adults (per cent)	0.4	6.7	1.6	7.5	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)

likely underestimate total numbers. Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



Table 48: Estimated diabetes related service activity, Wheatbelt, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	140	180	140	86	1.1
ED presentations	272	292	328	341	4.5
Community health occasions of service	744	660	281	199	2.6
Non admitted occasions of service	n.a.	4,756	3,096	3,065	40.8
GP services	9,442	9,684	9,932	10,180	135.5
Total diabetes services counted	10,598	15,572	13,777	13,871	184.7

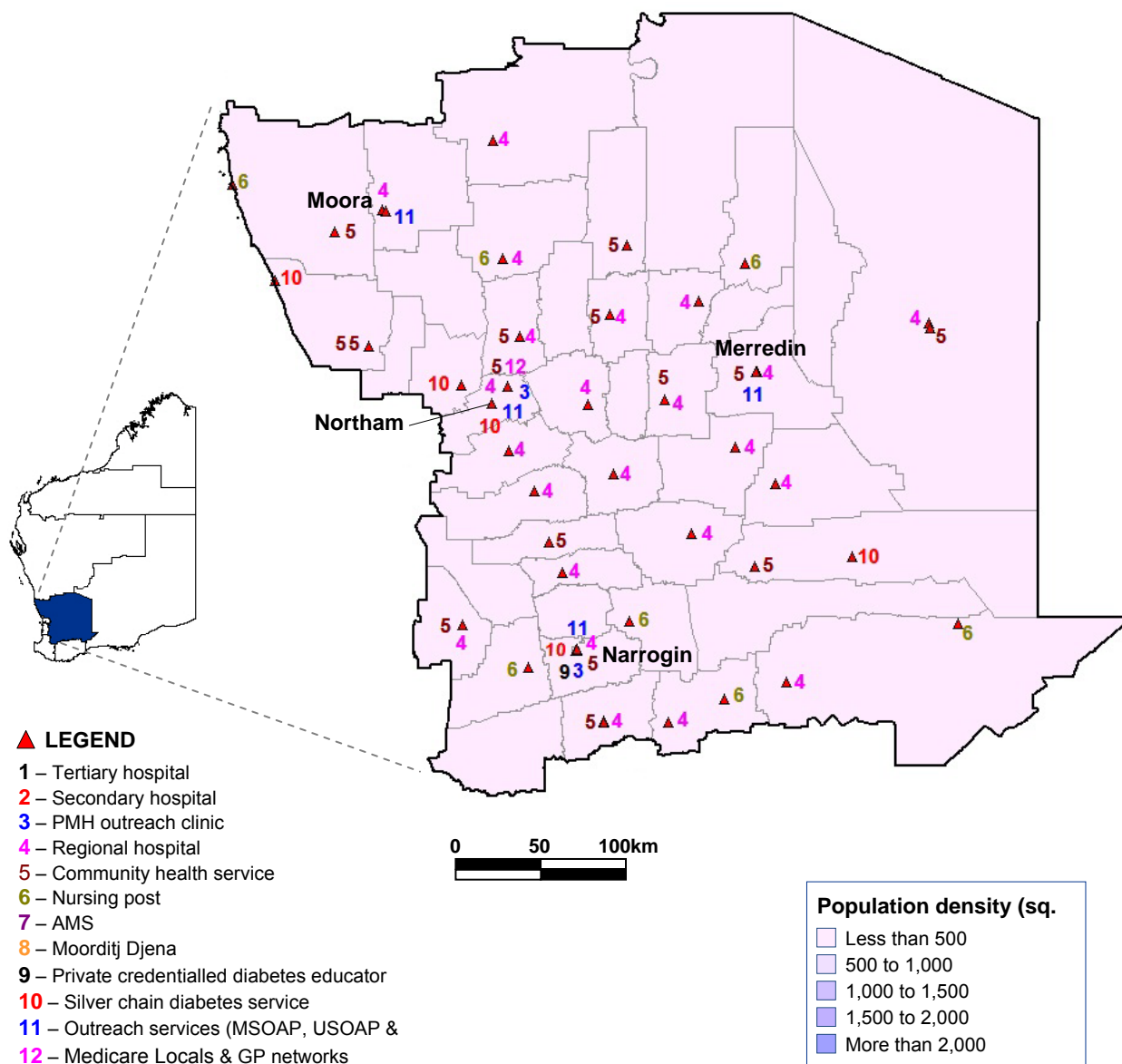
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012).



Map 5: Wheatbelt diabetes and related services

WHEATBELT

health region





Health districts

The health districts which form the Wheatbelt are Avon and Central, Eastern Wheatbelt, Southern Wheatbelt and Western Wheatbelt.

Avon and Central

The main towns in the Avon and Central Health District include Cunderin, Northam, Goomalling, Quairading, Toodyay and York. Key diabetes services in the district include:

- Northam Hospital and Avon and Central Primary Health, a WACHS service hosting a ≤ 1 FTE dual qualified diabetes educator / dietitian, 2 FTE dietitians and 2 FTE podiatrists (responsible for the entire Wheatbelt region)
- Wheatbelt GP Network, based in Northam and providing ≤ 1 FTE diabetes education and dietitian services and an additional ≤ 1 FTE dietitian, covering Beverley, Goomalling, Moora, Quairading and York
- Silver Chain providing a diabetes clinic and nurse practitioner service at Northam and nursing service at Toodyay
- visiting specialist services including:
 - Northam: a PMH diabetes outreach clinic (four times a year), diabetes services provided by an endocrinologist (twice a year) and podiatrist (eight times a year), cardiology services provided by a cardiologist and registered nurse (four times a year) under ICDP, and renal services provided by a general physician (five times a year) under MSOAP.

The other health services in the district include the:

- York, Beverley, Cunderdin and Goomalling Hospitals
- Goomalling and Koorda Community Health Centres.

Eastern Wheatbelt

The main towns in the Eastern Wheatbelt Health District include Merredin, Kellerberrin, Naremburn, Kununoppin, Southern Cross, Wyalkatchem, Mukinbudin, Bruce Rock, Corrigin, Koorda, Trayning and Nungarin. Key diabetes services in the district include:

- Eastern Primary Health, a WACHS service which hosts a dual qualified diabetes educator / dietitian (and a dietitian)
- Wheatbelt GP Network, based in Northam and providing ≤ 1 FTE diabetes education and ≤ 1 FTE dietitian services in Merredin, Dalwallinu and Wyalkatchem
- visiting specialist services including:



- Merredin: a podiatrist providing diabetes services (eight visits per year) plus a cardiologist and registered nurse providing cardiology services (four visits per year) under ICDP and ophthalmology service (five visits per year) under MSOAP.

The other health services provided in the area include:

- Naremben Memorial, Corrigin, Quairading, Kellerberrin Memorial, Merredin Hospital, Bruce Rock, Southern Cross and Kununoppin Hospitals
- Merredin, Southern Cross and Kellerberrin Community Health Services.

Southern Wheatbelt

The main towns in the Southern Wheatbelt Health District include Boddington, Brookton, Dumbleyung, Lake Grace, Narrogin, Hyden, Kondinin, Pingelly, Wagin, Wandering and Wickepin. Key diabetes services in the district include:

- Southern Wheatbelt Primary Health, a WACHS service which hosts ≤ 1 FTE dietitian services
- a private diabetes educator based in Narrogin and also servicing clients from Pingelly, Wagin and Boddington
- Silver Chain, which provides a nurse practitioner service in Narrogin and a nursing service in Hyden
- visiting specialists teams, which include:
 - Narrogin: a PMH diabetes outreach clinic (held four times a year), diabetes services provided by an endocrinologist (twice a year) and podiatrist (eight times a year) under ICDP, and cardiology services provided by a cardiologist (ten times a year) under MSOAP.

The other health services provided in the area include the:

- Boddington, Pingelly, Narrogin, Wagin, Dumbleyung Memorial and Lake Grace Hospitals
- Wagin, Brookton, Boddington and Kondinin Districts Community Health Services
- Kukerin, Varley, Wickepin and Williams Nursing Posts
- Saddleback Medical Centre.

Western Wheatbelt

The main towns in the Western Wheatbelt District include Bindoon, Cervantes, Gingin, Lancelin and Moora. The district has limited services, with diabetes specific services provided by:

- Western Primary Health, a WACHS service which hosts a ≤ 1 FTE diabetes educator and a ≤ 1 FTE dietitian



- Silver Chain, which provides a nursing service in Lancelin
- visiting specialists teams, which include:
 - Moora: diabetes services provided by an endocrinologist (twice a year) and podiatrist (eight times a year) and cardiology services provided by a cardiologist and registered nurse (four times a year) under ICDP.

Other health services relevant to the district include the:

- Wyalkatchem-Koorda and Districts, Moora, Wongan Hills and Dalwallinu Hospitals
- Coastal Health Service
- Gingin, Wyalkatchem, Dandaragan and Wongan Hills Community Health Centres
- Cervantes Nursing Post.

Primary health care

As described above, key primary health care services are provided by:

- WACHS services, particularly Avon and Central Primary Health, Eastern Primary Health, Southern Wheatbelt Primary Health and Western Primary Health
- Silver Chain, providing nursing (and for some location emergency services) in Beacon, Bencubbin, Bindoon, Brookton, Lancelin, Toodyay, Narrogin,⁹⁴ Hyden, Northam, Lancelin⁹⁵ and Merredin⁹⁶
- Wheatbelt GP Network, delivering diabetes education and dietitian services under the Rural Primary Health Services program
- 24 general practices.

Aboriginal health

Avon and Central Primary Health, Eastern Primary Health, Southern Wheatbelt Primary Health and Western Primary Health services all provide Aboriginal health services. Noongar Boodja Diabetes clinics are delivered by Aboriginal health workers, with support from a diabetes educator / dietitian and WACHS clinical nurse manager in a range of communities, including Merredin, Mooja,

⁹⁴ Includes a virtual Nurse Practitioner who covers that region around Northam.

⁹⁵ Servicing the Wheatbelt Coastal Strip.

⁹⁶ Delivered by a nurse practitioner who is a diabetes educator, servicing the Eastern Wheatbelt.



Narrogin, Northam and Wongan Hills. Visiting specialist teams under ICDP were also identified.

Outreach services

As described above, identified outreach services include:

- Merredin:
 - diabetes care delivered by an endocrinologist and / or podiatrist, under ICDP
 - cardiology care delivered a cardiologist and registered nurse, under ICDP
 - ophthalmology services, under MSOAP
- Moora:
 - diabetes care delivered by an endocrinologist and / or podiatrist, under ICDP
 - cardiology care delivered a cardiologist and registered nurse, under ICDP
- Narrogin:
 - diabetes clinics provided by PMH
 - diabetes care delivered by an endocrinologist and / or podiatrist, under ICDP
- Northam:
 - diabetes clinics provided by PMH
 - diabetes care delivered by an endocrinologist and / or podiatrist, under ICDP
 - cardiology care delivered by a cardiologist and registered nurse, under ICDP.



4.3.4 Midwest

The key towns within the Midwest health region are Geraldton, Carnarvon, Dongara, Exmouth, Kalbarri, Meekatharra, Mount Magnet, Murchison and Northampton. With over 65,230 people, the Midwest has only 2.7 per cent of the total WA population but includes a high proportion of Aboriginal people (15.7 per cent of the region's population). From 1998 to 2007, the mortality rate due to diabetes for Aboriginal people living in the Midwest region was 16.4 times higher than that of the total WA population.⁹⁷

The region is extremely large, covering more than 470,000 km², which is nearly one fifth of the total state land area. The majority of the population lives along the coast, with over 70 per cent of people living in the Geraldton-Greenough area.⁹⁸ Available data indicate diabetes prevalence is the third highest in WA (noting that estimates for areas with high Aboriginal populations are likely to be underestimates).

In addition to its size, the Midwest is sparsely populated and remote from Perth. Stakeholders reported that, as a remote area of WA, the approach to diabetes care in the region is based on use of generalist health resources. There are few diabetes specialists working in the region, with key resources identified during this review being:

- a general physician with a diabetes special interest, located at the St John of God Geraldton Hospital, providing private outpatient consultations as well as outreach services to Carnarvon (four days per month), Mt Magnet (two days per quarter) and Exmouth (one day per quarter)
- a dual dietitian and credentialled diabetes educator, who has specialised in GDM and is considered a key resource for the region. The diabetes educator works in private practice, for the St John of God (SJOG) Geraldton Hospital and for the Geraldton Regional Aboriginal Medical Service (GRAMS). Women with GDM are mainly managed in Geraldton, with around 80 per cent delivering locally. Tele-consultancy support is provided by KEMH to the local obstetrics team
- Geraldton Regional Aboriginal Medical Services (GRAMS), which holds a diabetes clinic every Tuesday delivered by a multidisciplinary team including GPs, the dual dietitian and diabetes educator (as described above), dietitian, Aboriginal health workers, podiatrist and physiotherapist. GRAMS also delivers mobile clinics in Mt Magnet and hosts visiting specialist teams delivered under MSOAP and ICDP

⁹⁷ Crouchley K and Carlose N. *Aboriginal Health Profile, Midwest Health Region, 2012*. Aboriginal Health Improvement Unit, WACHS: 2012.

⁹⁸ See Midwest health region website, Department of Health, WA. Accessed 10 October 2012 at www.health.wa.gov.au/services/detail.cfm?Unit_ID=63.



- Silver Chain, which provides diabetes educator services at Carnarvon, Geraldton, and Shark Bay (as a virtual clinic via telehealth with a Northam based diabetes educator). Silver Chain also delivers nursing services at Abrolhos Islands, Eneabba, Leeman and Mingenew
- Midwest GP Network, which provides dietitian services at GRAMS, Carnarvon, Exmouth and Coral Bay and podiatry services in Cue, Karalundi, Kardaloo Farm, Meekatharra, Mt Magnet, Murchison, Sandstone, Yalgagina, Yalgoo, Carnarvon, Shark Bay and Exmouth under the Rural Primary Health Services program
- visiting specialist services attending to Carnarvon, Exmouth, Geraldton, Meekatharra, Mt Magnet and Wiluna under the MSOAP and ICDP programs.

The region's overall diabetes service provider FTE profile (excluding visiting services) is outlined below.

Table 49: Midwest diabetes service provider workforce profile (FTE)

Service	General physician w diabetes special interest	DE / DNE	Dietitian	Podiatry
WACHS	≤1			
Midwest GP Network			≤1	≤1
Silver Chain		≤1		
Private		≤1 ⁹⁹		
Total¹⁰⁰	≤1	≤2	≤1	≤1

Source: KPMG based on stakeholder consultations

It is estimated there were approximately 52 full workforce equivalent (FWE) GPs (3 per cent of WA GPs) working from 21 practices in 2010. The FWE GP to population ratio was 1,298, compared to a state average of 1,496.¹⁰¹

Key statistics relating to the Midwest are outlined below.

⁹⁹ Also a dietitian.

¹⁰⁰ Note: GRAMS hosts a range of diabetes related services delivered by providers employed by other organisations.

¹⁰¹ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



Table 50: Estimated resident population, Midwest, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	65,230	2.8 (s)
Aboriginal ERP	8,141	12.5 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 51: Diabetes prevalence, Midwest, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	19	n.a.	n.a.	19	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	171	2,566	927	3,501	1,034
All adults (per cent)	0.3	5.1	3.9	7.0	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)



Table 52: Estimated diabetes related service activity, Midwest, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	264	250	197	103	1.6
ED presentations	223	178	237	246	3.8
Community health occasions of service	801	787	150	181	2.8
Non admitted occasions of service	n.a.	921	2,709	3,199	49.0
GP services	6,958	7,136	7,319	7,502	115.0
Total diabetes services counted	8,246	9,272	10,612	11,232	172.2

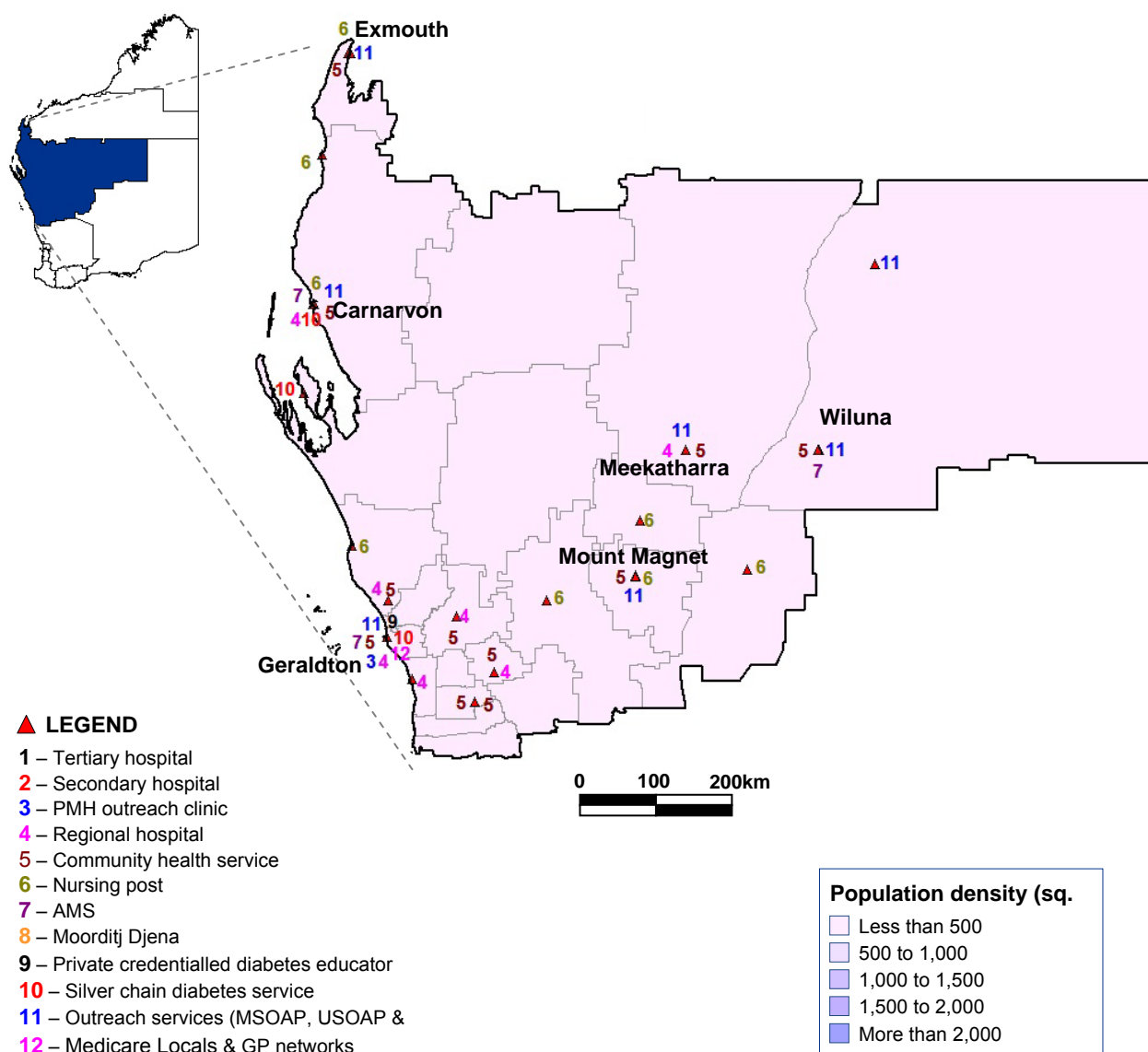
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012)



Map 6: Midwest diabetes and related services

MIDWEST

health region





Health districts

The health districts which form the Midwest are Gascoyne, Geraldton, Midwest and Murchison.

Gascoyne

Key towns in the Gascoyne Health District include Carnarvon, Coral Bay, Exmouth and Shark Bay. Diabetes related services are provided by:

- Silver Chain, which provides diabetes educator services at Carnarvon and Shark Bay (as a virtual clinic via telehealth with a Northam based diabetes educator). Silver Chain also delivers nursing services at Abrolhos Islands, Eneabba, Leeman and Mingenew
- a general physician with a diabetes special interest, providing outreach services to Carnarvon (four days per month) and Exmouth (one day per quarter)
- Midwest GP Network, which provides dietitian services at Carnarvon, Exmouth and Coral Bay and podiatry services in Carnarvon, Shark Bay and Exmouth under the Rural Primary Health Services program
- visiting specialists teams, which include:
 - Carnarvon: an ophthalmologist (eight times a year) provided by WACHS, under MSOAP
 - Exmouth: ophthalmology services (twice a year).

Geraldton

The regional centre of Geraldton forms this health district. Diabetes related services are provided by:

- a general physician with a diabetes special interest, based at the St John of God Geraldton Hospital
- a dual dietitian and credentialled diabetes educator, who has specialised in GDM and is considered a key resource for the region. The diabetes educator works in private practice, for the St John of God (SJOG) Geraldton Hospital and for the Geraldton Regional Aboriginal Medical Service (GRAMS). Women with GDM are mainly managed in Geraldton, with around 80 per cent delivering locally. Tele-consultancy support is provided by KEMH to the local obstetrics team
- Geraldton Regional Aboriginal Medical Services (GRAMS), which holds a diabetes clinic every Tuesday delivered by a multidisciplinary team including



GPs, a dual dietitian and diabetes educator (as described above), dietitian, Aboriginal health workers, podiatrist and physiotherapist

- Midwest GP Network, which provides dietitian services at GRAMS
- Silver Chain, which provides diabetes educator services at Geraldton
- visiting specialists teams, which include:
 - endocrinology services by a general physician (twice a year) and vascular surgeon (six times a year) provided by WACHS, under MSOAP
 - renal team consisting of a nephrology physician, registered nurse, Aboriginal health worker and administrator / coordinator (twice a year) provided by GRAMS, under ICDP.

Midwest

Key towns in the Midwest Health District include Dongara, Kalbarri, Morawa, Mullewa, Northampton and Three Springs. No diabetes related services were identified for this district.

Murchison

Key towns in the Murchison Health District include Cue, Meekatharra, Mt Magnet, Sandstone, Wiluna and Yalgoo. Diabetes related services are provided by:

- a general physician with a diabetes special interest, located at the St John of God Geraldton Hospital, providing outreach services to Mt Magnet (two days per quarter)
- Geraldton Regional Aboriginal Medical Services (GRAMS), delivers mobile clinics in Mt Magnet
- Midwest GP Network, which provides podiatry services in Cue, Karalundi, Kardaloo Farm, Meekatharra, Mt Magnet, Murchison, Sandstone, Yalgagina and Yalgoo under the Rural Primary Health Services program
- visiting specialists teams, which include:
 - Meekatharra:
 - a diabetes team consisting of a general physician, GP, diabetes educator, podiatrist, registered nurse, Aboriginal health workers and administrator / coordinator (four times a year) provided by GRAMS, under ICDP
 - a cardiology team consisting of a cardiology physician, diabetes educator / dietitian, podiatrist, Aboriginal health worker, physiotherapist, registered nurse, sonographer and administrator / coordinator (four times a year) provided by GRAMS, under ICDP



- a renal team consisting of a nephrology physician, registered nurse, Aboriginal health worker and administrator / coordinator (twice a year) provided by GRAMS, under ICDP
- a nephrology physician (twice a year) provided by WACHS, under MSOAP
- Mt Magnet
 - a diabetes team consisting of a general physician, GP, diabetes educator, Aboriginal health workers and administrator / coordinator (four times a year) provided by GRAMS, under ICDP
 - a renal team consisting of a nephrology physician, registered nurse, Aboriginal health worker and administrator / coordinator (twice a year) provided by GRAMS, under ICDP
 - a cardiology team consisting of a cardiology physician, diabetes educator / dietitian, podiatrist, Aboriginal health worker, physiotherapist, registered nurse, sonographer and administrator / coordinator (four times a year) provided by GRAMS, under ICDP
- Wiluna:
 - a diabetes team consisting of a diabetes educator and dietitian (twice a year, provided by the Goldfields Esperance GP Network, under ICDP.

Primary health care services, including a GP led patient retrieval service, are provided by the Royal Flying Doctor Service (RFDS) from Meekatharra, extending to Cue, Paynes Find, Sandstone and Yalgoo. The RFDS clinic at Meekatharra hosts the visiting specialist services described above.

Aboriginal health

In addition to the services described above, Aboriginal health services are provided by:

- Carnarvon Aboriginal Medical Service
- Geraldton Regional Aboriginal Medical Services
- Ngangganawili Aboriginal Community Health Centre.

Visiting specialist teams under ICDP were also identified.

Outreach services

Identified outreach services include:

- Geraldton:



- endocrinology services delivered by a general physician (twice a year) and vascular surgeon (six times a year) provided by WACHS, under MSOAP
- renal team consisting of a nephrology physician, registered nurse, Aboriginal health worker and administrator / coordinator (twice a year) provided by GRAMS, under ICDP
- Exmouth:
 - ophthalmology services (twice a year) provided by WACHS, under MSOAP
- Carnarvon:
 - an ophthalmologist (eight times a year) provided by WACHS, under MSOAP
- Meekatharra:
 - a diabetes team consisting of a general physician, GP, diabetes educator, podiatrist, registered nurse, Aboriginal health workers and administrator / coordinator (four times a year) provided by GRAMS, under ICDP
 - a cardiology team consisting of a cardiology physician, diabetes educator / dietitian, podiatrist, Aboriginal health worker, physiotherapist, registered nurse, sonographer and administrator / coordinator (four times a year) provided by GRAMS, under ICDP
 - a renal team consisting of a nephrology physician, registered nurse, Aboriginal health worker and administrator / coordinator (twice a year) provided by GRAMS, under ICDP
 - a nephrology physician (twice a year) provided by WACHS, under MSOAP
 - primary health care services, including a GP led patient retrieval service, extending to Cue, Paynes Find, Sandstone and Yalgoo, under the RFDS
- Mt Magnet:
 - a diabetes team consisting of a general physician, GP, diabetes educator, Aboriginal health workers and administrator / coordinator (four times a year) provided by GRAMS, under ICDP
 - a renal team consisting of a nephrology physician, registered nurse, Aboriginal health worker and administrator / coordinator (twice a year) provided by GRAMS, under ICDP
 - a cardiology team consisting of a cardiology physician, diabetes educator / dietitian, podiatrist, Aboriginal health worker, physiotherapist, registered



nurse, sonographer and administrator / coordinator (four times a year)
provided by GRAMS, under ICDP

- Wiluna:
 - a diabetes team consisting of a diabetes educator and dietitian (twice a year) provided by the Goldfields Esperance GP Network, under ICDP.



4.3.5 Goldfields

The main towns in the Goldfields health region are Kalgoorlie and Esperance, with smaller towns including Boulder, Laverton, Leonora, Coolgardie, Menzies and Norseman. With over 57,296 residents, the Goldfields region has the largest catchment of any WA health region, but a very low population density.

The Aboriginal population (5,296 in 2011) is proportionally higher than the state average (11.9 per cent versus 1.7 per cent). Available data indicate that diabetes prevalence is above the state average, being the second highest in WA. From 1998 to 2007, the mortality rate due to diabetes for Aboriginal people living in the Goldfields region was 18.3 times higher than that of the total WA population.¹⁰²

The region has only a very small diabetes specialist workforce based in Kalgoorlie and Esperance. The challenges of health service delivery in remote regions means that Goldfields has ongoing vacancies, with an unfilled diabetes educator, dietitian and podiatry positions at Kalgoorlie. Stakeholders reported that short term funding for part time positions, a lack of available local providers and competition between providers make recruitment difficult. In the absence of diabetes specialist workers, there is a reliance on the generalist health workforce, including staff at Kalgoorlie and Esperance hospitals and local GPs. However, stakeholders also reported that seven GPs are expected to depart Kalgoorlie in the next 12 months, which will impact diabetes service provision.

The main diabetes specific service providers identified during this review are:

- WACHS, which employs
 - a general physician with a diabetes special interest, and has vacant positions for a diabetes educator, dietitian and podiatrist, based at Kalgoorlie Regional Hospital
 - two nutritionists based at Kalgoorlie Regional Hospital to undertake health promotion educational activities for the Kalgoorlie-Boulder Population Health Unit
 - a diabetes educator at Esperance Hospital
- Goldfields Midwest Medicare Local (GMML), which employs a diabetes educator who works in the Kalgoorlie region from general practices and the Kalgoorlie Regional Hospital. GMML also has vacancies for a diabetes educator and a dietitian
- Bega Garnbirringu Health Service, which employs a diabetes educator

¹⁰² Crouchley K and Carlose N. *Aboriginal Health Profile, Midwest Health Region, 2012*. Aboriginal Health Improvement Unit, WACHS: 2012.



- visiting specialist services under PMH (visiting Kalgoorlie four times a year), MSOAP and ICDP programs.

The region's overall diabetes service provider FTE profile (excluding visiting services) is outlined below.

Table 53: Goldfields diabetes service provider workforce profile (FTE)

Service	General physician w diabetes special interest	DE / DNE	Dietitian	Podiatry
WACHS	≤1 ¹⁰³	≤1 vacant ¹⁰⁴	≤3, 1 vacant ¹⁰⁵	≤1 vacant ¹⁰⁶
Goldfields				
Midwest		≤1	≤1, 1 vacant	
Medicare Local				
Bega				
Garnbirringu Health Service		≤1		
Total	≤1	≤3, 1 vacant	≤4, 2 vacant	≤1 vacant

Source: KPMG based on stakeholder consultations

It is estimated there were approximately 33 full workforce equivalent (FWE) GPs (2 per cent of WA GPs) working from 19 practices in 2010. The FWE GP to population ratio was 1,782, compared to a state average of 1,496.¹⁰⁷

Key statistics relating to the Goldfields Region are outlined below.

Table 54: Estimated resident population, Goldfields, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	57,296	2.4 (s)
Aboriginal ERP	5,296	9.2 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

¹⁰³ Based at Kalgoorlie Regional Hospital.

¹⁰⁴ Includes a vacant 0.5 FTE position at Kalgoorlie and a filled 0.5 FTE position at Esperance.

¹⁰⁵ Includes a vacant position at Kalgoorlie, 2 positions under Public Health, Kalgoorlie and 1 position at Esperance.

¹⁰⁶ Vacant position at Kalgoorlie.

¹⁰⁷ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



Table 55: Diabetes prevalence, Goldfields, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	18	n.a.	n.a.	18	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	299	2,408	801	3,244	673
All adults (per cent)	0.7	5.4	3.9	7.3	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)

Table 56: Estimated diabetes related service activity, Goldfields, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	177	204	151	106	1.9
ED presentations	184	202	204	212	3.7
Community health occasions of service	891	1,027	1,085	1,225	21.4
Non admitted occasions of service	n.a.	756	919	897	15.7
GP services	9,727	9,977	10,233	10,488	183.1
Total diabetes services counted	10,979	12,166	12,592	12,929	225.6

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data



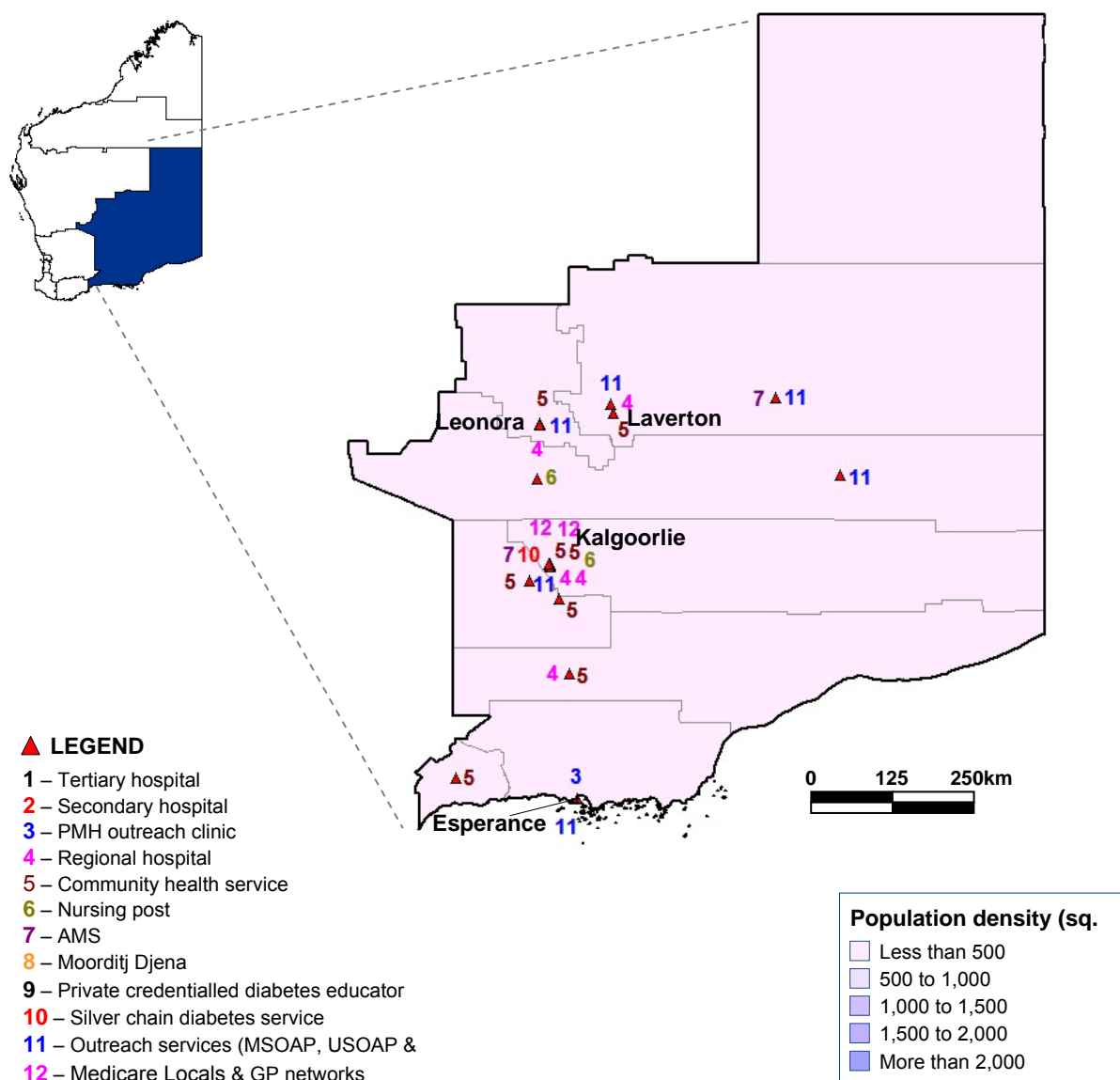
collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012)



Map 7: Goldfields diabetes and related services

GOLDFIELDS

health region





Health districts

The health districts which form the Goldfields Region are Northern Goldfields and South East Coastal.

Northern Goldfields

The main towns in the Northern Goldfields Health District are Kalgoorlie, Laverton and Leonora. Key diabetes services in the district include:

- Kalgoorlie Regional Hospital (see profile below), which employs a general physician with a diabetes special interest, and has vacant positions for a diabetes educator, dietitian and podiatrist, and hosts the GMML diabetes educator (once a month) and two nutritionists based at Kalgoorlie Regional Hospital to undertake health promotion educational activities for the Kalgoorlie-Boulder Population Health Unit
- Goldfields Midwest Medicare Local, which employs a diabetes educator
- Bega Garnbirringu Health Service, which holds a daily diabetes clinic (9am to 1pm) with a diabetes educator, Aboriginal health worker and assistance from the Kalgoorlie Regional Hospital general physician. The service also hosts visiting allied health providers
- visiting specialists teams, which include:
 - Kalgoorlie:
 - a diabetes outreach clinic (four times a year), under PMH
 - ophthalmologist and orthoptist services (twice a year) at Kalgoorlie, under MSOAP
 - Laverton
 - ophthalmologist and orthoptist services (twice times a year), under MSOAP
 - Leonora
 - ophthalmologist and orthoptist services (twice times a year), under MSOAP
 - diabetes services provided by a dietitian and physiotherapist (six times a year) provided by the Goldfields Esperance GP Network, under ICDP
 - Ngaanyatjarra Lands
 - diabetes services, provided by an endocrinologist, three diabetes educators, podiatrist, two dietitians, two chronic disease nurses,



Aboriginal health worker and administrator services (once to twice a year) provided by the Ngaanyatjarra Health Service, under ICDP

- renal services, provided by a renal physician, diabetes educator, podiatrist, chronic disease nurse, dietitian, Aboriginal health worker and administrator / coordinator (twice a year) provided by the Ngaanyatjarra Health Service, under ICDP
 - cardio vascular services, provided by a cardiology physician, registered nurse, dietitian, Aboriginal health work, echocardiogram technician and administrator / coordinator (one to three times a year) provided by the Ngaanyatjarra Health Service, under ICDP
 - ophthalmologist, orthoptist, chronic disease nurse, Aboriginal health worker, retinal photographer and administrator services (twice times a year) provided by the Ngaanyatjarra Health Service under MSOAP
 - a diabetes in pregnancy service, provided by the KEMH (four times a year), under MSOAP
- Tjuntuntjara
- renal services, provided by two renal physicians and a registered nurse (one to four times a year) provided by the Paupiyala Tjarutja Aboriginal Corporation, under ICDP
 - chronic disease services, provided by a general physician, GP, diabetic educator, podiatrist, occupational therapist, speech pathologist, audiologist and registered nurse (two to thirteen times a year) provided by the Rural Workforce Agency, under ICDP.

Table 57: Kalgoorlie Regional Hospital profile

Kalgoorlie Regional Hospital					Secondary hospital		
Treatment focus	TI, TII						
Workforce	Medical	Nurse prtnr	DE / DNE	Dietitian	Podiatry	Social worker	Psych-ologist
	≤1 ¹⁰⁸		≤0.5, 0.5 vacant ¹⁰⁹	≤1, 1 vacant ¹¹⁰	≤1 vacant ¹¹¹		

¹⁰⁸ General physician with a diabetes special interest based at Kalgoorlie Regional Hospital.

¹⁰⁹ Includes a vacant 0.5 FTE position at Kalgoorlie and a filled 0.5 FTE position at Esperance.

¹¹⁰ Includes a vacant position at Kalgoorlie, 2 positions under Public Health, Kalgoorlie and 1 position at Esperance.



Kalgoorlie Regional Hospital		Secondary hospital
Clinics and sessions	T1 clinic held every two months T2 clinic held fortnightly by general physician, 9am to 4pm – approx 8 new patients plus follow up appointments per session Driver's license clinic recently established	
Key points	KRH works with the GMML diabetes educator and the Bega Garbarringu Health Service in delivery of services KRH delivers diabetes and general medicine outreach services to Esperance (five times a year) Impacted by ongoing vacancies for multiple positions, preventing a multidisciplinary approach	

Other local health services include:

- Laverton and Leonora Hospitals
- Laverton, Leonora, Coolgardie, Coonana, Kambalda Menzies and Ninga Mia Health Services / Centres
- Goldfields Esperance GP Network
- Silver Chain, which provides a nursing service in Kalgoorlie.

South East Coastal

The main towns in the South East Coastal Health District are Esperance and Norseman. Key diabetes services in the district include:

- Esperance Hospital, which employs a diabetes educator
- visiting specialists teams, which include:
 - Esperance:
 - diabetes and general medicine outpatient clinics (five times a year), provided by a Kalgoorlie Regional Hospital team
 - a general physician (twice times a year), ophthalmologist (six times a year) and renal physician services (six times a year), under MSOAP
 - a cardiology physician (12 times a year), under ICDP.

Other local health services include:

- Esperance and Norseman Hospitals
- Norseman Health Centre.

¹¹¹ Vacant position at Kalgoorlie.



Aboriginal health

Identified Aboriginal health services include the:

- Ngaanyatjarra Health Service
- Bega Garnbirringu Health Service.

Visiting specialist teams under ICDP were also identified.

Outreach services

Identified outreach services visit the following communities:

- Kalgoorlie:
 - a diabetes outreach clinic (four times a year), under PMH
 - ophthalmologist and orthoptist services (twice a year) at Kalgoorlie, under MSOAP
- Laverton
 - ophthalmologist and orthoptist services (twice times a year), under MSOAP
- Leonora
 - ophthalmologist and orthoptist services (twice times a year), under MSOAP
 - diabetes services provided by a dietitian and physiotherapist (three times a year) at Leonora provided by the Goldfields Esperance GP Network, under ICDP
- Ngaanyatjarra Lands
 - diabetes services, provided by an endocrinologist, three diabetes educators, podiatrist, two dietitians, two chronic disease nurses, Aboriginal health worker and administrator services (twice times a year) provided by the Ngaanyatjarra Health Service, under ICDP
 - renal services, provided by a renal physician, diabetes educator, podiatrist, chronic disease nurse, dietitian, Aboriginal health worker and administrator / coordinator (twice a year) provided by the Ngaanyatjarra Health Service, under ICDP
 - cardio vascular services, provided by a cardiology physician, registered nurse, dietitian, Aboriginal health work, echocardiogram technician and administrator / coordinator (one to three times a year) provided by the Ngaanyatjarra Health Service, under ICDP



- ophthalmologist, orthoptist, chronic disease nurse, Aboriginal health worker, retinal photographer and administrator services (twice times a year) provided by the Ngaanyatjarra Health Service under MSOAP
- Tjuntuntjara
 - renal services, provided by two renal physicians and a registered nurse (one to four times a year) provided by the Paupiyala Tjarutja Aboriginal Corporation, under ICDP
 - chronic disease services, provided by a general physician, GP, diabetic educator, podiatrist, occupational therapist, speech pathologist, audiologist and registered nurse (two to thirteen times a year) provided by the Rural Workforce Agency, under ICDP.



4.3.6 Pilbara

The main towns of the region are Karratha, Port Hedland and Newman. There are a significant number of remote and town based Aboriginal communities in the region, with Onslow, Tom Price and Paraburdoo being notable. The estimated population of the Pilbara is over 62,736, with high growth in recent years.

A high proportion of the Pilbara population is Aboriginal, being about 12 per cent of the total population. Available data indicate diabetes prevalence rates are a little higher than the WA average. However, this data likely represent an underestimate, with stakeholders reporting diabetes prevalence rates among some Aboriginal communities of 25 to 50 per cent.

The resources boom has led to the addition of a very substantial fly-in fly-out workforce as well, extremely high rental and property prices, and significant wealth disparities in many communities. These pressures, together with the vast distances between towns, are placing substantial pressure on health and human services, with poor access a frequently cited concern. There is little to no public transport, which limits access for disadvantaged people in particular to attend health care appointments.

The Pilbara Aboriginal population has been described by stakeholders as experiencing some of the worst health outcomes in the state. Many Aboriginal people are highly mobile, moving between different households and communities and requiring use of opportunistic interventions the main mode of care. The Pilbara Aboriginal population is the equal highest ranked Aboriginal population by region in WA (equal to Goldfields) for hospitalisations due to diabetes. From 1998 to 2007, the mortality rate due to diabetes for Aboriginal people living in the Pilbara region was 19.1 times higher than that of the total WA population.¹¹² Despite the high hospitalisation rates the Pilbara Aboriginal population also has the third highest Aboriginal region mortality rate due to diabetes.

As with other remote regions, diabetes care is predominantly provided by generalist health providers. There are ongoing difficulties in recruiting and retaining health workers, and high rental prices and costs of living add further barriers. For example, the sole WACHS diabetes educator position of the region has been vacant for close to 12 months. Unsurprisingly, minimal diabetes related resources were identified during this review, being:

- Pilbara Health Network, which employs a diabetes educator and two podiatrists under the Rural Primary Health Services program and a podiatrist

¹¹² Crouchley K and Carllose N. *Aboriginal Health Profile, Pilbara Health Region, 2012*. Aboriginal Health Improvement Unit, WACHS: 2012.



(servicing the West Pilbara Health District) and a chronic disease coordinator under Closing The Gap funding

- Pilbara population health unit, which employs 2 dietitians and a regional podiatrist, based at the Hedland Health Campus and servicing the East Pilbara Health District
- visiting specialist services under the MSOAP and ICDP programs.

There are several hospitals and nursing posts in the Pilbara region, the largest being Hedland Health Campus located in South Hedland and the Nickol Bay Hospital at Karratha. There are three Aboriginal Medical Services in the region (Mawarnkurra; Wirraka Maya; and Puntukurnu); the RFDS Western Operations base; and the Pilbara Health Network also provide a range of primary health services.

It is estimated there were approximately 25 full workforce equivalent (FWE) GPs (2 per cent of WA GPs) working from 13 practices in 2010. The FWE GP to population ratio was 1,946, compared to a state average of 1,496.¹¹³

The region's overall diabetes service provider FTE profile (excluding visiting services) is outlined below.

Table 58: Pilbara diabetes service provider workforce profile (FTE)

Service	General physician w diabetes special interest	DE / DNE	Dietitian	Podiatry
WACHS		≤1 vacant ¹¹⁴	≤2	≤1
Pilbara Health Network		≤1		≤2
Total		≤1, 1 vacant	≤2	≤3

Source: KPMG based on stakeholder consultations

Key statistics relating to the Pilbara Region are outlined below.

¹¹³ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.

¹¹⁴ Includes a vacant 0.5 FTE position at Kalgoorlie and a filled 0.5 FTE position at Esperance.



Table 59: Estimated resident population, Pilbara, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	62,736	2.7 (s)
Aboriginal ERP	7,212	11.5 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 60: Diabetes prevalence, Pilbara, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	17	n.a.	n.a.	17	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	516	1,372	479	2,351	916
All adults (per cent)	1.4	3.8	3.1	6.5	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)



Table 61: Estimated diabetes related service activity, Pilbara, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	171	219	168	112	1.8
ED presentations	181	206	249	259	4.1
Community health occasions of service	584	571	562	486	7.7
Non admitted occasions of service	n.a.	2,138	1,454	1,056	16.8
GP services	5,277	5,413	5,551	5,690	90.7
Total diabetes services counted	6,213	8,547	7,984	7,603	121.2

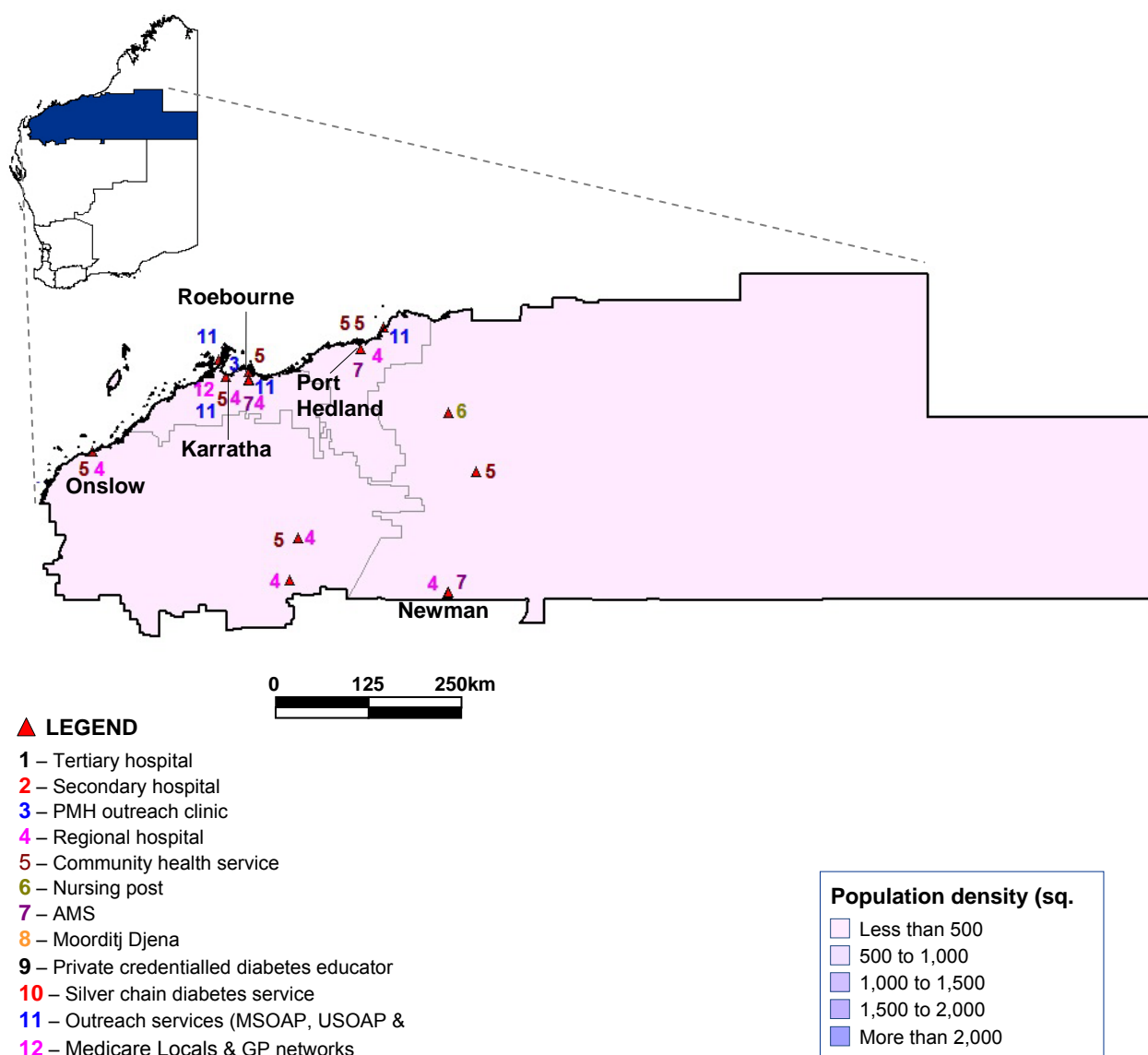
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012)



Map 8: Pilbara diabetes and related services

PILBARA

health region





Health districts

The health districts which form the Pilbara Region are East Pilbara and West Pilbara.

East Pilbara

The main towns in the East Pilbara Health District are Newman, Nullagine and Marble Bar. Key services in these towns include:

- Newman: Newman Hospital and Puntukurnu Aboriginal Medical Service. The Puntukurnu Aboriginal Medical Service hosts visiting podiatry (WACHS) and dietitian (Pilbara Health Network) services
- Nullagine: Nullagine Community Health Service
- Marble Bar: Marble Bar Nursing Post.

The Pilbara Population Health Unit regional podiatrist, based at the Hedland Health Campus, services the East Pilbara Health District. No other diabetes specific resources were identified for this region.

West Pilbara

The main towns in the West Pilbara Health District are Port Hedland, South Hedland, Karratha, Roebourne, Wickham, Onslow, Tom Price and Paraburdoo. Key services in these towns include:

- Pilbara Health Network, which provides diabetes education in Karratha, Roebourne, Onslow and Pannawonica, dietitian services in Karratha, Roebourne and Onslow, and podiatry services in Karratha and Roebourne
- Wirraka Maya Aboriginal Medical Service, which employs two to four GPs, four nurses, seven Aboriginal health workers, drivers and a social and emotional wellbeing unit and hosts visiting podiatry, dietitian and physiotherapy services
- Mawarnkarra Health Service Aboriginal Corporation
- visiting medical specialists providing
 - Port Hedland:
 - endocrinology services, under IDES
 - diabetes team consisting of an endocrinologist, diabetes educator, dietitian and podiatrist (four times a year), under ICDP
 - nephrology physician (eight times a year) and ophthalmologist services (three times a year) under MSOAP
 - Karratha:



- endocrinology services, under IDES
- diabetes team consisting of an endocrinologist, diabetes educator, dietitian and podiatrist (four times a year), under ICDP
- cardiology care delivered a general physician and registered nurse, under ICDP
- general and nephrology physician services (four times a year), under MSOAP
- Newman
 - endocrinology services, under IDES
- Roebourne
 - ophthalmology team consisting of an ophthalmologist, orthoptist, registrar and theatre nurse (four times a year) provided by WACHS under MSOAP
- Hedland Health Campus, Nickol Bay, Roebourne, Onslow, Tom Price and Paraburdoo Hospitals
- South Hedland, West Pilbara, Ashburton, Onslow, Wickham and Yandeyarra Health Centres / Community Health Services
- RFDS, which operates a GP service based at Port Hedland which provides primary health care clinics at Marble Bar and Yandeyarra.

Aboriginal health

Identified Aboriginal health services include the:

- Mawarnkarra Health Service Aboriginal Corporation
- Wirraka Maya Aboriginal Health Service
- Puntukurnu Aboriginal Medical Service

Visiting specialist teams under ICDP were also identified.

Outreach service

Identified outreach services include:

- the Pilbara Population Health Unit regional podiatrist, based at the Hedland Health Campus, services the East Pilbara Health District
- visiting medical specialists providing
 - Port Hedland:
 - endocrinology services, under IDES



- diabetes team consisting of an endocrinologist, diabetes educator, dietitian and podiatrist (four times a year), under ICDP
- nephrology physician (four times a year) and ophthalmologist services (three times a year) under MSOAP
- Karratha:
 - endocrinology services, under IDES. In September 2012 10 sessions were delivered and 64 people with diabetes were seen
 - diabetes team consisting of an endocrinologist, diabetes educator, dietitian and podiatrist (four times a year), under ICDP
 - cardiology care delivered a general physician and registered nurse, under ICDP
 - general physician and nephrology physician services (four times a year), under MSOAP
- Newman
 - endocrinology services, under IDES
- Roebourne
 - ophthalmology team consisting of an ophthalmologist, orthoptist, registrar and theatre nurse (four times a year) provided by WACHS, under MSOAP



4.3.7 Kimberley

The main towns in the Kimberley health region include Broome, Derby, Kununurra, Fitzroy Crossing, Halls Creek and Wyndham. The population of the region is the smallest in WA, at just over 37,673 people or 1.6 per cent of the state population. The region consists of mainly small towns and communities, separated by large distances. The annual wet season is a further hurdle to providing health care in remote settings. As with the Pilbara region, a lack of public transport acts as an access barrier for disadvantaged people.

The proportion of people who identify as Aboriginal is the largest in the state, and is one of the largest in Australia, being 37.0 per cent of the regional population (13,923 people, 2011 estimates). From 1998 to 2007, the mortality rate due to diabetes for Aboriginal people living in the Kimberley region was 39.8 times higher than that of the total WA population.¹¹⁵

There is not reliable data to provide an accurate measure of diabetes prevalence in the Kimberley region. Estimates provided by the WA Epidemiological Branch are likely to underestimate diabetes prevalence among the Aboriginal population, particularly among people with type 2 diabetes, as the data is collected via a telephone survey of households. Local stakeholders report diabetes prevalence rates of 25 to 30 per cent among some Aboriginal communities, with those located in the East Kimberley Health District more likely to have poor health outcomes. The age standardised mortality rate ratio due to diabetes in Kimberley is significantly higher than the statewide mortality rate. It is 39.8 times higher than the statewide non-Aboriginal mortality rate due to diabetes.¹¹⁶ Renal failure rates are also very high, with one stakeholder describing them as the highest in the world.

Given the Kimberley context of remoteness, a high proportion of Aboriginal people and ongoing health workforce challenges, diabetes care is predominantly provided by generalist health providers. There are ongoing difficulties in recruiting and retaining health workers, and while there is a long-term core workforce turnover rates are high, and the Kimberley is unable to sustain a specialist workforce. The region holds only three private GP practices, with key primary health care services being the AMS' and community health services.

Local stakeholders interviewed for this review emphasised the importance of a well trained and supported generalist health workforce, which provides a regular on-the-ground presence, is available to deliver opportunistic interventions to the Aboriginal population in particular, and can develop and sustain a relationship with people with diabetes.

¹¹⁵ Crouchley K and Carlose N. *Aboriginal Health Profile, Kimberley Health Region, 2012*. Aboriginal Health Improvement Unit, WACHS: 2012.

¹¹⁶ Aboriginal Health Profile. WACHS. 2012



In this context, some stakeholders have questioned the benefits of fly-in, fly-out (FIFO) specialist services, particularly if these workers are not connected to the local services. FIFO services involve significant amounts of travel time; even those based in Broome may require two to three hours of travel each way to deliver one or two sessions per day. Stakeholders also reported there is a need for better coordination of outreach services.

Given the distance from Perth and a preference for most women to deliver locally, GDM is managed within the region, with Broome Hospital as the main centre (which has an obstetrics team and cares for the most high risk women) as well as birthing centres located at Derby and Kununurra.

Key services identified in the region include the:

- Kimberley Public Health Unit, which employs a diabetes educator, two dietitians and two podiatrists who are based at Broome Hospital
- Boab Health, which employs two diabetes educators, three dietitians, three podiatrists and one regional paediatric nutritionist. These are mobile service providers that commonly work from AMS' and community health services
- Kimberley Aboriginal Medical Services Council (KAMSC), which coordinates a range of visiting specialist services under MSOAP and ICDP
- visiting specialist services under the MSOAP and ICDP programs covering Broome, Balgo, Mulin and Billiluna, the Dampier Peninsula, Derby, Fitzroy Crossing, Fitzroy Valley, Gibb River Road, Halls Creek, Kalumburu, Kununurra, Kutjungka, One Arm Point, Wyndham and Yuri Yungi.

The regional Aboriginal health planning forum, which includes WACHS, Boab, AMS' and the RFDS, is a key structure for coordinating health promotion activities.

The region's overall diabetes service provider FTE profile (excluding visiting services) is outlined below.

Table 62: Kimberley diabetes service provider workforce profile (FTE)

Service	General physician	DE / DNE	Dietitian	Podiatry
WACHS	≤3	≤1	≤2	≤2
Boab Health		≤2	≤3	≤3
Total	≤3	≤3	≤2	≤3

Source: KPMG based on stakeholder consultations



It is estimated there were approximately 21 full workforce equivalent (FWE) GPs (1 per cent of WA GPs) working from 8 practices in 2010. The FWE GP to population ratio was 1,689, compared to a state average of 1,496.¹¹⁷

Key statistics relating to the Kimberley Region are outlined below.

Table 63: Estimated resident population, Kimberley, 2011

	Number	Proportion of state (s) / region (r) (per cent)
ERP (all ages)	37,673	1.6 (s)
Aboriginal ERP	13,923	37.0 (r)

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); ABS 2011 Census (2012)

Table 64: Diabetes prevalence, Kimberley, 2011

	Type 1	Type 2	GDM	Diabetes - all types	Aboriginal diabetes - all types
All children (number)	13	n.a.	n.a.	13	n.a.
All children (per cent)	0.3	n.a.	n.a.	0.3	n.a.
All adults (number)	109	1,489	262	1,088	1,768
All adults (per cent)	0.4	2.8	2.2	4.1	12.7

Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System (2012); Prevalence of Type 1 diabetes in Australian children, 2008 and AIHW (2011)

¹¹⁷ Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



Table 65: Estimated diabetes related service activity, Kimberley, 2008 to 2011

	2008	2009	2010	2011	Rate per 1,000 persons 2011
Inpatient separations	210	202	150	131	3.5
ED presentations	264	349	296	308	8.2
Community health occasions of service	1,483	1,081	2,487	2,150	57.1
Non admitted occasions of service	n.a.	277	157	182	4.8
GP services	3,016	3,093	3,172	3,252	86.3
Total diabetes services counted	4,973	5,002	6,262	6,022	159.9

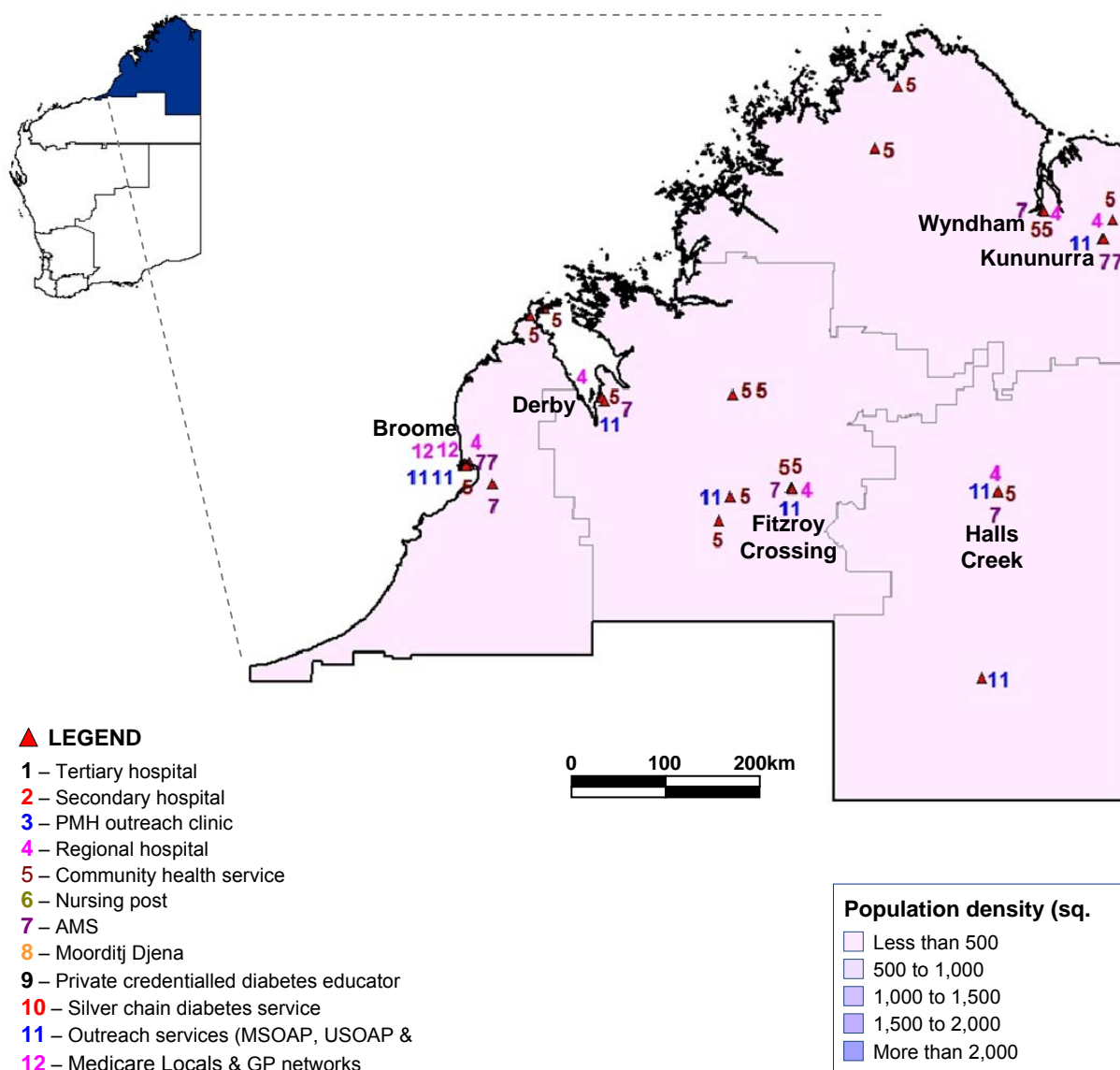
Source: KPMG calculation based on 2011 ABS Estimated Resident Population (all ages) (2012); WA Hospital Morbidity Data System, Performance Activity & Quality Division (2012); Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances, WA Epidemiology Branch (2012); KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network (2012); Diabetes non admitted data collection, Performance Activity & Quality Division; AOD data collection, WACHS (2012); Social Health Atlas of Australia: Western Australia, 2012, PHIDU and Medicare Australia data (2012)



Map 9: Kimberley diabetes and related services

KIMBERLEY

health region





Health districts

The health districts which form the Kimberley Region are East Kimberley and West Kimberley.

East Kimberley

The main towns in the East Kimberley health district are Kununurra, Halls Creek and Wyndham. Key services located in the district include the:

- Halls Creek, Kununurra and Wyndham Hospitals
- Halls Creek, Kalumburu, Kununurra, Oombulgurri, Warmun and Wyndham Community / Remote Area Health Services
- Yura Yungi, Ord Valley, Waringarri and Ngnowar Aerwah Aboriginal Medical Services
- Boab Health Kununurra office
- visiting specialist services, including:
 - Kalumburu:
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker and sonographer (once a year) provided by KAMSC, under ICDP
 - Kununurra:
 - diabetes educator, dietitian and / or podiatrist services (fortnightly or monthly) provided by Boab Health, under the RPHS program
 - an ophthalmologist and cardiology physician (once a year) provided by WACHS Kimberley, under MSOAP
 - an orthoptist (eight times a year) provided WACHS Kimberley, under ICDP
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker and sonographer (twice a year) provided by KAMSC, under ICDP
 - cardiology team consisting of a GP, registered nurse, tobacco health worker and echocardiogram technician (three times a year) provided by KAMSC, under ICDP
 - Kutjungka region
 - diabetes educator, dietitian and / or podiatrist services (quarterly) provided by Boab Health, under the RPHS program



- a general physician (three times a year) , provided by WACHS Kimberley, under MSOAP
- a cardiology physician (once a year to Balgo), provided by WACHS Kimberley, under MSOAP
- a renal team consisting of a general physician, registered nurse and Aboriginal health worker (twice a year to Balgo), provided by KAMSC, under ICDP
- a renal team consisting of a general physician, registered nurse and Aboriginal health worker (once a year) and a cardiology team consisting of a GP, registered nurse, tobacco health worker and echocardiogram technician (three times a year), to Balgo, Mulin and Billiluna, provided by KAMSC, under ICDP
- Wyndham:
 - diabetes educator, dietitian and / or podiatrist services (monthly) provided by Boab Health, under the RPHS program
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (one to two times a year), provided by KAMSC, under ICDP
- Yura Yungi:
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker (three times a year) provided by KAMSC, under ICDP.

West Kimberley

The main towns in the West Kimberley health district are Broome, Derby, Fitzroy Crossing and Halls Creek. Key services located in the district include the:

- Broome, Derby and Fitzroy Crossing Hospitals
- Broome, Derby, Bayulu, Fitzroy Crossing, Lombadina, Looma, Mowanjum, Noonkanbah and One Arm Point Community / Remote Area Health Services
- Broome Regional, Milliya Rumurra, Derby and Marra Worra Worra Aboriginal Medical Services, as well as the Kimberley Aboriginal Medical Service Council
- Boab Health Broome office
- Kimberley - Pilbara Medicare Local
- visiting specialist services, including:
 - Broome



- an ophthalmologist, cardiology physician and vascular surgeon (once a year) provided WACHS Kimberley, and an ophthalmologist and an orthoptist (twice a year) provided by Outreach Eye Services, under MSOAP
- an orthoptist (eight times a year), provided by WACHS Kimberley, under ICDP
- a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (twice a year) provided by KAMSC, under ICDP
- Dampier Peninsula
 - diabetes educator, dietitian and / or podiatrist services (monthly) provided by Boab Health, under the RPHS program
 - a general physician (three times a year) provided WACHS Kimberley, under MSOAP
- Derby
 - diabetes educator, dietitian and / or podiatrist services (monthly) provided by Boab Health, under the RPHS program
 - an ophthalmologist, cardiology physician and vascular surgeon (one to two times a year) provided WACHS Kimberley, under MSOAP
 - an orthoptist (eight times a year), provided WACHS Kimberley, under ICDP
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (one to two times a year) provided by KAMSC, under ICDP
- Fitzroy Crossing
 - dietitian and podiatrist services (monthly) provided by Boab Health, under the RPHS program
 - a general physician, cardiology physician and ophthalmologist (one to two times a year) provided WACHS Kimberley, under MSOAP
 - an orthoptist (eight times a year), provided by WACHS Kimberley, under MSOAP
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (one to two times a year) provided by KAMSC, under ICDP



- Fitzroy Valley:
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (three times a year) provided by KAMSC, under ICDP
- Gibb River Road
 - diabetes educator, dietitian and / or podiatrist services (biannually) provided by Boab Health, under the RPHS program
 - a general physician (once a year) provided WACHS Kimberley, under MSOAP
- Halls Creek
 - diabetes educator, dietitian and / or podiatrist services (fortnightly or monthly) provided by Boab Health, under the RPHS program
 - a general physician, ophthalmologist and cardiology physician (once a year) provided WACHS Kimberley, under MSOAP
 - a chronic disease paediatric team consisting of a paediatrician and allied health provider (twice a year) provided by WACHS Kimberley, under ICDP
 - an orthoptist (four times a year) provided by WACHS Kimberley, under ICDP
 - a cardiology team consisting of a GP, registered nurse, tobacco health worker and echocardiogram technician (three times a year) provided by KAMSC, under ICDP
- One Arm Point:
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker (once a year) provided by KAMSC, under ICDP.

Aboriginal health

Identified Aboriginal health services include the:

- Broome Regional Aboriginal Medical Service
- Derby Aboriginal Health Service
- KAMSC¹¹⁸
- Marra Worra Worra

¹¹⁸ While the primary function of KAMSC is regional coordination and administration support to the Kimberley AMS', the organisation also delivers ICDP services at present.



- Milliya Rumurra Aboriginal Corporation
- Ngnowar Aerwah
- Nindilingarri Cultural Health Service
- Ord Valley Aboriginal Medical Service
- Waringarri Aboriginal Corporation
- Yura Yungi Aboriginal Medical Service.

Visiting specialist teams under ICDP were also identified.

Outreach service

Identified outreach services include:

- Balgo:
 - a cardiology physician (once a year), provided by WACHS Kimberley, under MSOAP
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker (twice a year), provided by KAMSC, under ICDP
- Balgo, Mulin and Billiluna:
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker (once a year) and a cardiology team consisting of a GP, registered nurse, tobacco health worker and echocardiogram technician (three times a year), provided by KAMSC, under ICDP
- Broome:
 - an ophthalmologist, cardiology physician and vascular surgeon (once a year) provided by WACHS Kimberley, under MSOAP
 - an ophthalmologist and an orthoptist (twice a year) provided by Outreach Eye Services, under MSOAP
 - an orthoptist (eight times a year), provided by WACHS Kimberley, under ICDP
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (twice a year) provided by KAMSC, under ICDP
- Dampier Peninsula:
 - a general physician (three times a year) provided by WACHS Kimberley, under MSOAP



- Derby:
 - an ophthalmologist, cardiology physician and vascular surgeon (one to two times a year) provided by WACHS Kimberley, under MSOAP
 - an orthoptist (eight times a year), provided by WACHS Kimberley, under ICDP
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (one to two times a year) provided by KAMSC, under ICDP
- Fitzroy Crossing:
 - a general physician, cardiology physician and ophthalmologist (one to two times a year) provided by WACHS Kimberley, under MSOAP
 - an orthoptist (eight times a year), provided by WACHS Kimberley, under MSOAP
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (one to two times a year) provided by KAMSC, under ICDP
- Fitzroy Valley:
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (three times a year) provided by KAMSC, under ICDP
- Gibb River Road:
 - a general physician (once a year) provided by WACHS Kimberley, under MSOAP
- Halls Creek:
 - a general physician, ophthalmologist and cardiology physician (once a year) provided by WACHS Kimberley, under MSOAP
 - a chronic disease paediatric team consisting of a paediatrician and allied health provider (twice a year) provided by WACHS Kimberley, under ICDP
 - an orthoptist (four times a year) provided by WACHS Kimberley, under ICDP
 - a cardiology team consisting of a GP, registered nurse, tobacco health worker and echocardiogram technician (three times a year) provided by KAMSC, under ICDP



- Kalumburu:
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker and sonographer (once a year) provided by KAMSC, under ICDP
- Kununurra:
 - an ophthalmologist and cardiology physician (once a year) provided by WACHS Kimberley, under MSOAP
 - an orthoptist (eight times a year) provided by WACHS Kimberley, under ICDP
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker and sonographer (twice a year) provided by KAMSC, under ICDP
 - cardiology team consisting of a GP, registered nurse, tobacco health worker and echocardiogram technician (three times a year) provided by KAMSC, under ICDP
- Kutjungka:
 - a general physician (three times a year) provided by WACHS Kimberley, under MSOAP
- One Arm Point:
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker (once a year) provided by KAMSC, under ICDP
- Wyndham:
 - a renal team consisting of a general physician, registered nurse, Aboriginal health worker and sonographer (one to two times a year) provided by KAMSC, under ICDP
- Yura Yungi:
 - a renal team consisting of a general physician, registered nurse and Aboriginal health worker (three times a year) provided by KAMSC, under ICDP.



4.4 Non government service providers

4.4.1 Diabetes WA

Diabetes WA¹¹⁹ is the peak NGO body for diabetes in WA. Diabetes WA provides a range of services to the health system in WA via contracts managed by the WA Department of Health and the Commonwealth Department of Health and Ageing. Diabetes WA has a state wide remit and aims to address gaps in diabetes consumer awareness, information and self management services. The organisation provides a range of services and programs to people with diabetes as well health professionals that include:

- administration of the National Diabetes Service Scheme
- diabetes education services
- health promotion
- Aboriginal health.

In order to administer their programs, Diabetes WA employ seven diabetes educators and approximately 15 diabetes educators as sub-contractors.

National Diabetes Services Scheme

The National Diabetes Services Scheme (NDSS) is a Commonwealth funded program which delivers subsidised products, information and supports services to people with diabetes across Australia. People registered with the NDSS can access a range of products to assist in their diabetes management.

Diabetes WA is responsible for coordinating the NDSS in WA. Across WA, there are currently approximately 520 Access Points which are approved outlets where NDSS products can be purchased. These are mainly comprised of pharmacies (c. 450) and other proxy organisations such as aged care providers or community health service organisations. The number of Agents in WA has grown significantly from only 40 Agents three years ago.

The majority of Agents in rural and remote WA only provide products to their customers. The ability to provide information services is limited. Diabetes WA provides a level of training for providers in order that they can deliver a basic level of information to NDSS clients.

NDSS clients are registered through either GP or Diabetes Educator referral. Approximately, 800 new people are registered with NDSS each month.

¹¹⁹ Diabetes WA – www.diabeteswa.com.au



Diabetes WA is responsible for processing applications and maintaining the NDSS database.

Support and education services

Diabetes WA provides three evidence based programs that are designed to assist people who have recently been diagnosed with diabetes understand and manage their disease. The following Diabetes WA programs are promoted as the first step in a suite of programs designed and planned to provide support and assistance across the continuum of care for a person with diabetes.

Diabetes Education for ongoing and Newly Diagnosed (DESMOND) program

The Diabetes Education for ongoing and Newly Diagnosed (DESMOND) is targeted to newly diagnosed people with type 2 diabetes and is designed to build self management skills.

An alternative program is the DESMOND program that also supports people with type 2 diabetes. The program is delivered via six hours of education across one full day or two half day sessions. The DESMOND program is currently available in Albany, Belmont, Geraldton, Joondalup, Kwinana, Katanning, Mandurah, Meekatharra, Mount Magnet, Midland, Rockingham and Subiaco. DESMOND is delivered in a couple of other languages, including Mandarin.

Living with Diabetes program

The Living with Diabetes (LWD) program is an extended self-management education program to assist people with type 2 diabetes to manage and live well. It comprises six interactive modules delivered in two-three hour sessions over consecutive weeks. Modules cover Getting Started; Balancing Life: Stress Reduction and Physical Activity; Balance in Your Eating; Shopping Tour; Risk Management, Medication and Diabetes and Foot Care and Self-Management. The program is standardised and presented by a multidisciplinary team.

The LWD program is delivered in a range of locations including Armadale, Bentley, Hilton, Mandurah, Rockingham, Swan, Albany, Bunbury, Busselton, Geraldton and Manjimup. The program also includes CALD programs and is delivered by Diabetes WA in Mandarin.

In 2011, there were 297 course bookings with 213 participants going on to attend at least four sessions. There were a total of 25 programs delivered of which four were CALD programs.¹²⁰

¹²⁰ Diabetes WA, Final Report 2011 for the Living with Diabetes Program, January 2012



Dose Adjustment for Normal Eating (DAFNE) program

DAFNE is a group program designed for adults with type 1 diabetes and delivered by a trained diabetes educator. It is a five day course covering carbohydrate estimation, insulin adjustment, blood glucose monitoring, illness and exercise.

Other diabetes programs

Other programs also offered by Diabetes WA include:

- Diabetes Information and Advice Line (DIAL) – delivered by credentialled diabetes educators who provide diabetes related information; counselling; problem-solving; referrals; and education services over the telephone. The service operates weekdays between 8:30am and 4:30pm. In the year to June 2012, the Information Service received 2,678 contacts (66 per cent from callers known to have type 2 diabetes). The service also made 2,734 referrals over the same period, with the largest number to GPs (820) and local health services (397)¹²¹
- a range of other programs that are designed to provide people with diabetes access to ongoing support and advice through a series of drop in sessions of 1-2 hour duration. These programs include: Shop Smart; Cook Smart; and Meter Smart
- a range of Aboriginal resources and services, including the ‘Feltman’ education model (an NDSS funded resources) and training sessions for health professionals working with people with diabetes and those at risk.

Diabetes WA are also building their telehealth and videoconferencing capability. This will enable them to connect more easily with service providers and consumers around the state.

4.4.2 Rural Health West outreach service coordination

Rural Health West (RHW) coordinates outreach services funded by the Department of Health and Ageing under four key programs:

- **Medical Specialist Outreach Assistance Program (MSOAP)** – MSOAP aims to improve health and medical service delivery by increasing access to medical specialists for people living in rural and remote communities. The MSOAP program provides funding to assist with the travel costs associated with rural and remote service delivery. Objectives of program include: increase visiting medical specialist services in areas of identified need; support specialists to provide outreach services in rural and remote

¹²¹ Diabetes WA, Half Year Report (July to December 2011) and End of Financial Year Report (January – June 2012) Diabetes Information Service (DIAL)



communities; increase and maintain the skills of health professionals in regional, rural and remote areas; and facilitate communication between visiting medical specialists and health professionals in local areas¹²²

- **Urban Specialist Outreach Assistance Program (USOAP)** – assistance to establish new and expand existing medical specialist outreach services that focus on the management and treatment of chronic disease for Indigenous Australians living in urban areas
- **Indigenous Chronic Disease Package (ICDP)** – ICDP is a key component of the Closing The Gap initiative. Under ICDP, MSOAP services for Indigenous communities have been funded to support multi-disciplinary teams to provide outreach services to rural and remote communities. The program aims to increase access to a range of health services, including expanded primary health care, provided to people in rural and remote Aboriginal communities for the treatment and management of chronic disease
- **Integrated Diabetes and Endocrinology Service (IDES)** – endocrinology services delivered under IDES include the Peel Health Campus, Albany, Port Hedland, Karratha and Newman. RHW provides administration support from its office in Nedlands, including management of patient referrals, bookings, Medicare billings and medical typing to reduce the burden on the financial and administrative resources of visiting endocrinologists.

RHW also coordinates

- multi-disciplinary maternity service teams which aim to provide outreach maternity services to rural and remote communities and provide increased support to services via telehealth led by KEMH
- ophthalmology and orthoptist services to rural and remote locations across WA.

In order to access MSOAP, USOAP and ICDP funding, agencies must submit a proposal to Rural Health West following endorsement by the Rural Health Workforce. This is reviewed by a Working Party that includes RHW, WACHS, the Commonwealth Department of Health and Ageing, Medicare Locals and the Aboriginal Health Council of WA (AHCWA). Each proposal must be endorsed by the DoHA Advisory Forum, which meets twice a year.

Funding under the program is currently under review and will be subject to tender. As such, existing funding is only for a one year period. As part of the tender process, it is likely that RHW will need to develop service plans for their programs which will require a coordinated / round table effort by stakeholders including AMS'.

¹²² MSOAP guidelines at www.health.gov.au/internet/main/publishing.nsf/Content/ruralhealth-services-msoap-guidelines



A list of visiting specialist services coordinated by RHW is located at Appendix G.

Closing The Gap and the Indigenous Chronic Disease Package

In November 2008, the Council of Australian Governments (COAG) committed up to \$1.6 billion over four years to 'Closing The Gap' in life expectancy between Indigenous and non-Indigenous Australians within a generation. This national partnership involves all level of governments working together with health and medical professionals, and Aboriginal and Torres Strait Islander communities. There are five areas that are funded under Closing the Gap:

- Tackling Smoking
- Healthy Transition to Adulthood
- Making Indigenous Health Everyone's Business
- Primary Health Care that Delivers
- Fixing the Gaps in service and Improving the Patient's Journey.

All of these areas have been implemented throughout Western Australia, with some programs being run throughout the state and others within Health Regions.

The most significant component of the Closing the Gap initiative in terms of diabetes care is the ICDP. ICDP has three main elements:¹²³

- Tackling chronic disease risk factors – this element includes Indigenous tobacco campaign activities, a new tobacco action workforce, a health promotion workforce, healthy lifestyle programs and improved access to smoking cessation services by Aboriginal and Torres Strait Islander people
- Improve chronic disease management and follow-up care – this element includes MBS funded Indigenous health check item numbers and related follow up care, as well as a incentives under the Practice Incentives Program to encourage general practices to improve the coordination of health care for Aboriginal and Torres Strait Islander people. This element is particularly relevant for diabetes care, as it is supporting the provision of visiting specialist teams to rural and remote in country WA
- Workforce expansion and support – this element includes measures to expand the primary care workforce in Indigenous and mainstream health

¹²³ Sources: Australian Government Department of Health and Ageing website, 'Closing the Gap'; accessed 5 November 2012 at www.health.gov.au/internet/ctg/publishing.nsf/Content/Indigenous-Chronic-Disease-Package-factsheet; and WACHS Aboriginal Health Program Descriptors by Region.



services to increase the uptake of health services by Aboriginal and Torres Strait Islander people. Measures include communication and marketing activity to attract more Indigenous people to work in health and more people to work in Indigenous health; additional workforce including Aboriginal and Torres Strait Islander Outreach Workers and care coordinators, health professionals and practice managers; and additional nursing scholarships, registrar training posts and nurse clinical placements. Outreach workers and care coordinators have been identified as particularly beneficial for the delivery of diabetes services, given the importance of engaging with Aboriginal people and coordinating visiting services with the availability of the people they aim to assist.

4.4.3 Silver Chain

Silver Chain is contracted by the Department to provide a range of nursing services across Western Australia, including provision of diabetes specific as well as general nursing services such as nurse practitioners, primary and emergency clinics, wound care and telehealth support. Silver Chain diabetes services aim to assist clients in taking an active and informed role in the management of both type 1 and 2 diabetes and include provision of expert care, assessment, support and education.

Services are provided by Silver Chain in a range of locations. These include:

- diabetes specific clinics or services at:
 - SMHS
 - Perth and Mandurah (via the Peel Diabetes Clinic delivered in partnership with the Perth South Coastal Medicare Local)
 - South West
 - Busselton, Collie, Manjimup
 - Wheatbelt
 - Wheatbelt Coastal District, provided by a nurse practitioner who is a diabetes educator
 - Midwest
 - Carnarvon,¹²⁴ Geraldton and Shark Bay¹²⁵

¹²⁴ This service also provides a telehealth monitoring service for Aboriginal clients, including those with diabetes.

¹²⁵ This service is a virtual clinic delivering telehealth care provided by a diabetes educator located in Northam.



- general nursing services at:
 - South West
 - Bunbury, Bridgetown, Margaret River, Harvey and Walpole
 - Great Southern
 - Albany and Katanning¹²⁶
 - Wheatbelt
 - Beacon, Bencubbin, Bindoon, Brookton, Lancelin, Merredin¹²⁷,
Narrogin / Northam¹²⁸ and Toodyay
 - Midwest region
 - Abrolhos Islands, Eneabba, Leeman and Mingenew
 - Goldfields
 - Kalgoorlie and Eucla.

Sliver Chain is also a partner in the delivery of the Wounds West service, as described below.

4.4.4 Medicare Benefits Scheme funded services

General practice

General practitioners practice nurses acting on behalf of the GP routinely provide diabetes care in the general practice setting. As outlined under Section 2.2.3, there were 1,496 full workforce equivalent (FWE) general practitioners working across 573 general practices at 1 July 2010. GPs may be remunerated for diabetes related care under standard consult MBS item numbers or via the Chronic Disease Management item numbers (which include health check, care plan and team care arrangement item numbers).

As outlined under section 3.1.3, it is estimated that approximately 410,308 diabetes related services were provided by WA GPs in 2010/11.

Private allied health providers

Private allied health, particularly diabetes educators, dietitians and podiatrists, also provide diabetes related services under MBS funding. These services are

¹²⁶ Nurse practitioner service.

¹²⁷ Nurse practitioner service who provides services in the Eastern Wheatbelt area.

¹²⁸ Nurse practitioner who provides a virtual, telehealth service to the Narrogin and Northam areas.



provided on referral from a GP as part of a GP management plan, and typically involve up to five occasions of service per person with diabetes per year. As outlined under Section 3.1.3, 3,733 services were provided by private diabetes educators in 2011, compared to 36,291 exercise physiology, 56,640 dietetics, 163,920 physiotherapy and 312,874 podiatry services. This indicates that MBS funded private diabetes education services are not extensively accessed by people with diabetes (less than 33 services per 1,000 persons with diabetes).

4.4.5 Medicare Locals and general practice networks

Medicare Locals have been established under the national health reform agenda as primary health care organisations to:

- improve the patient journey through developing integrated and coordinated services
- provide support to clinicians and service providers to improve patient care
- identify the health needs of local areas and develop locally focused and responsive services
- facilitate the implementation of primary health care initiatives and programs.

There are eight Medicare Locals in WA, being:

- NMHS: Perth North Metropolitan Medicare Local and Perth Central & East Metropolitan Medicare Local
- SMHS: Bentley - Armadale Medicare Local, Fremantle Medicare Local and Perth South Coastal Medicare Local
- South West, Great Southern and Wheatbelt: South West WA Medicare Local
- Midwest and Goldfields: Goldfield - Midwest Medicare Local
- Pilbara and Kimberley: Kimberley - Pilbara Medicare Local.

Medicare Locals have been recently established, with all commencing operation between 1 July 2011 and 1 July 2012. Early activities have included a focus on population health planning, after hours general practice and coordinating rollout of person controlled electronic health records. In time, Medicare Locals are expected to take on a role in developing and implementing locally adapted services and programs to improve the health of their communities, including in the area of diabetes. This role may involve commissioning or delivering health services direct to the community to meet the needs of marginalised groups or address local service gaps.

At present, Medicare Locals have a relatively minor role in diabetes service provision, with relevant programs being:

- for metropolitan regions: Metropolitan Healthy Lifestyle and diabetes care coordination programs being established (see outline below)



- for country regions: delivery of allied health services under the Rural Primary Health Services (see outline below), MSOAP or ICDP initiatives. However, at present the majority of diabetes services are still being delivered by the remaining general practice networks (GPNs) such as Koombana Health Network (South West), Amity Health (Great Southern), Wheatbelt GP Network (Wheatbelt), Goldfields Esperance GP Network (Goldfields), Pilbara Health Network (Pilbara) and Boab Health Services (Kimberley). In time, it is expected that responsibility for these programs will be switched to the Medicare Locals, but many will continue to commission GPNs to deliver the services on the ground, particularly those with large catchments.

Metropolitan Healthy Lifestyle Program

The Metropolitan Healthy Lifestyle Program (MHLP) is a coordinated patient-centred support program focussed on early identification and intervention for chronic diseases. The overall aim of the project is to provide practical support for people at risk of developing chronic disease, and for those who have chronic disease to make informed lifestyle choices and healthy behaviour change. It is delivered within the Perth metropolitan area. Funding is provided by the WA Department of Health.

Patient care is coordinated through general practice, trained clinic staff and supported allied health and community providers, with clear referral pathways and monitored patients to support lifestyle and risk modification.

The program was initially funded to the end of December 2011. The Department has extended funding for MHLP due to positive patient outcomes. In 2012, Fremantle, Perth Central and East Metro and Perth North Metro Medicare Locals became Service Delivery Centres and will be providing the service to patients across the region.¹²⁹

Rural Primary Health Services Program

Rural Primary Health Services (RPHS) is a Commonwealth funded program aiming to improve access to a range of primary and allied health care services and activities for rural and remote communities. The RPHS program enables the employment or contracting of allied health providers to address gaps resulting from a lack of private providers operating in small rural and remote

¹²⁹ Sources: Fremantle Medicare Local, accessed 5 November 2012 at www.fremantlemedicarelocal.com.au/health-care-professionals/research-and-innovation/; WA Health website, accessed 5 November 2012 at www.healthnetworks.health.wa.gov.au/abhi/project/metro.cfm; and Dr Michael Rosenberg, 2011, *Evaluation of the Metropolitan Healthy Lifestyle Program*.



communities.¹³⁰ Primary health care funded under the RPHS program are provided free of charge to consumers. A number of organisations deliver the RPHS in WA, particularly general practice networks and Medicare Locals.

4.4.6 GP Super Clinics

GP Super Clinics are an element in the Australian Government's agenda to build a stronger national primary health care system with a greater focus on health promotion and illness prevention and better coordination between GPs and allied health services, community health and other state and territory funded services.

It is intended that GP Super Clinics will bring together general practitioners, nurses, visiting medical specialists, allied health professionals and other health care providers to deliver better health care, tailored to the needs and priorities of the local community. In particular, GP Super Clinics are expected to support patients with or at risk of chronic disease, providing them with the option to receive a full range of health services in a coordinated manner at single location. GP Super Clinics will include facilitate to run regular chronic disease management programs and communicate education. Stakeholders reported that some GP Super Clinics are expected to host / offer diabetes specific service once operational.

WA GP Super Clinics will be located in Cockburn, Karratha, Midland, Northam, Rockingham and Wanneroo.¹³¹ The Midland GP Super Clinic is now operational; all other clinics are at various stages of planning and development.

4.4.7 Royal Flying Doctor Service

The Royal Flying Doctor Service provide a range of services primary health care services to rural and remote WA including:

- primary health care clinics
- planned transportation
- patient retrieval services
- remote services including telehealth and maintenance of medical chests.

¹³⁰ Australian Government Department of Health and Ageing website, Rural Primary Health Services; accessed 5 November 2012 at www.health.gov.au/rphs.

¹³¹ Department of Health and Ageing – GP Super Clinics Program. Further information at www.health.gov.au/internet/main/publishing.nsf/Content/pacd-gpsuperclinics.



Primary health care clinics

RFDS GP retrieval doctors are based at the following locations: Kalgoorlie; Meekatharra; Port Hedland and Derby. GPs and a primary healthcare nurse working from each of the regional bases provide fortnightly (one day) clinics to the following locations on an outreach basis:

- Kalgoorlie – Menzies, Cosmo Newberry, Transline and Coonana
- Meekatharra – Sandstone, Paynes Find, Yalgoo and Cue
- Derby – Fitzroy Valley (Noonkanbah, Yakanarra) and Gibb River Road
- Port Hedland – Marble Bar and Yandeyarra.

RFDS mobile clinics connect with local health services – usually remote area nurses, who are responsible for coordinating services (e.g. booking appointments) and liaising with other services servicing the community (e.g. MSOAP outreach services). RFDS do not employ any allied health professionals directly but they do facilitate their access to communities by arranging access to RFDS transportation.

In addition to the remote clinics that are held, RFDS have a permanent clinic based located at the Meekatharra hospital. This is a permanent clinic staffed by local GPs. There is no other GP clinic in town. The clinic is serviced by a range of health professionals who service it on an outreach basis. These include:

- a diabetes educator (1 day a fortnight from diabetes educator based in Geraldton)
- a cardiologist; podiatrist; physiotherapist and optometrist.

Planned transportation

RFDS also provide scheduled transportation services for people with diabetes; e.g. women requiring transport to KEMH at 36 weeks of pregnancy. In these instances, RFDS will usually arrange commercial transportation for these women rather than the specialist plane.

Retrieval services

Retrieval services include emergency evaluation via a RFDS specialist plane. Alternatively, a GP may identify a need for evacuation during one of their clinics and will transport the patient back to their base on their scheduled charter flight.

Remote services

RFDS provides telehealth advice services to health professionals and people in remote areas via a 1800 number. This is staffed by a GP Retrieval Specialist 24 hours a day. The telehealth line can also be used for insulin management if needed.



RFDS also provide Medical Chests, which are repositories of medical supplies located across WA. The GP Retrieval Specialist provides advice over the phone directing the recipient to the supply with instructions on how to use the supplies.

4.4.8 **healthdirect Australia**

healthdirect Australia is a nationwide telehealth service operated by the National Health Call Centre Network which provides 24 hours a day, seven days a week access to healthcare triage, health advice and information. Advice is provided via a telephone triage, health advice and information line. healthdirect Australia also incorporates healthInsite¹³² which provides a public source of online health information, including relating to diabetes. healthdirect Australia also hosts the After Hours GP helpline which provides health information and assistance from a registered nurse, or medical advice from a GP.¹³³

During the 2011/12 financial year, healthdirect Australia received a total of 993 diabetes related calls from WA, covering issues such as high HbA1c levels, glucose intolerance, respiratory, foot, paediatric and pregnancy related issues.¹³⁴

¹³² Further information at www.healthinsite.gov.au.

¹³³ Further information at www.healthdirect.org.au.

¹³⁴ National Health Call Centre Network. Nurse triage helpline – WA patient data – diabetes related guidelines.



5 Analysis of service availability

5.1 Overview of analysis approach

An analysis of service availability and access for each WA health region is provided below. The analysis focuses on the following features of diabetes service provision:

- access to endocrinologists and general physicians with a diabetes special interest
- access to diabetes specialist allied health providers; i.e. diabetes educators as well as dietitians and podiatrists who routinely provide diabetes related care
- access to multidisciplinary teams which include diabetes specialists (medical and allied health)
- access to general practitioners
- number of inpatient separations and (measured) non admitted occasions of service (using the composite data set developed by KPMG) per 1,000 persons (total population)
- frequency of visiting specialist teams attendances to regional centres and communities
- maximum distance a regional resident may travel to access a regional centre
- average waiting times for diabetes services (where known)
- access relating to special population groups such as people with type 1, type 2 and gestational diabetes mellitus, children and adolescents, and Aboriginal people.

Specific criteria for assessing diabetes service coverage in WA health regions are outlined in Table 66 below. These criteria are an indication of service availability and are not an indication of the quality, appropriateness or effectiveness of the services delivered.

The analysis provided by against these criteria reflects the available data, and its limitations; region specific limitations have been identified where possible. For the graphs provided in the chapter below, it should be noted that scales vary by region, according to population size and activity levels. These differences and limitations must be considered when interpreting the information provided.



Table 66: Criteria for assessing diabetes service coverage in WA health regions

Criteria	Level				
	1	2	3	4	5
No. of FTE endocrinologists or general physicians with a diabetes special interest permanently located in this region / service	0 endos, 0 gen phys	0 endos ≤2 gen phys	≤2 endos	3-5 endos	≥6 endos
No. of FTE diabetes focussed allied health providers (i.e. diabetes educators, dietitians and podiatrists) permanently located in this region / at this service ¹³⁵	≤5	6 - 10	11 - 20	21 - 30	≥31
Access to multidisciplinary diabetes focussed team (which includes medical and allied health providers working collaboratively)	Team based on generalist providers	Team based on diabetes focussed providers available from tertiary centres only	Team based on diabetes focussed providers, available from tertiary and regional centres only	Team based on diabetes focussed providers, available from regional centres and communities	Team based on diabetes focussed providers, available throughout the catchment
No. of persons per FWE GP ¹³⁶	>1,700	1,451 - 1,700	1,201 - 1,450	951 - 1,200	700 - 950
Non admitted occasions of service per 1,000 persons ¹³⁷	≤15.1	15.2 – 23.7	23.8 – 32.3	32.4 – 40.8	≥40.9

¹³⁵ Diabetes focussed allied health providers is interpreted as those identified to the review as working mainly in diabetes related roles. This includes diabetes educators, dietitians, and podiatrists as well as a small number of nurse practitioners, social workers, psychologists, physiotherapists and Aboriginal health workers.

¹³⁶ Access to FWE GPs in Australia ranges from 730 persons per FWE GP (in Adelaide) to 1,946 persons per FWE GP (in the Pilbara). The Australian rate is 1,101 persons per FWE GP. Therefore, criteria for access to general practice proposed in this document are based on a national as opposed to WA specific comparison of population to GP ratios. See Key Division of General Practice characteristics 2010-2011, as reported by the Primary Health Care Research Institute, March 2012.

¹³⁷ The range for non admitted occasions of service has been determined by (1) calculating the difference between the highest and lowest rates of service per 1,000 persons, (2) dividing this by 5 to determine the increments for each level, and (3) adding the incremental values to the lowest reported rate of occasions of service. Kimberley data was omitted when calculating the range given advice that significant levels of



Criteria	Level				
	1	2	3	4	5
Community health occasions of service per 1,000 persons ¹³⁸	≤4.5	4.6 – 8.8	8.9 – 13.1	13.2 – 17.5	≥17.6
ED presentations per 1,000 persons ¹³⁹	≤2.9	3.0 – 4.3	4.4 – 5.7	5.8 – 7.2	≥7.3
Inpatient separations per 1,000 persons ¹⁴⁰	≤1.4	1.5 – 2.0	2.1 – 2.7	2.8 – 3.3	≥3.4
Frequency of visiting specialist team attendances	Biannually	Quarterly	Monthly	Not applicable	
Maximum distance people with diabetes are required to travel to access specialist services (e.g. from a regional / remote location to a regional centre)	>500 km	250 - 500 km	50 - 250 km	20 - 50 km	<20 km
Specific population groups					
People with type 1 diabetes	Visiting specialists attend regional centres quarterly or less	Visiting specialists attend regional centres monthly or more	Diabetes specialists located at secondary hospital	Tertiary services available 20-50 km	Tertiary services available <20 km

Kimberley activity are not recorded in the non admitted data collection due to use of alternative information management systems in this region.

¹³⁸ The range for community health occasions of service has been determined by (1) calculating the difference between the highest and lowest rates of service per 1,000 persons, (2) dividing this by 5 to determine the increments values for each level, and (3) adding the incremental values to the lowest reported rate of occasions of service. Kimberley data was omitted when calculating the range given the significantly higher rates of community health activity not in this region.

¹³⁹ The range for inpatient presentations has been determined by (1) calculating the difference between the highest and lowest rates of service per 1,000 persons, (2) dividing this by 5 to determine the increments values for each level, and (3) adding the incremental values to the lowest reported rate of presentations.

¹⁴⁰ The range for inpatient separations has been determined by (1) calculating the difference between the highest and lowest rates of service per 1,000 persons, (2) dividing this by 5 to determine the increments values for each level, and (3) adding the incremental values to the lowest reported rate of separations.



Criteria	Level				
	1	2	3	4	5
People with type 2 diabetes	Visiting diabetes specialist teams attend regional communities quarterly or less	Visiting diabetes specialist teams attend regional communities monthly or more	Diabetes specialists available within 250 km	Diabetes specialists available 20-50 km	Diabetes specialists available <20 km
People with gestational diabetes	No GDM educator identified	Obstetrician and GDM educator available within 500 km	Obstetrician and GDM educator available within 250 km	Tertiary services available 20-50 km	Tertiary services available <20 km
Children and adolescents	PMH team visits biannually or less	PMH team visits quarterly	PMH team visits monthly or more	Tertiary services available 20-50 km	Tertiary services available <20 km
Aboriginal people	AMS' plus visiting ICDP diabetes teams attending quarterly or more	AMS' plus visiting ICDP diabetes teams attending monthly or more	Aboriginal and diabetes specific services provided at regional centres only	Aboriginal and diabetes specific services provided at regional centres and multiple communities	Aboriginal and diabetes specific services provided throughout the catchment

Source: KPMG



5.2 Statewide services

5.2.1 Children and Adolescent Health Service

As indicated by Figure 20, for the CAHS:

- inpatient separations were reported at substantially lower rates than the WA average¹⁴¹
- non admitted occasions of service were reported at substantially higher rates than the WA average¹⁴²
- total estimated diabetes services were reported at substantially higher rates than the WA average.

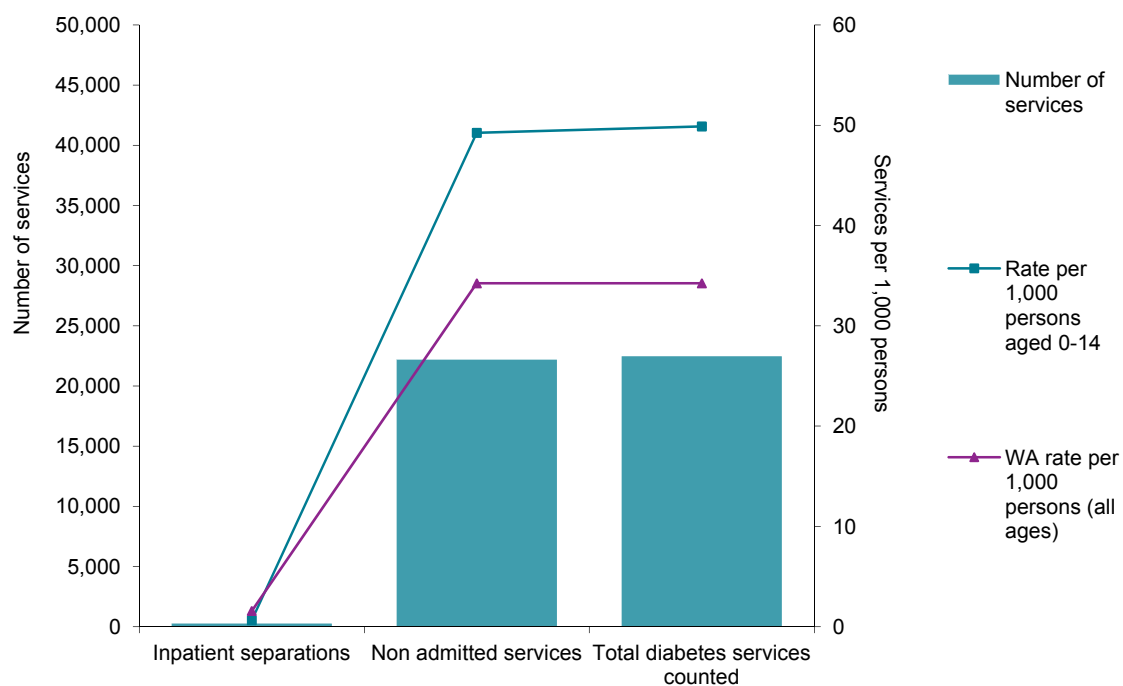
It should be noted that the CAHS target population differs from that of the total WA population and caution is required when making comparisons between the rate of service delivery per 1,000 persons between the two groups.

¹⁴¹ CAHS inpatient separations per 1,000 persons calculated based on the WA 0-14 years ERP. Total WA inpatient separations calculated based on the WA total number and total WA ERP.

¹⁴² CAHS outpatient occasions of service per 1,000 persons calculated based on the WA 0-14 years ERP. Total WA occasions of service calculated based on the WA total number and total WA ERP.



Figure 20 : Summary of CAHS diabetes service activity, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 67: Assessment of CAHS diabetes service coverage

Assessment criteria	Rating	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	4	Approx 5 endocrinologists / paediatricians based at PMH
No. of diabetes focussed allied health providers permanently located in this region	3	Approx ≤11 FTE providers identified, based at PMH
Access to multidisciplinary diabetes focussed team	3	Broad team based at PMH; limited coverage for the rest of the state
No. of non admitted occasions of service per 1,000 persons	5	CAHS non admitted occasions of service per 1,000 persons are calculated based on the WA 0-14 years ERP. Assumes CAHS is responsible for the statewide child and adolescent population
No. of inpatient separations per 1,000 persons	1	CAHS inpatient separations per 1,000 persons calculated based on the WA 0-14 years ERP Expect inpatient separations to be low for this group given the age range
Frequency of visiting specialist team attendances	2 – 3	PMH provides outreach services to a number of regions
Maximum distance people with diabetes are required to travel to access specialist services	n.a.	PMH provides outreach services to a number of regions
Average waiting times for diabetes specialist services	n.a.	Unknown
Specific population groups		
People with type 1 diabetes	1 – 5	Major focus of PMH Diabetes and Endocrinology Dept Access varies by resident location
People with type 2 diabetes	1 – 5	Limited occurrence of T2 among young people. Around 1/6 of PMH patient profile Access varies by resident location
People with gestational diabetes	n.a.	n.a.
Children and adolescents	5	Focus of service
Aboriginal people	2	Some Aboriginal community support but not a major focus of the service



Summary

CAHS is a statewide service that provides greatest coverage for people living near the Perth CBD. Fortnightly outreach clinics are also delivered at Joondalup and Rockingham to service outer metropolitan residents. Access is limited for rural locations other than Albany, Bunbury, Kalgoorlie, Narrogin and Northam. Residents of other rural and remote communities must travel to access PMH care, in many cases significant distances.

Strategies for supporting transition from CAHS to adult services vary by clinic and location. For rural and remote regions, the lack of specialist services and variability for visiting specialist services suggests transition is particularly difficult. This review had no visibility of transitioning in these locations.

PMH tele-consultancy support is provided to metropolitan and regionally based providers, but not currently under a formalised arrangement.

Stakeholders identified a need for increased psycho-social support, proactive screening for complications, and better management of life transitions for young people.

Source: KPMG



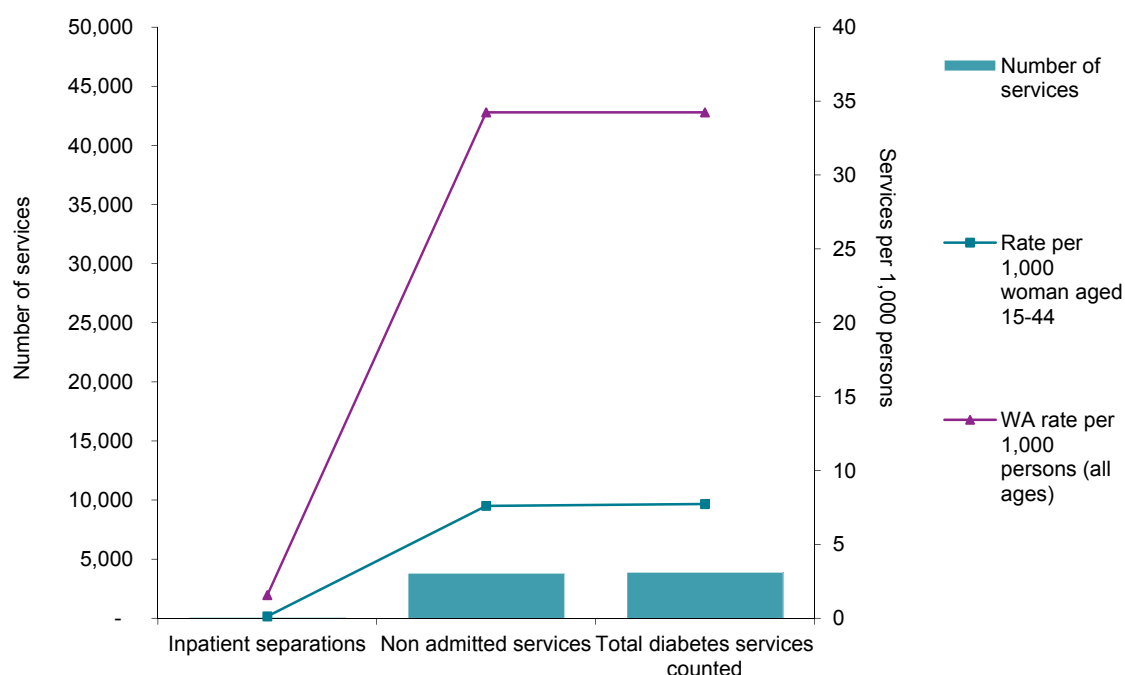
5.2.2 Women and Newborns Health Service

As indicated by Figure 21, for the WNHS:

- inpatient separations were reported at substantially lower rates than the WA average¹⁴³
- non admitted occasions of service were reported at substantially lower rates than the WA average¹⁴⁴
- total estimated diabetes services were reported at substantially lower rates than the WA average.

It should be noted that the WNHS target population differs from that of the total WA population and caution is required when making comparisons between the rate of service delivery per 1,000 persons between the two groups.

Figure 21 : Summary of WNHS diabetes service activity, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data

¹⁴³ WNHS inpatient separations per 1,000 persons calculated based on the WA 15-44 years estimated female resident population. Total WA inpatient separations calculated based on the WA total number and total WA ERP.

¹⁴⁴ WNHS outpatient occasions of service per 1,000 persons calculated based on the WA 15-44 years estimated female resident population. Total WA occasions of service calculated based on the WA total number and total WA ERP.



Table 68: Assessment of WNHS diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	2	≤3 obstetricians and general physicians with a diabetes special interest identified
No. of diabetes focussed allied health providers permanently located in this region	1	Approx ≤5 FTE providers identified
Access to multidisciplinary diabetes focussed team	2	Multidisciplinary team based at KEMH; limited coverage for the rest of the state
No. of non admitted occasions of service per 1,000 persons	1	WNHS occasions of service per 1,000 persons calculated based on the WA 15-44 years estimated female resident population
No. of inpatient separations per 1,000 persons	1	WNHS outpatient occasions of service per 1,000 persons calculated based on the WA 15-44 years estimated female resident population. Assumes WNHS is responsible for the statewide women and newborn population Many women with diabetes in pregnancy related issues may be admitted under non diabetes coding
Frequency of visiting specialist team attendances	n.a.	KEMH provides outreach services to one regional location
Maximum distance people with diabetes are required to travel to access specialist services	>2,500 km	> 2,500 km for transfer of high risk women from Kununurra to Perth. Note however, Kimberley, Pilbara and Midwest are managing most women with diabetes in pregnancy locally, with KEMH tele-consultancy support
Average waiting times for diabetes specialist services	n.a.	
Specific population groups		
People with type 1 diabetes	2	Covered at KEMH; must travel if not living near this service
People with type 2 diabetes	2	Covered at KEMH; must travel if not living near this service
People with gestational diabetes	4	Major focus (approx 80 per cent of referrals)
Children and adolescents	n.a.	



Assessment criteria	Level	Comments
Aboriginal people	2	Some Aboriginal community support but not a major focus of the service

Summary

The WNHS is a statewide service that provides greatest coverage for people living in the Perth inner metropolitan suburbs; coverage is more limited for outer metropolitan suburbs and access is difficult for women in regional and remote areas. As a result, areas such as the Midwest, Pilbara and Kimberley regions are managing women with diabetes in pregnancy locally, with tele-consultancy support provided by KEMH.¹⁴⁵ While GDM focussed diabetes educators are located in Bunbury, Albany and Geraldton, many other communities do not have GDM specific providers.

KEMH provides:

- structured weekly telehealth services provided for health professionals and women living in rural and remote settings, which have been effective in reducing the need for women to travel to KEMH
- informal tele-consultancy support and advice provided for health across the state
- regular workshops and study days are provided for all health professionals including university based midwifery and other students by the diabetes educators and dietitians
- a formal quarterly outreach service to the Ngaanyatjarra Lands east of Kalgoorlie, under MSOAP.

Stakeholders identified a need for additional diabetes education for other pregnancy related care providers, increased diabetes educator and psycho social support at KEMH, and proactive pregnancy counselling for women with pre-pregnancy diabetes.

Source: KPMG

¹⁴⁵ This review has not assessed the extent or adequacy of telehealth support.



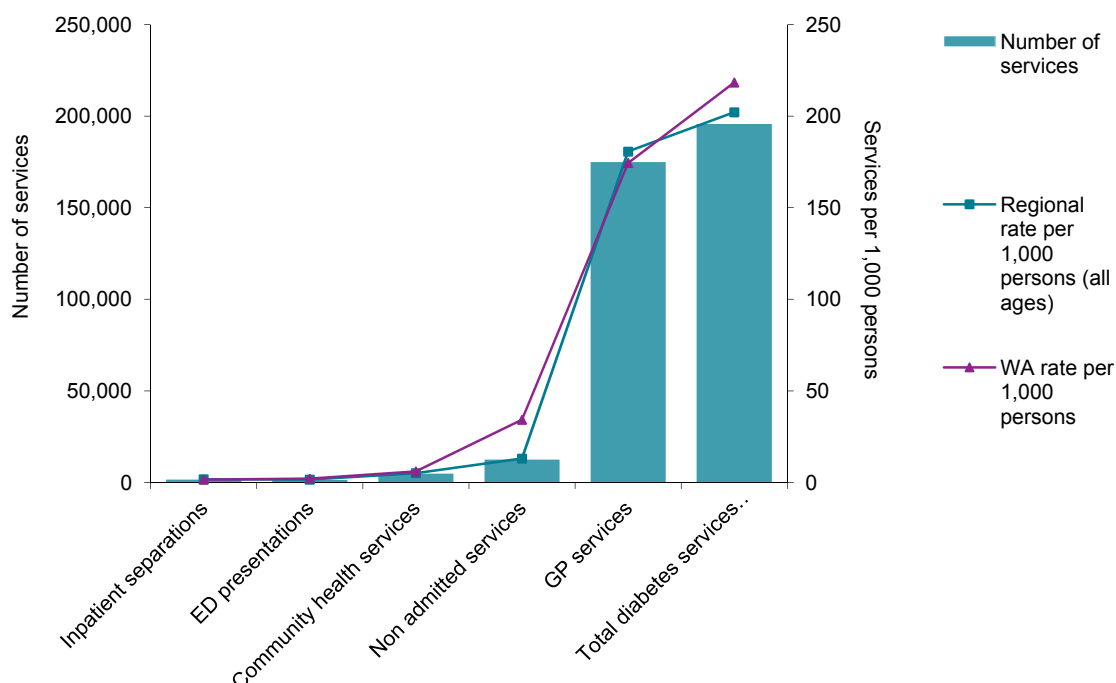
5.3 Metropolitan regions

5.3.1 North Metropolitan Health Service

As indicated by Figure 22, within the NMHS region:

- inpatient separations per 1,000 persons were reported at slightly higher rates than the WA average
- ED presentations were reported at lower rates than the WA average
- community health occasions of service were reported at lower rates than the WA average
- non admitted occasions of service per 1,000 persons were reported at lower rates than the WA average
- GP services were reported at higher rates than the WA average
- total estimated diabetes services were reported at lower rates than the WA average.

Figure 22: Summary of NMHS diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 69: Assessment of NMHS diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	5	Approx 5 FTE endocrinology and 1 FTE general physician with a diabetes special interest public positions identified, plus private providers
No. of diabetes focussed allied health providers permanently located in this region	5	Approx ≤25 FTE public positions identified plus private & NGO providers
Access to multidisciplinary diabetes focussed team	4 – 5	5 for people accessing SCGH tertiary service; likely 4 for others, especially in outer metropolitan suburbs
No. of persons per FWE GP	3	Greatest for inner metropolitan suburbs; more limited for outer metropolitan suburbs
No. of non admitted occasions of service per 1,000 persons	1	Potential under-reporting in SCGH data. Coverage may be more significant than indicated by the available data Non admitted services delivered at lower rates than the WA average
Community health occasions of service per 1,000 persons	2	Community health services delivered at lower rates than the WA average. ¹⁴⁶
ED presentations per 1,000 persons	1	ED presentations occurring at lower rates than the WA average
No. of inpatient separations per 1,000 persons	2	Inpatient separations occurring at slightly higher rates than the WA average. This may in part reflect admissions of rural residents to NMHS facilities
Frequency of visiting specialist team attendances	n.a.	
Maximum distance people with diabetes are required to travel to access specialist services	<50km	<20 km for majority of residents
Average waiting times for diabetes specialist services		SCGH: 1 week for urgent referrals

¹⁴⁶ Data provided by the NMHS Public Health & Ambulatory Care Unit indicates activity delivered under its auspices during 2011 consisted of 2,121 individual occasions of service, 1,827 individual podiatry occasions of service, 101 group sessions and 995 group occasions of service.



Assessment criteria	Level	Comments
Specific population groups		
People with type 1 diabetes	4 – 5	Range of services available Greatest for inner metropolitan suburbs; more limited for outer metropolitan suburbs
People with type 2 diabetes	5	Range of services available Greatest for inner metropolitan suburbs; outer metropolitan suburbs access (e.g. to GPs) varying from moderate to high
People with gestational diabetes	5	KEMH located within NMHS catchment Range of services available, access best for inner metropolitan, with outer metropolitan access (e.g. to GPs) varying from moderate to high
Children and adolescents	4 – 5	PMH located within NMHS catchment Greatest for inner metropolitan suburbs; more limited for outer metropolitan suburbs
Aboriginal people	4 – 5	Aboriginal specific services provided by Derbarl Yerrigan Aboriginal Health Service and NMHS Moorditj Djena team



Summary

Key service providers in the NMHS include public hospitals (including tertiary and secondary services), the NMHS Public Health and Ambulatory Care Unit and private providers such as GPs. Access to care is greatest for those living in inner metropolitan suburbs, with coverage more limited for outer metropolitan suburbs, particularly for those requiring endocrinologist, paediatric or pregnancy related care.

Stakeholders identified service gaps for all types of care in:

- the area between Osborne Park and Joondalup Hospitals
- north of Joondalup
- north eastern areas such as are Bullsbrook and Ellenbrook.

Diabetes care provided at the Joondalup, Osborne Park and Swan Districts services is limited; NMHS Public Health and Ambulatory Care Unit services address gaps at a range of locations.

No diabetes specific services or resources were identified for Kalamunda and Stirling Coastal. Bayswater-Bassendean and Wanneroo receive visiting services only.

Stakeholders called:

- re-establishment of a multidisciplinary high risk foot clinic at SCGH
- increasing availability of diabetes educators and education services, working with Diabetes WA and others, to enable the NMHS Public Health and Ambulatory Care Unit to focus on providing subacute care
- improving care coordination and transition of people with diabetes between hospital and general practice, and establishing a Medicare Local led care coordination service
- extension of Aboriginal specific diabetes services
- better defining and communicating referral pathways, role and responsibilities across care settings.

Source: KPMG

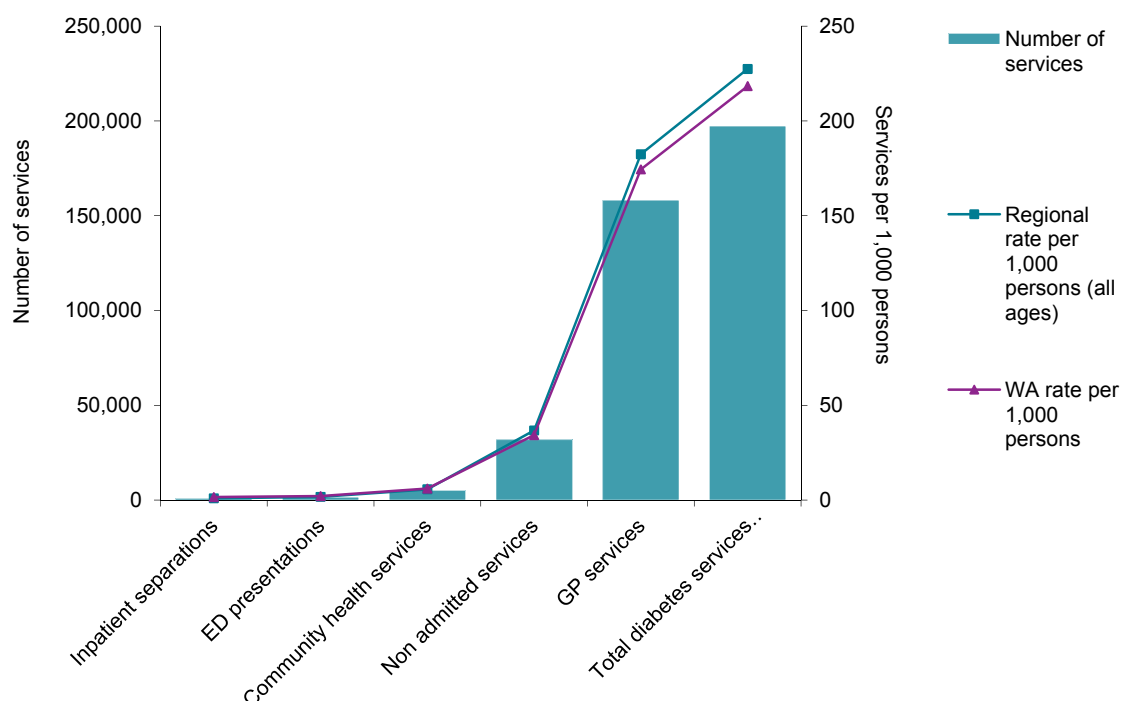


5.3.2 South Metropolitan Health Service

As indicated by Figure 23, within the SMHS region:

- inpatient separations were reported at lower rates than the WA average
- ED presentations were reported at lower rates than the WA average
- community health occasions of service were reported at higher rates than the WA average
- non admitted occasions of service were reported at higher rates than the WA average
- GP services were reported at higher rates than the WA average
- total estimated diabetes services were reported at higher rates than the WA average.

Figure 23: Summary of SMHS diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 70: Assessment of SMHS diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	5	Approx 5 FTE public endocrinologists and a 0.3 FTE general physician with a diabetes special interest positions identified, plus private providers
No. of diabetes focussed allied health providers permanently located in this region	5	Approx 38 FTE public positions identified, plus private & NGO providers
Access to multidisciplinary diabetes focussed team	4 – 5	5 for people accessing RPH or FHHS tertiary services, as well as RGH; likely 4 for others, especially in outer metropolitan suburbs
No. of persons per FWE GP	2	Greatest for inner metropolitan suburbs; more limited for outer metropolitan suburbs
No. of non admitted occasions of service per 1,000 persons	4	Improved data recording in SMHS recently – this region may be recording and reporting more comprehensively than other regions
Community health occasions of service per 1,000 persons	2	Community health services delivered at higher rates than the WA average
ED presentations per 1,000 persons	1	ED presentations occurring at lower rates than the WA average
No. of inpatient separations per 1,000 persons	1	Inpatient separations occurring at lower rates than the WA average
Frequency of visiting specialist team attendances	2	Visiting PMH team attending RGH quarterly
Maximum distance people with diabetes are required to travel to access specialist services	<100km	<20 km for majority of residents <75 Mandurah to Rockingham
Average waiting times for diabetes specialist services		RPH Diabetes and Endocrinology Clinic: Urgent 1-2 weeks; non-urgent 3 to >6 months. Approx 300 people RPH High Risk Foot Clinic: Urgent 2-4 weeks; non-urgent 6-8 weeks. At limit. Significant demand preventing provision of clinical support to country services RGH Diabetes Clinic: Urgent – up to two weeks; non urgent – up to 10 months



Assessment criteria	Level	Comments
Specific population groups		
People with type 1 diabetes	4 – 5	Range of services available Greatest for inner metropolitan suburbs; more limited for outer metropolitan suburbs
People with type 2 diabetes	4 – 5	Range of services available Greatest for inner metropolitan suburbs; outer metropolitan suburbs access (e.g. to GPs) varying from moderate to high
People with gestational diabetes	4 – 5	Range of services available, access best for inner metropolitan, with outer metropolitan access (e.g. to GPs) varying from moderate to high
Children and adolescents	4 – 5	Greatest for inner metropolitan suburbs; more limited for outer metropolitan suburbs PMH outreach clinic held at RGH
Aboriginal people	4 – 5	Aboriginal specific services provided by Moorditch Curlongga, Derbarl Yerrigan (East Perth and Maddington Clinics) and the SMHS Moorditj Djena team

Summary

The key service providers in the SMHS are the public community services and hospitals (including tertiary and secondary services), and private providers such as GPs. Access to care is greatest for those living in inner metropolitan suburbs, with coverage more limited for outer metropolitan suburbs, particularly for those requiring endocrinologist, paediatric or pregnancy related care.

Service gaps were reported for the Peel area (covered by a single diabetes educator and monthly endocrinologist session), as well as for the Armadale (providing private outpatient general physician sessions and a public diabetes educator) and Rockingham (high growth, high demand) areas.

Stakeholders identified a need for:

- identifying mechanisms for extending access to endocrinologist and general physician with a diabetes special interest support
- reorientation of diabetes specialist services away from the CBD, with extension of resources located in the outer metropolitan suburbs, particularly around Armadale, Rockingham and Peel
- improving coordination of people moving between service settings (i.e. between hospital or tertiary services and primary health care)
- greater psycho-social support (i.e. psychologist and mental health support) as part of multidisciplinary teams.

Source: KPMG



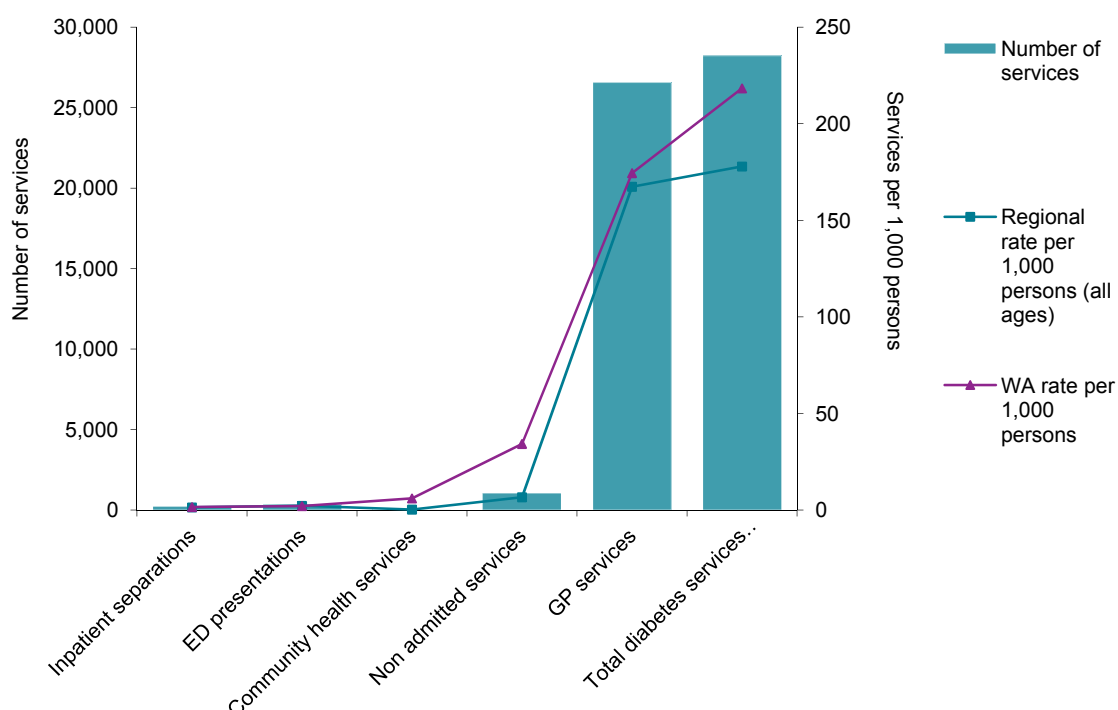
5.4 WA country regions

5.4.1 South West

As indicated by Figure 24, within the South West region:

- inpatient separations were reported at lower rates than the WA average
- ED presentations were reported at slightly higher rates than the WA average
- community health occasions of service were reported at substantially lower rates than the WA average¹⁴⁷
- non admitted occasions of service were reported at lower rates than the WA average
- GP services were reported at lower rates than the WA average
- total estimated diabetes services were reported at lower rates than the WA average.

Figure 24: Summary of South West diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data

¹⁴⁷ This most likely indicates use of alternative information management systems.



Table 71: Assessment of South West diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	1	One visiting endocrinologist / general physician identified, attending Margaret River once a month Visiting PMH attending Bunbury once a month Otherwise, residents required to travel to Perth
No. of diabetes focussed allied health providers permanently located in this region	3	Approximately 17 FTE public, NGO and private providers identified, and an unidentified number of private providers flagged. Diabetes educators are mainly located in Bunbury; dietician and podiatry services are more widely available
Access to multidisciplinary diabetes focussed team	2	Identified FTE indicates likelihood is low, especially outside of Bunbury
No. of persons per FWE GP	3	Likely to be concentrated around Bunbury and Busselton
No. of non admitted occasions of service per 1,000 persons	1	Data reported by the Bunbury Community Health Centre, Augusta, Boyup Brook Soldiers Memorial, Bridgetown, Busselton, Collie, Donnybrook, Harvey, Nannup, Pemberton and Warren Hospitals varied by location and year. Note: No data relating to the South West Health Campus reported in the non admitted data collection; however, substantial activity levels were recorded for the Bunbury Community Health Centre.
Community health occasions of service per 1,000 persons	1	Community health services delivered at substantially lower rates per 1,000 persons than the WA average; may indicate use of alternative data systems to record this activity
ED presentations per 1,000 persons	1	ED presentations occurring at slightly higher rates than the WA average
No. of inpatient separations per 1,000 persons	1	Inpatient separations occurring at lower rates than the WA average
Frequency of visiting specialist team attendances	3	PMH team visiting Bunbury monthly Endocrinologist / general physician visiting Margaret River monthly



Assessment criteria	Level	Comments
Maximum distance people with diabetes are required to travel to access specialist services	250-500 km	Approx 250 km Walpole to Bunbury Approx 420 km Walpole to Perth
Average waiting times for diabetes specialist services		SWHC: Waiting lists for outpatient appointments are approximately 1 month, and 1-2 months for group education
Specific population groups		
People with type 1 diabetes	1 – 2	Limited visiting services. Care provided by Perth based specialists, local diabetes educators and GPs, with support from other allied health providers
People with type 2 diabetes	2 – 3	Care provided by local GPs and allied health providers
People with gestational diabetes	2	GDM related care provided from South West Health Campus by combined diabetes education / High Risk Antenatal Clinic teams. KEMH support also provided
Children and adolescents	2 – 3	Visiting PMH team attends Bunbury monthly. Diabetes educator employed by St John of God Bunbury (part funded by PMH)
Aboriginal people	3	South West Aboriginal Medical Service only identified Aboriginal specific service, which employs a diabetes educator.



Summary

Available information indicates a need for more access to endocrinologist / general physician with a diabetes special interest. Stakeholders also flagged a need for more diabetes educators, who are currently concentrated around Bunbury. Local coverage for people with complex diabetes (e.g. type 1 diabetes) appears to be poor.

A range of public, private and NGO service providers are active in the South West, introducing challenges in coordinating service delivery.

A number of vacancies have been identified relating to South West services, particularly where part time roles are too limited to attract staff.

No diabetes specific services or resources were identified for Warren-Blackwood and Leschenault.

Stakeholders recommended:

- implementation of a centralised referral system for assessment, prioritisation and allocation of people with complex diabetes to relevant service throughout the region
- introduction of a mobile diabetes service to respond to identified needs and service gaps
- increased use of telehealth services
- strengthening of secondary prevention focussed service and linking of diabetes services to other relevant chronic disease programs such as chronic disease self management support.

Source: KPMG

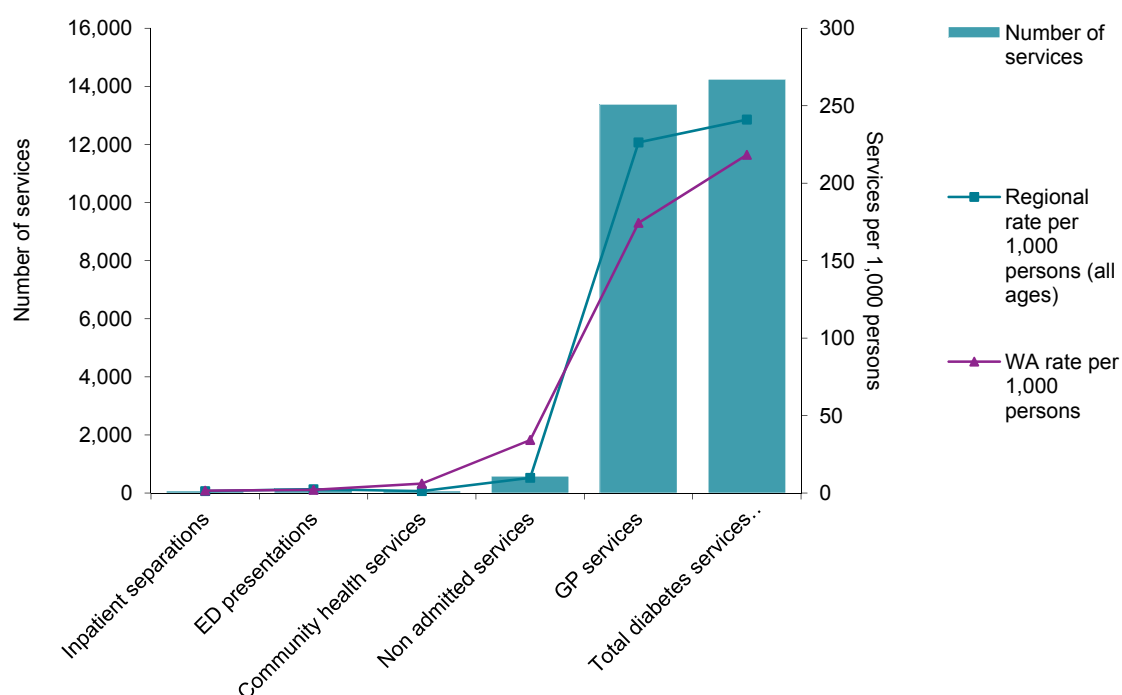


5.4.2 Great Southern

As indicated by Figure 25, within the Great Southern region:

- inpatient separations were reported at lower rates than the WA average
- ED presentations reported at higher rates than the WA average
- community health occasions of service reported at substantially lower rates than the WA average
- non admitted occasions of service were reported at lower rates than the WA average
- GP services were reported at higher rates than the WA average
- total estimated diabetes services were reported at higher rates than the WA average.

Figure 25: Summary of Great Southern diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 72: Assessment of Great Southern diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	1	Visiting endocrinologist and PMH team identified, attending Albany and providing tele-consultancy advice to local GPs
No. of diabetes focussed allied health providers permanently located in this region	2	Approx 10 FTE public, private and NGO providers identified
Access to multidisciplinary diabetes focussed team	3	Identified FTE indicates likelihood is very low, especially outside of Albany
No. of persons per FWE GP	3	Indicates GPs are key resources for this area, together with allied health providers Likely to be concentrated around Albany
No. of non admitted occasions of service per 1,000 persons	1	May be an underestimate if relevant service data is not included in the non admitted data collection Data reported for the Albany, Denmark, Gnowangerup, Katanning, Kojonup, Plantagenet Hospitals, Bremer Bay Health Centre, Jerramungup Nursing Post varied by location and year
Community health occasions of service per 1,000 persons	1	Community health services delivered at substantially lower rates per 1,000 persons than the WA average; may indicate use of alternative data systems to record this activity
ED presentations per 1,000 persons	1	ED presentations occurring at higher rates than the WA average
No. of inpatient separations per 1,000 persons	1	Inpatient separations occurring at lower rates than the WA average
Frequency of visiting specialist team attendances	2 – 3	Albany based: <ul style="list-style-type: none"> • quarterly PMH clinic • monthly endocrinology services • monthly to quarterly ophthalmology service
Maximum distance people with diabetes are required to travel to access specialist services	<200 km	<200 km Katanning to Albany >400 km Albany to Perth
Average waiting times for diabetes specialist services	n.a.	



Assessment criteria	Level	Comments
Specific population groups		
People with type 1 diabetes	2	Care provided by mix of visiting specialist, local diabetes educators and GPs, with support from other allied health providers. Some people with diabetes may travel to Perth also
People with type 2 diabetes	2 – 3	Care provided by local GPs and diabetes educators, with support from other allied health providers
People with gestational diabetes	2	Care provided by local GPs and diabetes educator. High risk women referred to KEMH
Children and adolescents	2	Visiting PMH team attends Albany quarterly. Local GPs and allied health providers provide additional care
Aboriginal people	3	Great Southern Aboriginal Health Service employs a chronic disease nurse at each of Albany (also a diabetes educator) and Katanning ICDP services provided at Albany

Summary

Available information indicates a need to ensure ongoing provision of the visiting endocrinology service and support delivered at Albany.

The local diabetes educator, a key resource for the area, is nearing retirement. Succession planning should be undertaken for this role.

MBS information suggests that GPs are a key resource for the region.

A range of public, private and NGO service providers are active in the Great Southern region, introducing challenges in coordinating service delivery. Stakeholders report services work collaboratively to plan and deliver services; this should be maintained and formalised where possible.

Expansion of GDM related coverage is required.

Stakeholders identified a need to:

- extend service provision based in Katanning
- expand the diabetes educator, dietitian and podiatry workforces, but services currently experience recruitment difficulties
- provide diabetes services for the aged care sector as the area has a high proportion of older residents.

Source: KPMG

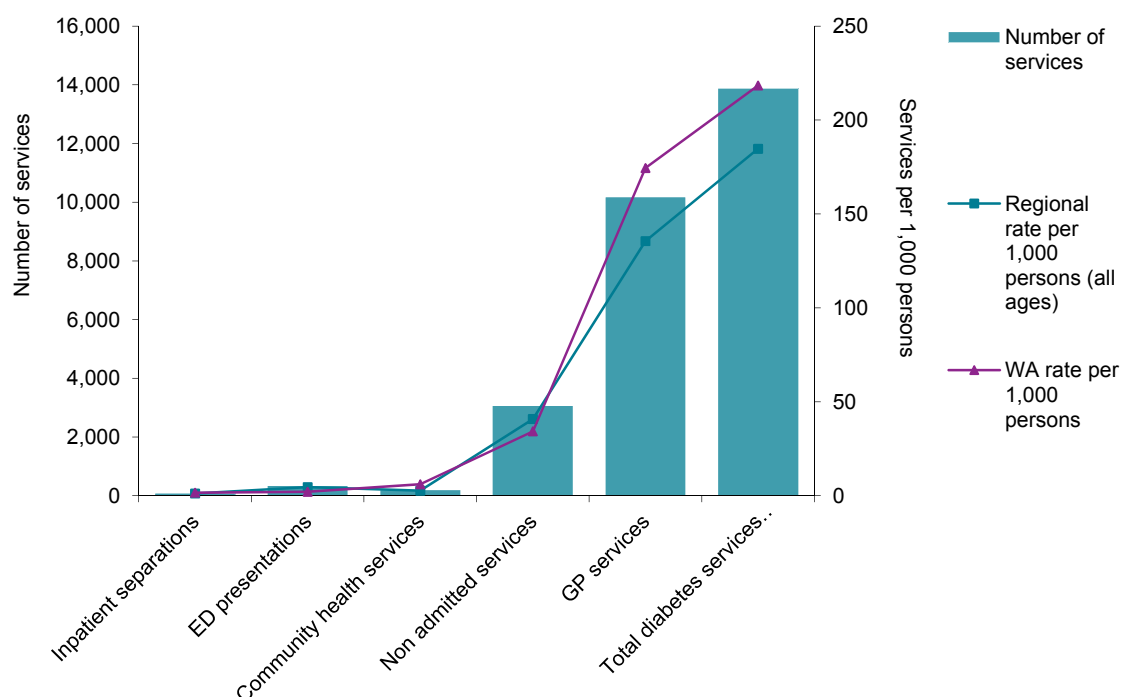


5.4.3 Wheatbelt

As indicated by Figure 26, within the Wheatbelt region:

- inpatient separations were reported at lower rates than the WA average
- ED presentations were reported at higher rates than the WA average
- community health occasions of service were reported at lower rates than the WA average
- non admitted occasions of service were reported at higher rates than the WA average
- GP services were reported at lower rates than the WA average
- total estimated diabetes services were reported at lower rates than the WA average.

Figure 26: Summary of Wheatbelt diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 73: Assessment of Wheatbelt diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	1	No local providers identified Visiting endocrinologist and PMH team identified, attending Northam, Narrogin and Moora
No. of diabetes focussed allied health providers permanently located in this region	2	Approx 10 FTE public, private and NGO providers identified
Access to multidisciplinary diabetes focussed team	3	Identified FTE indicates access most likely in regional centres. Note, while a large number of allied health providers was identified, these are dispersed across a large number of towns
No. of persons per FWE GP	2	The Wheatbelt region has the highest proportion of solo general practices in WA
No. of non admitted occasions of service per 1,000 persons	4	Second highest rate of non admitted occasions of service recorded. Uncertain if this is a reflection of relative activity levels or under-reporting in other regions. Wheatbelt has the highest type 2 and overall diabetes prevalence estimates in WA ¹⁴⁸
Community health occasions of service per 1,000 persons	1	Community health services delivered at lower rates per 1,000 persons than the WA average
ED presentations per 1,000 persons	3	Second highest rate of ED presentations in WA
No. of inpatient separations per 1,000 persons	1	Inpatient separations occurring at lower rates than the WA average PMH and endocrinologist attending Northam and Narrogin; endocrinologist attending Moora
Frequency of visiting specialist team attendances	2 – 3	Podiatrist attending Northam, Narrogin, Merredin and Moora Ophthalmology service visiting Merredin

¹⁴⁸ Data reported for the Beverley, Boddington, Bruce Rock Memorial, Dalwallinu, Dumbleyung Memorial, Goomalling, Kellerberrin Memorial, Kondinin, Kununoppin, Lake Grace, Merredin, Moora, Narembeen Memorial, Narrogin, Northam, Pingelly, Quairading, Southern Cross, Wagin, Wongan Hills, Wyalkatchem-Koorda And District and York Hospitals, Jurien Bay Health Centre and Mukinbudin Nursing Post varied by location and year. Prevalence rates as per Epidemiology Branch estimates, 2012.



Assessment criteria	Level	Comments
Maximum distance people with diabetes are required to travel to access specialist services	>300 km	>200 km from Mukinbudin to Northam >300 km from Mukinbudin to Perth
Average waiting times for diabetes specialist services	n.a.	
Specific population groups		
People with type 1 diabetes	1 – 2	Care mainly provided by visiting or Perth based specialists Some use of telehealth services identified also
People with type 2 diabetes	3	Care provided by local GPs and diabetes educators, with support from other allied health providers
People with gestational diabetes	1	No GDM specific resources identified. Care likely provided by KEMH
Children and adolescents	1 – 2	Visiting PMH teams attend Northam and Narrogin. Children also likely to travel to Perth for care
Aboriginal people	3	Avon and Central Primary Health, Eastern Primary Health, Southern Wheatbelt Primary Health and Western Primary Health services all provide Aboriginal health services Noongar Boodja Diabetes clinics are delivered in a range of communities, including Merredin, Mooja, Narrogin, Northam and Wongan Hills Visiting services under ICDP include endocrinologist and podiatry services at Moora, Narrogin and Northam, and podiatry services at Merredin



Summary

Wheatbelt is characterised by small towns located throughout the region. Given the relatively low GP to population rates, it is apparent that the four Primary Health Units, together with allied health providers employed by Silver Chain and the Wheatbelt GP Network, are critical to service provision in the region.

A range of public, private and NGO service providers are active in the Wheatbelt region, introducing challenges in coordinating service delivery and competition for resources such as diabetes educators.

Stakeholders suggested diabetes in pregnancy services could be improved by building stronger connections between KEMH and local diabetes educators, to reduce the need to travel to Perth. Local GDM capable resources should be identified to lead and coordinate care.

Stakeholders also identified a need for:

- education and training for general practice
- stronger referral pathways
- early intervention services (following diagnosis) as well as advanced diabetes education
- more coordinated and planned use of telehealth services.

Source: KPMG

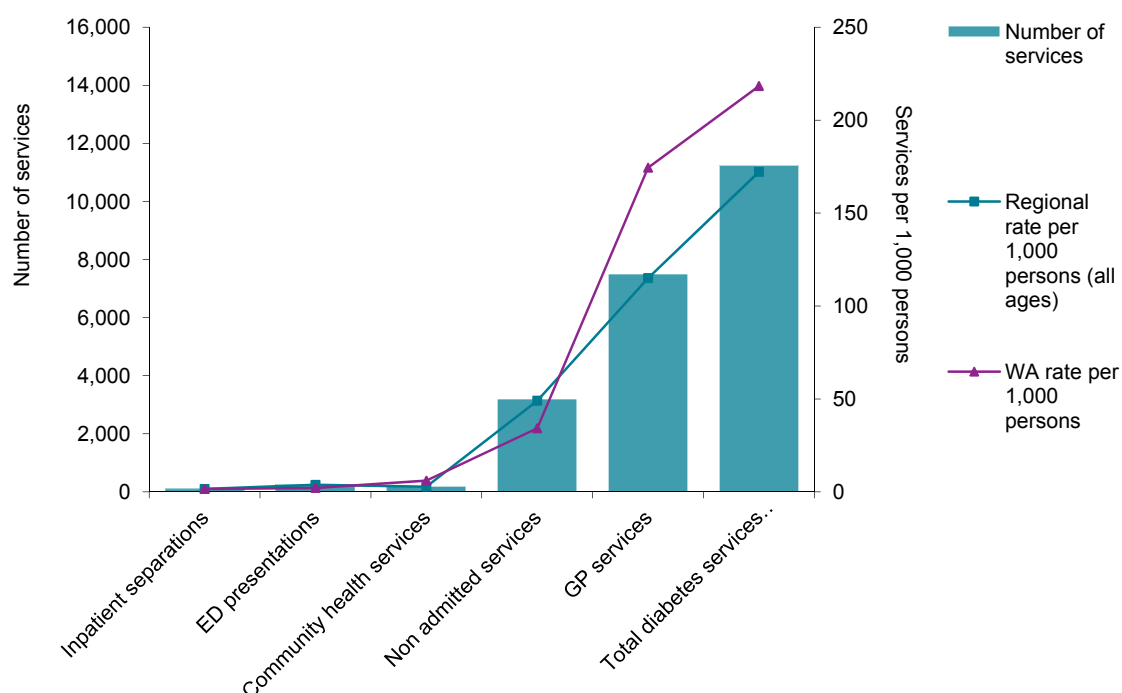


5.4.4 Midwest

As indicated by Figure 27, within the Midwest region:

- inpatient separations were reported at the same rate as the WA average
- ED presentations were reported at higher rates than the WA average
- community health occasions of service were reported at lower rates than the WA average
- non admitted occasions of service were reported at higher rates than the WA average
- GP services were reported at lower rates than the WA average
- total estimated diabetes services were reported at lower rates than the WA average.

Figure 27: Summary of Midwest diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 74: Assessment of Midwest diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	2	Approx ≤ 1 FTE general physician with a diabetes special interest identified
No. of diabetes focussed allied health providers permanently located in this region	1	Approx ≤ 4 FTE providers identified, the lowest of any WA region. Three are Geraldton based and another is based in Carnarvon
Access to multidisciplinary diabetes focussed team	1 – 2	Access likely to be best in Geraldton and decreases significantly for those in the central and eastern parts of the region
No. of persons per FWE GP	3	Likely concentrated around Geraldton
No. of non admitted occasions of service per 1,000 persons	5	Highest recorded number of occasions of service per 1,000 persons recorded for any region, despite having the lowest number of identified diabetes specific service providers. Midwest may be recording and reporting more comprehensively than any other region. ¹⁴⁹ Significant activity levels reported for the Geraldton Hospital
Community health occasions of service per 1,000 persons	1	Community health services delivered at lower rates than the WA average
ED presentations per 1,000 persons	2	ED presentations occurring at higher rates than the WA average
No. of inpatient separations per 1,000 persons	3	Inpatient separations occurring at the rate as the WA average
Frequency of visiting specialist team attendances	1 – 2	Teams attending Carnarvon, Exmouth, Geraldton, Meekatharra, Mt Magnet and Wiluna
Maximum distance people with diabetes are required to travel to access specialist services	>700 km	>700 km from Wiluna to Geraldton >900 km from Wiluna to Perth
Average waiting times for diabetes specialist services	n.a.	

¹⁴⁹ Data reported by the Carnarvon, Exmouth, Geraldton, Meekatharra, Morawa, North Midlands and Northampton Hospitals; Burringurrah, Coral Bay, Cue, Mount Magnet and Yalgoo Nursing Posts; Dongara Multi-Purpose Health Centre; and Kalbarri Health Centre varied by location and year.



Assessment criteria	Level	Comments
Specific population groups		
People with type 1 diabetes	1 – 3	Care mainly provided by Geraldton based general physician and diabetes educator, or visiting / Perth based specialists
People with type 2 diabetes	1 – 3	Care provided by local GPs and Geraldton based diabetes educators, with support from other allied health providers
People with gestational diabetes	2	Care provided by Geraldton based 1 FTE diabetes educator (with a GDM focus) and 2 FTE obstetricians, enabling local delivery of babies. KEMH tele-consultancy support provided
Children and adolescents	1	No child specific resources identified. Likely to be managed by PMH (Perth based) and local GPs
Aboriginal people	3 – 4	Three AMS' identified. GRAMS delivers a weekly diabetes clinic in Geraldton and provides mobile outreach services to a number of communities around Mt Magnet Visiting specialists under ICDP provided to Geraldton, Meekatharra and Mt Magnet

Summary

The Midwest region relies on visiting teams from Perth, supported by outreach services delivered from Geraldton, for diabetes specific services. The region has the lowest number of identified local diabetes providers in the state.

Diabetes in pregnancy is now managed by local services. Stakeholders reported this has led to reduced travel and better compliance.

Stakeholders identified a need for more local training to develop additional CDEs, extend local CDEs to become nurse practitioners, develop more Aboriginal health workers, and maintain currency of diabetes knowledge in general practice.

Source: KPMG

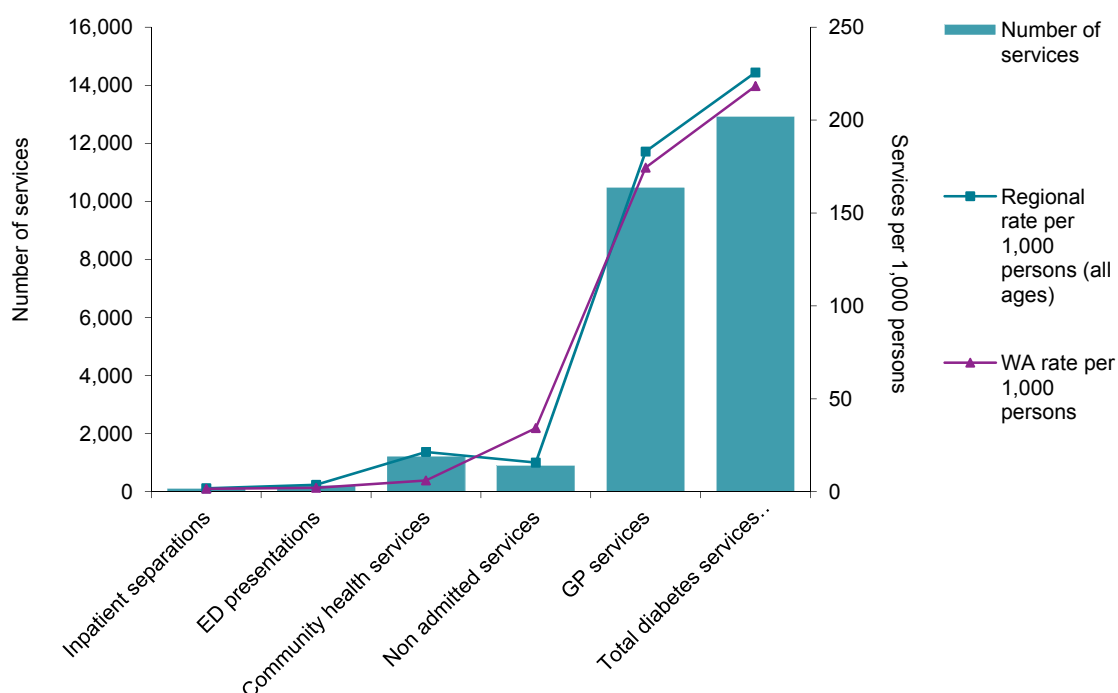


5.4.5 Goldfields

As indicated by Figure 28, within the Goldfields region:

- inpatient separations were reported at higher rates than the WA average
- ED presentations were reported at higher rates than the WA average
- community health occasions of service were reported at substantially higher rates than the WA average
- non admitted occasions of service were reported at lower rates than the WA average
- GP services were reported at higher rates than the WA average
- total estimated diabetes services were reported at lower rates than the WA average.

Figure 28: Summary of Goldfields diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 75: Assessment of Goldfields diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	2	Approx ≤ 1 FTE general physician with a diabetes special interest identified
No. of diabetes focussed allied health providers permanently located in this region	2	Approx ≤ 6 FTE providers, based in Kalgoorlie and Esperance
Access to multidisciplinary diabetes focussed team	1 – 2	Vacant diabetes educator, dietitian and podiatrist positions based in Kalgoorlie
No. of persons per FWE GP	1	Second lowest GP to population ratio in the state
No. of non admitted occasions of service per 1,000 persons	2	Data reported by the Kalgoorlie, Esperance and Ravensthorpe ¹⁵⁰ Hospitals varied by location and year
Community health occasions of service per 1,000 persons	5	Community health services delivered at substantially higher rates than the WA average
ED presentations per 1,000 persons	2	ED presentations occurring at higher rates than the WA average
No. of inpatient separations per 1,000 persons	3	Inpatient separations occurring at higher rates than the WA average
Frequency of visiting specialist team attendances	1 – 2	Teams attending five locations: Kalgoorlie, Laverton, Leonora, Ngaanyatjarra Lands and Tjuntuntjara
Maximum distance people with diabetes are required to travel to access specialist services	>900 km	>900 km Warburton to Kalgoorlie >900 km Warburton to Alice Springs >1,500 km Warburton to Perth
Average waiting times for diabetes specialist services	n.a.	
Specific population groups		
People with type 1 diabetes	1 – 3	Inpatient and outpatient care mainly provided by Kalgoorlie based general physician and visiting specialists
People with type 2 diabetes	1 – 2	Care mainly provided by GPs and Kalgoorlie and Esperance based diabetes educators, with assisting from the Kalgoorlie based general physician

¹⁵⁰ Note: Ravensthorpe has recently been transferred to Great Southern region.



Assessment criteria	Level	Comments
People with gestational diabetes	1	No specific resources identified. Prevalence estimates suggest there are over 800 women with GDM in the region
Children and adolescents	2	PMH visiting team attends Kalgoorlie quarterly
Aboriginal people	1 – 2	Bega Garnbirringu Health Service employs a diabetes educator and delivers a daily diabetes clinic Visiting teams under ICDP attend Leonora, Ngaanyatjarra Lands and Tjuntuntjara

Summary

The Goldfields region has the largest catchment of any WA region, and a low population density concentrated mainly in the western half. Workforce availability is a major constraint, with WACHS and NGO providers reporting ongoing difficulty recruiting and retaining staff.

MBS information suggests that GPs are a key resource for the region. However, a number of GPs are also expected to leave the Kalgoorlie area in the next 12 months. Given staffing difficulties, there is a reliance on visiting specialist teams to supplement local providers.

Stakeholders recommended:

- the establishment of more permanent diabetes educator and other allied posts to improve recruitment potential
- provision of diabetes related education and training to generalist health staff
- establishment of mentors to support rural and remote generalist health staff providing diabetes care
- implementation of formal telehealth and consultancy services
- development of tools and resources to support non specialist providers delivering diabetes care.

Source: KPMG

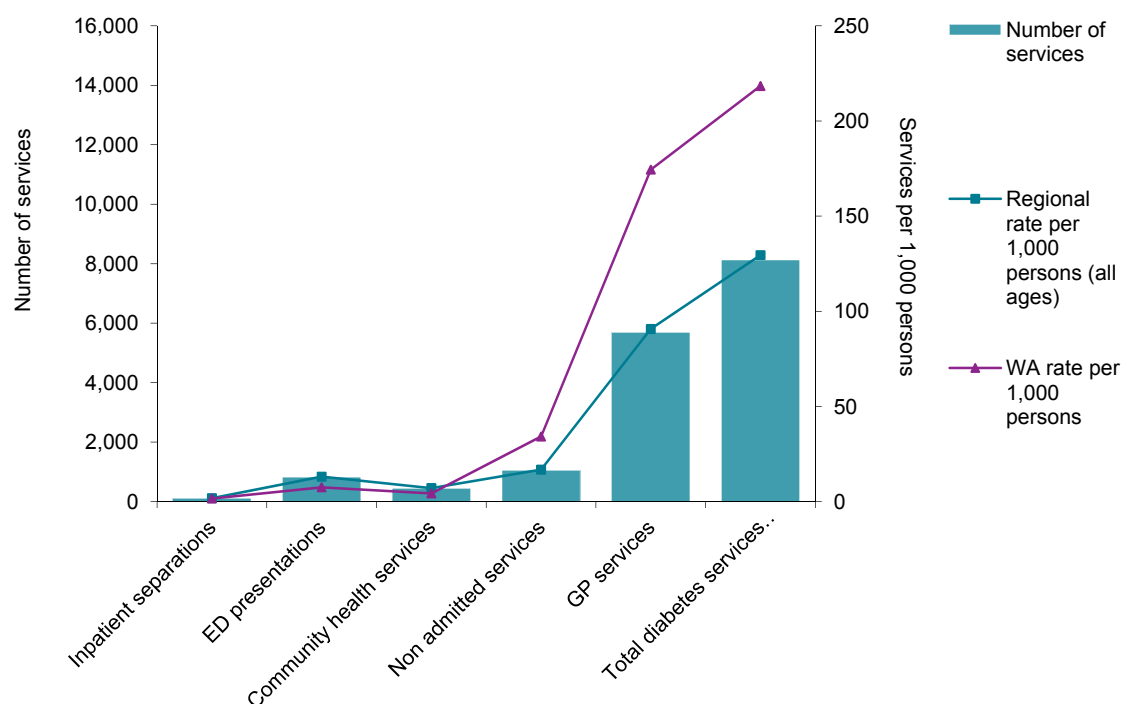


5.4.6 Pilbara

As indicated by Figure 29, within the Pilbara region:

- inpatient separations were reported at higher rates than the WA average
- non admitted occasions of service were reported at lower rates than the WA average
- GP services were reported at substantially lower rates than the WA average
- total estimated diabetes services were reported at substantially lower rates than the WA average.

Figure 29: Summary of Pilbara diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data



Table 76: Assessment of Pilbara diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	1	No local providers identified Visiting endocrinologist identified, attending Karratha, Port Hedland and Newman
No. of diabetes focussed allied health providers permanently located in this region	2	Approx 6 FTE providers identified
Access to multidisciplinary diabetes focussed team	1 – 2	Karratha and Roebourne have access to multidisciplinary teams
No. of persons per FWE GP	1	Lowest GP to population ratio in the state
No. of non admitted occasions of service per 1,000 persons	2	Accuracy of available information is unknown. Data reported by Hedland Health Campus, Newman, Nickol Bay, Onslow, Paraburdoo, Roebourne and Wickham Hospitals varied by location and year
Community health occasions of service per 1,000 persons	2	Community health services delivered at higher rates than the WA average
ED presentations per 1,000 persons	2	ED presentations occurring at higher rates than the WA average
No. of inpatient separations per 1,000 persons	2	Inpatient separations occurring at higher rates than the WA average
Frequency of visiting specialist team attendances	2	Visiting teams attending Port Hedland, Karratha, Roebourne and Newman on a quarterly basis
Maximum distance people with diabetes are required to travel to access specialist services	>600 km	>600 km Jigalong to Port Hedland >2,000 km Jigalong to Perth
Average waiting times for diabetes specialist services	n.a.	
Specific population groups		
People with type 1 diabetes	1	No local providers identified. Reliance on visiting team attending four locations on a quarterly basis
People with type 2 diabetes	1 – 2	Reliance on generalist health providers; however, the Pilbara region has the lowest GP to population ratio in the state
People with gestational diabetes	1	No GDM specific resources identified. Prevalence estimates suggest there are over 450 women with GDM in the region



Assessment criteria	Level	Comments
Children and adolescents	1	No child specific resources identified. Prevalence estimates suggest there are 17 children with T1 diabetes in the region
Aboriginal people	1 – 2	Three AMS' identified. Visiting ICDP teams attend Port Hedland and Karratha. WACHS outreach services also provided for East Pilbara communities including Newman and Jigalong

Summary

The Pilbara must contend with large distances, high population mobility, wealth disparity and significant health workforce constraints. Aboriginal health outcomes are described as the worst in the state. Stakeholders reported long term vacancies for diabetes related posts, and the region has WA's lowest number of GPs per person. The main diabetes service providers in this context are WACHS, the AMS', the Pilbara Health Network and visiting specialist teams.

Gaps relating to resources for people with type 1 and GDM, as well as children with diabetes were identified.

Stakeholders recommended a focus on:

- up-skilling local generalist health providers in diabetes care
- formalising relationships between the region's service providers and Perth based specialist / tertiary services
- establishing a common data and info management systems common to public, private and service providers
- implementing formal telehealth and consultancy services.

Source: KPMG

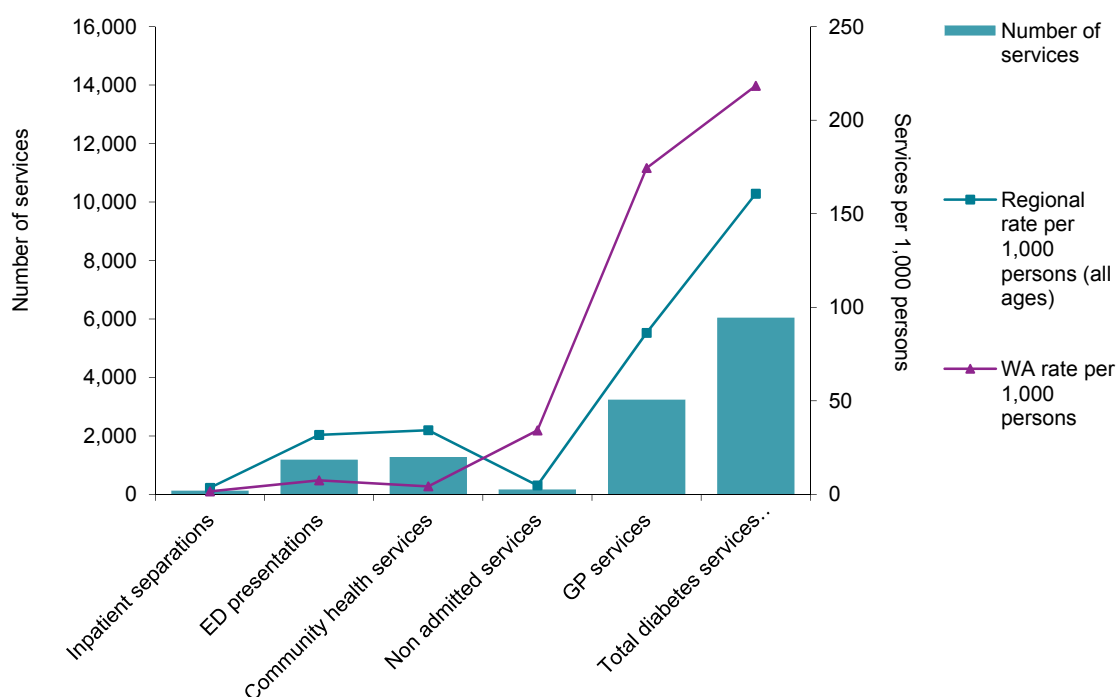


5.4.7 Kimberley

As indicated by Figure 30, within the Kimberley region:

- inpatient separations were reported at substantially higher rates than the WA average
- non admitted occasions of service were reported at substantially lower rates than the WA average¹⁵¹
- GP services were reported at substantially lower rates than the WA average
- total estimated diabetes services were reported at substantially lower rates than the WA average.

Figure 30: Summary of Kimberley diabetes services, 2011



Source: KPMG calculation based on inpatient, non admitted, AOD, MBS and ERP data

¹⁵¹ Available occasions of service data do not currently include data recorded in Kimberley specific data management systems such as MMex and are therefore not considered an accurate measurement for this region.



Table 77: Assessment of Kimberley diabetes service coverage

Assessment criteria	Level	Comments
No. of endocrinologists or general physicians with a diabetes special interest permanently located at this service	1	No local providers identified No visiting endocrinologist services identified
No. of diabetes focussed allied health providers permanently located in this region	2	Approx 8 FTE providers identified, based in Broome
Access to multidisciplinary diabetes focussed team	2	Outside of Broome, visiting multidisciplinary teams attend over 16 communities; however these are chronic disease, cardiology or renal disease focussed
No. of persons per FWE GP	2	Third lowest GP to population ratio in WA
No. of non admitted occasions of service per 1,000 persons	1	Only one-fifth of the state average. However, available occasions of service data do not currently include data recorded in Kimberley specific data management systems such as MMex and are therefore not considered an accurate measurement for this region ¹⁵²
Community health occasions of service per 1,000 persons	5	Highest rate of services reported for WA; may be used as the main data recording system
ED presentations per 1,000 persons	5	Highest rate of ED presentations; almost four times the WA average
No. of inpatient separations per 1,000 persons	5	Highest rate of inpatient separations; over twice the WA average
Frequency of visiting specialist team attendances	1 – 2	Visiting teams visiting over 16 communities. Frequency varies, ranging from yearly to every six weeks
Maximum distance people with diabetes are required to travel to access specialist services	>800 km	>800 km from Kalumburu to Broome
Average waiting times for diabetes specialist services	n.a.	

¹⁵² Data reported by Broome, Derby, Fitzroy Cross, Halls Creek, Kununurra and Wyndham Hospitals, which varied by location and year.



Assessment criteria	Level	Comments
Specific population groups		
People with type 1 diabetes	1	No endocrinologist resources identified; likely to be managed by local GPs and Broome based diabetes educators and podiatrists
People with type 2 diabetes	2	Relatively low GP to population ratio. GPs, Aboriginal health workers, public health physicians, diabetes educators and other allied health providers most significant resources
People with gestational diabetes	2	GDM and diabetes in pregnancy care is led by a general physician with an obstetrics special interest and an obstetrician based in Broome. Women with diabetes in pregnancy are managed locally where possible Prevalence estimates suggest there are over 250 women with GDM in the region
Children and adolescents	1	No child specific resources identified. Prevalence estimates suggest there are approximately 13 children with T1 diabetes in the region
Aboriginal people	2 – 3	As Aboriginal people make up almost half of the population, Aboriginal health is essential to most health services. Eight AMS' identified plus KAMSC Visiting teams provided under RPHS, MSOAP and ICDP to over 16 communities



Summary

The health needs of the Kimberley Aboriginal population are significant, and diabetes is a key issue (along with renal failure). WACHS, AMS' and Boab Health were identified as the region's main service providers.

While the Kimberley has attracted a range of visiting services, targeted at the Aboriginal population, these mainly have a cardiovascular or renal disease focus. However, given the complexity of service provision in the Kimberley and the need for culturally appropriate services, some stakeholders questioned the value and long-term sustainability of a service model dependent on visiting services.

Gaps relating to resources for people with type 1 and children with diabetes were identified. Additional resources to support diabetes in pregnancy are also likely warranted.

Stakeholder recommended a focus on:

- extending the size and capacity of the existing generalist health workforce
- enhancing the skills and level of support provided to local generalist health providers, including:
 - provision of education and training
 - tele-consultancy services delivered by providers with an understanding of the Kimberley and Aboriginal health contexts
- improving coordination of visiting specialist services to address overlap, gaps and scheduling issues relating to these services.

Source: KPMG



5.5 Summary

5.5.1 Statewide services

Although they are statewide services, CAHS and WNHS are located in the Perth CBD area. For people with diabetes living outside of Perth or a regional centre, access to diabetes paediatric or pregnancy related care is likely to be limited, with that person required to travel (often considerable distances) to access care.

CAHS appears to be a well resourced service which works with a cohort that has fewer complications than other services. This enables it to provide a good foundation for young people diagnosed with diabetes in terms managing their diabetes; however once young people transition into adult services the same level of care is not able to be maintained. While based at PMH in Perth's CBD area, the service does also provide regular outreach clinics to a number of outer metropolitan and regional centres.

WNHS supports women with the most complex pregnancies in the state. Compared to other WA health regions / services, its activity levels appear to be relatively low; however this is likely to reflect both limited demand for this type of service and coding of its activity to other health issues. WNHS provides very little outreach care.

While there are therefore access issues relating to both services, both routinely provide telehealth support to other health professionals located around WA (noting the extent and adequacy of this support was not assessed by this review). Given their respective roles, both Services should be considered priorities for development of a diabetes telehealth strategy.

5.5.2 Metropolitan regions

The NMHS and SMHS regions are able to offer much higher levels of access to diabetes services than country regions. There are a range of services and service providers delivering diabetes related care, including tertiary and secondary level hospitals and diabetes clinics, community health centres, public health units, primary health care, private and NGO providers.

Despite the range of service options, access varies depending on where a person with diabetes lives. At present, tertiary level diabetes clinics and services are all based in inner metropolitan areas, which in turn raise access barriers for people with complex diabetes – those most in need of care – living in outer metropolitan suburbs. This review has been unable to provide a detailed analysis of waiting times across metropolitan diabetes services; however available information indicates that while urgent referrals are usually seen within one to two weeks, non urgent referrals may take as long as 10 to 12



months to be seen. Given the current and projected shortages of endocrinologists, diabetes educators and other related providers, strategies are required to ensure the most efficient use of these resources is achieved.

Secondary hospitals, community health centres and primary health care providers located in outer metropolitan areas are consequently important services, and there is a need to build their capacity to deliver care closer to patients' home. Capacity building needs to be accompanied by more clearly defined referral pathways as well as improved visibility of diabetes capable services, tertiary service support, and access to specialists for advice when required.

While NMHS and SMHS provide coordination and planning around the delivery of public health services, it is more difficult to influence the delivery of private and NGO services. The establishment of Medicare Locals provides a mechanism for improving service planning and coordination, as well as strengthening local level networks between services. There is also a need to more closely consider the role of Diabetes WA in the delivery of diabetes education given the number of public health services also delivering this function.

5.5.3 Rural regions

The South West, Great Southern, Wheatbelt and Midwest regions are able to offer more limited access to diabetes services than metropolitan regions. These locations lack permanent endocrinology services and have only small numbers of diabetes educators. Workforce shortages and ageing present ongoing challenges for these regions. The resources that are available are typically located in regional centres, with people with diabetes often required to travel to either these locations or Perth to receive care.

Given the lack of local specialists, there is a reliance on visiting services to support people with more complex diabetes. It is notable that visiting services are funded under different programs (e.g. MSOAP, ICDP and IDES), leading to a fragmented approach that is likely unsustainable in the long term. There is a need to develop a more sustainable platform for the provision of specialist care, supported by telehealth services.

Population health teams are key providers in their regions, particularly in the Wheatbelt and Midwest regions. While access to general practices appears to be reasonable to good for the South West and Great Southern regions, the Wheatbelt and Midwest regions experience lower levels of access. Former general practice networks and Silver Chain were also identified as important organisations which are delivering allied health services.



5.5.4 Remote regions

The Goldfields, Pilbara and Kimberley regions are characterised by both very limited access to diabetes focussed services and high levels of diabetes prevalence and complexity. These regions have notably high levels of ED presentations and inpatient separations, while

Given the lack of private primary health care providers, population health teams, Aboriginal medical services and former general practice networks are critical service providers. These are supplemented visiting specialist teams, but as for the rural regions they are fragmented and infrequent. Given the lack of access to specialist services, stakeholders have emphasised the importance of generalist health services which offer local understanding and ongoing access. Stakeholders also emphasised the need for increasing the capacity and provision of support to these providers through education and training as well as access to specialists for tele-consultancy support.



6 Recommendations

6.1 Context for the recommendations

In considering the review's recommendations, the context in which diabetes services are delivered and this review has been undertaken must be understood. These considerations are briefly outlined below.

At present, it is difficult to access comprehensive, consistent and accurate data relating to diabetes service delivery. Diabetes service activity is recorded in a number of data collections, which are at various stages of development, operate under different approaches to data management and have varying levels of compliance at the service level. Furthermore, while it has been possible to collate data at the health region level, it has not been possible within the scope of this review to undertake more detailed analysis at the health district level. In particular, data constraints have limited the ability of the review to undertake detailed analysis of diabetes prevalence and service delivery by diabetes type. These impediments present significant barriers when undertaking statewide diabetes service planning.

Despite the data limitations, it is clear that access to diabetes services varies considerably according to a person with diabetes' location of residence, especially for those with complex care requirements. The analysis of service availability located in Section 5 of this report indicates that people living in the two metropolitan regions consistently have better access to all forms of diabetes services than residents of rural and remote regions. In noting access issues, it is important to acknowledge the challenges of delivering diabetes care in a state with a single major metropolitan centre, limited number of regional centres, and many small communities separated by large distances. WA's geography and population size also present challenges in terms of workforce recruitment and retention.

Given these constraints, a well integrated and coordinated diabetes system in which diabetes specialist and general health providers work collaboratively to provide timely care is required. There are a number of features which are desirable for achieving a more integrated system, including improved access to multidisciplinary teams (particularly for rural and remote regions), clear and effective referral pathways, well defined roles and responsibilities, and strengthened links between specialist and generalist providers. Similarly, formalised relationships between tertiary services and their outer metropolitan, rural and remote counterparts may be beneficial for improving access to care for people with diabetes as well as access to specialist advice and education and training for other care providers. Use of tools such as guidelines,



benchmarks, protocols, decision support tools and service directories may assist in achieving these outcomes.

There is also scope for improving the planning of diabetes services across WA which takes into consideration organisations and providers working in the full range of care settings; i.e. public, private and non government; primary, secondary and tertiary; metropolitan, rural and remote. Undertaking such a comprehensive approach will require strong dialogue between planners in the central Department divisions and its health regions to ensure local drivers of care are well understood. Statewide planning would need to focus on improving access to all forms of care through building local capacity and improving service integration. In doing so, it will be important to retain the benefits of local flexibility to address region-specific environments while improving the central Department visibility and understanding of system needs.

6.2 Recommendations for future consideration

Recommendations for implementing the service and system improvements in diabetes have been grouped under four broad themes:

- consistency and quality of care
- access and equity
- policy and planning
- specific population groups.

Recommendations relating to each theme are outlined below.

Themes and recommendations

1. Consistency and quality of care

- 1.1. **Promote person centred models of care, self management and health literacy.** This should involve strategies tailored to the general community, people at elevated risk of developing diabetes, as well as people with diagnosed diabetes.
- 1.2. **Clearly define and communicate roles and responsibilities of diabetes services and providers.** This should include renewing the WA Diabetes Model of Care. The levels of support to be provided by tertiary services to secondary and primary care services should be specified. Variations between metropolitan, rural and remote settings should be explicitly considered. Once agreed, these roles and responsibilities should be clearly communicated, with clinical change champions and executive level support engaged to lead implementation.



Themes and recommendations

- 1.3. **Establish clear referral pathways, processes and protocols to support shared care and improve the referral and transition of people with diabetes between care settings.** This may require identification of mechanisms (e.g. service directory, care coordinators, standardised referral systems between GPs and State provided services) to improve the visibility of diabetes capable providers and resources across geographic and service settings.
- 1.4. **Promote consistent approaches to care through development / identification of guidelines, benchmarks, protocols, decision support tools and other relevant resources.** In particular, use of these resources can assist providers who are less familiar with diabetes care due to less advanced training or infrequent contact with patients with diabetes.
- 1.5. **Strengthen existing or develop new formal networks between tertiary diabetes clinics and regional services.** This may include use of hub and spoke type models linking services in a particular region, as well as formalised partnerships between particular services.
- 1.6. **Build capacity in the secondary, community and primary health care settings** through the provision of diabetes education and training, especially in relation to insulin and medications management, supporting self management, screening, foot and wound care. Education and training should address basic through to advanced skills.
- 1.7. **Identify strategies to strengthen communication between providers and services across care settings.** While person controlled electronic health records (PCEHRs) may eventually assist with this, other measures may include standardised discharge forms, case conferencing, secure messaging and telehealth technologies that take advantage of new Commonwealth funding arrangements.

2. Access and equity

- 2.1. **Undertake diabetes specific workforce planning to address identified shortages and ageing, especially with regard to endocrinologists and credentialed diabetes educators.** This should consider the impacts of FTE caps and the lack of training placements available to support development of new workers. Strategies specific to metropolitan, rural and remote settings will be required.
- 2.2. **Consider the allocation of diabetes resources across geographic**



Themes and recommendations

and service settings, including the location of tertiary / specialist teams. There is a need to improve access to specialist care for people with diabetes living outside of inner metropolitan areas. Furthermore, current and projected workforce shortages indicate the need to reconsider use of specialised providers such as endocrinologists and diabetes educators to ensure these resources are maximised. When considering the relocation of specialist resources to outer metropolitan areas, the benefits associated with collocating diabetes services at tertiary hospitals with other specialist resources need to be weighed against the benefits of improved access. Alternative approaches like transport services and care coordinators may be more appropriate.

- 2.3. **Consider the role of statewide organisations such as Diabetes WA in the provision of diabetes education and information services.** There may be opportunities to promote the uptake of consistent, evidence based programs, share existing resources, and more efficiently utilise diabetes educators.
- 2.4. **Develop a statewide telehealth strategy for diabetes services.** This should align with the state telehealth strategy and consider the role of telehealth in providing direct patient care, tele-consultancy support to other health providers and services, and education, training and professional development. This strategy should be undertaken as an enabler of all recommendations outlined in this report.
- 2.5. **Develop a sustainable and coordinated program for visiting specialist diabetes services to rural and remote communities.** Currently visiting specialist services are funded under a range of different, time limited programs, resulting in a fragmented and unsustainable model. Close consultation with relevant communities and regional planning bodies will be required. As per Recommendation 2.3, use of telehealth technologies should be a 'first line' component of this program.
- 2.6. **Establish and promote after hours diabetes services and education to groups which typically have limited access to business hours services.**
- 2.7. **Work with the Australian Government to improve design of MBS chronic disease item numbers,** particularly those relating to allied health providers such as diabetes educators, podiatrists and dietitians. MBS chronic disease item numbers currently limit access to relevant allied health providers, requiring use of brief interventions and requiring a focus on low acuity, low complexity diabetes.



Themes and recommendations

3. Policy and planning

- 3.1. **Consider the establishment of statewide and regional forums to assist with the planning and monitoring of diabetes services.** At present, the diabetes care system appears to be ad hoc and regionally driven. While the benefits of this approach in terms of flexibility to respond to local settings should not be lost, there is a need to enable better connectivity and strategic allocation of resources across WA health regions. Relevant stakeholders from across the public, private and NGO as well as tertiary, secondary and primary care settings should be engaged. Where possible, existing planning forums should be used to minimise duplication and administrative burden.
- 3.2. **Undertake diabetes service demand modelling to determine future needs for diabetes services, and the types and levels of services required.** This modelling should give specific consideration to the anticipated number of people with complex diabetes and comorbidities.
- 3.3. **Improve the quality and accessibility of diabetes related data collections.** This review experienced considerable difficulties in accessing data relating to diabetes prevalence and service activity that is accurate, complete and detailed. WA health regions and services are currently using a range of data and information management products. Data is entered differently by system users, introducing both variable coding and various inaccuracies. Data collections are managed by different teams located within different areas of the WA Department of Health infrastructure.

4. Specific population groups

4.1. *People with type 1 diabetes*

Increase the availability and accessibility of specialist diabetes services through redistribution of resources, provision outreach services and / or use of patient transport and care coordinator services.

4.2. *People with type 2 diabetes*

Build the capacity and skills of primary and secondary care providers to manage more complex type 2 diabetes. Improve the access of these to specialist providers for the provision of advice when required.

4.3. *People with gestational diabetes*

Improve the capacity of King Edward Memorial Hospital to provide



Themes and recommendations

outreach and tele-consultancy support to regional and remote services. Build the capacity and skills of primary and secondary care providers to manage more GDM.

4.4. **Young people with diabetes**

Identify mechanisms and best practice support for young people with diabetes transitioning to adult services. Improve the capacity of Princess Margaret Hospital to provide outreach and tele-consultancy support to regional and remote services

4.5. **Aboriginal people with diabetes**

Promote the development of the Aboriginal health workforce. Improve the capacity of Aboriginal health workers, GPs, outreach workers, care coordinators and other providers working with Aboriginal people to provide diabetes care.

Promote the delivery of culturally appropriate care by all health care providers.



Appendices



A Acronyms

Commonly used acronyms included in this report are outlined below.

Table 78: Acronyms

Acronym	Title
ABS	Australian Bureau of Statistics
ADEA	Australian Diabetes Educators Association
AHCWA	Aboriginal Health Council of WA
AHS	Allied Health Services (data collection)
AIHW	Australian Institute of Health and Welfare
AMS	Aboriginal medical service
AOD	Ambulatory and Other Domiciliary
ATSI	Aboriginal and Torres Strait Islander
CAHS	Child and Adolescent Health Service
CALD	Culturally and linguistically diverse
CBD	Central business district
CDE	Credentialed diabetes educators
CSF	WA Clinical Services Framework
CTG	Closing The Gap
DAFNE	Dose Adjustment for Normal Eating
DESMOND	Diabetes Education and Self-Management for Ongoing and Newly Diagnosed
DIAL	Diabetes Information and Advice Line
DNA	Did not attend
DVA	Department of Veterans' Affairs



Acronym	Title
ED	Emergency department
ERP	Estimated resident population
FHHS	Fremantle Hospital and Health Service
FTE	Full time equivalent
FWE	Full workforce equivalent
GDM	Gestational diabetes mellitus
GP	General practitioner
GPN	General practice network
GRAMS	Geraldton Regional Aboriginal Medical Services
HWSS	Health and Wellbeing Surveillance System
ICD	International Classification of Disease
ICDP	Indigenous Chronic Disease Packages
IDES	Integrated Diabetes and Endocrinology Service
IGT	Impaired glucose tolerance
KAMSC	Kimberley Aboriginal Medical Services Council
KEMH	King Edward Memorial Hospital For Women
LWD	Living with Diabetes
MBS	Medicare Benefits Schedule
ML	Medicare Local
MSOAP	Medical Specialist Services Outreach Assistance Program
NA	Not available
NP	Not published



Acronym	Title
NAPAAWL DC	Non-admitted patient activity & wait list data collection
NDSS	National Diabetes Services Scheme
NGO	Non government organisation
NMHS	North Metropolitan Health Service
OPH	Osborne Park Hospital
PHIDU	Public Health Information Development Unit, University of Adelaide
PMH	Princess Margaret Hospital For Children
RFDS	Royal Flying Doctor Service
RGH	Rockingham General Hospital
RHW	Rural Health West
RPH	Royal Perth Hospital
SCGH	Sir Charles Gairdner Hospital
SLA	Statistical local area
SMHS	South Metropolitan Health Service
T1	Type 1 diabetes
T2	Type 2 diabetes
TOPAS	The Open Patient Administration System
USOAP	Urban Specialist Outreach Assistance Program
WACHS	WA Country Health Service
WNHS	Women and Newborn's Health Service



B Stakeholders

The stakeholders consulted during the review are outlined below.

Table 79: Stakeholders consulted

Health region	Name	Position	Organisation
Goldfields	Kate Nell	Diabetes educator	Esperance Hospital
Goldfields	Helen Robinson	Deputy CEO	Goldfields Midwest Medicare Local
Goldfields	Dr Sean George	General physician w diabetes special interest	Kalgoorlie Hospital
Goldfields	Helen Fullarton	Coordinator of Nursing	Kalgoorlie Hospital
Goldfields	Anne Mahony	Regional Population Health Director, Goldfields	Population Health Unit, WACHS Goldfields
Great Southern	Robin Surridge	Executive Officer	Amity Health
Great Southern	Clare Valley	Program Manager	Amity Health
Great Southern	Emily Eaton	Dietitian	Amity Health
Great Southern	Suzanne Belanger	Diabetes educator	Private provider
Great Southern	Sandra Crowe	Regional Population Health Director, Great Southern	Population Health Unit, WACHS South West
Great Southern	Shirley Cornelius	Chronic disease nurse consultant	Population Health Unit, WACHS South West
Kimberley	Margie Ware	Clinical Health Services Manager	Boab Health Services
Kimberley	Donna Hindmarsh	Director of Nursing	Kimberley - Broome Regional Health Campus, Northern and Remote Country Health Service
Kimberley	Dr Philippa Chidgzey	Public Health Registrar, Kimberley Public Health Unit	Kimberley - Broome Regional Health Campus, Northern and Remote Country Health Service
Kimberley	Dr David Atkinson	Medical Director	Kimberley Aboriginal Medical Services Council
Kimberley	Tim O'Brien	Regional Population Health Director, Kimberley	Population Health Unit, WACHS, Kimberley



Health region	Name	Position	Organisation
Midwest	Cindy Porter	Diabetes educator	Private provider
Midwest	Deborah Woods	CEO	Geraldton Regional Aboriginal Medical Service
Midwest	Dr Teresa Tierney	Coordinator GP Services	Royal Flying Doctor Service
Midwest	Dr Charles Greenfield	General physician w diabetes special interest	St John of God Geraldton Hospital & Specialist Centre
Midwest	David Richardson	Regional Population Health Director, Midwest	Population Health Unit, WACHS, Midwest
NMHS	Learne Durrington	CEO	Diabetes care coordination program
NMHS	Dr Warwick Howe	Endocrinologist	Private provider
NMHS	Jo Scheepers	Podiatrist	Public Health and Ambulatory Care Unit, NMHS
NMHS	Judy Wenban	Program Director Ambulatory Care	Public Health and Ambulatory Care Unit, NMHS
NMHS	Denise Smith	Diabetes educator	Public Health and Ambulatory Care Unit, NMHS
NMHS	Paola Morellini	Clinical Planner	NMHS
NMHS	Sophie McGough	Private dietitian & diabetes educator	Private
NMHS	Dr Joey Kaye	Endocrinologist and Head of Department	Sir Charles Gairdner Hospital
NMHS	Dr David Henley	Endocrinologist	Sir Charles Gairdner Hospital
NMHS	Eugenie Nicolandis	Podiatrist	Sir Charles Gairdner Hospital
NMHS	Dr Mark Lee	General physician	Swan Districts Hospital
NMHS	Rachel Resuggan	Allied Health Manager	Swan Districts Hospital
NMHS	Rachale Critchell	Diabetes educator	Swan Districts Hospital
Pilbara	Danny Brown	CEO	Mawarnkarra Health Service Aboriginal Corporation
Pilbara	Judith Dee	Chronic disease manager	Pilbara Health Network
Pilbara	Jo Halpin	CEO	Pilbara Health Network



Health region	Name	Position	Organisation
Pilbara	Karen Lehrke	Diabetes Educator	Pilbara Health Network
Pilbara	Megan Ewing	CEO	Puntukurnu Aboriginal Medical Services
Pilbara	Margaret Abernethy	Regional Population Health Director, Pilbara	Population Health Unit, WACHS Kimberley
Pilbara	Dr Philip Montgomery	Regional Medical Director	WACHS Kimberley
Pilbara	Dr Pascall Burton	GP Port Hedland	Wirraka Maya Health Service Aboriginal Corporation
SMHS	Dr Tony Ryan	General physician w diabetes special interest	Armadale Health Service
SMHS	Carol Chong	Manager Chronic Disease Team	Bentley Armadale Medicare Local
SMHS	Cheryl Laird	Diabetes educator	Bentley Armadale Medicare Local
SMHS	Kathryn Swain	Diabetes educator	Bentley Health Service
SMHS	Clory Corello	Manager	Cockburn GP Super Clinic
SMHS	Professor Bu Yeap	Head of Department	Fremantle Hospital and Health Service
SMHS	Professor Tim Davis	General physician and endocrinologist	Fremantle Hospital and Health Service
SMHS	Dr Ashley Makepeace	Endocrinologist	Fremantle Hospital and Health Service
SMHS	Mary Duck	Diabetes educators	Fremantle Hospital and Health Service
SMHS	Laurie Foley	Podiatrist	Fremantle Hospital and Health Service
SMHS	Jackie Davis	Chronic disease program manager	Fremantle Medicare Local
SMHS	Christa Riegler	CEO	Fremantle Medicare Local
SMHS	Kylie Connor	Diabetes educator	Hilton Community Diabetes Education
SMHS	Mark Burrows	Allied Health Services Manager	Rockingham General Hospital and Mandurah Community Health centre
SMHS	Maxine Schlaeppi	Diabetes educator	Rockingham General Hospital
SMHS	Dr Gerry Fegan	Endocrinologist	Fremantle Hospital and



Health region	Name	Position	Organisation
			Rockingham General Hospital
SMHS	Dr Seng Khee Gan	Endocrinologist and Head of Department	Royal Perth Hospital
SMHS	Dr Jonathan Beilin	Endocrinologist	Royal Perth Hospital
SMHS	Cara Westphal	Podiatrist	Royal Perth Hospital
SMHS	Dr Kim Stanton	Endocrinologist	Royal Perth Hospital & private provider
SMHS	Karen Banks	A/Executive Director	Public Health, Ambulatory Care & Strategic Allied Health, SMHS
South West	Wendy Pittick	Diabetes Educator	Bunbury Hospital
South West	Jenny McDonnell	Diabetes Educator	Bunbury Hospital
South West	Paul Hersey	Deputy CEO	Perth South Coastal Medicare Local
South West	Sarah Fergus	Clinical Support Coordinator	South West WA Medicare Local
South West	Jo Moore	Regional Population Health Director, South West	Population Health Unit, WACHS South West
Statewide	Andrew Wagstaff	CEO	Diabetes WA
Statewide	Helen Mitchell	General Manager, Health Services	Diabetes WA
Statewide	A/Prof Barry Walters	Obstetrician	King Edward Memorial Hospital
Statewide	Dianne Bond	Diabetes educator	King Edward Memorial Hospital
Statewide	Dr Janet Hornbuckle	KEMH Consultant, GDM interest. Clinical lead, Women's & Newborn Health Network	King Edward Memorial Hospital
Statewide	Dr Angus Turner	Ophthalmologist	Lions Eye Institute
Statewide	Dr Tim Jones	Paediatrician & Endocrinologist	Princess Margaret Hospital
Statewide	Nola Harrington	Diabetes Educator	Princess Margaret Hospital
Statewide	Dr Brett Sillars	Endocrinologist	Private provider, Western Endocrinology & Diabetes
Statewide	Dr Paul Myhill	Endocrinologist	Private provider, Western Endocrinology



Health region	Name	Position	Organisation
			& Diabetes
Statewide	Sally Congdon	Manager Special Projects	Rural Health West
Statewide	Vivienne Duggin	General Manager Outreach Services	Rural Health West
Statewide	Steve Carmody	Director Community Nursing	Silver Chain
Statewide	Carole Bain	General Manager, Country Services	Silver Chain
Statewide	Tim Shackleton	Director	Virtual Health
Statewide	Melissa Vernon	Executive Director Primary Healthcare	WACHS
Statewide	Kate Gatti	Population Health Director	WACHS
Statewide	Anna McDonald	Allied Health Coordinator	WACHS
Statewide	Susan Powe	COAG Implementation Manager	WACHS
Statewide	Alan Hamilton	Telehealth Manager	WACHS
Statewide	Genevieve Stone	WACHS chronic condition manager	WACHS
Statewide	Dr Jenny Prentice	Program Director	Wounds West
Wheatbelt	Brie Elson	Senior dietitian	Avon and Central Wheatbelt Primary Health Service
Wheatbelt	Mary Jane Gabelish	Chronic disease coordinator	Southern Country Health Service
Wheatbelt	Sean Conlan	Regional Population Health Director, Wheatbelt	Population Health Unit, WACHS Wheatbelt



C General practice in Western Australia

The table below provides an overview of GP numbers around WA in 2010 (being the most recent figures available). While not directly comparable to the WA health region boundaries, the general practice network boundaries are broadly comparable, as indicated in the second column of the table.

Table 80: Number of GPs in WA by general practice network boundary, 2010

Name of Division of General Practice	Most relevant WA health region	Total number of practices	No. of practices as proportion of WA total (per cent)	Estimated number of practising GPs	Number of GP as proportion of WA total (per cent)	FWE GPs as at 30 June 2010 ¹⁵³	FWE GPs as proportion of WA total (per cent)	Estimated number of GPs: population 2010 ratio	FWE GP: population 2010 ratio	Population : FWE GP ratio - Region vs Aust
Perth Primary Care Network	NMHS	148	26	616	25	399	24	809	1,250	114%
Osborne GP Network	NMHS	94	16	428	17	308	19	1,049	1,459	133%
Canning Division of General Practice	SMHS	72	13	291	12	220	13	1,176	1,556	141%

¹⁵³ Workforce data for the 2010-11 period is provided by the Australian Government Department of Health and Ageing. Data reflect Division boundaries based on 2006 ABS Collection Districts as at 1st July 2010. FWE is reported in place of Fulltime Equivalence (FTE) as the former is considered to be a more accurate measure (and is preferred by Department of Health and Ageing). For a definition of FTE and FWE please see: www.phcris.org.au/fastfacts/index.php.



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Name of Division of General Practice	Most relevant WA health region	Total number of practices	No. of practices as proportion of WA total (per cent)	Estimated number of practising GPs	Number of GP as proportion of WA total (per cent)	FWE GPs as at 30 June 2010 ¹⁵³	FWE GPs as proportion of WA total (per cent)	Estimated number of GPs: population n 2010 ratio	FWE GP: population n 2010 ratio	Population : FWE GP ratio - Region vs Aust
Fremantle GP Network	SMHS	71	12	338	14	199	12	812	1,376	125%
Rockingham Kwinana Division of General Practice	SMHS	22	4	115	5	96	6	1,192	1,422	129%
GP Down South	South West	39	7	174	7	136	8	961	1,227	111%
Greater Bunbury Division of General Practice	South West	19	3	81	3	57	3	1,037	1,482	135%
Great Southern GP Network	Great Southern	23	4	96	4	63	4	854	1,311	119%
Wheatbelt GP Network	Wheatbelt	24	4	45	2	31	2	1,136	1,644	149%
Midwest GP Network	Midwest	21	4	95	4	52	3	706	1,298	118%
Goldfields Esperance GP Network	Goldfields	19	3	63	3	33	2	936	1,782	162%



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Name of Division of General Practice	Most relevant WA health region	Total number of practices	No. of practices as proportion of WA total (per cent)	Estimated number of practising GPs	Number of GP as proportion of WA total (per cent)	FWE GPs as at 30 June 2010 ¹⁵³	FWE GPs as proportion of WA total (per cent)	Estimated number of GPs: population n 2010 ratio	FWE GP: population n 2010 ratio	Population : FWE GP ratio - Region vs Aust
Pilbara Division of General Practice	Pilbara	13	2	56	2	25	2	868	1,946	177%
Boab Health Services	Kimberley	8	1	56	2	21	1	638	1,689	153%
WA	All	573	100	2,454	100	1,640	100	936	1,496	136%
Australia		7,035	n.a.	24,720	n.a.	20,082	n.a.	894	1,101	100%

Source: Key Division of General Practice characteristics 2010-2011, Primary Health Care Research & Information Service (PHCRIS). Last updated March 2012. Accessed 10 October 2012 at www.phcris.org.au/products/asd/keycharacteristic/KeyDGPstatistics.xls.



D Data tables

D.1 Population size

Table 81: WA estimated resident population, all ages, by region, 2011

	Male	Female	Totals	Total as proportion of WA pop
NMHS	482,855	486,245	969,100	41.2%
SMHS	432,718	434,653	867,371	36.9%
South West	78,521	80,094	158,615	6.7%
Great Southern	29,293	29,784	59,077	2.5%
Wheatbelt	38,508	36,609	75,117	3.2%
Midwest	33,330	31,900	65,230	2.8%
Goldfields	30,070	27,226	57,296	2.4%
Pilbara	38,240	24,496	62,736	2.7%
Kimberley	19,801	17,872	37,673	1.6%
Total	1,183,336	1,168,879	2,352,215	100.0%

Table 82: WA estimated Aboriginal resident population, 2011

	Aboriginal population	Aboriginal population as proportion of total population
NMHS	12,531	1.3%
SMHS	12,231	1.4%
South West	3,349	2.1%
Great Southern	2,249	3.8%
Wheatbelt	4,262	5.7%
Midwest	8,141	12.5%
Goldfields	5,296	9.2%
Pilbara	7,212	11.5%
Kimberley	13,923	37.0%



	Aboriginal population	Aboriginal population as proportion of total population
Total ¹⁵⁴	69,654	3.0%

Source: KPMG calculation based on 2011 ABS Census

D.2 Prevalence of diabetes in WA

D.2.1 Prevalence estimates for total WA population

Table 83: Prevalence estimates (number of people) for persons aged 15 years and over, by type and region, 2011, based on WA Epidemiology Branch data

	Type 1	Type 2	GDM	Diabetes - all types
NMHS	3,555	33,202	7,956	43,110
SMHS	2,412	37,523	6,800	45,497
South West	442	6,046	1,545	7,800
Great Southern	154	2,167	455	2,681
Wheatbelt	218	4,027	451	4,505
Midwest	171	2,566	927	3,501
Goldfields	299	2,408	801	3,244
Pilbara	516	1,372	479	2,351
Kimberley	109	1,489	1,221	1,088
Total	7,814	90,313	19,609	113,936

Source: Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System

¹⁵⁴ Includes 460 Aboriginal people living outside WA.



Table 84: Prevalence estimates (proportion of population) for persons aged 15 years and over, by type and region, 2011, based on WA Epidemiology Branch data

	Type 1	Type 2	GDM	Diabetes - all types
NMHS	0.5	4.4	2.1	5.7
SMHS	0.4	5.6	2.0	6.8
South West	0.4	4.8	2.5	6.2
Great Southern	0.3	4.6	2.0	5.7
Wheatbelt	0.4	6.7	1.6	7.5
Midwest	0.3	5.1	3.9	7.0
Goldfields	0.7	5.4	3.9	7.3
Pilbara	1.4	3.8	3.1	6.5
Kimberley	0.4	2.8	2.2	4.1
WA total	0.4	5.0	2.2	6.3

Source: Prevalence of diabetes in Western Australian adults, WA Health and Wellbeing Surveillance System

D.2.2 Prevalence estimates for persons aged 0 to 14 years

Table 85: Prevalence estimates (number of people) for persons aged 0 to 14 years, by region, 2011, based on AIHW data

	Number of persons	Proportion of persons
NMHS	252	40%
SMHS	227	36%
South West	46	7%
Great Southern	17	3%
Wheatbelt	21	3%
Midwest	19	3%
Goldfields	18	3%
Pilbara	17	3%
Kimberley	13	2%
Total	629	100%

Source: KPMG calculation based on Prevalence of Type 1 diabetes in Australian children, 2008, AIHW (2011) and ERP, ABS (2011)



D.2.3 Prevalence estimates for Aboriginal population

Estimates of diabetes prevalence for the WA Aboriginal population are based on an assumption that all Indigenous Australians have a diabetes (all types) prevalence rate of 12.7 per cent.

Table 86: Prevalence estimates (number of people) for the WA Aboriginal estimated resident population, all ages, by region, 2011, based on AIHW and ABS data

	Aboriginal population size	Number of Aboriginal people with diabetes (all types)	Proportion of Aboriginal persons with diabetes
NMHS	12,531	1,591	18%
SMHS	12,231	1,553	18%
South West	3,349	425	5%
Great Southern	2,249	286	3%
Wheatbelt	4,262	541	6%
Midwest	8,141	1,034	12%
Goldfields	5,296	673	8%
Pilbara	7,212	916	10%
Kimberley	13,923	1,768	20%
Total	*69,654	8,788	100%

* Includes 460 Aboriginal people living outside WA

Source: KPMG calculation based on AIHW 2011 analysis of ABS NHS 1995, 2001, 2004–05 and 2007–08 (reissue), ABS NHS–IS 2001 and NATSIHS 2004–05. Census 2011 Local Government Area Boundaries, Age, Sex, ATSI

D.3 Diabetes service provision

D.3.1 Inpatient separations

Table 87: Inpatient separations by health region based on location of service, 2007 to 2011

Region	Year	Type 1	Type 2	GDM	Other	Total
CAHS	2008	302	8	n.a	-	310
	2009	248	8	n.a	5	261
	2010	283	20	n.a	-	303



Region	Year	Type 1	Type 2	GDM	Other	Total
WNHS	2011	278	11	n.a	-	289
	2008	26	39	123	-	188
	2009	28	52	187	-	267
	2010	29	28	106	-	163
NMHS	2011	21	24	18	-	63
	2008	553	4,176	94	54	4,877
	2009	586	4,316	215	63	5,180
	2010	563	2,610	182	78	3,433
SMHS	2011	479	1,105	18	89	1,691
	2008	302	1,937	88	16	2,343
	2009	334	2,218	121	24	2,697
	2010	301	1,420	75	14	1,810
South West	2011	287	497	15	9	808
	2008	87	534	24	5	650
	2009	77	553	30	5	665
	2010	66	366	22	-	454
Great Southern	2011	58	154	-	6	218
	2008	31	136	-	-	167
	2009	29	117	5	-	151
	2010	24	131	-	-	155
Wheatbelt	2011	24	50	-	-	74
	2008	22	118	-	-	140
	2009	22	158	-	-	180
	2010	12	128	-	-	140
Midwest	2011	20	66	-	-	86
	2008	26	227	11	-	264
	2009	34	202	14	-	250
	2010	35	156	6	-	197
Goldfields	2011	28	75	-	-	103
	2008	34	131	12	-	177
	2009	34	153	17	-	204
	2010	23	114	14	-	151
Pilbara	2011	39	61	6	-	106
	2008	22	139	10	-	171



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Region	Year	Type 1	Type 2	GDM	Other	Total
Kimberley	2009	27	174	18	-	219
	2010	24	125	19	-	168
	2011	18	87	7	-	112
	2008	5	186	19	-	210
	2009	10	174	18	-	202
	2010	12	123	15	-	150
	2011	10	116	-	5	131

Source: WA Hospital Morbidity Data System, Performance Activity & Quality Division

Table 88: Inpatient separations per 1,000 persons, by health region, based on location of service, 2011

	Separations (all diabetes)	Separations per 1,000 persons (total pop)	Inpatient separations (all types) per 1,000 persons with diabetes
NMHS*	1,691	1.7	37.2
SMHS	808	0.9	18.7
South West	218	1.4	27.9
Great Southern	74	1.3	27.6
Wheatbelt	86	1.1	19.1
Midwest	103	1.6	29.4
Goldfields	106	1.9	32.7
Pilbara	112	1.8	47.6
Kimberley	131	3.5	120.4
WA average**	3,681	1.6	32.3

* Excludes CAHS & WNHS data

** Includes CAHS & WNHS data

Source: WA Hospital Morbidity Data System, Performance Activity & Quality Division

D.3.2 Emergency department presentations

Table 89: ED presentations for endocrine, nutritional and metabolic diseases and disorders, by region, 2007 to 2010

	2008	2009	2010	2011	Presentations per 1,000 persons (2010)
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	2008	2009	2010	2011	Presentations per 1,000 persons (2010)
NMHS	1,439	1,467	1,470	1,528	1.6
SMHS	1,289	1,326	1,409	1,465	1.7
South West	356	338	339	352	2.2
Great Southern	141	119	139	145	2.4
Wheatbelt	272	292	328	341	4.5
Midwest	223	178	237	246	3.8
Goldfields	184	202	204	212	3.7
Pilbara	181	206	249	259	4.1
Kimberley	264	349	296	308	8.2
WA total	4,349	4,477	4,671	4,856	2.1

Source: Specific health condition analysis: Endocrine, nutritional and metabolic diseases and disorders ED attendances. Health status report on Endocrine, nutritional and metabolic diseases and disorders ED attendances for WA Health Regions. Epidemiology Branch (PHI) in collaboration with the Cooperative Research Centre for Spatial Information (CRC-SI). Generated using data from the WA Emergency Department Data Collection. Accessed Tuesday, 27 November 2012.

D.3.3 Outpatient (non admitted) occasions of service

Table 90: Non admitted data collection – metropolitan regions and services, 2008 to 2011

Region	Hospital	2008	2009	2010	2011
CAHS	Princess Margaret Hospital For Children	15,233	16,553	16,774	22,205
WNHS	King Edward Memorial Hospital For Women	3,108	3,457	3,503	3,799
NMHS	Osborne Park Hospital	-	252	834	1,203
	Sir Charles Gairdner Hospital	8,670	9,159	10,002	11,213
	Swan District Hospital	-	-	25	237
SMHS	Bentley Health Service	5,395	5,131	5,700	6,707
	Bentley Older Adult Mental Health ¹⁵⁵	-	-	-	69
	Fremantle Hospital	9,108	9,909	9,944	11,562
	Rockingham General Hospital	2,263	2,146	2,991	4,584

¹⁵⁵ Collocated with the Bentley Health Service.



Region	Hospital	2008	2009	2010	2011
	Royal Perth Hospital	8,423	8,336	8,247	8,918
WA total		52,200	54,943	58,020	70,497

Source: Diabetes non admitted data collection, Performance Activity & Quality Division

Table 91: Non admitted data collection – WA country regions and services, 2008 to 2011

Region	Hospital	2008	2009	2010	2011
South West	Donnybrook Hospital	61	68	51	36
Great Southern	Albany Hospital	-	-	-	16
	Katanning Hospital	-	-	-	12
Wheatbelt	Northam Hospital	-	-	1	-
	Wagin Hospital	2,452	1,917	990	93
	Wongan Hills Hospital	-	1	-	-
Midwest	Carnarvon Hospital	715	121	-	-
	Exmouth Hospital	23	21	20	6
	Geraldton Hospital	-	-	86	398
Goldfields	Esperance Hospital	-	5	-	-
Pilbara	Port Hedland Hospital	33	62	-	-
Kimberley	Broome Hospital	-	-	-	3
	Derby Hospital	-	80	24	-
Unknown	Other Community Health Service Within Australia	105	7	39	211
WA total		3,389	2,282	1,211	775

Source: Diabetes non admitted data collection, Performance Activity & Quality Division

Table 92: AOD data collection, by region and health service, 2009/10 to 2011/12

Region	Service	2009/10	2010/11	2011/12
Goldfields	Esperance Hospital	196	278	196
	Kalgoorlie Hospital	691	826	902
	Ravensthorpe Hospital	3	3	-
	Total	890	1,107	1,098
Great Southern	Albany Hospital	325	450	471
	Bremer Bay Health Centre	-	5	16



Region	Service	2009/10	2010/11	2011/12
	Denmark Hospital	-	-	44
	Gnowangerup Hospital	7	4	2
	Jerramungup Nursing Post	-	-	2
	Katanning Hospital	50	409	345
	Kojonup Hospital	3	1	2
	Plantagenet Hospital	-	-	14
	Total	385	869	896
Kimberley	Broome Hospital	49	41	57
	Derby Hospital	50	6	41
	Fitzroy Crossing Hospital	-	-	18
	Halls Creek Hospital	-	-	3
	Kununurra Hospital	106	62	17
	Wyndham Hospital	42	30	92
	Total	247	139	228
Midwest	Burringurrah Nursing Post	23	70	106
	Carnarvon Hospital	89	39	90
	Coral Bay Nursing Post	1	-	1
	Cue Nursing Post	85	53	13
	Dongara Multi-Purpose Health Centre	192	219	128
	Exmouth Hospital	53	86	108
	Geraldton Hospital	166	1,397	2,297
	Kalbarri Health Centre	236	438	422
	Meekatharra Hospital	37	65	124
	Morawa Hospital	54	22	16
	Mount Magnet Nursing Post	2	13	2
	North Midlands Hospital	10	10	34
	Northampton Hospital	85	573	43
	Yalgoo Nursing Post	15	5	1
	Total	1,048	2,990	3,385
Pilbara	Hedland Health Campus	1,902	1,238	554
	Newman Hospital	6	28	13
	Nickol Bay Hospital	7	6	31
	Onslow Hospital	119	153	155



Region	Service	2009/10	2010/11	2011/12
South West	Paraburdoo Hospital	10	14	6
	Roebourne Hospital	-	-	1
	Wickham Hospital	3	1	-
	Total	2,047	1,440	760
	Augusta Hospital	1	-	1
	Boyup Brook Soldiers Memorial	2	12	1
	Bridgetown Hospital	123	42	4
	Bunbury Community Health Centre	1,997	2,331	2,307
	Busselton Hospital	87	94	123
	Collie Hospital	282	298	186
	Donnybrook Hospital	172	99	154
	Harvey Hospital	151	139	123
	Nannup Hospital	7	8	-
	Pemberton Hospital	1	1	24
	Warren Hospital	136	162	139
Wheatbelt	Total	2,959	3,186	3,062
	Beverley Hospital	114	99	36
	Boddington Hospital	-	1	-
	Bruce Rock Memorial Hospital	108	78	745
	Dalwallinu Hospital	2	1	-
	Dumbleyung Memorial Hospital	27	21	35
	Goomalling Hospital	139	49	18
	Jurien Bay Health Centre	-	1	1
	Kellerberrin Memorial Hospital	61	57	12
	Kondinin Hospital	419	49	54
	Kununoppin Hospital	15	30	3
	Lake Grace Hospital	12	9	7
	Merredin Hospital	170	215	287
	Moora Hospital	681	664	680
	Mukinbudin Nursing Post	6	11	10
	Narembeen Memorial Hospital	-	2	1
	Narrogin Hospital	161	144	241
	Northam Hospital	768	636	837



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Region	Service	2009/10	2010/11	2011/12
	Pingelly Hospital	42	48	3
	Quairading Hospital	71	41	40
	Southern Cross Hospital	-	1	5
	Wagin Hospital	143	71	197
	Wongan Hills Hospital	61	42	-
	Wyalkatchem-Koorda And District	-	-	7
	York Hospital	16	-	5
	Total	3,016	2,270	3,224
WA		10,592	12,001	12,653

Source: AOD data collection, WACHS



Table 93: Composite non admitted and AOD diabetes occasions of service by region and year, 2009 to 2011

	2009	2010	2011
CAHS	16,553	16,774	22,205
WNHS	3,457	3,503	3,799
NMHS	9,411	10,861	12,653
SMHS	25,522	26,882	31,840
South West	1,153	1,303	1,054
Great Southern	306	556	580
Wheatbelt	4,756	3,096	3,065
Midwest	921	2,709	3,199
Goldfields	756	919	897
Pilbara	2,138	1,454	1,056
Kimberley	277	157	182
WA total	65,250	68,214	80,530

Source: Diabetes non admitted data collection, Performance Activity & Quality Division and AOD data collection, WACHS

Table 94: Composite AOD and non admitted diabetes occasions of service by region and year, 2011, per 1,000 persons and 1,000 persons with diabetes

	Total occasions of service	Occasions of service per 1,000 persons (total pop)	Occasions of service per 1,000 persons with diabetes
NMHS*	12,653	13.1	293.5
SMHS	31,840	36.7	699.8
South West	1,054	6.6	135.1
Great Southern	580	9.8	216.3
Wheatbelt	3,065	40.8	680.4
Midwest	3,199	49.0	913.7
Goldfields	897	15.7	276.5
Pilbara	1,056	16.8	449.2
Kimberley	182	4.8	167.3
WA average**	80,530	34.2	706.8

* Excludes CAHS & WNHS data

** Includes CAHS & WNHS data

Source: KPMG calculation based on diabetes non admitted data collection, Performance Activity & Quality Division, AOD data collection, WACHS, and WA ERP



Table 95: Outcomes of occasions of service, metropolitan services, 2008 to 2011

	Attended	Did not attend (not OOS)	Chart only (not OOS)	Did not wait	Not reported / unknown
PMH	90.5%	8.5%	0.8%	0.0%	0.2%
KEMH	88.8%	6.6%	4.6%	0.0%	0.0%
Osborne Park	96.0%	3.7%	0.1%	0.3%	0.0%
Sir Charles Gairdner	74.3%	12.9%	12.7%	0.1%	0.0%
Swan District	77.9%	22.1%	0.0%	0.0%	0.0%
Bentley	89.7%	9.7%	0.0%	0.1%	0.5%
Bentley Older Adult Mental Health	59.4%	36.2%	0.0%	0.0%	4.3%
Fremantle	79.7%	15.3%	4.9%	0.1%	0.0%
Rockingham	85.0%	14.3%	0.2%	0.5%	0.1%
Royal Perth	77.8%	20.3%	1.6%	0.3%	0.0%
NMHS average	75.5%	12.4%	11.9%	0.1%	0.0%
SMHS average	81.8%	15.6%	2.3%	0.2%	0.1%
Average all services	81.3%	14.7%	3.3%	0.1%	0.5%

Source: KPMG calculation based on diabetes non admitted data collection, Performance Activity & Quality Division



D.3.4 Community health services

Table 96: Community health occasions of services by region and location of service, 2008 to 2011

	2008	2009	2010	2011
NMHS	5,841	6,513	6,136	4,938
SMHS	5,486	4,511	4,491	4,930
South West	154	68	48	42
Great Southern	311	263	178	73
Wheatbelt	744	660	281	199
Midwest	801	787	150	181
Goldfields	891	1,027	1,085	1,225
Pilbara	584	571	562	486
Kimberley	1,483	1,081	2,487	2,150
WA total	16,295	15,481	15,418	14,224

Source: KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network

Table 97: Community health occasions of service for diabetes treatment and management (all types, per 1,000 persons), by region, 2011

	Occasions of service per 1,000 persons	Occasions of service per 1,000 persons with diabetes
NMHS	5.1	114.5
SMHS	5.7	108.4
South West	0.3	5.4
Great Southern	1.2	27.2
Wheatbelt	2.6	44.2
Midwest	2.8	51.7
Goldfields	21.4	377.6
Pilbara	7.7	206.7
Kimberley	57.1	1,976.1
WA total	6.0	124.8

Source: KPMG calculation based on HCARE CMS data collection, 2007-2011. Health Information Network



D.3.5 General practice services

Table 98: General practice services per person, by Australian states and territories, 2011

	NSW	VIC	QLD	SA	WA	TAS	ACT	NT	Australia
Total unreferred GP attendances	44,098,309	31,926,964	25,808,677	9,622,101	10,650,083	2,727,935	1,564,060	767,257	127,165,386
Population size	7,247,669	5,574,455	4,513,009	1,645,040	2,387,232	511,718	370,729	232,365	22,485,340
Unreferred GP attendances per person	6.1	5.7	5.7	5.8	4.5	5.3	4.2	3.3	5.7

Source: All Medicare by Broad Type of Service (BTOS) processed from January 2008 to December 2011, Medicare Australia¹⁵⁶ and Australian Demographic Statistics, Mar 2012, ABS¹⁵⁷

¹⁵⁶ Accessed 27 September 2012 at www.medicareaustralia.gov.au/provider/medicare/mbs.jsp#N1003F.

¹⁵⁷ Accessed 31 October 2012 at www.abs.gov.au/AUSSTATS/abs@.nsf/DetailsPage/3101.0Mar%202012?OpenDocument.



Table 99: Estimates of total GP services (MBS and DVA) - total number, 2007/08 to 2010/11

	2007/08	2008/09	2009/10	2010/11
NMHS	4,058,942	4,163,018	4,269,762	4,376,506
SMHS	3,668,300	3,762,359	3,858,829	3,955,300
South West	615,626	631,412	647,602	663,792
Great Southern	310,038	317,988	326,141	334,295
Wheatbelt	236,040	242,092	248,300	254,507
Midwest	173,946	178,407	182,981	187,556
Goldfields	243,184	249,420	255,815	262,211
Pilbara	131,931	135,314	138,784	142,253
Kimberley	75,391	77,324	79,307	81,290
Total	9,513,400	9,757,333	10,007,521	10,257,709

Source: KPMG calculation based on MBS data and Social Health Atlas of Australia: Western Australia, 2012, PHIDU

Table 100: Estimated total GP services (MBS and DVA) for diabetes care, 2007/08 to 2010/11

	2007/08	2008/09	2009/10	2010/11
NMHS	162,358	166,521	170,790	175,060
SMHS	146,732	150,494	154,353	158,212
South West	24,625	25,256	25,904	26,552
Great Southern	12,402	12,720	13,046	13,372
Wheatbelt	9,442	9,684	9,932	10,180
Midwest	6,958	7,136	7,319	7,502
Goldfields	9,727	9,977	10,233	10,488
Pilbara	5,277	5,413	5,551	5,690
Kimberley	3,016	3,093	3,172	3,252
Total	380,536	390,293	400,301	410,308

Source: KPMG calculation based on BEACH study and Social Health Atlas of Australia: Western Australia, 2012, PHIDU



Table 101: Selected chronic disease management services provided by private allied health providers in WA and Australia, 2008 to 2011

	Number	Number per 1,000 persons - WA	Number per 1,000 persons - Australia
10950 - Aboriginal health worker	20	0.01	0.02
10951 - Diabetes educator	3,733	1.59	3.04
10953 - Exercise physiology	9,867	4.19	4.29
10954 - Dietetics services	16,601	7.06	10.55
10960 - Physiotherapy	47,987	20.40	42.06
10962 - Podiatry	107,526	45.71	66.62

Source: KPMG calculation based on Medicare Australia data



Table 102: Selected chronic disease management services provided by private allied health providers in WA and Australia, 2008 to 2011

		2008	2009	2010	2011	Total
10950 - Aboriginal health worker	WA	0	0	7	20	27
	Aust	133	156	451	540	1,280
10951 - Diabetes educator	WA	1,599	1,910	2,950	3,733	10,192
	Aust	32,163	44,595	58,804	67,838	203,400
10953 - Exercise physiology	WA	5,921	10,679	9,824	9,867	36,291
	Aust	48,384	66,463	79,412	95,802	290,061
10954 - Dietetics services	WA	10,552	14,067	15,420	16,601	56,640
	Aust	139,053	184,028	204,980	235,505	763,566
10960 - Physiotherapy	WA	32,828	40,045	43,060	47,987	163,920
	Aust	540,389	699,887	803,505	938,850	2,982,631
10962 - Podiatry	WA	46,601	70,082	88,665	107,526	312,874
	Aust	610,829	914,715	1,193,055	1,487,184	4,205,783
All	WA	97,501	136,783	159,926	185,734	579,944
	Aust	1,370,951	1,909,844	2,340,207	2,825,719	8,446,721

Source: KPMG calculation based on Medicare Australia data



E Alternative diabetes prevalence estimates

E.1 National Health Survey based estimates

Diabetes prevalence estimates were sourced from the *National Health Survey 2011-12: First Release* (ABS, 2012), as outlined under Table 103. These prevalence estimates were applied to WA health region ERPs to produce estimates of the number of people with diabetes for each WA health region, as presented under



Table 104 Table 103.

Table 103: Estimated prevalence (per cent) of diabetes in Australia, all persons, by age, gender and type, 2011/12, based on National Health Survey: First Release results

	Age cohorts								Males	Female s	Persons
	0–14	15–24	25–34	35–44	45– 54	55– 64	65– 74	75+			
Type 1	0.1	0.4	0.5	0.4	0.8	0.4	1.0	1.2	0.6	0.4	0.5
Type 2	0.0	0.1	0.1	1.3	3.3	7.7	14.5	12.8	3.6	3.1	3.4
Total diabetes mellitus	0.1	0.5	0.7	1.8	4.1	8.2	16.0	14.3	4.3	3.6	4.0

Source: Australian Health Survey: First Results, 2011-12, ABS (2012)



Table 104: Estimated number of people with diabetes (all types), by region and age cohort, 2011, based on National Health Survey 2011-12 results and 2011 ERP statistics

	0-14	25-24	25-34	35-44	45-54	55-64	65-74	75+	All
NMHS	180	697	1,036	2,568	5,486	8,893	10,290	7,448	36,598
SMHS	162	646	910	2,197	4,753	7,961	9,718	7,153	33,500
South West	33	94	135	410	946	1,640	1,989	1,299	6,547
Great Southern	12	33	44	140	359	648	861	602	2,700
Wheatbelt	15	37	57	182	473	900	1,120	659	3,443
Midwest	14	40	58	170	392	667	780	458	2,579
Goldfields	13	42	67	160	334	440	425	222	1,703
Pilbara	12	42	101	220	393	399	163	40	1,371
Kimberley	9	27	50	106	201	271	197	77	937
Total	451	1,660	2,457	6,154	13,337	21,820	25,543	17,958	89,378

Source: KPMG calculation based on prevalence estimates based on Australian Health Survey: First Results, 2011-12, ABS (2012) and Estimated Resident Population (Ages 15 and over), 2011 (ABS)

Table 105: Estimated number of people with type 1 diabetes, by region and age cohort, 2011, based on National Health Survey 2011-12 results and 2011 ERP statistics

	0-14	25-24	25-34	35-44	45-54	55-64	65-74	75+	All
NMHS	180	558	740	571	1,071	434	643	52	4,248
SMHS	162	517	650	488	927	388	607	50	3,790
South West	33	75	96	91	185	80	124	9	694
Great Southern	12	27	32	31	70	32	54	4	261
Wheatbelt	15	30	41	40	92	44	70	5	337
Midwest	14	32	41	38	76	33	49	3	286
Goldfields	13	33	48	36	65	21	27	2	244
Pilbara	12	34	72	49	77	19	10	0	273
Kimberley	9	22	35	24	39	13	12	1	155
WA total	451	1,328	1,755	1,367	2,602	1,064	1,596	126	10,289

Source: KPMG calculation based on prevalence estimates based on Australian Health Survey: First Results, 2011-12, ABS (2012) and Estimated Resident Population (Ages 15 and over), 2011 (ABS)



Table 106: Estimated number of people with type 2 diabetes, by region and age cohort, 2011, based on National Health Survey 2011-12 results and 2011 ERP statistics

Type 2 diabetes	0-14	25-24	25-34	35-44	45-54	55-64	65-74	75+	All
NMHS	-	139	148	1,854	4,416	8,350	9,325	6,667	30,900
SMHS	-	129	130	1,587	3,826	7,476	8,807	6,403	28,357
South West	-	19	19	296	762	1,540	1,802	1,162	5,602
Great Southern	-	7	6	101	289	608	780	539	2,331
Wheatbelt	-	7	8	131	381	845	1,015	590	2,977
Midwest	-	8	8	123	315	626	707	410	2,198
Goldfields	-	8	10	116	269	413	385	199	1,400
Pilbara	-	8	14	159	316	375	148	36	1,057
Kimberley	-	5	7	76	161	255	178	68	752
WA total	-	332	351	4,444	10,735	20,489	23,148	16,074	75,573

Source: KPMG calculation based on prevalence estimates based on Australian Health Survey: First Results, 2011-12, ABS (2012) and Estimated Resident Population (Ages 15 and over), 2011 (ABS)



E.2 National Diabetes Support Scheme (NDSS) based estimates

The number of people with diabetes in WA registered with the National Diabetes Support Scheme was sourced from Diabetes Australia, via Diabetes WA. The data outlined under Table 107 is presented according to Medicare Local catchments, with individual cell values below 5 being suppressed (but included in catchment totals). It should be noted that the data provided may not reflect incidence of diabetes in the population, only those who register with the NDSS.

Furthermore, in order to improve access to essential medicines by clients of remote Aboriginal Health Services, special Pharmaceutical Benefits Schedule (PBS) supply arrangements have been enacted under the provisions of section 100 of the National Health Act 1953. These arrangements in effect provide many Aboriginal people with diabetes with free medical supplies under S100, and hence have reduced incentive to register with the NDSS. Therefore, Aboriginal people may be under-represented in the NDSS data presented below.

Table 107: Estimated number of people with diabetes, by Medicare Local catchment, 30 June 2012, based on NDSS statistics

	Type 1	Type 2	GDM	Other	All
Perth Central and East Metro	3,053	23,652	641	105	27,451
Perth North Metro	2,473	18,249	584	91	21,397
Fremantle	1,082	8,707	207	38	10,034
Bentley - Armadale	2,046	16,909	497	68	19,520
Perth South Coastal	1,219	11,133	185	46	12,583
Goldfields - Midwest	533	5,770	93	33	6,429
Kimberley - Pilbara	227	2,502	73	13	2,815
WA	10,633	86,922	2,280	394	100,229

Source: NDSS data, provided to KPMG by Diabetes WA (2012)



F Identified services

Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
NMHS	Oceanic	Sir Charles Gairdner Hospital	Nedlands	Tertiary hospital	1	Public	Y	Hospital Avenue, Nedlands, 6009, WA	6009
NMHS	Oceanic	King Edward Memorial Hospital	Subiaco	Tertiary hospital	1	Public	Y	374 Bagot Road, Subiaco, 6008, WA	6008
NMHS	Oceanic	Princess Margaret Hospital	Subiaco	Tertiary hospital	1	Public	Y	Roberts Road, Subiaco, 6008, WA	6008
NMHS	Joondalup	Joondalup Health Campus	Joondalup	Secondary hospital	2	Public	Y	Shenton Avenue, Joondalup, 6027, WA	6027
NMHS	Stirling SEC	Osborne Park Hospital	Stirling	Secondary hospital	2	Public	Y	Osborne Place, Stirling, 6021, WA	6021
NMHS	Valley & Hills	Swan District Health Campus	Middle Swan	Secondary hospital	2	Public	Y	Eveline Road, Middle Swan, 6056, WA	6056
NMHS	Joondalup	PMH Diabetes Outreach Clinic	Joondalup	PMH outreach clinic	3	Public	Y	Joondalup, 6027, WA	6027



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
NMHS	Bayswater-Bassendean	Lockridge Community Health Centre	Lockridge	Community health service	5	Public	Y	32 Weddall Road, Lockridge, 6054, WA	6054
NMHS	Joondalup	NMHS Public Health & Ambulatory Care	Joondalup	Community health service	5	Public	Y	52 Davidson Tce, Joondalup, 6027, WA	6027
NMHS	Oceanic	NMHS Public Health & Ambulatory Care - Italo Australian Welfare and Cultural Centre	East Perth	Community health service	5	Public	Y	160 Hay Street, East Perth, 6004, WA	6004
NMHS	Oceanic	NMHS Public Health & Ambulatory Care - Rod Evans Senior Citizens Centre	Perth	Community health service	5	Public	Y	209 Fitzgerald Street, Perth, 6001, WA	6001
NMHS	Stirling SEC	NMHS Public Health & Ambulatory Care - Child and Adolescent Health Service, Mirrabooka	Mirrabooka	Community health service	5	Public	Y	21 Sudbury Rd, Mirrabooka, 6061, WA	6061
NMHS	Valley & Hills	NMHS Public Health & Ambulatory Care	Midland	Community health service	5	Public	Y	18 Helena St, Midland, 6056, WA	6056



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
NMHS	Bayswater-Bassendean	Derbarl Yerrigan Elizabeth Hansen Autumn Centre	Bayswater	Aboriginal medical service	7	NGO		340 Guildford Rd, Bayswater, 6053, WA	6053
NMHS	Oceanic	Derbarl Yerrigan Aboriginal Health Service	East Perth	Aboriginal medical service	7	NGO	Y	156 Wittenoom Street, East Perth, 6004, WA	6004
NMHS	Oceanic	Derbarl Yerrigan Boomerang House	East Perth	Aboriginal medical service	7	NGO		28 Bulwer Street, East Perth, 6004, WA	6004
NMHS	Stirling SEC	Derbarl Yerrigan Mirrabooka Clinic	Mirrabooka	Aboriginal medical service	7	NGO		22 Chesterfield Road, Mirrabooka, 6061, WA	6061
NMHS	Bayswater-Bassendean	NMHS Public Health & Ambulatory Care	Ashfield	Moorditj Djena	8	Public	Y	2 Colstoun Rd, Ashfield, 6054, WA	6054
NMHS	Joondalup	NMHS Public Health & Ambulatory Care	Joondalup	Moorditj Djena	8	Public	Y	52 Davidson Terrace, Joondalup, 6027, WA	6027
NMHS	Stirling SEC	NMHS Public Health & Ambulatory Care	Mirrabooka	Moorditj Djena	8	Public	Y	22 Chesterfield Road, Mirrabooka, 6061, WA	6061



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
NMHS	Stirling SEC	NMHS Public Health & Ambulatory Care	Nollamara	Moorditj Djena	8	Public	Y	72 Sylvia Street, Nollamara, 6061, WA	6061
NMHS	Stirling SEC	NMHS Public Health & Ambulatory Care	Stirling	Moorditj Djena	8	Public	Y	1 Puccini Ct, Stirling, 6021, WA	6021
NMHS	Valley & Hills	NMHS Public Health & Ambulatory Care	Cullacabard ee	Moorditj Djena	8	Public	Y	Baal Street, Cullacabardee, 6067, WA	6067
NMHS	Valley & Hills	NMHS Public Health & Ambulatory Care	Ellenbrook	Moorditj Djena	8	Public	Y	Ellenbrook, 6069, WA	6069
NMHS	Valley & Hills	NMHS Public Health & Ambulatory Care	Koongamia	Moorditj Djena	8	Public	Y	3 Astroloma Place, Koongamia, 6056, WA	6056
NMHS	Valley & Hills	NMHS Public Health & Ambulatory Care	Midland	Moorditj Djena	8	Public	Y	18 Helena St, Midland, 6056, WA	6056
NMHS	Wanneroo	NMHS Public Health & Ambulatory Care	Clarkson	Moorditj Djena	8	Public	Y	17 Caloundra Road, Clarkson, 6030, WA	6030
NMHS	Wanneroo	NMHS Public Health & Ambulatory Care	Girrawheen	Moorditj Djena	8	Public	Y	Denston Way, Girrawheen, 6064, WA	6064



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
NMHS	Wanneroo	NMHS Public Health & Ambulatory Care	Merriwa	Moorditj Djena	8	Public	Y	26 Jenolan Way, Merriwa, 6030, WA	6030
NMHS	Bayswater-Bassendean	Carolyn Nugent, Total Support - Diabetes Education	Bedford	Private credentialled diabetes educator	9	Private	Y	4/72 Walter Road, Bedford, 6051, WA	6051
NMHS	Bayswater-Bassendean	Yvonne Tate, Noranda Diabetes Education Service	Noranda	Private credentialled diabetes educator	9	Private	Y	Noranda, 6062, WA	6062
NMHS	Joondalup	Annette Hart, Directions for Diabetes	Joondalup	Private credentialled diabetes educator	9	Private	Y	Joondalup, 6027, WA	6027
NMHS	Joondalup	Wendy Lawson, Balance Diabetes Services	Joondalup	Private credentialled diabetes educator	9	Private	Y	180 Lakeside Drive, Joondalup, 6027	6027
NMHS	Joondalup	Marina Mickleson, Diabetes and Pregnancy Education	Kingsley	Private credentialled diabetes educator	9	Private	Y	121 Moolanda Boulevard, Kingsley 6023, WA	6023
NMHS	Oceanic	Inger Wang, Diabetes'N'Stuff West	Leederville	Private credentialled diabetes educator	9	Private	Y	2/45 Oxford Close, West Leederville, 6007, WA	6007



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
NMHS	Oceanic	Joanne Beer, Revitalise Australia Pty Ltd	Nedlands	Private credentialled diabetes educator	9	Private	Y	Perth Orthopaedic Institute, Entrance 6, Hollywood Private Hospital, Verdun St, Nedlands, 6009, WA	6009
NMHS	Oceanic	Narelle Lampard, Diabetes WA	Subiaco	Private credentialled diabetes educator	9	Private / NGO	Y	Level 3 / 322 Hay Street, Subiaco. 6008, WA	6008
NMHS	Oceanic	Andrea Gilbey, Start Right Nutrition	Wembley	Private credentialled diabetes educator	9	Private	Y	92 Harborne Street, Wembley, 6014, WA	6014
NMHS	Stirling SEC	Carolyn Nugent, Lindisfarne Medical Group	Mt Lawley	Private credentialled diabetes educator	9	Private	Y	697 Beaufort Street, Mt Lawley, 6050, WA	6050
NMHS	Stirling SEC	Sophie McGough - Mt Lawley	Mt Lawley	Private credentialled diabetes educator	9	Private	Y	779 Beaufort St, Mt Lawley, 6050, WA	6050
NMHS	Valley & Hills	Jennifer Duff	Greenmount	Private credentialled diabetes educator	9	Private	Y	11 Stirling Rd, Greenmount, 6056	6056



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
NMHS	Valley & Hills	Rachael Critchell, Diabetes Life Support	Mundaring	Private credentialled diabetes educator	9	Private	Y	100 Patrick Place, Mundaring, 6073, WA	6073
NMHS	Wanneroo	Fiona Nash, Diabetes Matters	Mindarie	Private credentialled diabetes educator	9	Private	Y	7 Tees court, Mindarie, 6030, WA	6030
NMHS	Bayswater-Bassendean	Perth Central And East Metro Medicare Local	Ashfield, Midland	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Ashfield, 6054, WA	6054
NMHS	Oceanic	Derbarl Yerrigan Health Service	East Perth	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	East Perth, 6004, WA	6004
NMHS	Stirling SEC	Perth North Metro Medicare Local	Osborne Park	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Osborne Park, 6017, WA	6017
NMHS	Stirling SEC	Perth North Metro Medicare Local	Osborne Park	Medicare Locals & GP Networks	12	NGO	Y	Osborne Park, 6017, WA	6017
NMHS	Valley & Hills	Perth Central & East Metro Medicare Local	Guildford	Medicare Locals & GP Networks	12	NGO		48A James Street, Guildford, 6055, WA	6055



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
SMHS	Fremantle	Fremantle Hospital and Health Service	Fremantle	Tertiary hospital	1	Public	Y	South Terrace, Fremantle , 6160, WA	6160
SMHS	Oceanic	Royal Perth Hospital	Perth	Tertiary hospital	1	Public	Y	Wellington Street, Perth, 6000, WA	6000
SMHS	Armadale	Armadale Health Service	Mount Nasura	Secondary hospital	2	Public	Y	3056 Albany Highway, Mount Nasura, 6112, WA	6112
SMHS	Bentley	Bentley Health Service	Bentley	Secondary hospital	2	Public	Y	Mills Street, Bentley, 6102, WA	6102
SMHS	Rockingham-Kwinana	Rockingham General Hospital	Coolongup	Secondary hospital	2	Public	Y	Elanora Drive, Coolongup, 6168, WA	6168
SMHS	Rockingham-Kwinana	PMH Diabetes Outreach Clinic	Coolongup	PMH outreach clinic	3	Public	Y	Elanora Drive, Coolongup, 6168, WA	6168
SMHS	Armadale	Armadale Community Health & Development Centre	Mount Nasura	Community health service	5	Public	Y	3056 Albany Highway, Mount Nasura, 6112, WA	6112



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
SMHS	Bentley	Aboriginal Health Team: Child & Adolescent Community Health	Belmont	Community health service	5	Public		240 Hardey Road, Belmont, 6104, WA	6104
SMHS	Bentley	Bentley Community Health Centre	Bentley	Community health service	5	Public	Y	22 Coolgardie Street, Bentley, 6102, WA	6102
SMHS	Fremantle	Hilton Community Health Centre	Hilton	Community health service	5	Public	Y	34 Paget Street, Hilton, 6163, WA	6163
SMHS	Peel	Mandurah Community Health and Development Centre	Greenfields	Community health service	5	Public	Y	112 Lakes Road, Greenfields, 6210, WA	6210
SMHS	Armadale	Derbarl Yerrigan Maddington Clinic	Maddington	Aboriginal medical service	7	NGO		Lot 5, Binley Place, Maddington, 6109, WA	6109
SMHS	Armadale	Moorditch Curlongga	Maddington	Aboriginal medical service	7	NGO		2075 Albany Highway, Maddington, 6109, WA	6109
SMHS	Rockingham-Kwinana	Derbarl Yerrigan Mirambeena Medina Day Care	Medina	Aboriginal medical service	7	NGO		13 Leasham Way, Medina, 6167, WA	6167



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
SMHS	Armadale	SMHS Public Health & Ambulatory Care	Kelmscott	Moorditj Djena	8	Public	Y	4 Rundle Street, Kelmscott, 6111, WA	6111
SMHS	Armadale	SMHS Public Health & Ambulatory Care	Maddington	Moorditj Djena	8	Public	Y	Lot 5, Binley Place, Maddington, 6109, WA	6109
SMHS	Bentley	SMHS Public Health & Ambulatory Care - Bentley-Armadale Medicare Local	Bentley	Moorditj Djena	8	Public	Y	4/1140 Albany Hwy, Bentley, 6102, WA	6102
SMHS	Fremantle	SMHS Public Health & Ambulatory Care - Burdiya Aboriginal Corporation	Hamilton Hill	Moorditj Djena	8	Public	Y	8 Caffrey Place, Hamilton Hill, 6163, WA	6163
SMHS	Fremantle	SMHS Public Health & Ambulatory Care	South Lake	Moorditj Djena	8	Public	Y	2A South Lake Drive, South Lake, 6164, WA	6164



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
SMHS	Peel	SMHS Public Health & Ambulatory Care - Nidjalla Waangan Mia (Mandurah Community Health and Development Centre)	Mandurah	Moorditj Djena	8	Public	Y	112 Lakes Rd, Mandurah, 6210, WA	6210
SMHS	Peel	SMHS Public Health & Ambulatory Care - Murray District Hospital	Pinjarra	Moorditj Djena	8	Public	Y	Beddingfeld Rd, Pinjarra, 6208, WA	6208
SMHS	Rockingham-Kwinana	SMHS Public Health & Ambulatory Care - Moorditj Koort (Perth South Coastal Medicare Local)	Medina	Moorditj Djena	8	Public	Y	150 Gilmore Ave, Medina, 6167, WA	6167
SMHS	Rockingham-Kwinana	SMHS Public Health & Ambulatory Care - Babbingur Mia	Rockingham	Moorditj Djena	8	Public	Y	Aquatic Centre, Council Avenue, Rockingham, 6168, WA	6168
SMHS	Peel	Silver Chain	Greenfields	Silver Chain diabetes service	10	Private	Y	72 Lakes Rd, Greenfields, 6210, WA	6210



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
SMHS	Fremantle	South Metropolitan Health Unit	Fremantle	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Fremantle, 6160, WA	6160
SMHS	Peel	Perth South Coastal Medicare Local	Mandurah	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Mandurah, 6210, WA	6210
SMHS	Rockingham-Kwinana	Perth South Coastal Medicare Local	Kwinana	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Kwinana, 6167, WA	6167
SMHS	Bentley	Bentley - Armadale Medicare Local	Bentley	Medicare Locals & GP Networks	12	NGO	Y	4/1140 Albany Hwy, Bentley, 6102, WA	6102
SMHS	East Fremantle	Fremantle Medicare Local	East Fremantle	Medicare Locals & GP Networks	12	NGO		10 Silas Street, East Fremantle, 6158, WA	6158
SMHS	Rockingham-Kwinana	Perth South Coastal Medicare Local	Medina	Medicare Locals & GP Networks	12	NGO	Y	22B Pace Road, Medina, 6167, WA	6167
South West	Bunbury	PMH Diabetes Outreach Clinic	Bunbury	PMH outreach clinic	3	Public	Y	Bunbury, 6230, WA	6230



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
South West	Blackwood	Boyup Brook Soldiers Memorial Hospital	Boyup Brook	Regional hospital	4	Public		Hospital Drive, Boyup Brook, 6244, WA	6244
South West	Blackwood	Bridgetown Hospital	Bridgetown	Regional hospital	4	Public		Peninsula Road, Bridgetown, 6255, WA	6255
South West	Blackwood	Nannup Hospital	Nannup	Regional hospital	4	Public		Carey Street, Nannup, 6275, WA	6275
South West	Bunbury	South-West Health Campus	Bunbury	Regional hospital	4	Public	Y	Bussell Highway (cnr Robertson Drive), Bunbury, 6230, WA	6230
South West	Busselton	Busselton Hospital	Busselton	Regional hospital	4	Public		Mill Road, Busselton, 6280, WA	6280
South West	Leeuwin	Augusta Hospital	Augusta	Regional hospital	4	Public		Donovan Street, Augusta, 6290, WA	6290
South West	Leeuwin	Margaret River Hospital	Margaret River	Regional hospital	4	Public		Farrelly Street, Margaret river, 6285, WA	6285



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
South West	Leschenault	Harvey Hospital	Harvey	Regional hospital	4	Public		45 Hayward Street, Harvey, 6220, WA	6220
South West	Warren	Warren Hospital	Manjimup	Regional hospital	4	Public		Hospital Avenue, Manjimup, 6258, WA	6258
South West	Warren	Pemberton Hospital	Pemberton	Regional hospital	4	Public		Railway Crescent, Pemberton, 6260, WA	6260
South West	Wellington	Collie Hospital	Collie	Regional hospital	4	Public		Deakin Street, Collie, 6225, WA	6225
South West	Wellington	Donnybrook Hospital	Donnybrook	Regional hospital	4	Public		Bentley Street, Donnybrook, 6239, WA	6239
South West	Bunbury	Bunbury Primary Health Service	Bunbury	Community health service	5	Public		Lot 11 Hudson Road, Bunbury, 6230, WA	6230
South West	Busselton	Busselton (Kevin Cullen) Community Health Centre	Busselton	Community health service	5	Public		Mill Road, Busselton, 6280, WA	6280



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
South West	Busselton	Naturaliste Community Health - Diabetic Podiatry Service	Busselton	Community health service	5	Public		Mill Road, Busselton, 6280, WA	6280
South West	Warren	Northcliffe Nursing Post	Northcliffe	Nursing post	6	Public		Wheatley Coast Road, Northcliffe, 6262, WA	6262
South West	Bunbury	South West Aboriginal Medical Service	Bunbury	Aboriginal medical service	7	NGO	Y	Unit 1/ 11 Sandridge Road, Bunbury , 6230, WA	6230
South West	Blackwood	Silver Chain	Bridgetown	Silver Chain diabetes service	10	Private	Y	Lot 22 Pioneer St, Bridgetown, 6255, WA	6255
South West	Bunbury	Silver Chain	Bunbury	Silver Chain diabetes service	10	Private	Y	1 Mitchell Crescent, Bunbury, 6230, WA	6230
South West	Busselton	Silver Chain	Busselton	Silver Chain diabetes service	10	Private	Y	58 West St, Busselton, 6280, WA	6280
South West	Leeuwin	Silver Chain	Margaret River	Silver Chain diabetes service	10	Private	Y	7 Farrelly St, Margaret River, 6285, WA	6285



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
South West	Leschenault	Silver Chain	Harvey	Silver Chain diabetes service	10	Private	Y	Wright St, Harvey, 6220, WA	6220
South West	Warren	Silver Chain	Manjimup	Silver Chain diabetes service	10	Private	Y	23 Mount St, Manjimup, 6258, WA	6258
South West	Warren	Silver Chain	Walpole	Silver Chain diabetes service	10	Private	Y	8 Jarrah Road Walpole 6398, WA	6398
South West	Wellington	Silver Chain	Collie	Silver Chain diabetes service	10	Private	Y	52 Johnston St, Collie, 6225, WA	6225
South West	Bunbury	Outreach Eyes Services	Bunbury	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Bunbury, 6230, WA	6230
Great Southern	Lower Great Southern	PMH Diabetes Outreach Clinic	Albany	PMH outreach clinic	3	Public	Y	Albany, 6330, WA	6330
Great Southern	Central Great Southern	Gnowangerup Hospital	Gnowangerup	Regional hospital	4	Public		Yougenup Road, Gnowangerup, 6335, WA	6335
Great Southern	Central Great Southern	Katanning Hospital	Katanning	Regional hospital	4	Public		Clive Street, Katanning, 6317, WA	6317



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Great Southern	Central Great Southern	Kojonup Hospital	Kojonup	Regional hospital	4	Public		Spring Street, Kojonup, 6395, WA	6395
Great Southern	Lower Great Southern	Albany Hospital	Albany	Regional hospital	4	Public	Y	Warden Avenue, Albany, 6330, WA	6330
Great Southern	Lower Great Southern	Denmark Hospital and Health Service	Denmark	Regional hospital	4	Public		50 Scotsdale Road, Denmark, 6333, WA	6333
Great Southern	Lower Great Southern	Plantagenet Hospital	Mount Barker	Regional hospital	4	Public		Langton Road, Mount Barker, 6324, WA	6324
Great Southern	Central Great Southern	Gnowangerup Community Health Centre	Gnowangerup	Community health service	5	Public		Yougenup Road, Gnowangerup, 6335, WA	6335
Great Southern	Central Great Southern	Katanning Child Health Service	Katanning	Community health service	5	Public		8 Austral Terrace, Katanning, 6317, WA	6317
Great Southern	Central Great Southern	Katanning Community Health Service	Katanning	Community health service	5	Public		114 Clive Street, Katanning, 6317, WA	6317



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Great Southern	Lower Great Southern	Ravensthorpe Health Centre	Ravensthorpe	Community health service	5	Public		Martin Street, Ravensthorpe, 6346, WA	6346
Great Southern	Central Great Southern	Tambellup Nursing Post	Tambellup	Nursing post	6	Public		30 Norrish Street, Tambellup, 6320, WA	6320
Great Southern	Lower Great Southern	Bremer Bay Health Centre	Bremer Bay	Nursing post	6	Public		29 John Street, Bremer Bay, 6338, WA	6338
Great Southern	Lower Great Southern	Jerramungup Health Centre	Jerramungup	Nursing post	6	Public		Kokoda Road, Jerramungup, 6337, WA	6337
Great Southern	Central Great Southern	Great Southern Aboriginal Health Service	Katanning	Aboriginal medical service	7	NGO		Clive Street, Katanning, 6317, WA	6317
Great Southern	Lower Great Southern	Great Southern Aboriginal Health Service	Albany	Aboriginal medical service	7	NGO		191 Lower Stirling Terrace, Albany, 6330, WA	6330
Great Southern	Lower Great Southern	Southern Aboriginal Corporation	Albany	Aboriginal medical service	7	NGO		Shop 4, Peel Place, Albany, 6330, WA	6330



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Great Southern	Lower Great Southern	Suzanne Bellanger, Diabetes Education Service	Albany	Private credentialled diabetes educator	9	Private	Y	170 Lower King Rd, Albany, 6330, WA	6530
Great Southern	Lower Great Southern	Silver Chain	Albany	Silver Chain diabetes service	10	Private	Y	91 Seymour St, Albany, 6330, WA	6330
Great Southern	Central Great Southern	David M. Offerman	Katanning	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Katanning, 6317, WA	6317
Great Southern	Lower Great Southern	Amity Health	Albany	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO	Y	Albany, 6330, WA	6330
Great Southern	Lower Great Southern	David M. Offerman	Denmark	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Denmark, 6333, WA	6333
Great Southern	Lower Great Southern	Amity Health	Albany	Medicare Locals & GP Networks	12	NGO		Albany, 6330, WA	6330
Great Southern	Lower Great Southern	South West WA Medicare Local	Albany	Medicare Locals & GP Networks	12	NGO		106 Stirling Terrace, Albany, 6330, WA	6330
Wheatbelt	Southern Wheatbelt	PMH Diabetes Outreach Clinic	Narrogin	PMH outreach clinic	3	Public	Y	Narrogin, 6312, WA	6312



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Wheatbelt	Avon and Central	PMH Diabetes Outreach Clinic	Northam	PMH outreach clinic	3	Public	Y	Northam, 6401, WA	6401
Wheatbelt	Eastern Wheatbelt	Bruce Rock Memorial Hospital	Bruce Rock	Regional hospital	4	Public		35 Dunstall Street, Bruce Rock, 6418, WA	6418
Wheatbelt	Eastern Wheatbelt	Corrigin Hospital	Corrigin	Regional hospital	4	Public		49 Kirkwood Street, Corrigin, 6375, WA	6375
Wheatbelt	Eastern Wheatbelt	Kellerberrin Memorial Hospital	Kellerberrin	Regional hospital	4	Public		51-63 Gregory Street, Kellerberrin, 6410, WA	6410
Wheatbelt	Eastern Wheatbelt	Kununoppin Hospital	Kununoppin	Regional hospital	4	Public		Leake Street, Kununoppin, 6489, WA	6489
Wheatbelt	Eastern Wheatbelt	Merredin Hospital	Merredin	Regional hospital	4	Public		Kitchener Road, Merredin, 6415, WA	6415
Wheatbelt	Eastern Wheatbelt	Narembeen Memorial Hospital	Narembeen	Regional hospital	4	Public		Ada Street, Narembeen, 6369, WA	6369



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Wheatbelt	Eastern Wheatbelt	Quairading Hospital	Quairading	Regional hospital	4	Public		Harris Street, Quairading, 6383, WA	6383
Wheatbelt	Eastern Wheatbelt	Southern Cross Hospital	Southern Cross	Regional hospital	4	Public		Coolgardie Road, Southern Cross, 6426, WA	6426
Wheatbelt	Southern Wheatbelt	Dumbleyung Memorial Hospital	Dumbleyung	Regional hospital	4	Public		McIntyre Street, Dumbleyung, 6350, WA	6350
Wheatbelt	Southern Wheatbelt	Lake Grace Hospital	Lake Grace	Regional hospital	4	Public		Stubbs Street, Lake Grace, 6353, WA	6353
Wheatbelt	Southern Wheatbelt	Narrogin Hospital	Narrogin	Regional hospital	4	Public		Williams Road, Narrogin, 6312, WA	6312
Wheatbelt	Southern Wheatbelt	Pingelly Hospital	Pingelly	Regional hospital	4	Public		38 Stratford Street, Pingelly, 6308, WA	6308
Wheatbelt	Southern Wheatbelt	Wagin Hospital	Wagin	Regional hospital	4	Public		Warwick Street, Wagin, 6315, WA	6315
Wheatbelt	Southern Wheatbelt	Boddington Hospital	Boddington	Regional hospital	4	Public		Hotham Avenue, Boddington, 6390, WA	6390



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Wheatbelt	Avon and Central	Beverley Hospital	Beverley	Regional hospital	4	Public		Sewell Street, Beverley, 6304, WA	6304
Wheatbelt	Avon and Central	Cunderdin Hospital	Cunderdin	Regional hospital	4	Public		Cubbine Street, Cunderdin, 6407, WA	6407
Wheatbelt	Avon and Central	Dalwallinu Hospital	Dalwallinu	Regional hospital	4	Public		Myers Street, Dalwallinu, 6609, WA	6609
Wheatbelt	Avon and Central	Goomalling Hospital	Goomalling	Regional hospital	4	Public		Forrest Street, Goomalling, 6460, WA	6460
Wheatbelt	Avon and Central	Moora Hospital	Moora	Regional hospital	4	Public		Dandaragan Road, Moora, 6510, WA	6510
Wheatbelt	Avon and Central	Northam Hospital	Northam	Regional hospital	4	Public		Robinson Street, Northam, 6401, WA	6401
Wheatbelt	Avon and Central	Wongan Hills Hospital	Wongan Hills	Regional hospital	4	Public		Ackland Street, Wongan Hills, 6603, WA	6603
Wheatbelt	Avon and Central	Wyalkatchem-Koorda and Districts Hospital	Wyalkatchem	Regional hospital	4	Public		Honour Avenue, Wyalkatchem, 6485, WA	6485



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Wheatbelt	Avon and Central	York Hospital	York	Regional hospital	4	Public		Trews Road , York, 6302, WA	6302
Wheatbelt	Western Wheatbelt	Coastal Health Service	Gingin	Community health service	5	Public		Brockman Street, Gingin, 6503, WA	6503
Wheatbelt	Western Wheatbelt	Gingin Community Health Centre	Gingin	Community health service	5	Public		Brockman Street, Gingin, 6503, WA	6503
Wheatbelt	Eastern Wheatbelt	Kellerberrin Community Health Service	Kellerberrin	Community health service	5	Public		51-63 Gregory Street, Kellerberrin, 6410, WA	6410
Wheatbelt	Eastern Wheatbelt	Merredin Community Health Service	Merredin	Community health service	5	Public		Queen St & Mitchell St, Merredin, 6415, WA	6415
Wheatbelt	Eastern Wheatbelt	Southern Cross Community Health Service	Southern Cross	Community health service	5	Public		Archernar Street, Southern Cross, 6426, WA	6426
Wheatbelt	Southern Wheatbelt	Kondinin Districts Health Service	Kondinin	Community health service	5	Public		Graham Street, Kondinin, 6367, WA	6367
Wheatbelt	Southern Wheatbelt	Southern Wheatbelt Primary Health Service	Narrogin	Community health service	5	Public		Williams Road, Narrogin, 6312, WA	6312
Wheatbelt	Southern Wheatbelt	Wagin Community Health Services	Wagin	Community health service	5	Public		Tavistock Road, Wagin, 6315, WA	6315



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Wheatbelt	Southern Wheatbelt	Boddington Community Health Service	Boddington	Community health service	5	Public		Hotham Avenue, Boddington, 6390, WA	6390
Wheatbelt	Southern Wheatbelt	Brookton Community Health Service, Saddleback Medical Centre	Brookton	Community health service	5	Public		456 Whittington Street, Brookton, 6306, WA	6306
Wheatbelt	Avon and Central	Dandaragan Community Health Centre	Dandaragan	Community health service	5	Public		Dandaragan Road, Dandaragan, 6507, WA	6507
Wheatbelt	Avon and Central	Goomalling Community Health Centre	Goomalling	Community health service	5	Public		Forrest Street, Goomalling, 6460, WA	6460
Wheatbelt	Avon and Central	Koorda Community Health Service	Koorda	Community health service	5	Public		21 Allenby Street, Koorda, 6475, WA	6475
Wheatbelt	Avon and Central	Avon and Central Primary Health Service	Northam	Community health service	5	Public	Y	Robinson Street, Northam, 6401, WA	6401
Wheatbelt	Avon and Central	Wyalkatchem Community Health Service	Wyalkatchem	Community health service	5	Public		Honour Avenue, Wyalkatchem, 6485, WA	6485



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Wheatbelt	Western Wheatbelt	Cervantes Nursing Post	Cervantes	Nursing post	6	Public		Weston Street, Cervantes, 6511, WA	6511
Wheatbelt	Eastern Wheatbelt	Mukinbudin Nursing Post	Mukinbudin	Nursing post	6	Public		Ferguson St & Maddock St, Mukinbudin, 6479, WA	6479
Wheatbelt	Southern Wheatbelt	Kukerin Nursing Post	Kukerin	Nursing post	6	Public		33 Manser Street, Kukerin, 6352, WA	6352
Wheatbelt	Southern Wheatbelt	Varley Nursing Post	Lake Varley	Nursing post	6	Public		Lot 18, Arthur Street, Lake Varley, 6355, WA	6355
Wheatbelt	Southern Wheatbelt	Wickepin Nursing Post	Wickepin	Nursing post	6	Public		Johnson Street, Wickepin, 6370, WA	6370
Wheatbelt	Southern Wheatbelt	Williams Nursing Post	Williams	Nursing post	6	Public		5 Adams Street, Williams, 6391, WA	6391
Wheatbelt	Avon and Central	Wongan Hills Community Health Centre	Wongan Hills	Nursing post	6	Public		Ackland Street, Wongan Hills, 6603, WA	6603



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Wheatbelt	Southern Wheatbelt	Sandra Burges, Allied Health Centre	Narrogin	Private credentialled diabetes educator	9	Private	Y	92 Earl Street, Narrogin, 6312, WA	6312
Wheatbelt	Western Wheatbelt	Silver Chain	Lancelin	Silver Chain diabetes service	10	Private	Y	1 Gingin Rd, Lancelin, 6044, WA	6044
Wheatbelt	Southern Wheatbelt	Silver Chain	Hyden	Silver Chain diabetes service	10	Private	Y	1-3 Naughton St, Hyden, 6359	6359
Wheatbelt	Southern Wheatbelt	Silver Chain	Narrogin	Silver Chain diabetes service	10	Private	Y	2 Williams Rd, Narrogin, 6312	6312
Wheatbelt	Avon and Central	Silver Chain	Northam	Silver Chain diabetes service	10	Private	Y	84 Newcastle Rd, Northam, 6401	6401
Wheatbelt	Avon and Central	Silver Chain	Toodyay	Silver Chain diabetes service	10	Private	Y	79 Stirling Terrace, Toodyay, 6566, WA	6566
Wheatbelt	Eastern Wheatbelt	Dr Jean-Louis De Sousa	Merredin	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Merredin, 6415, WA	6415
Wheatbelt	Southern Wheatbelt	WACHS-Wheatbelt	Narrogin	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO	Y	Narrogin, 6312, WA	6312
Wheatbelt	Avon and Central	WACHS-Wheatbelt	Moora	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO	Y	Moora, 6510, WA	6510



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Wheatbelt	Avon and Central	WACHS-Wheatbelt	Northam	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Northam, 6401, WA	6401
Wheatbelt	Avon and Central	Wheatbelt GP Network	Northam	Medicare Locals & GP Networks	12	NGO	Y	15 Elizabeth Place, Northam, 6401, WA	6401
Midwest	Geraldton	PMH Diabetes Outreach Clinic	Geraldton	PMH outreach clinic	3	Public	Y	Geraldton, 6530, WA	6530
Midwest	Gascoyne	Carnarvon Hospital	Carnarvon	Regional hospital	4	Public		Cleaver Street, Carnarvon, 6701, WA	6701
Midwest	Geraldton	Geraldton Hospital	Geraldton	Regional hospital	4	Public	Y	Shenton Street, Geraldton, 6530, WA	6530
Midwest	Midwest	Dongara Eneabba Mingenew Health Service	Dongara	Regional hospital	4	Public	Y	48 Blenheim Road, Dongara, 6525, WA	6525
Midwest	Midwest	Morawa Perenjori Health Service	Morawa	Regional hospital	4	Public		Caufield Road, Morawa, 6623, WA	6623
Midwest	Midwest	Mullewa Hospital	Mullewa	Regional hospital	4	Public		Elder Street, Mullewa, 6630, WA	6630



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Midwest	Midwest	Northampton Hospital	Northampton	Regional hospital	4	Public		Stephen Street, Northampton, 6535, WA	6535
Midwest	Murchison	Meekatharra Hospital	Meekatharra	Regional hospital	4	Public		Savage Street, Meekatharra, 6642, WA	6642
Midwest	Gascoyne	Carnarvon Community Health Service	Carnarvon	Community health service	5	Public		Stuart St & Johnson St, Carnarvon, 6701, WA	6701
Midwest	Gascoyne	Exmouth Community Health Service	Exmouth	Community health service	5	Public		Lot 913 Payne Street, Exmouth, 6707, WA	6707
Midwest	Geraldton	Geraldton Community Health Service	Geraldton	Community health service	5	Public		Shenton Street, Geraldton, 6530, WA	6530
Midwest	Midwest	Morawa Perenjori Community Health Service	Morawa	Community health service	5	Public		Caufield Road, Morawa, 6623, WA	6623
Midwest	Midwest	Mullewa Community Health Service	Mullewa	Community health service	5	Public		Elder Street, Mullewa, 6630, WA	6630



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Midwest	Midwest	Northampton Health Centre	Northampton	Community health service	5	Public		Stephen Street, Northampton, 6535, WA	6535
Midwest	Midwest	North Midlands Community Health Service	Three Springs	Community health service	5	Public		Thomas Street, Three Springs, 6519, WA	6519
Midwest	Midwest	North Midlands Health Service	Three Springs	Community health service	5	Public		Thomas Street, Three Springs, 6519, WA	6519
Midwest	Murchison	Meekatharra Community Health Service	Meekatharra	Community health service	5	Public		Savage Street, Meekatharra, 6642, WA	6642
Midwest	Murchison	Mount Magnet Health Centre	Mt Magnet	Community health service	5	Public		Lot 4536, Criddle Street, Mount Magnet, 6638, WA	6638
Midwest	Murchison	Ngangganawili Aboriginal Community Health Centre	Wiluna	Community health service	5	NGO		Thompson Street, Wiluna, 6646, WA	6646



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Midwest	Gascoyne	Burringurrah Nursing Post	Carnarvon	Nursing post	6	Public		Burringurrah Remote Community, Carnarvon, 6701, WA	6701
Midwest	Gascoyne	Coral Bay Nursing Post	Coral Bay	Nursing post	6	Public		Robinson Street, Coral Bay, 6701, WA	6701
Midwest	Gascoyne	Exmouth Multipurpose Service	Exmouth	Multipurpose health service	6	Public		Lyons Street, Exmouth, 6707, WA	6707
Midwest	Midwest	Kalbarri Health Centre	Kalbarri	Nursing post	6	Public		Kaiber Street, Kalbarri, 6536, WA	6536
Midwest	Murchison	Cue Health Centre	Cue	Nursing post	6	Public		310 Victoria Street, Cue, 6640, WA	6640
Midwest	Murchison	Mount Magnet Community Health Service	Mt Magnet	Nursing post	6	Public		Lot 4536 Criddle Street, Mount Magnet, 6638, WA	6638
Midwest	Murchison	Sandstone Health Centre	Sandstone	Nursing post	6	Public		Oroya Street, Sandstone, 6639, WA	6639



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Midwest	Murchison	Yalgoo Health Service	Yalgoo	Nursing post	6	Public		20 Gibbons Street, Yalgoo, 6635, WA	6635
Midwest	Gascoyne	Carnarvon Aboriginal Medical Service	Carnarvon	Aboriginal medical service	7	NGO		14-16 Rushton Street, Carnarvon , 6701, WA	6701
Midwest	Geraldton	Geraldton Regional Aboriginal Health Service	Geraldton	Aboriginal medical service	7	NGO	Y	30-32 Holland Street, Geraldton , 6530, WA	6530
Midwest	Murchison	Ngangganawili Aboriginal Community Health Centre	Wiluna	Aboriginal medical service	7	NGO		Thompson Street, Wiluna , 6646, WA	6646
Midwest	Geraldton	Cindy Porter, Durlacher Dietetic Suites	Geraldton	Private credentialled diabetes educator	9	Private	Y	141 Durlacher St, Geraldton, 6530, WA	6530
Midwest	Gascoyne	Silver Chain	Carnarvon	Silver Chain diabetes service	10	Private	Y	107 Olivia Terrace, Carnarvon, 6701	6701
Midwest	Gascoyne	Silver Chain	Shark Bay	Silver Chain diabetes service	10	Private	Y	53 Hughes St, Shark Bay 6537	6537
Midwest	Geraldton	Silver Chain	Geraldton	Silver Chain diabetes service	10	Private	Y	114 Sanford St, Geraldton, 6530	6530



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Midwest	Gascoyne	WACHS-Midwest	Carnarvon	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Carnarvon, 6701, WA	6701
Midwest	Gascoyne	WACHS-Midwest	Exmouth	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Exmouth, 6707, WA	6707
Midwest	Geraldton	WACHS-Midwest	Geraldton	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Geraldton, 6530, WA	6530
Midwest	Murchison	Geraldton Regional Aboriginal Medical Service	Meekatharra	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Meekatharra, 6642, WA	6642
Midwest	Murchison	Geraldton Regional Aboriginal Medical Service	Mt Magnet	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Mt Magnet, 6638, WA	6638
Midwest	Murchison	Goldfields Esperance GP Network	Wiluna	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO	Y	Wiluna, 6646, WA	6646
Midwest	Geraldton	Goldfields - Midwest Medicare Local	Geraldton	Medicare Locals & GP Networks	12	NGO	Y	Geraldton, 6530, WA	6530



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Goldfields	Northern Goldfields	PMH Diabetes Outreach Clinic	Kalgoorlie	PMH outreach clinic	3	Public	Y	Kalgoorlie, 6430, WA	6430
Goldfields	Northern Goldfields	Kalgoorlie Hospital	Kalgoorlie	Regional hospital	4	Public	Y	Piccadilly Street, Kalgoorlie, 6430, WA	6430
Goldfields	Northern Goldfields	Laverton Hospital	Laverton	Regional hospital	4	Public		Beria Road, Laverton, 6440, WA	6440
Goldfields	Northern Goldfields	Leonora Hospital	Leonora	Regional hospital	4	Public		Sadie Canning Drive, Leonora, 6438, WA	6438
Goldfields	South East Coastal	Esperance Hospital	Esperance	Regional hospital	4	Public	Y	Hicks Street, Esperance, 6450, WA	6450
Goldfields	South East Coastal	Norseman Hospital	Norseman	Regional hospital	4	Public		Talbot Street, Norseman, 6443, WA	6443
Goldfields	Northern Goldfields	Coolgardie Health Centre	Coolgardie	Community health service	5	Public		Wilkie Street, Coolgardie, 6429, WA	6429



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Goldfields	Northern Goldfields	Coonana Health Centre	Kalgoorlie	Community health service	5	Public		Ware St, Kalgoorlie, 6430, WA	6430
Goldfields	Northern Goldfields	Ninga Mia Health Centre	Kalgoorlie	Community health service	5	Public		Yarri Road, Kalgoorlie, 6430, WA	6430
Goldfields	Northern Goldfields	Kambalda Health Centre	Kambalda	Community health service	5	Public		Gumnut Place, Kambalda, 6444, WA	6444
Goldfields	Northern Goldfields	Laverton Community Health Service, DCD Building	Laverton	Community health service	5	Public		Laver Place, Laverton, 6440, WA	6440
Goldfields	Northern Goldfields	Leonora Community Health Service	Leonora	Community health service	5	Public		96 Tower Street, Leonora, 6438, WA	6438
Goldfields	South East Coastal	Norseman Community Health	Norseman	Community health service	5	Public		72-74 Prinsep Street, Norseman, 6443, WA	6443
Goldfields	Northern Goldfields	Kalgoorlie-Boulder Population Health Unit	Boulder	Nursing post	6	Public		36-42 Ware Street, Boulder, 6430, WA	6430
Goldfields	Northern Goldfields	Menzies Health Centre	Menzies	Nursing post	6	Public		Sandstone Road, Menzies, 6436, WA	6436



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Goldfields	Northern Goldfields	Ngaanyatjarra Health Service	Warburton	Aboriginal medical service	7	NGO		2/58 Head Street, Alice Springs NT	0871
Goldfields	Northern Goldfields	Bega Garnbirringu Health Service	Kalgoorlie	Aboriginal medical service	7	NGO		16-18 McDonald Street, Kalgoorlie , 6430, WA	6430
Goldfields	Northern Goldfields	Ngaanyatjarra Health Service	Ngaanyatjarra Lands	Aboriginal medical service	7	Private / NGO		Ngaanyatjarra Lands, 6431, WA	6431
Goldfields	Northern Goldfields	Silver Chain	Kalgoorlie	Silver Chain diabetes service	10	Private	Y	19 York St, Kalgoorlie, 6430, WA	6430
Goldfields	Northern Goldfields	Outreach Eye Services	Kalgoorlie	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Kalgoorlie, 6430, WA	6430
Goldfields	Northern Goldfields	Outreach Eye Services	Laverton	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Laverton, 6440, WA	6440
Goldfields	Northern Goldfields	Goldfields Esperance GP Network	Leonora	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Leonora, 6438, WA	6438



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Goldfields	Northern Goldfields	Ngaanyatjarra Health Service	Ngaanyatjarra Lands	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Ngaanyatjarra Lands, 6431, WA	6431
Goldfields	Northern Goldfields	Rural Doctors Workforce Agency	Tjuntuntjara	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Plumridge Lakes, 6431, WA	6431
Goldfields	South East Coastal	WACHS - Goldfields	Esperance	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Esperance, 6450, WA	6450
Goldfields	Northern Goldfields	Goldfield - Midwest Medicare Local	Kalgoorlie	Medicare Locals & GP Networks	12	NGO	Y	49 Brookman Street, Kalgoorlie, 6430, WA	6430
Goldfields	Northern Goldfields	Goldfields - Esperance GP Network	Kalgoorlie	Medicare Locals & GP Networks	12	NGO	Y	Kalgoorlie, 6430, WA	6430
Pilbara	West Pilbara	PMH Diabetes Outreach Clinic	Karratha	PMH outreach clinic	3	Public	Y	Karratha, 6714, WA	6714
Pilbara	East Pilbara	Newman Hospital	Newman	Regional hospital	4	Public		Mindarra Drive, Newman, 6753, WA	6753
Pilbara	West Pilbara	Nickol Bay Hospital	Karratha	Regional hospital	4	Public		Millstream Road, Karratha, 6714, WA	6714



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Pilbara	West Pilbara	Onslow Hospital	Onslow	Regional hospital	4	Public		Second Avenue, Onslow, 6710, WA	6710
Pilbara	West Pilbara	Paraburdoo Hospital	Paraburdoo	Regional hospital	4	Public		Rocklea Road, Paraburdoo, 6754, WA	6754
Pilbara	West Pilbara	Roebourne Hospital	Roebourne	Regional hospital	4	Public		42-44 Hampton Street, Roebourne, 6718, WA	6718
Pilbara	West Pilbara	Hedland Health Campus	South Hedland	Regional hospital	4	Public		Colebatch Way, South Hedland, 6722, WA	6722
Pilbara	West Pilbara	Tom Price Hospital	Tom Price	Regional hospital	4	Public		Mine Road, Tom Price, 6751, WA	6751
Pilbara	East Pilbara	Nullagine Community Health Service	Nullagine	Community health service	5	Public		Marble Bar Road, Nullagine, 6758, WA	6758
Pilbara	West Pilbara	West Pilbara Community Health Service	Karratha	Community health service	5	Public		Warambie Road, Karratha, 6714, WA	6714
Pilbara	West Pilbara	Onslow Community Health Service	Onslow	Community health service	5	Public		Second Avenue, Onslow, 6710, WA	6710



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Pilbara	West Pilbara	South Hedland Community Health Service	South Hedland	Community health service	5	Public		Colebatch Way, South Hedland, 6722, WA	6722
Pilbara	West Pilbara	Yandeyarra Community Health Service	South Hedland	Community health service	5	NGO		South Hedland, 6722, WA	6722
Pilbara	West Pilbara	Ashburton Community Health Service	Tom Price	Community health service	5	Public		Mine Road, Tom Price, 6751, WA	6751
Pilbara	West Pilbara	Wickham Health Centre	Wickham	Community health service	5	Public		Mulga Way, Wickham, 6720, WA	6720
Pilbara	East Pilbara	Marble Bar Nursing Post	Marble Bar	Nursing post	6	Public		Station Street, Marble Bar, 6760, WA	6760
Pilbara	East Pilbara	Puntukurnu Aboriginal Medical Service	Newman	Aboriginal medical service	7	NGO		Newman , 6753, WA	6753
Pilbara	West Pilbara	Mawarnkarra Health Service Aboriginal Corporation	Roebourne	Aboriginal medical service	7	NGO		20 Sholl Street, Roebourne , 6718, WA	6718



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Pilbara	West Pilbara	Wirraka Maya Aboriginal Health Service	South Hedland	Aboriginal medical service	7	NGO		Unit 1/ 5 Hamilton Street , South Hedland , 6722, WA	6722
Pilbara	West Pilbara	WACHS-Pilbara	Karratha	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO	Y	Karratha, 6714, WA	6714
Pilbara	West Pilbara	WACHS-Pilbara	Port Hedland	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO	Y	Port Hedland, 6722, WA	6722
Pilbara	West Pilbara	Outreach Eye Services	Roebourne	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Roebourne, 6718, WA	6718
Pilbara	West Pilbara	Pilbara Health Network	Karratha	Medicare Locals & GP Networks	12	NGO	Y	Karratha, 6714, WA	6714
Kimberley	East Kimberley	Halls Creek Hospital	Halls Creek	Regional hospital	4	Public		70 Roberta Avenue, Halls Creek, 6770, WA	6770
Kimberley	East Kimberley	Kununurra Hospital	Kununurra	Regional hospital	4	Public		96 Coolibah Drive, Kununurra, 6743, WA	6743



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Kimberley	East Kimberley	Wyndham Hospital	Wyndham	Regional hospital	4	Public		Minderoo Road, Wyndham, 6740, WA	6740
Kimberley	West Kimberley	Broome Hospital	Broome	Regional hospital	4	Public		Robinson Street, Broome, 6725, WA	6725
Kimberley	West Kimberley	Derby Hospital	Derby	Regional hospital	4	Public		Clarendon Street, Derby, 6728, WA	6728
Kimberley	West Kimberley	Fitzroy Crossing Hospital	Fitzroy Crossing	Regional hospital	4	Public		Fallon Road, Fitzroy Crossing, 6765, WA	6765
Kimberley	East Kimberley	Halls Creek Community Health Service	Halls Creek	Community health service	5	Public		70 Roberta Avenue, Halls Creek, 6770, WA	6770
Kimberley	East Kimberley	Kalumburu Remote Area Health Service	Kalumburu	Community health service	5	Public		Kalumburu, 6740, WA	6740
Kimberley	East Kimberley	Kununurra Community Health Service	Kununurra	Community health service	5	Public	Y	Messeamate Way, Kununurra, 6743, WA	6743
Kimberley	East Kimberley	Oombulgurri Remote Area Health Service	Oombulgurri	Community health service	5	Public		Oombulgurri, 6740, WA	6740



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Kimberley	East Kimberley	Warmun Remote Area Health Service	Warmun	Community health service	5	Public		Ord Street, Warmun, 6743, WA	6743
Kimberley	East Kimberley	Wyndham Community Health Service	Wyndham	Community health service	5	Public		Minderoo Road, Wyndham, 6740, WA	6740
Kimberley	West Kimberley	Broome Community Health Service	Broome	Community health service	5	Public	Y	Robinson Street, Broome, 6725, WA	6725
Kimberley	West Kimberley	Derby Community Health Service	Derby	Community health service	5	Public	Y	Loch St & Hardman St, Derby, 6728, WA	6728
Kimberley	West Kimberley	Bayulu Remote Area Health Service	Fitzroy Crossing	Community health service	5	Public		Fitzroy Crossing, 6765, WA	6765
Kimberley	West Kimberley	Fitzroy Crossing Community Health	Fitzroy Crossing	Community health service	5	Public	Y	Fallon Road, Fitzroy Crossing, 6765, WA	6765
Kimberley	West Kimberley	Lombadina Remote Area Health Service	Lombadina	Community health service	5	Public		Lombadina, 6725, WA	6725
Kimberley	West Kimberley	Looma Remote Area Health Service	Looma	Community health service	5	Public		Looma, 6728, WA	6728
Kimberley	West Kimberley	Mowanjum Community Health Service	Mowanjum	Community health service	5	NGO		Mowanjum, 6728, WA	6728



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Kimberley	West Kimberley	Noonkanbah Remote Area Health Service	Noonkanbah	Community health service	5	Public		Noonkanbah, 6765, WA	6765
Kimberley	West Kimberley	One Arm Point Community Remote Area Health Service	One Arm Point	Community health service	5	Public		One Arm Point, 6725, WA	6725
Kimberley	West Kimberley	Wangkatijunka Remote Area Health Service	Wangkatijunka	Community health service	5	Public		Wangkatijunka, 6765, WA	6765
Kimberley	East Kimberley	Yura Yungi Aboriginal Medical Service	Halls Creek	Aboriginal medical service	7	NGO		Duncan Highway, Halls Creek , 6770, WA	6770
Kimberley	East Kimberley	Ord Valley Aboriginal Medical Service	Kununurra	Aboriginal medical service	7	NGO		1125 Ironwood Street, Kununurra, 6743, WA	6743
Kimberley	East Kimberley	Waringarri Aboriginal Corporation	Kununurra	Aboriginal medical service	7	NGO		Lot 2229 Speargrass Road, Kununurra , 6743, WA	6743
Kimberley	East Kimberley	Ngnowar Aerwah	Wyndham	Aboriginal medical service	7	NGO		60 Great Northern Highway, Wyndham , 6740, WA	6740



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Kimberley	West Kimberley	Broome Regional Aboriginal Medical Service	Broome	Aboriginal medical service	7	NGO	Y	Lot 640 Cnr Anne & Dora Streets, Broome , 6725, WA	6725
Kimberley	West Kimberley	Kimberley Aboriginal Medical Service Council	Broome	Aboriginal medical service	7	NGO		Lot 640 Cnr Anne & Dora Streets, Broome , 6725, WA	6725
Kimberley	West Kimberley	Milliya Rumurra Aboriginal Corporation	Broome	Aboriginal medical service	7	NGO		78 Great Northern Highway, Broome , 6725, WA	6725
Kimberley	West Kimberley	Derby Aboriginal Health Service	Derby	Aboriginal medical service	7	NGO		1 Stanley Street, Derby , 6728, WA	6728
Kimberley	West Kimberley	Marra Worra Worra	Fitzroy Crossing	Aboriginal medical service	7	NGO		42 Robert Street, Fitzroy Crossing , 6765, WA	6765
Kimberley	East Kimberley	WACHS-Kimberley	Halls Creek	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Halls Creek, 6770, WA	6770
Kimberley	East Kimberley	WACHS-Kimberley	Kununurra	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Kununurra, 6743, WA	6743



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Kimberley	East Kimberley	WACHS-Kimberley	Kutjungka	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Wirrimanu (Balgo), Tanami, Western Australia	
Kimberley	West Kimberley	WACHS-Kimberley	Broome	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Broome, 6725, WA	6725
Kimberley	West Kimberley	Outreach Eye Services	Broome	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Broome, 6725, WA	6725
Kimberley	West Kimberley	WACHS-Kimberley	Dampier Peninsula	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Dampier Peninsula, 6713, WA	6713
Kimberley	West Kimberley	WACHS-Kimberley	Derby	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Derby, 6728, WA	6728
Kimberley	West Kimberley	WACHS-Kimberley	Fitzroy Crossing	Outreach services under MSOAP, USOAP & ICDP	11	Private / NGO		Fitzroy Crossing, 6765, WA	6765



Health region	Health district	Health service name	Suburb	Service classification	Service code	Service type	Diabetes focussed resource identified	Main address	Post code
Kimberley	West Kimberley	WACHS-Kimberley	Fitzroy Valley, Halls Creek & Kutjungka	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Fitzroy Valley, Halls Creek & Kutjungka, 6765, WA	6765
Kimberley		WACHS-Kimberley	Gibb River Road	Outreach services under MSOAP, USOP & ICDP	11	Private / NGO		Gibb River Road, , WA	
Kimberley	West Kimberley	Boab Health Services	Broome	Medicare Locals & GP Networks	12	NGO	Y	Broome, 6725, WA	6725
Kimberley	West Kimberley	Kimberley - Pilbara Medicare Local	Broome	Medicare Locals & GP Networks	12	NGO		27-29 Dampier Terrace, Broome, 6725, WA	6725

Source: Compiled by KPMG using publicly available information from the websites of the Department of Health and other relevant organisations



G Outreach services coordinated by Rural Health West

Outreach services coordinated by Rural Health West (RHW) are outlined below.

G.1 Medical Specialists Outreach Assistance Program (MSOAP) outreach services

Table 108: Medical Specialists Outreach Assistance Program (MSOAP) outreach services

Region	Service	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Goldfields	Physician - Cardiology	Esperance	Perth Cardiovascular Institute	12	3	6
Goldfields	Physician - General	Esperance	WACHS - Goldfields	2	3	6
Goldfields	Physician - Nephrology	Esperance	Professor Mark Thomas	6	2	4
Goldfields	Physician - Ophthalmology	Esperance	David M. Offerman	6	6	10
Goldfields	Orthoptist	Kalgoorlie	Outreach Eye Services	2	5	9
Goldfields	Physician - Ophthalmology	Kalgoorlie	Outreach Eye Services	2	5	9
Goldfields	Orthoptist	Laverton	Outreach Eye Services	2	1	1
Goldfields	Physician - Ophthalmology	Laverton	Outreach Eye Services	2	1	1
Goldfields	Orthoptist	Leonora	Outreach Eye Services	2	1	1



Region	Service	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Goldfields	Physician - Ophthalmology	Leonora	Outreach Eye Services	2	1	1
Goldfields	Aboriginal Health Worker	Ngaanyatjarra Lands	Ngaanyatjarra Health Service	2	5	10
Goldfields	Administration	Ngaanyatjarra Lands	Ngaanyatjarra Health Service	2	5	10
Goldfields	Chronic Disease Nurse 1	Ngaanyatjarra Lands	Ngaanyatjarra Health Service	2	5	10
Goldfields	Chronic Disease Nurse 2	Ngaanyatjarra Lands	Ngaanyatjarra Health Service	2	5	10
Goldfields	Optometrist	Ngaanyatjarra Lands	Ngaanyatjarra Health Service	2	5	10
Goldfields	Physician - Ophthalmology	Ngaanyatjarra Lands	Ngaanyatjarra Health Service	2	5	10
Goldfields	Retinal Photographer	Ngaanyatjarra Lands	Ngaanyatjarra Health Service	2	5	10
Goldfields	Orthoptist	Wiluna	Outreach Eye Services	2	1	2
Goldfields	Physician - Ophthalmology	Wiluna	Outreach Eye Services	2	1	2
Great Southern	Physician - Paediatric Cardiology	Albany	Princess Margaret Hospital	2	1	2
Great Southern	Physician - Paediatric Endocrinology	Albany	Dr. Timothy Jones	4	1	2



Region	Service	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Great Southern	Physician -Ophthalmology	Albany	Outreach Eye Services	3	2	3
Great Southern	Surgery - Vascular	Albany	Vascular Solutions Pty Ltd.	4	1	2
Great Southern	Surgery - Vascular	Albany	Vascular Solutions Pty Ltd.	6	2	4
Great Southern	Physician - Ophthalmology	Denmark	David M. Offerman	3	1	2
Great Southern	Physician - Ophthalmology	Katanning	David M. Offerman	10	3	4
Kimberley	Physician - Cardiology	Balgo	WACHS – Kimberley	1	1	2
Kimberley	Orthoptist	Broome	Outreach Eye Services	2	5	9
Kimberley	Physician - Cardiology	Broome	WACHS – Kimberley	1	1	2
Kimberley	Physician - Ophthalmology	Broome	Outreach Eye Services	2	5	9
Kimberley	Physician - Ophthalmology	Broome	WACHS – Kimberley	1	6	12
Kimberley	Surgery - Vascular	Broome	WACHS – Kimberley	1	2	4
Kimberley	Physician - General	Dampier Peninsula	WACHS – Kimberley	3	3	6
Kimberley	Physician - Cardiology	Derby	WACHS – Kimberley	1	1	2
Kimberley	Physician - Ophthalmology	Derby	WACHS – Kimberley	4	2	4



Region	Service	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Surgery - Vascular	Derby	WACHS – Kimberley	1	2	4
Kimberley	Physician - Cardiology	Fitzroy Crossing	WACHS – Kimberley	1	1	2
Kimberley	Physician - General	Fitzroy Crossing	WACHS – Kimberley	1	3	12
Kimberley	Physician - Ophthalmology	Fitzroy Crossing	WACHS – Kimberley	2	2	4
Kimberley	Physician - General	Gibb River Road	WACHS – Kimberley	1	4	6
Kimberley	Physician - Cardiology	Halls Creek	WACHS – Kimberley	1	1	2
Kimberley	Physician - General	Halls Creek	WACHS – Kimberley	1	3	12
Kimberley	Physician - Ophthalmology	Halls Creek	WACHS – Kimberley	1	7	14
Kimberley	Physician - Cardiology	Kununurra	WACHS – Kimberley	1	1	2
Kimberley	Physician - Ophthalmology	Kununurra	WACHS – Kimberley	1	7	14
Kimberley	Physician - General	Kutjungka	WACHS – Kimberley	3	4	7
Midwest	Physician - Nephrology	Carnarvon	WACHS - Midwest	2	1	2
Midwest	Physician - Ophthalmology	Carnarvon	WACHS - Midwest	8	2	4
Midwest	Physician - Ophthalmology	Carnarvon	WACHS - Midwest	3	1	2
Midwest	Physician - Ophthalmology	Exmouth	WACHS - Midwest	2	2	4
Midwest	Paediatric Cardiology	Geraldton	Princess Margaret Hospital	2	1	2
Midwest	Physician - Endocrinology	Geraldton	WACHS - Midwest	2	1	2
Midwest	Surgery - Vascular	Geraldton	WACHS - Midwest	6	1	2



Region	Service	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Midwest	Physician - Nephrology	Meekatharra	WACHS - Midwest	2	1	2
Midwest	Physician - Rheumatology	Meekatharra	Royal Flying Doctor Service	2	2	4
Pilbara	Physician - General	Karratha	WACHS - Pilbara	4	2	4
Pilbara	Physician - Nephrology	Karratha	WACHS - Pilbara	4	1	2
Pilbara	Orthoptist	Karratha - outreach to Roebourne	Outreach Eye Services	4	5	10
Pilbara	Physician - Ophthalmology	Karratha - outreach to Roebourne	Outreach Eye Services	4	5	10
Pilbara	Registrar	Karratha - outreach to Roebourne	Outreach Eye Services	4	5	10
Pilbara	Theatre Nurse	Karratha - outreach to Roebourne	Outreach Eye Services	4	2	4
Pilbara	Physician - Nephrology	Port Hedland	WACHS - Pilbara	8	1	2
Pilbara	Physician - Ophthalmology	Port Hedland	WACHS - Pilbara	3	4	8
Wheatbelt	Physician - Ophthalmology	Merredin	Dr Jean-Louis de Sousa	5	2	4
Wheatbelt	Physician - Cardiology	Narrogin	Dr GK Lane	10	1	2
Wheatbelt	Physician - Renal	Northam	WACHS - Wheatbelt	5	1	2



Source: Rural Health West

G.2 Urban Specialists Outreach Assistance Program (USOAP) outreach services

Table 109: Urban Specialists Outreach Assistance Program (USOAP) outreach services

Region	Service	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
North Metro	Cardiology	Ashfield & Midland	Perth Central and East Metro Medicare Local	4	1	2
North Metro	Endocrinology	Ashfield & Midland	Perth Central and East Metro Medicare Local	4	1	2
North Metro	Cardiology	East Perth	Derbarl Yerrigan Health Service	10	1	2
North Metro	Endocrinology	East Perth	Derbarl Yerrigan Health Service	10	1	2
North Metro	Geriatrics	East Perth	Derbarl Yerrigan Health Service	2	1	2
North Metro	Nephrology	East Perth	Derbarl Yerrigan Health Service	12	1	2
North Metro	Ophthalmology	East Perth	Outreach Eye Services	4	1	2
North Metro	Endocrinology, Cardiology, Renal & Respiratory	Osborne Park	Perth North Metro Medicare Local	20	1	2
South Metro	Ophthalmology	Bunbury	Outreach Eye Services	4	1	2



Region	Service	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
South Metro	Cardiology	Fremantle	South Metropolitan Health Unit	2	1	2
South Metro	Endocrinology	Fremantle	South Metropolitan Health Unit	3	1	2
South Metro	Renal Specialist	Fremantle	South Metropolitan Health Unit	2	1	2
South Metro	Endocrinology	Kwinana	Perth South Coastal Medicare Local	5	1	2
South Metro	Renal Specialist	Kwinana	Perth South Coastal Medicare Local	4	1	2
South Metro	Cardiology	Mandurah	GP Down South	5	1	2
South Metro	Endocrinology	Mandurah	GP Down South	5	1	2
South Metro	Renal Specialist	Mandurah	GP Down South	4	1	2

Source: Rural Health West

G.3 Indigenous Chronic Disease Packages (ICDP) outreach services

Table 110: Indigenous Chronic Disease Packages (ICDP) outreach services

Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
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Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Goldfields	Diabetes	Dietitian / Nutritionist	Leonora	Goldfields Esperance GP Network	6	4	N/A
Goldfields	Diabetes	Physiotherapist	Leonora	Goldfields Esperance GP Network	6	4	N/A
Goldfields	Cardio Vascular	Administration / Coordination	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	3	6
Goldfields	Cardio Vascular	Aboriginal Health Worker	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	3	6
Goldfields	Cardio Vascular	Registered Nurse	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	3	6
Goldfields	Cardio Vascular	Echocardiogram Technician	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	3	6
Goldfields	Cardio Vascular	Physician - Cardiology	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	3	6
Goldfields	Cardio Vascular	Dietitian / Nutritionist	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	3	6
Goldfields	Diabetes	Dietitian / Nutritionist	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	5	10
Goldfields	Diabetes	Podiatrist	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	5	10
Goldfields	Diabetes	Physician-Endocrinology (Diabetes)	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	5	10
Goldfields	Diabetes	Administration / Coordination	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	5	10
Goldfields	Diabetes	Aboriginal Health Worker	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	5	10



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Goldfields	Diabetes	Registered Nurse - CD	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	5	10
Goldfields	Diabetes	Diabetes Educator	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	5	10
Goldfields	Diabetes	Physician-Endocrinology (Diabetes)	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	1	5	8.5
Goldfields	Diabetes	Diabetes Educator	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	3	5	8.5
Goldfields	Diabetes	Dietitian / Nutritionist	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	3	5	8.5
Goldfields	Diabetes	Registered Nurse - CD	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	3	5	8.5
Goldfields	Diabetes	Aboriginal Health Worker	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	3	5	8.5
Goldfields	Diabetes	Administration / Coordination	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	3	5	2
Goldfields	Renal	Aboriginal Health Worker	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	6	12
Goldfields	Renal	Administration / Coordination	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	6	12
Goldfields	Renal	Podiatrist	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	6	12
Goldfields	Renal	Dietitian / Nutritionist	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	6	12
Goldfields	Renal	Physician - Nephrology	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	6	12
Goldfields	Renal	Diabetes educator	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	6	12
Goldfields	Renal	Registered Nurse - CD	Ngaanyatjarra	Ngaanyatjarra Health Service Inc	2	6	12



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Goldfields	Chronic Disease	Physician - General	Tjuntuntjara	Rural Doctors Workforce Agency	6	2	N/A
Goldfields	Chronic Disease	Registered Nurse	Tjuntuntjara	Rural Doctors Workforce Agency	12	2	N/A
Goldfields	Chronic Disease	Allied Health Worker	Tjuntuntjara	Rural Doctors Workforce Agency	5	2	N/A
Goldfields	Chronic Disease	Podiatrist	Tjuntuntjara	Rural Doctors Workforce Agency	3	2	N/A
Goldfields	Chronic Disease	Audiologist	Tjuntuntjara	Rural Doctors Workforce Agency	3	2	N/A
Goldfields	Chronic Disease	Diabetic Nurse Educator	Tjuntuntjara	Rural Doctors Workforce Agency	2	2	N/A
Goldfields	Chronic Disease	Occupational Therapist	Tjuntuntjara	Rural Doctors Workforce Agency	2	2	N/A
Goldfields	Chronic Disease	Speech Pathologist	Tjuntuntjara	Rural Doctors Workforce Agency	2	2	N/A
Goldfields	Chronic Disease	General Practitioner	Tjuntuntjara	Rural Doctors Workforce Agency	13	2	N/A
Goldfields	Chronic Disease	Student	Tjuntuntjara	Rural Doctors Workforce Agency	1,333	2	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Goldfields	Renal Team	Physician - Nephrology	Tjuntuntjara	Paupiyala Tjarutja Aboriginal Corporation	4	2	N/A
Goldfields	Renal Team	Registered Nurse	Tjuntuntjara	Paupiyala Tjarutja Aboriginal Corporation	4	2	N/A
Goldfields	Diabetes	Diabetes Educator	Wiluna	Goldfields Esperance GP Network	6	3	N/A
Goldfields	Diabetes	Dietitian / Nutritionist	Wiluna	Goldfields Esperance GP Network	6	3	N/A
Great Southern	Endocrinology	Physician - Endocrinology (Diabetes)	Albany	Great Southern GP Network	11	3	N/A
Great Southern	Paediatric Cardiology	Cardiac Technician	Albany	Princess Margaret Hospital	3	1	N/A
Great Southern	Paediatric Cardiology	Physician - Paediatric (Cardiology)	Albany	Princess Margaret Hospital	3	1	N/A
Kimberley	Cardiology Team	Registered Nurse	Balgo (incl Mulin, Billiluna)	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Cardiology Team	General Practitioner	Balgo (incl Mulin, Billiluna)	Kimberley Aboriginal Medical Services Council	3	5	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Cardiology Team	Health Worker - Tobacco	Balgo (incl Mulin, Billiluna)	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Cardiology Team	Echocardiogram Technician	Balgo (incl Mulin, Billiluna)	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	General Physician	Balgo (incl Mulin, Billiluna)	Kimberley Aboriginal Medical Services Council	1	2	N/A
Kimberley	Renal Team	Registered Nurse	Balgo (incl Mulin, Billiluna)	Kimberley Aboriginal Medical Services Council	1	2	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Balgo (incl Mulin, Billiluna)	Kimberley Aboriginal Medical Services Council	1	2	N/A
Kimberley	Chronic Disease Child & Adolescent	Psychiatrist	Broome	Kimberley Mental Health and Drug Service Team - WACHS-Kimberley	1	14	N/A
Kimberley	Diabetes Team	Orthoptist	Broome	WACHS-Kimberley	8	2	N/A
Kimberley	Renal Team	General Physician	Broome	Kimberley Aboriginal Medical Services Council	2	5	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Renal Team	Registered Nurse	Broome	Kimberley Aboriginal Medical Services Council	2	5	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Broome	Kimberley Aboriginal Medical Services Council	2	5	N/A
Kimberley	Chronic Disease Child & Adolescent	Psychiatrist	Dampier Peninsular	Kimberley Mental Health and Drug Service Team - WACHS-Kimberley	1	14	N/A
Kimberley	Chronic Disease Child & Adolescent	Psychiatrist	Derby	Kimberley Mental Health and Drug Service Team – WACHS – Kimberley	1	14	N/A
Kimberley	Diabetes Team	Orthoptist	Derby	WACHS – Kimberley	8	2	N/A
Kimberley	Renal Team	General Physician	Derby	Kimberley Aboriginal Medical Services Council	3	3	N/A
Kimberley	Renal Team	Registered Nurse	Derby	Kimberley Aboriginal Medical Services Council	3	3	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Derby	Kimberley Aboriginal Medical Services Council	3	3	N/A
Kimberley	Renal Team	Sonographer	Derby	Kimberley Aboriginal Medical Services Council	2	3	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Chronic Disease Child & Adolescent	Psychiatrist	Fitzroy Crossing	Kimberley Mental Health and Drug Service Team – WACHS – Kimberley	1	14	N/A
Kimberley	Diabetes Team	Orthoptist	Fitzroy Crossing	WACHS – Kimberley	8	2	N/A
Kimberley	Renal Team	General Physician	Fitzroy Crossing	Kimberley Aboriginal Medical Services Council	1	3	N/A
Kimberley	Renal Team	Registered Nurse	Fitzroy Crossing	Kimberley Aboriginal Medical Services Council	1	3	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Fitzroy Crossing	Kimberley Aboriginal Medical Services Council	1	3	N/A
Kimberley	Renal Team	General Physician	Fitzroy Crossing	Kimberley Aboriginal Medical Services Council	3	4	N/A
Kimberley	Renal Team	Registered Nurse	Fitzroy Crossing	Kimberley Aboriginal Medical Services Council	3	4	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Fitzroy Crossing	Kimberley Aboriginal Medical Services Council	3	4	N/A
Kimberley	Renal Team	Sonographer	Fitzroy Crossing	Kimberley Aboriginal Medical Services Council	3	4	N/A
Kimberley	Renal Team	General Physician	Fitzroy Valley	Kimberley Aboriginal Medical Services Council	3	4	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Renal Team	Registered Nurse	Fitzroy Valley	Kimberley Aboriginal Medical Services Council	3	4	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Fitzroy Valley	Kimberley Aboriginal Medical Services Council	3	4	N/A
Kimberley	Renal Team	Sonographer	Fitzroy Valley	Kimberley Aboriginal Medical Services Council	3	4	N/A
Kimberley	Chronic Disease Paediatric Team	Paediatrician	Fitzroy Valley, Halls Creek & Kutjungka	WACHS – Kimberley	2	2	N/A
Kimberley	Chronic Disease Paediatric Team	Paediatric Allied Health	Fitzroy Valley, Halls Creek & Kutjungka	WACHS – Kimberley	2	2	N/A
Kimberley	Cardiology Team	General Practitioner	Halls Creek	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Cardiology Team	Health Worker - Tobacco	Halls Creek	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Cardiology Team	Registered Nurse	Halls Creek	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Cardiology Team	Echocardiogram Technician	Halls Creek	Kimberley Aboriginal Medical Services Council	3	5	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Diabetes Team	Orthoptist	Halls Creek	WACHS – Kimberley	4	2	N/A
Kimberley	Renal Team	General Physician	Halls Creek (incl Balgo)	Kimberley Aboriginal Medical Services Council	2	5	N/A
Kimberley	Renal Team	Registered Nurse	Halls Creek (incl Balgo)	Kimberley Aboriginal Medical Services Council	2	5	N/A
Kimberley	Renal Team	Sonographer	Halls Creek (incl Balgo)	Kimberley Aboriginal Medical Services Council	2	5	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Halls Creek (incl Balgo)	Kimberley Aboriginal Medical Services Council	2	5	N/A
Kimberley	Renal Team	General Physician	Halls Creek (Yuri Yungi)	Kimberley Aboriginal Medical Services Council	1	2	N/A
Kimberley	Renal Team	Registered Nurse	Halls Creek (Yuri Yungi)	Kimberley Aboriginal Medical Services Council	1	2	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Halls Creek (Yuri Yungi)	Kimberley Aboriginal Medical Services Council	1	2	N/A
Kimberley	Renal Team	General Physician	Kalumburu	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Registered Nurse	Kalumburu	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Kalumburu	Kimberley Aboriginal Medical Services Council	3	5	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Renal Team	Sonographer	Kalumburu	Kimberley Aboriginal Medical Services Council	2	5	N/A
Kimberley	Cardiology Team	General Practitioner	Kununurra	Kimberley Aboriginal Medical Services Council	3	5	8
Kimberley	Cardiology Team	Registered Nurse	Kununurra	Kimberley Aboriginal Medical Services Council	3	5	8
Kimberley	Cardiology Team	Health Worker - Tobacco	Kununurra	Kimberley Aboriginal Medical Services Council	3	5	8
Kimberley	Cardiology Team	Echocardiogram Technician	Kununurra	Kimberley Aboriginal Medical Services Council	3	5	8
Kimberley	Diabetes Team	Orthoptist	Kununurra	WACHS – Kimberley	4	2	N/A
Kimberley	Renal Team	General Physician	Kununurra	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Registered Nurse	Kununurra	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Kununurra	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Sonographer	Kununurra	Kimberley Aboriginal Medical Services Council	2	5	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Kimberley	Chronic Disease Adult	Psychiatrist	Kutjungka (Balgo, Mulan, Bililuna)	Kimberley Mental Health and Drug Service Team – WACHS – Kimberley	4	7	N/A
Kimberley	Renal Team	General Physician	One Arm Point	Kimberley Aboriginal Medical Services Council	1	3	N/A
Kimberley	Renal Team	Registered Nurse	One Arm Point	Kimberley Aboriginal Medical Services Council	1	3	N/A
Kimberley	Renal Team	Sonographer	One Arm Point	Kimberley Aboriginal Medical Services Council	1	3	N/A
Kimberley	Renal Team	Aboriginal Health Worker	One Arm Point	Kimberley Aboriginal Medical Services Council	1	3	N/A
Kimberley	Renal Team	General Physician	Wyndham	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Registered Nurse	Wyndham	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Aboriginal Health Worker	Wyndham	Kimberley Aboriginal Medical Services Council	3	5	N/A
Kimberley	Renal Team	Sonographer	Wyndham	Kimberley Aboriginal Medical Services Council	2	5	N/A
Midwest	Renal Team	Physician - Nephrology	Geraldton	Geraldton Regional Aboriginal Medical Service	2	3	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Midwest	Renal Team	Registered Nurse	Geraldton	Geraldton Regional Aboriginal Medical Service	2	3	N/A
Midwest	Renal Team	Aboriginal Health Worker	Geraldton	Geraldton Regional Aboriginal Medical Service	2	3	N/A
Midwest	Renal Team	Administration / Coordination	Geraldton	Geraldton Regional Aboriginal Medical Service	2	3	N/A
Midwest	Cardiology Team	Physician - Cardiology	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Sonographer	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Registered Nurse	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Diabetes Educator / Dietitian	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Physiotherapist	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Podiatrist	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Aboriginal Health Worker	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Midwest	Cardiology Team	Administration / Coordination	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Diabetes Team	General Practitioner	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	4	8
Midwest	Diabetes Team	Aboriginal Health Worker x 2	Meekatharra	Geraldton Regional Aboriginal Medical Service	8	4	8
Midwest	Diabetes Team	Podiatrist	Meekatharra	Geraldton Regional Aboriginal Medical Service	0	0	0
Midwest	Diabetes Team	Diabetes Educator	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	4	8
Midwest	Diabetes Team	Administration / Coordination	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	2	4
Midwest	Diabetes Team	General Physician	Meekatharra	Geraldton Regional Aboriginal Medical Service	4	4	8
Midwest	Diabetes Team	Aboriginal Health Worker	Meekatharra	Geraldton Regional Aboriginal Medical Service			
Midwest	Renal Team	Physician - Nephrology	Meekatharra	Geraldton Regional Aboriginal Medical Service	2	6	N/A
Midwest	Renal Team	Registered Nurse	Meekatharra	Geraldton Regional Aboriginal Medical Service	2	6	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Midwest	Renal Team	Aboriginal Health Worker	Meekatharra	Geraldton Regional Aboriginal Medical Service	2	6	N/A
Midwest	Renal Team	Administration/ Coordination	Meekatharra	Geraldton Regional Aboriginal Medical Service	2	6	N/A
Midwest	Cardiology Team	Physician - Cardiology	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Sonographer	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Registered Nurse	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Diabetes Educator / Dietitian	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Physiotherapist	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Podiatrist	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	3	6
Midwest	Cardiology Team	Aboriginal Health Worker	Mt Magnet	Geraldton Regional Aboriginal Medical Service	8	3	6
Midwest	Cardiology Team	Administration / Coordination	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	3	6



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Midwest	Diabetes Team	General Practitioner	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	4	8
Midwest	Diabetes Team	Diabetes Educator	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	4	8
Midwest	Diabetes Team	Administration / Coordination	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	2	4
Midwest	Diabetes Team	General Physician	Mt Magnet	Geraldton Regional Aboriginal Medical Service	4	4	8
Midwest	Diabetes Team	Aboriginal Health Worker	Mt Magnet	Geraldton Regional Aboriginal Medical Service	8	4	8
Midwest	Renal Team	Physician - Nephrology	Mt Magnet	Geraldton Regional Aboriginal Medical Service	2	6	N/A
Midwest	Renal Team	Registered Nurse	Mt Magnet	Geraldton Regional Aboriginal Medical Service	2	6	N/A
Midwest	Renal Team	Aboriginal Health Worker	Mt Magnet	Geraldton Regional Aboriginal Medical Service	2	6	N/A
Midwest	Renal Team	Administration / Coordination	Mt Magnet	Geraldton Regional Aboriginal Medical Service	2	6	N/A
Pilbara	Diabetes	Physician - Endocrinology (Diabetes)	Karratha	WACHS - Pilbara	4	2	N/A
Pilbara	Diabetes Team	Diabetes Educator	Karratha	WACHS - Pilbara	4	2	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Pilbara	Diabetes Team	Dietitian / Nutritionist	Karratha	WACHS - Pilbara	4	2	N/A
Pilbara	Diabetes Team	Podiatrist	Karratha	WACHS - Pilbara	4	2	N/A
Pilbara	Diabetes	Physician - Endocrinology (Diabetes)	Port Hedland	WACHS - Pilbara	4	2	N/A
Pilbara	Diabetes Team	Diabetes Educator	Port Hedland	WACHS - Pilbara	4	2	N/A
Pilbara	Diabetes Team	Dietitian / Nutritionist	Port Hedland	WACHS - Pilbara	4	2	N/A
Pilbara	Diabetes Team	Podiatrist	Port Hedland	WACHS - Pilbara	4	2	N/A
Wheatbelt	Cardiology Team	Physician - Cardiology	Merredin	WACHS - Wheatbelt	4	2	N/A
Wheatbelt	Cardiology Team	Registered Nurse	Merredin	WACHS - Wheatbelt	2	1	N/A
Wheatbelt	Endocrinology Team	Podiatrist	Merredin	WACHS - Wheatbelt	8	1	N/A
Wheatbelt	Cardiology Team	Physician-Cardiology	Moora	WACHS - Wheatbelt	4	1	N/A
Wheatbelt	Cardiology Team	Registered Nurse	Moora	WACHS - Wheatbelt	2	1	N/A
Wheatbelt	Endocrinology Team	Physician - Endocrinology (Diabetes)	Moora	WACHS - Wheatbelt	2	1	N/A



Region	Team	Speciality / Discipline / Sub discipline	Location	Service Provider	# visits per year	# days per visit	# sessions per visit
Wheatbelt	Endocrinology Team	Podiatrist	Moora	WACHS - Wheatbelt	8	1	N/A
Wheatbelt	Endocrinology Team	Physician - Endocrinology (Diabetes)	Narrogin	WACHS - Wheatbelt	2	1	N/A
Wheatbelt	Endocrinology Team	Podiatrist	Narrogin	WACHS - Wheatbelt	8	1	N/A
Wheatbelt	Cardiology Team	Physician - Cardiology	Northam	WACHS - Wheatbelt	4	1	N/A
Wheatbelt	Cardiology Team	Registered Nurse	Northam	WACHS - Wheatbelt	2	1	N/A
Wheatbelt	Endocrinology Team	Physician - Endocrinology (Diabetes)	Northam	WACHS - Wheatbelt	2	1	N/A
Wheatbelt	Endocrinology Team	Podiatrist	Northam	WACHS - Wheatbelt	8	1	N/A

Source: Rural Health West