



S·A·R·R·A·H

Services for Australian  
Rural and Remote Allied Health



# Addressing Diabetes-Related Foot Disease in Indigenous NSW

## A Scan of Available Evidence

## Acknowledgements

Services for Australian Rural and Remote Allied Health (SARRAH) is proud to acknowledge the traditional owners of the land on which we live and work, and pay our respect to their elders past and present. We acknowledge the ongoing and vibrant relationship Indigenous people throughout Australia have with their traditional lands.

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## List of Abbreviations

ABS	Australian Bureau of Statistics
ACCHO	Aboriginal Community Controlled Health Organisation
AHW	Aboriginal Health Worker
AIHW	The Australian Institute of Health and Welfare
AMIC	Aboriginal Maternal and Infant Care Worker
AMIHS	Aboriginal Maternal and Infant Health Service
AMS	Aboriginal Medical Service
ATSI	Aboriginal and Torres Strait Islander
ATSIHP	Aboriginal and Torres Strait Islander Health Practitioner
DART	Diabetic Foot Assessment of Risk
DRFD	Diabetes Related Foot Disease
FTE	Full Time Equivalent
GP	General Practitioner
HWA	Health Workforce Australia
IDFP	Indigenous Diabetic Foot Program
LHD	Local Health District
MDT	Multidisciplinary Team
NHMRC	National Health and Medical Research Council
NAHSSS	Nursing and Allied Health Scholarship Support Scheme
NSW	New South Wales
NT	Northern Territory
PVD	Peripheral Vascular Disease
PN	Peripheral Neuropathy
SARRAH	Services for Australian Rural and Remote Allied Health
WA	Western Australia

## Terminology

This report consistently uses the term 'Indigenous' in reference to Aboriginal and/or Torres Strait Islander people, in continuation with the original research questions. The term 'Aboriginal' is used only in direct quotations, or when mentioning pre-existing terms (such as Aboriginal Health Worker and Aboriginal Medical Service) which are widely used and accepted.

## Methodology and Limitations

The research and writing of this report was conducted over a six week period from March to April 2016. The short timeframe and wide scope eliminated the possibility of a systematic literature review for all elements of the report. Thus, the approach used was 'horizon scanning', in which readily available evidence was identified across a number of areas. As a systematic review of trials/programs was not feasible, the report has taken a 'case study' approach to sections two and three. This has enabled shared characteristics from successful programs to be analysed and discussed.

Databases searched included Google Scholar, PubMed, NLA's Trove, and Australian Indigenous HealthInfoNet for general information, studies and reports. Searches also included AIHW, ABS, and NSW Health Stats for statistics. Generally research was limited to Australian-based sources, unless international sources were appropriate, as in the 'Interventions for DRFD' section. In searching the Australian Indigenous HealthInfoNet for case studies, results were filtered by area (diabetes), target (Indigenous) and evaluation status (evaluated).

In an attempt to gauge a practical/'on the ground' perspective of the issue of Indigenous DRFD, three key informant interviews were conducted. These interviews were arranged via email and conducted between 29<sup>th</sup> March and 5<sup>th</sup> April 2016. The interviewees were:

- Jason Warnock, Author of the Indigenous Diabetic Foot Project (2003-05), Director of the Indigenous Diabetic Foot Program, and currently the Director of Podiatry, Metro North Hospital and Health Service in Brisbane and Chair of Qld Podiatry Network.
- Vanessa Nube, Director, Podiatry - Sydney Local Health District and Co-chair, Agency for Clinical Innovation, Endocrine Network Diabetic Foot Working Group.
- Matthew West, a Wiradjuri man working as a Podiatrist, and Researcher at the University of Newcastle Podiatry Faculty.

Interviewees were contacted after preliminary research, on the basis of recommendations by SARRAH Board member Susan Nancarrow and Indigenous Allied Health Australia.

Limitations in research included the notable lack of data on Indigenous DRFD in NSW. Although general diabetic amputation rates are available for NSW, there are no Indigenous-specific statistics. There is a clear opportunity for further research and/or analysis in this area. Another key limitation was the lack of evaluated workforce strategies addressing DRFD. Despite some projects having strong workforce elements, the outcomes have not been clearly evaluated and thus findings in this area were limited.

## Executive Summary

### Prevalence

Indigenous people in Australia experience higher rates of diabetes complications than non-Indigenous Australians, including diabetes-related foot disease (DRFD). Indigenous Australians are admitted to hospital for foot complications more regularly, and are more likely to have a diabetes-related lower limb amputation. Despite a lack of specific data on rates of DRFD among the NSW Indigenous population, the existing evidence indicates that the high rates of DRFD among Indigenous people is likely to be a nation-wide problem.

### Interventions

A range of strategies for lessening the burden of DRFD have been implemented successfully. Primary prevention strategies which focus on patient education and foot screening have been associated with fewer amputations. Treatment for people with established DRFD requires the involvement of a multidisciplinary foot care team. This improves outcomes for patients, reduces amputations and makes re-ulceration and infection less likely. Podiatrists are vital to the treatment of patients with DRFD. Increased utilisation of podiatric care has been shown to lead to better outcomes. Podiatrists place feet as their first priority and have a specialised skill set for foot treatment. Strategies that have been successful in addressing Indigenous diabetes have involved community consultation, participation and ownership, the engagement of Indigenous staff, and coordinated and holistic care. In general, approaches to Indigenous health conditions should work on building trust with patients, and use a 'close to home' model.

### Workforce

Approaches targeting DRFD with strong workforce components are evident. Principally, this has involved utilising non-podiatrists in primary prevention (especially in screening and providing patient education), and increasing access to podiatrists for the secondary prevention and treatment of established DRFD. However, results from implementing this type of model have not been explored adequately. Workforce strategies which successfully address Indigenous health conditions have crucially involved Aboriginal Health Workers (who have often been upskilled in a specific area), and a culturally competent non-Indigenous workforce. Successful approaches have also partnered with existing community networks such as Aboriginal Community Controlled Health Organisations (ACCHOs).

### Discussion

Aboriginal Health Workers (AHWs) and podiatrists are two workforces central to an approach addressing DRFD within the NSW Indigenous population. It is considered that training AHWs to become designated foot care workers is a highly promising approach. This should be accompanied by support for an increase in the NSW podiatry workforce, particularly Indigenous podiatrists and podiatrists working in rural areas. Any approach to addressing Indigenous health conditions should consider health within a wider social context, necessitating community ownership of programs, and integration with existing health services and local networks.

## Introduction

This report was commissioned by the Workforce Development and Planning Branch, NSW Ministry of Health, as a broad scan of available evidence on chronic and complex foot disease in the NSW Indigenous population, and related workforce approaches. The initial research questions were:

- 1 Evidence of the prevalence of chronic and complex foot conditions in NSW Indigenous populations.
- 2 Evidence of increasing rates of foot conditions associated with diabetes and renal disease in Indigenous populations.
- 3 Evidence of targeted workforce strategies addressing Indigenous health conditions in NSW and nationally.
- 4 Commentary about the value of private and public service delivery models for Indigenous health services.
- 5 Any other data that would support the targeted workforce approach.

After preliminary research and liaison with expert advisors, and in consultation with the NSW Ministry of Health, the research questions were refined in order to clarify the scope of the report. The questions which this report attempts to answer are:

- 1 What evidence is there that diabetes, and diabetes-related foot disease more specifically, is a major problem in the Indigenous population, and is growing in severity?
- 2 What conclusions can be drawn about diabetes-related foot disease specifically in the NSW Indigenous population?
- 3 What strategies have been successful in addressing diabetes-related foot disease?
- 4 What strategies have been successful in addressing other Indigenous health conditions?
- 5 What targeted workforce strategies have been successful in addressing diabetes-related foot disease?
- 6 What targeted workforce strategies have been successful in addressing other Indigenous health conditions?
- 7 What evidence is there to support a targeted podiatry workforce strategy to address this issue? What are the important considerations that such a strategy should take into account?

Importantly, the refined research questions focus specifically on DRFD, rather than 'chronic and complex foot disease' in general, as diabetes was identified as the major cause of foot disease not only within Indigenous people but within the general Australian population.

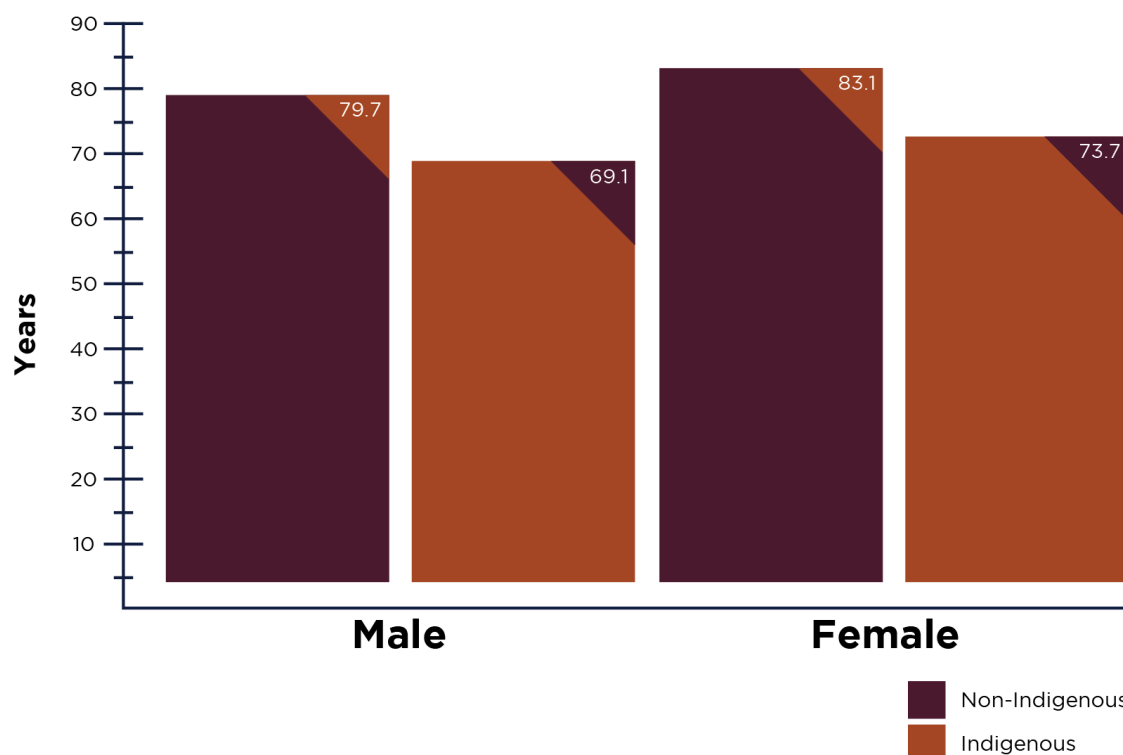


## Background

### Indigenous Health

#### Disadvantage

The Indigenous population of Australia experiences poorer health in general than the non-Indigenous population. On average, Indigenous males have a life expectancy 10 years less than non-Indigenous males; at 69.1 and 79.7 years respectively<sup>1</sup>. Females fare only slightly better, with Indigenous female life expectancy at 73.7, and non-Indigenous at 83.1<sup>2</sup>.



Additionally, rates of mental illness and chronic disease are much higher in Indigenous Australians. Indigenous people are three times as likely to have diabetes, three times as likely to experience psychological distress, twice as likely to die from intentional self-harm, six times as likely to experience chronic kidney disease, more than twice as likely to die from respiratory disease, and have poorer indicators for oral health, eye problems, disability, and infectious diseases than non-Indigenous people<sup>3</sup>.

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<sup>1</sup> Australian Indigenous HealthInfoNet. "Summary of Australian Indigenous Health, 2014", accessed March 24, 2016. <http://www.healthinfolnet.ecu.edu.au/health-facts/summary>.

<sup>2</sup> *ibid.*

<sup>3</sup> *ibid.*

## Social Determinants of Health

It has been widely postulated that a large majority of Indigenous health disadvantage can be explained by the social determinants of health. The World Health Organisation defines social determinants of health as “the conditions in which people are born, grow, work, live, and age, and the wider set of forces and systems shaping the conditions of daily life”<sup>4</sup>. These determinants may include a large variety of factors such as education level, employment status, income, residential location, support networks, and economic and political systems.



For example, high education levels have been associated with improved health literacy, healthy lifestyle choices and reduced rates of risk factors such as smoking<sup>5</sup>. For Indigenous Australians, racism, connection to land and intergenerational trauma are important social determinants to consider<sup>6</sup>.

Additionally, access to healthcare services for Indigenous Australians may be inhibited by remote location, culturally inappropriate services, and the high cost of services<sup>7</sup>.

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<sup>4</sup> World Health Organisation, “Social Determinants of Health”, accessed March 29, 2016.

[http://www.who.int/social\\_determinants/en/](http://www.who.int/social_determinants/en/).

<sup>5</sup> Australian Government, *National Aboriginal and Torres Strait Islander Health Plan 2013-2023* (Canberra: Commonwealth of Australia, 2013), 12.

<sup>6</sup> Australian Indigenous HealthInfoNet, “Summary of Indigenous Health 2014”.

<sup>7</sup> *ibid.*

## An Integrated Approach to Health

The approach to health in Australian Indigenous populations is multifaceted, and 'wellbeing' does not simply indicate the absence of disease. The National Aboriginal and Torres Strait Islander Health Plan<sup>8</sup> defines Aboriginal health as:

“not just the physical wellbeing of an individual but refers to the social, emotional and cultural wellbeing of the whole community in which each individual is able to achieve their full potential as a human being, thereby bringing about the total wellbeing of their Community. It is a whole-of-life view and includes the cyclical concept of life-death-life.”

Therefore, efforts to improve Indigenous health require an integrated approach, which may include improving education, economic development, housing, and community functioning, among other factors<sup>9</sup>.

Varying ideas of what 'health' means between the Indigenous and non-Indigenous populations means that health services and initiatives must be culturally appropriate. This should include the involvement of AHWs, culturally competent staff, and specifically targeted health promotion campaigns<sup>10</sup>.

## Diabetes-Related Foot Disease

### What is Diabetes?

Diabetes is a chronic condition, for which there is no cure, and is Australia's fastest growing chronic disease<sup>11</sup>. Diabetes occurs when one's body cannot properly convert glucose (sugar) into energy, leading to a build-up of sugar in the blood<sup>12</sup>. The process of converting glucose into energy is usually facilitated by the hormone insulin, but in people with diabetes, insulin is not produced at all, or not produced sufficiently enough for this process to occur<sup>13</sup>. The main types of diabetes are Type 1 and Type 2 diabetes.

Type 1 diabetes comprises around 10% of all diabetes cases and is often detected in childhood<sup>14</sup>. In people with Type 1 diabetes, the immune system destroys cells which would usually produce insulin. People with Type 1 diabetes are dependent on daily injections of insulin to manage their blood sugar levels.

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<sup>8</sup> Australian Government, *ATSI Health Plan*, 9.

<sup>9</sup> *ibid*, 13.

<sup>10</sup> Australian Indigenous HealthInfoNet, "Summary of Indigenous Health 2014".

<sup>11</sup> Diabetes Australia, "Diabetes in Australia", accessed April 18 2016.

<https://www.diabetesaustralia.com.au/diabetes-in-australia>

<sup>12</sup> Diabetes Australia, "What is Diabetes", accessed April 18 2016. <https://www.diabetesaustralia.com.au/what-is-diabetes>.

<sup>13</sup> *ibid*.

<sup>14</sup> Diabetes Australia, "Type 1 Diabetes", accessed April 18 2016. <https://www.diabetesaustralia.com.au/type-1-diabetes>.

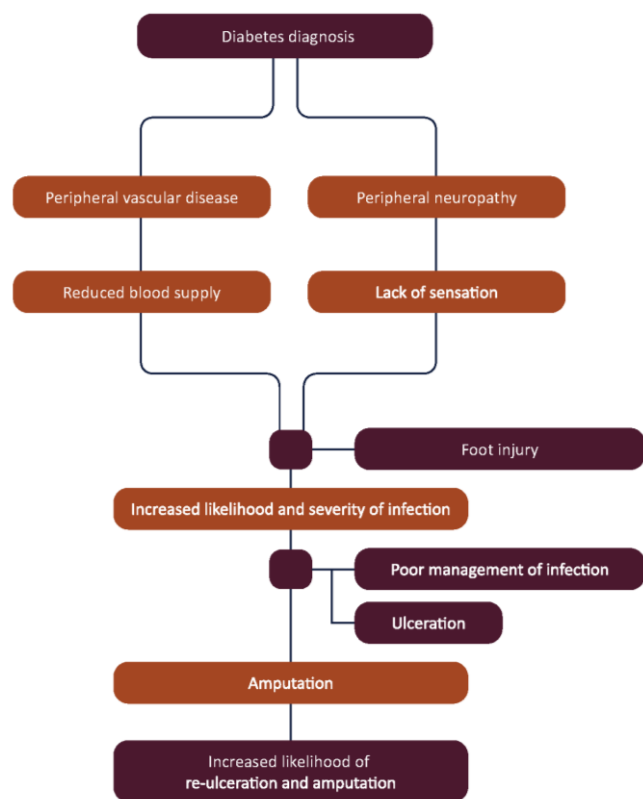
Type 2 diabetes comprises 85-90% of all diabetes cases and is associated with, though not necessarily caused by, lifestyle factors such as obesity and irregular physical exercise<sup>15</sup>. It occurs when an insufficient amount of insulin is produced, or when the body becomes resistant to insulin. Type 2 diabetes has typically occurred in people over the age of 45, but diagnoses at a younger age are becoming more common.

Type 1 diabetes is rare in the Australian Indigenous population. Type 2 diabetes has a much higher burden amongst the Indigenous population and in 2013 accounted for 94% of all diabetes problems for Indigenous people<sup>16</sup>.

### What is Diabetes-Related Foot Disease?

Foot disease is among the most common complications of diabetes. Foot disease occurs in people diagnosed with diabetes due to the development of Peripheral Vascular Disease (PVD) and Peripheral Neuropathy (PN), which are more common among people with diabetes than the general population<sup>17</sup>. PVD, or reduced blood supply to the extremities, increases the chance of infection when an injury occurs<sup>18</sup>. PN, or nerve damage in the extremities, causes a loss of sensation and consequent decreased perception of pain and discomfort<sup>19</sup>. Therefore, when a person with PVD and PN injures their foot (due to ill-fitting shoes, presence of foreign bodies, cut, etc.), it is likely to become infected quickly, and the lack of pain experienced increases the chance that they will not notice the injury. This further increases the progression of infection and potentially leads to the development of a foot ulcer. People with diabetes who have existing foot deformities are at an increased risk of injury and consequential infection<sup>20</sup>.

Chronic and Complex Foot Disease and Diabetes



<sup>15</sup> Diabetes Australia, "Type 2 Diabetes", accessed April 18 2016. <https://www.diabetesaustralia.com.au/type-2-diabetes>.

<sup>16</sup> Australian Health Minister's Advisory Council, *Aboriginal and Torres Strait Islander Health Performance Framework 2014 Report*, (Canberra: AHMAC, 2015), 48.

<sup>17</sup> Nalini Singh et al, "Preventing Foot Ulcers in Patients with Diabetes", *Journal of the American Medical Association* 293, no.2 (2005): 217-228, 218.

<sup>18</sup> Australian Institute of Health and Welfare, *Diabetes: Australian Facts 2008*, (Canberra: AIHW, 2008), 44.

<sup>19</sup> *ibid.*

<sup>20</sup> Craig Payne, "Diabetes-related lower-limb amputations in Australia", *Medical Journal of Australia* 173, no.7 (2000): 352-354, 352.

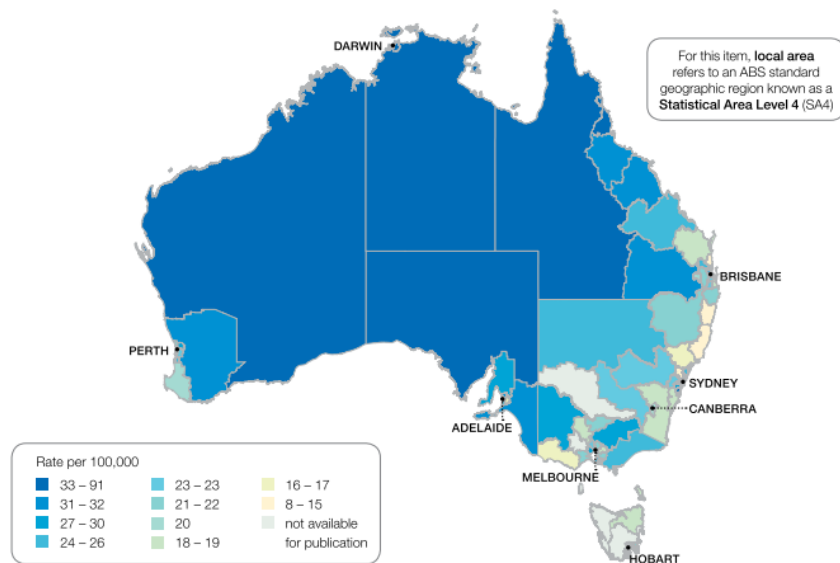
## Diabetes-Related Amputations

Serious ulcers and infections, if left untreated, may lead to minor (foot or toe) or major (below or above the knee, or full hindquarter) lower limb amputation. Being the end-stage of DRFD, amputations generally signify a failure of prevention and management of infection. A high incidence of amputations may reflect a high level of diabetes prevalence, late referral, or limited resources, while a low incidence of amputation may indicate the success of primary and secondary care<sup>21</sup>. Once a person with diabetes has undergone one amputation, their chances of needing another amputation increase significantly, due to the vulnerability and increased pressure on the remaining toes/limb<sup>22</sup>.

Lower limb amputations place a significant burden on the Australian health system and on individuals, both with the initial cost of the surgery, and the resulting loss of functional ability and potential need for long-term care. Each diabetes-related amputation is estimated to have a direct cost of \$26,700 to the Australian healthcare system<sup>23</sup>.

In Australia, diabetes causes 60% of all amputations<sup>24</sup>. The rate of diabetic amputations in Australia is 20/100,000 people, compared with an average of 12/100,000 people in the developed world<sup>25</sup>.

The following map shows rates of diabetic amputation admissions across Australia for 2012-2013.



Source: Australian Commission on Safety and Quality in Healthcare and National Health Performance Authority 2015<sup>26</sup>.

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<sup>21</sup> W.J Jeffcoate and W.H van Houtum, "Amputation as a marker of the quality of foot care in diabetes", *Diabetologia* 47 (2004): 2051-2058, 2051.

<sup>22</sup> Payne, "Lower limb amputations", 353.

<sup>23</sup> Services for Australian Rural and Remote Allied Health, *The impact of allied health professionals in improving outcomes and reducing the cost of treating diabetes, osteoarthritis and stroke*, (Canberra: SARRAH, 2015), 28.

<sup>24</sup> Peter Lazzarini et al, "Diabetes foot disease: the Cinderella of Australian diabetes management?", *Journal of Foot and Ankle Research* 24, no.5 (2012): 1-9, 4.

<sup>25</sup> *ibid*, 3.

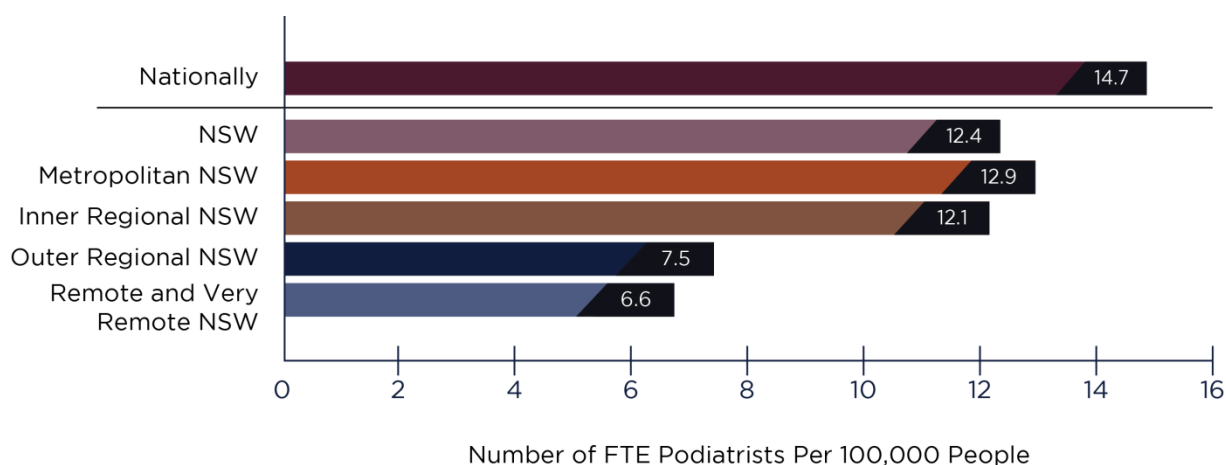
The Northern Territory has the highest rate of diabetic amputation at 65/100,000 people. NSW has the second lowest rate at 20/100,000 people, but the highest numerical admissions for diabetic amputation. Within NSW, Sydney-Blacktown and Illawarra has the highest diabetic amputation rate at 35/100,000.

As evidenced by the map, the rate of diabetes-related amputations is generally higher in rural and remote areas. Indeed, rural Australians with DRFD are hospitalised at four times the rate of urban Australians with DRFD<sup>27</sup>. Of people with diabetes, 4.1/1000 in major cities were hospitalised for lower limb amputation in 2007-2008, compared with 6.1/1000 in outer regional and remote areas<sup>28</sup>.

## The Podiatry Workforce

The Australian Podiatry Council defines podiatry as “The allied health area dedicated to the diagnosis, treatment, prevention and management of medical conditions and injuries of the foot, ankle and lower limb”<sup>29</sup>.

In 2013, AIHW reported that there were 4,037 registered podiatrists in Australia, representing a rate of 14.7 full time equivalent (FTE) podiatrists per 100,000 people<sup>30</sup>. Nationally, the FTE rate was 15.8/100,000 for major cities, 13.8/100,000 for inner regional areas, 9.8/100,000 for outer regional areas, and 4.4/100,000 for remote/very remote areas.



<sup>26</sup> Australian Commission on Safety and Quality in Healthcare and National Health Performance Authority, *Australian Atlas of Healthcare Variation*, (Sydney: ACSQHC, 2015), 332.

<sup>27</sup> Shan Bergin et al, “A limb lost every three hours: can Australia reduce amputations in people with diabetes?”, *Medical Journal of Australia* 197, no.4 (2012): 197-198, 198.

<sup>28</sup> Australian Institute of Health and Welfare, “Lower limb amputations”, accessed April 15 2016.

<http://www.aihw.gov.au/diabetes-indicators/lower-limb-amputations/>.

<sup>29</sup> Australian Podiatry Council, “What is Podiatry?”, accessed April 15 2016. <http://www.apodc.com.au/what-is-podiatry/what-is-podiatry>.

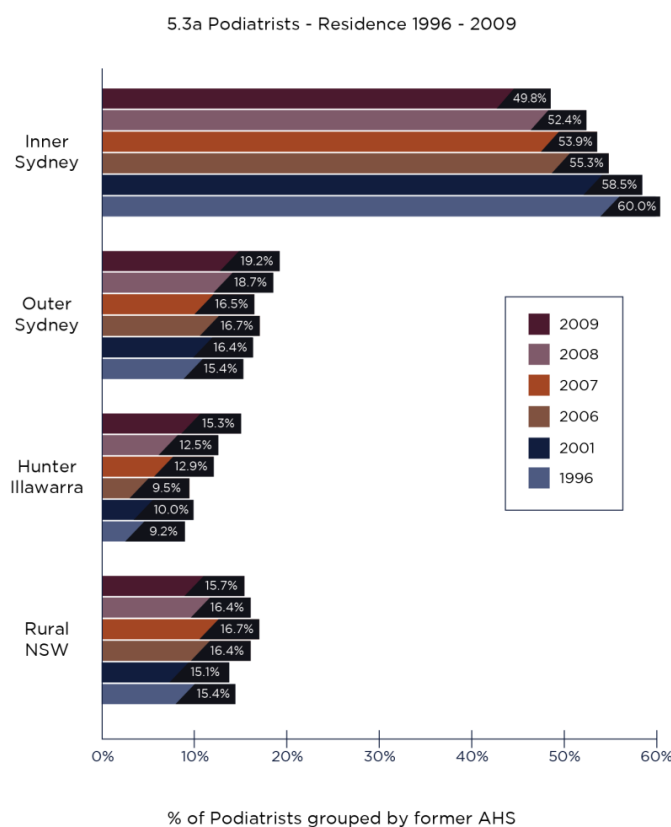
<sup>30</sup> Australian Institute of Health and Welfare, *Detailed tables: Podiatry workforce 2014*, (Canberra: National Health Workforce Data Set, 2014).

Statistics on the podiatry workforce indicate that the workforce in NSW is smaller than the national average, and that there are few podiatrists in rural and remote areas of the state.

In 2013, AIHW reported that there were 1,035 registered podiatrists in NSW, a rate of 12.4 FTE podiatrists per 100,000 people, compared to 14.7/100,000 nationally<sup>31</sup>. Within NSW, the FTE rate was 12.9/100,000 in cities, 12.1/100,000 in inner regional areas, 7.5/100,000 in outer regional areas, and 6.6/100,000 in remote and very remote areas<sup>32</sup>.

Health Workforce Australia (HWA) reported that in 2011-2012 there were only 30 podiatrists nationally working in remote or very remote areas<sup>33</sup>. The HWA report also suggested that people living in rural and remote areas across Australia, including Indigenous people, often rely on health practitioners such as GPs and nurses rather than podiatrists<sup>34</sup>.

NSW rates fared particularly poorly in this report in terms of the distribution of podiatrists per population. In a list of the number of employed podiatrists per 100,000 population by Medicare Local Regions, NSW regions made up none of the top ten highest rates, but six of the lowest ten (Nepean-Blue Mountains, Southern NSW, Western NSW, South Western Sydney, Western Sydney and Far West NSW)<sup>35</sup>.



Data from a 2009 NSW Health report indicates a trend over time that the vast majority of NSW podiatrists are located in cities<sup>36</sup>. The percentage of the workforce in rural areas has been consistently lower than that in urban areas. The graph to the left shows that while the proportion of podiatrists located in regional cities and outer Sydney has increased, the proportion in rural areas has fluctuated with only a very slight upwards trend. The difference between Inner-Sydney based podiatrists and rural-based podiatrists remained significant, with only 15.7% of the workforce in rural NSW and 49.8% in Inner Sydney in 2009.

Source: NSW Health 2009<sup>37</sup>

<sup>31</sup> *ibid.*

<sup>32</sup> *ibid.*

<sup>33</sup> Health Workforce Australia, *Australia's Health Workforce Series: Podiatrists in Focus*, (Adelaide: HWA, 2014), 17.

<sup>34</sup> *ibid.*, 32.

<sup>35</sup> *ibid.*, 39-41.

<sup>36</sup> NSW Health, *2009 Profile of the Podiatrist Workforce in NSW*, (Sydney, 2009), 14.

<sup>37</sup> *ibid.*, 18.

Census data indicates that nationally, the proportion of podiatrists identifying as Indigenous is very low, with only 3 of 2,807 respondents (0.1%) in 2011 identifying as such<sup>38</sup>. However, National Health Workforce Dataset data indicates that the proportion of Indigenous podiatrists nationally has grown significantly, from 0.4% of the total workforce in 2013 (n=16) to 1.9% in 2014 (n=82)<sup>39</sup>. After communication with the Department of Health, it was revealed that this somewhat incongruous increase was an error, and the correct number of podiatrists identifying as Indigenous in 2014 was 23<sup>40</sup>. With a total workforce in 2014 of 4316<sup>41</sup>, Indigenous podiatrists remain a very small percentage of the podiatry workforce (0.48%) compared to their proportion of the general population (3.0%)<sup>42</sup>.

### **Podiatry Assistant Workforce**

A podiatry assistant is defined by the Podiatry Board of Australia as “a member of staff employed within a facility or practice who is not a registered podiatrist and who assists a podiatrist in the delivery of services to his or her patients or clients”<sup>43</sup>. The duties of podiatry assistants vary, but in general they have the competency to treat ‘low risk’ patients after the patient has undergone an initial assessment by a qualified podiatrist<sup>44</sup>. It is recommended that podiatry assistants are qualified with either a Certificate III or Certificate IV in Allied Health Assistance<sup>45</sup>. A 2012 survey conducted by NSW Health found that there were 3 podiatry assistants working in NSW<sup>46</sup>. The notably small workforce, and minimal mention of podiatry assistants in the literature reviewed for this report, has meant that the report has not focused on them specifically in terms of DRFD treatment/management.

## **The Aboriginal Health Worker Workforce**

Health Workforce Australia<sup>47</sup> reports that AHWs:

- Provide culturally safe health care to Indigenous people, including advocating for Indigenous clients to other health professionals, and educating non-Indigenous staff on culturally safe health care delivery.
- Perform a comprehensive primary health care role, including disease prevention and health promotion.
- Adapt their roles in response to local health needs and contexts, and understand the importance of community knowledge and holistic care.

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<sup>38</sup> Health Workforce Australia, *Podiatrists in Focus*, 22.

<sup>39</sup> AIHW, *Podiatry workforce 2014*.

<sup>40</sup> Jaclyn Newman, *Email correspondence* (April 20, 2016).

<sup>41</sup> AIHW, *Podiatry workforce 2014*.

<sup>42</sup> Australian Bureau of Statistics, “Estimates of Aboriginal and Torres Strait Islander Australians, June 2011”, accessed April 20 2016. <http://www.abs.gov.au/ausstats/abs@.nsf/mf/3238.0.55.001>.

<sup>43</sup> Podiatry Board of Australia, *Guidelines for podiatrists working with podiatric assistants in podiatry practice*, (AHPRA, 2010), 2.

<sup>44</sup> *ibid*, 1.

<sup>45</sup> *ibid*.

<sup>46</sup> NSW Health, *Allied Health Assistants- Survey Results 2012*, (North Sydney: NSW Health, 2012), 14.

<sup>47</sup> Health Workforce Australia, *Growing our Future: Final Report of the Aboriginal and Torres Strait Islander Health Worker Project*, (Adelaide: HWA, 2011), 2-3.



### NSW Health identifies five models for AHW positions:

**Aboriginal Health Practitioners:** This position provides direct clinical services to local Aboriginal communities. Aboriginal Health Practitioners are required to hold a Certificate IV in Aboriginal Primary Health Care (Practice), and be registered with the Aboriginal and Torres Strait Islander Health Practice Board of Australia (ATSIHPBA) supported by the Australian Health Practitioner Regulation Agency (AHPRA). Aboriginal Health Practitioners perform a range of clinical practice and primary healthcare duties.

**Aboriginal Community Health Workers:** This position is non-clinical and provides increased access, liaison, health promotion and preventative health services to local Aboriginal communities.

**Aboriginal Hospital Liaison Officers:** This position is non-clinical and provides advocacy, support and liaison for Aboriginal people with an acute care setting e.g. hospitals and multipurpose services.

**Principal Aboriginal Health Workers:** This position provides a career pathway for Aboriginal Health workers with a degree qualification. Principal Aboriginal Health Workers will develop, implement and review Aboriginal primary health care strategy and policies and may be responsible for the supervision and training of Aboriginal Health Workers.

**Senior Aboriginal Health Worker:** This position manages resources for the delivery of individual health services or health programs and may be responsible for the supervision and training of Aboriginal Health Workers.

(Source: Good Health-Great Jobs: Aboriginal Health Worker Guidelines for NSW Health, updated May 2016)

Registration for Aboriginal and Torres Strait Islander Health Practitioners (ATSIHP) began nationally on 1st July 2012<sup>48</sup>. Requirements for registration include a minimum Certificate IV in Aboriginal and/or Torres Strait Islander Primary Health Care (Practice) and 60 hours of continuing professional development over a three year period<sup>49</sup>. The development of registration for ATSHIPs came after recognition that some AHW roles were clinically focused and involved “the performance of a number of high risk clinical activities”<sup>50</sup>. There are currently 558 registered ATSIHPs nationally, of which 107 are located in NSW<sup>51</sup>. ATSHIP registrant data does not reflect the entire AHW workforce but rather those AHWs working specifically in clinical roles. The total number of AHWs was estimated to be 1600 nationally in 2009<sup>52</sup>.

A very high proportion of AHWs are located in rural and remote areas (85%). This creates a perceived maldistribution, as 75% of the Indigenous population live in urban settings<sup>53</sup>.

This report uses the term ‘AHW’ to refer to all Aboriginal Health Workers, including those registered as ATSIHPs and those who are not registered but still working within an Indigenous health context.

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<sup>48</sup> Aboriginal and Torres Strait Islander Health Practice Board of Australia, “Statistics”, accessed April 19 2016. <http://www.atsihealthpracticeboard.gov.au/About/Statistics.aspx>.

<sup>49</sup> Aboriginal and Torres Strait Islander Health Practice Board of Australia, “Registration Standards”, accessed April 19 2016. <http://www.atsihealthpracticeboard.gov.au/Registration-Standards.aspx>.

<sup>50</sup> NSW Health, *Good Health-Great Jobs*, 25.

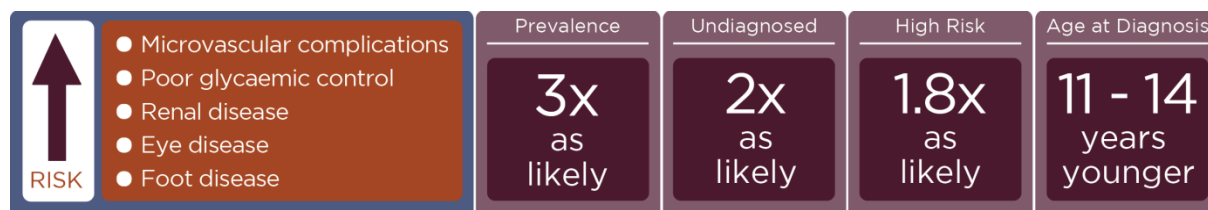
<sup>51</sup> Aboriginal and Torres Strait Islander Health Practice Board of Australia, *Registrant Data* (AHPRA, December 2015).

<sup>52</sup> Health Workforce Australia, *Growing our Future*, 37.

<sup>53</sup> Jennifer Mason, *Review of Australian Government Health Workforce Programs* (Department of Health, 2013).

## Section One: Prevalence

### Diabetes in the Indigenous Population



In 2013, the prevalence of diabetes in the general Australian population was 4.6%, compared with 11% in the Indigenous population<sup>54</sup>. When adjusted for age, this means that Indigenous people are three times more likely to have diabetes than non-Indigenous people.<sup>55</sup> The prevalence of diabetes in Indigenous people living in remote areas is as much as ten times higher than the general population<sup>56</sup>. Furthermore, Indigenous people in Australia are twice as likely to have undiagnosed diabetes, 1.8 times more likely to be at high risk of diabetes, and 1.4 times more likely to have poorly managed diabetes than non-Indigenous people<sup>57</sup>.

In addition to a higher prevalence of disease, Indigenous people develop diabetes at an earlier age than non-Indigenous people. The Fremantle Diabetes Study, conducted between 1993 and 2011, found that Indigenous participants had an average age at diabetes diagnosis 14 years younger than the general population (45.6 compared to 59.2 years)<sup>58</sup>. Similarly, the DRUID study conducted in Darwin found a mean age among Indigenous diabetic participants of 53, compared with an average age of 64 reported in the AusDiab study<sup>59</sup>.

Indigenous people with diabetes are more likely to develop diabetes-related complications than non-Indigenous people with diabetes. Indigenous participants in the Fremantle diabetes study were more likely to develop microvascular complications, had worse blood sugar control, and were more likely to smoke, increasing the risk of further complications<sup>60</sup>. Renal disease, which is commonly associated with diabetes, is six times more common in Indigenous people<sup>61</sup>. Blindness caused by diabetic retinopathy is 30 times more common in Indigenous adults compared with their non-Indigenous counterparts<sup>62</sup>.

<sup>54</sup> James Charles, "An Investigation into the foot health of Aboriginal and Torres Strait Islander peoples: A Literature Review", *Australian Indigenous Health Bulletin* 15, no.3 (2015): 1-7, 3.

<sup>55</sup> Australian Health Minister's Advisory Council, *ATSI Health Performance Framework*, 38.

<sup>56</sup> *ibid*, 48.

<sup>57</sup> *ibid*, 38.

<sup>58</sup> Timothy M.E Davis et al, "Continuing Disparities in Cardiovascular Risk Factors and Complications Between Aboriginal and Anglo-Celt Australians with Type 2 Diabetes: The Fremantle Diabetes Study", *Diabetes Care* 35(2012): 2005-2011, 2005.

<sup>59</sup> Louise Maple-Brown et al, "Complications of diabetes in urban Indigenous Australians: The DRUID study", *Diabetes Research and Clinical Practice* 80 (2008): 455-462, 457.

<sup>60</sup> Davis, "The Fremantle Diabetes Study", 2009.

<sup>61</sup> Australian Indigenous HealthInfoNet, "Summary of Indigenous Health 2014".

<sup>62</sup> *ibid*.

## Diabetes Related Foot Disease in the Indigenous Population

DRFD, like other diabetic complications, is more common among the Australian Indigenous population. Available evidence suggests that Indigenous Australians suffer disproportionately high rates of hospital admissions for diabetic foot complications, ulcerations and amputations, and at a younger age. The fact that Australian Indigenous people are at a high risk of foot disease is emphasised in the National Evidence-Based Guideline on Diabetic Foot Complications, which states that:

“All Aboriginal and Torres Strait Islander people with diabetes are considered to be at high risk of developing foot complications and therefore will require foot checks at every clinical encounter and active follow-up.”<sup>64</sup>

Internationally, Indigenous populations suffer a higher incidence of risk factors for DRFD, including PN and PVD, and consequently, increased rates of ulceration and lower extremity amputations<sup>64</sup>.

In Australia, risk factors for DRFD are also higher among the Indigenous population. The DRUID study found a minimum two-fold increased risk of PVD among Indigenous patients with diabetes compared to the general population with diabetes, and a 1.7-fold increased risk of neuropathy<sup>65</sup>. The prevalence of PVD has been estimated at 12% within the general Indigenous population, a rate ten times higher than the non-Indigenous population<sup>66</sup>.

A scan of available published literature identified five relevant case studies, all of which provided evidence that DRFD is disproportionately prevalent within the Indigenous Australian population.

### Case Study 1: Western Australia Hospitalisations 1998-2008<sup>67</sup>

- Indigenous patients with diabetes were 27 times more likely to have a minor amputation than non-Indigenous patients with diabetes.
- Indigenous patients with diabetes were 38 times more likely to have a major amputation than non-Indigenous patients with diabetes.

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<sup>63</sup> National Health and Medical Research Council, *Prevention, Identification and Management of Foot Complications in Diabetes: National Evidence-Based Guideline*, (Melbourne: NHMRC, 2011), 5.

<sup>64</sup> Deborah E Schoen and Paul E Norman, “Diabetic Foot Disease in Indigenous People”, *Management Perspective* 4, no.6 (2014): 489-500, 489.

<sup>65</sup> Maple-Brown et al, “The DRUID Study”, 458-459.

<sup>66</sup> Charles, “An Investigation into the foot health of ATSI peoples”, 4.

<sup>67</sup> Department of Health Western Australia, *High Risk Foot Model of Care*, (Perth: Cardiovascular and Diabetes & Endocrine Health Networks, 2010), 11.

Rate of Amputations / 100,000 Population with Diabetes				
	Major Amputations		Minor Amputations	
Age	25-49	50+	25-49	50+
Indigenous	15	76.8	46.4	185
Non-Indigenous	0.4	13.1	1.7	28.9

### Case Study 2: The DEFINE Study, Royal Darwin Hospital 2012-2013<sup>68</sup>

- Indigenous patients comprised 64% of diabetic foot infection admissions but only 25.9% of Top End population.
- Average age of Indigenous patients with DRFD 50.5 years compared to 61.6 years for non-Indigenous patients.
- Major amputation incidence 4.1 times higher in Indigenous patients compared to non-Indigenous patients.
- Minor amputation incidence 6.2 times higher in Indigenous patients than non-Indigenous patients.

### Case Studies 3 and 4: Cairns Base Hospital Studies 1992-1994<sup>69</sup> and 1998-2008<sup>70</sup>

- Initial study from 1992-1994 found that Indigenous patients comprised 13% of regional population but 57% of patients admitted for diabetic foot complications, and 59% of patients who had a major amputation.
- Second study from 1998-2008 found that Indigenous patients comprised 15% of the regional population but 52% of those who had a major amputation.
- 1998-2008 study also found that Indigenous patients were 14 years younger (on average) than non-Indigenous patients, had a longer length of stay and were more likely to suffer from co-morbidities.

### Case Study 5: Central Australian Hospital Separations<sup>71</sup>

- Indigenous patients comprised 38% of regional population, but 91% of hospitalisations for diabetic foot complications.
- The number of hospitalisations for foot complications increased by more than 200% over six year study period.

<sup>68</sup> Robert J Commons et al, "High burden of diabetic foot infections in the top end of Australia: An emerging health crisis (DEFINE study)", *Diabetes Research and Clinical Practice* 110 (2015): 147-157.

<sup>69</sup> Christina Steffen and Sharon O'Rourke, "Surgical Management of Diabetic Foot Complications: The Far North Queensland Profile", *Australian and New Zealand Journal of Surgery* 68 (1998): 258-260.

<sup>70</sup> Sharon O'Rourke et al, "Diabetic major amputation in Far North Queensland 1998-2008: What is the Gap for Indigenous patients?", *Australian Journal of Rural Health* 21 (2013): 268-273.

<sup>71</sup> Dan Ewald et al, "Hospital Separations Indicate Increasing Need for Prevention of Diabetic Foot Complications in Central Australia", *Australian Journal of Rural Health* 9 (2001): 275-279.

These five studies show unanimously that Indigenous patients suffer a higher rate of DRFD than their non-Indigenous counterparts. This finding has been consistent regardless of the metric used to measure rates of foot disease.

According to the available evidence, Indigenous patients are admitted to hospital more often, have more amputations (both minor and major), suffer more co-morbidities, stay in hospital longer, and suffer from DRFD at a younger age, relative to non-Indigenous patients.

Various reasons were put forward in each of the studies for the disproportionate rate of foot disease amongst Indigenous people. A common reason cited was the high incidence of diabetes itself within the Indigenous population<sup>72</sup>.

Inadequate or unavailable care was the most common reason cited. The Western Australian Department of Health suggested in their study that “gaps in current services” could partly explain the problem<sup>73</sup>. Commons et al postulate that the low amount of podiatrists in the Top End results in a decreased capacity for the primary detection and prevention of foot ulcers<sup>74</sup>. Steffen and O’Rourke propose that Indigenous people have a “limited access to medical care”, which increases their chances of developing foot complications<sup>75</sup>. O’Rourke et al also allude to this in the later study, suggesting that improved primary health care services will lessen the burden of diabetes for Indigenous people<sup>76</sup>.

Geographically isolated populations<sup>77</sup>, a lack of awareness about foot disease<sup>78</sup>, the higher rate of poorly controlled diabetes<sup>79</sup>, social determinants of health<sup>80</sup>, and the failure of secondary prevention<sup>81</sup> were also reasons suggested for the high rate of DRFD in the Indigenous population.

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<sup>72</sup> Department of Health Western Australia, *High Risk Foot Model of Care*, 11. Steffen and O’Rourke, “The Far North Queensland Profile”, 260.

<sup>73</sup> Department of Health Western Australia, *High Risk Foot Model of Care*, 11.

<sup>74</sup> Commons et al, “DEFINE Study”, 154.

<sup>75</sup> Steffen and O’Rourke, “The Far North Queensland Profile”, 260.

<sup>76</sup> O’Rourke et al, “Diabetic major amputation”, 271.

<sup>77</sup> Department of Health Western Australia, “High Risk Foot Model of Care”, 11

<sup>78</sup> *ibid.*

<sup>79</sup> Steffen and O’Rourke, “The Far North Queensland Profile”, 260.

<sup>80</sup> O’Rourke et al, “Diabetic major amputation”, 271.

<sup>81</sup> Ewald et al, “Hospital Separations”, 278.

## Diabetic Foot Disease in the NSW Indigenous Population

The rate of diabetes prevalence within the Indigenous population of NSW is increasing. NSW HealthStats reports that it has increased from a prevalence of 10.1% of the total Indigenous population in the state in 2002 to 13.7% in 2014<sup>82</sup>. Data from NSW suggests that Indigenous people in the state experience a higher rate of diabetic complications than non-Indigenous people. They are hospitalised for diabetes 3.3 times as often as non-Indigenous people<sup>83</sup>. Additionally, the mortality rate for diabetes amongst Indigenous people from NSW is 50/100,000 compared with 14/100,000 for the non-Indigenous population<sup>84</sup>.

However, there is a dearth of data and studies focusing on DRFD in the NSW Indigenous population specifically. Examples discussed above indicate a heavily disproportionate presence of DRFD among Indigenous people in Australia. These studies were conducted in Queensland, Northern Territory and Western Australia. One would reasonably assume that, as this phenomenon is spread across multiple states, it is also likely to be the case in NSW. However, the literature review for this project found no specific studies or data sets to confirm this assumption. Broad data sets on amputation rates in NSW, which are separated for Indigenous status, appear to exist, but are not publicly available.

Evidence from key informant interviews conducted for this report indicated that there is a high rate of Indigenous patients accessing high risk foot clinics in NSW compared to their proportion of the general population, suggesting that they experience a higher rate of DRFD<sup>85</sup>. The informant interviews also indicated that whilst data on Indigenous status is collected at point of service, the time and resources needed to collate and analyse the data is lacking. Key informant evidence also suggested that designing healthcare strategies for Indigenous DRFD in NSW is complicated by the lack of research in the area, stating that “we really don’t even have an adequate understanding of what the landscape looks like”<sup>86</sup>.

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<sup>82</sup> HealthStats NSW, “Diabetes Prevalence in Adults”, accessed March 18 2016.

[http://www.healthstats.nsw.gov.au/Indicator/dia\\_prev\\_age/dia\\_prev\\_ati](http://www.healthstats.nsw.gov.au/Indicator/dia_prev_age/dia_prev_ati).

<sup>83</sup> Australian Institute of Health and Welfare, *Aboriginal and Torres Strait Islander Health Performance Framework 2014 report: New South Wales*, (Canberra: AIHW, 2015), 49.

<sup>84</sup> *ibid.*

<sup>85</sup> Vanessa Nube, Interview by Virginia DeCourcy and Anne Buck, (Canberra, March 30 2016).

<sup>86</sup> Matthew West, Interview with Virginia DeCourcy, (Canberra, April 5 2016).

## Section Two: Interventions

### Interventions for Diabetes Related Foot Disease

There have been a variety of interventions that have been successful in addressing DRFD. This section will discuss general guidelines on the treatment of DRFD, as well as specific approaches for which there is widespread support.

It should be noted that foot disease is only one complication arising from diabetes. Patients with poorly managed diabetes, who are more likely to develop foot complications, are also more likely to develop other diabetes-related complications such as heart disease, eye disease and kidney disease. Thus, interventions relating to DRFD should be recognised as part of a wider context of care for many patients.

#### Clinical Guidelines

The National Health and Medical Research Council's National Evidence-Based Guideline recommends several approaches to addressing DRFD<sup>87</sup>. It endorses foot risk assessment for all diabetic patients, annual foot screening for low-risk patients, and screening every 3-6 months for intermediate and high-risk patients. Patients in intermediate and high-risk categories should also have access to an integrated foot care program (education, footwear and podiatry review). Podiatrists are noted as important in the screening/reviewing process, but "where this is not possible", another healthcare worker can facilitate this process<sup>88</sup>. Debridement, wound dressings, pressure reduction, and offloading devices are listed as efficacious treatments for existing ulcers. It is strongly recommended that patients with foot ulceration should be managed by a "multidisciplinary foot care team", or if access is limited, by a GP and a podiatrist as a minimum<sup>89</sup>. The International Working Group on the Diabetic Foot has similar recommendations for best-practice care<sup>90</sup>. It echoes the NHMRC's guidelines on screening low-risk patients annually and high-risk patients on a 3-monthly basis. It also recommends that an 'integrated program' involving professional foot care, patient education on self-management of foot care, and provision of footwear to patients with a history of DRFD.

#### Patient Education

Among other literature, patient education is proposed as a possible strategy for lessening the burden of DRFD. Singh et al list two reviews that show education increased the short term knowledge of patients, and indicate that patient education "may modestly reduce" the rate of foot complications<sup>91</sup>.

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<sup>87</sup> NHMRC, *National Evidence-Based Guideline*.

<sup>88</sup> *ibid*, 6.

<sup>89</sup> *ibid*, 7.

<sup>90</sup> International Working Group on the Diabetic Foot. *IWGDF Guidance on the prevention of foot ulcers in at-risk patients with diabetes*, (Amsterdam: IWGDF, 2015).

<sup>91</sup> Singh et al, "Preventing Foot Ulcers", 220.

One study conducted in the United States found that the implementation of a patient education program was associated with a 70% reduction in amputation rates over a two year period<sup>92</sup>. However, this was not confirmed in another study assessing the impact of education on amputation rates<sup>93</sup>. Overall, when patient education is combined with other strategies such as correct footwear and treatment of foot deformities, a reduction in ulceration rates has been recorded<sup>94</sup>.

### **Nauru 'Love Your Feet' Health Promotion Campaign**

Nauru is a small Pacific island nation with a population of approximately 10,000 people, 80% of whom are Indigenous Nauruans. Nauru has an extremely high prevalence of diabetes, which was reported as 34.4% in 1975, the second highest in the world at that point. It had decreased to a reported level of 16.2% in 2004 but still remains “alarmingly high”.

In Nauru, a national 'Love Your Feet' health promotion campaign was conducted between 1982 and 1994. It involved the dissemination of bumper stickers, posters, leaflets, and a five minute video screened on national television over a 6-month period, in order to educate Nauruans on appropriate methods of foot care self-management<sup>1</sup>. It was accompanied by the development of a specialised foot clinic, staffed by two community nurses who had received foot care training in Australia delivered by podiatrists. The education program focused on five key steps to improving foot health: foot hygiene and self-examination, wearing correct footwear, correct toenail trimming, regular attendance at the foot clinic and early presentation when foot complications arose. The program was associated with a 50% decrease in lower extremity amputations over the 12-year study period.

Sources: Khambalia et al 2011<sup>95</sup>, Humphrey et al 1996<sup>96</sup>

### **Multidisciplinary Foot Care Clinic**

Multidisciplinary teams are in general vital to diabetes treatment. Providing general diabetes care and facilitating patient self-management is best delivered by a multidisciplinary team, including a GP, nurses, various Allied Health Professionals, and an endocrinologist<sup>97</sup>. Other than management of lifestyle factors, a principle aim of general diabetes management is blood glucose control<sup>98</sup>. Control of a patient's blood glucose levels is

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<sup>92</sup> Jan Apelqvist and Jan Larsson, “What is the most effective way to reduce incidence of amputation in the diabetic foot?”, *Diabetes/Metabolism Research and Reviews*, 16 (2000):75-83, 77.

<sup>93</sup> *ibid*, 77.

<sup>94</sup> *ibid*.

<sup>95</sup> Amina Khambalia et al, “Prevalence and risk factors of diabetes and impaired fasting glucose in Nauru”, *BMC Public Health* 11 (2011): 1-10.

<sup>96</sup> A.R.G Humphrey et al, “Diabetes and Nontraumatic Lower Extremity Amputations : Incidence, risk factors and prevention- a 12 year follow-up study in Nauru”, *Diabetes Care* 19, no.7 (1996): 710-714.

<sup>97</sup> Royal Australian College of General Practitioners, *General Practice Management of Type 2 Diabetes*, (Melbourne: RACGP, 2014), 22.

<sup>98</sup> *ibid*, x.



integral to the prevention of diabetes-related complications and reducing mortality and cardiovascular risk factors<sup>99</sup>.

For the treatment of DRFD in particular, the involvement of a multidisciplinary foot care team is resoundingly cited as a vital element. Crucially, multidisciplinary teams (MDTs) should be involved in the treatment of established foot ulcers<sup>100</sup>. As previously mentioned, treatment by a MDT is recommended in national and international guidelines on the treatment of DRFD.

Research demonstrates the effectiveness of MDTs in treating DRFD. A study conducted at Royal Liverpool University Hospital in the United Kingdom found that of patients who had access to a multidisciplinary foot clinic, only 29% of foot ulcers progressed to an amputation, compared to 66% of ulcers in patients without access to the clinic<sup>101</sup>. Another trial involving a multidisciplinary clinic found that patients who missed a large proportion of visits to the clinic were 54 times more likely to require an amputation than those patients who attended the clinic regularly<sup>102</sup>. The Queensland Diabetic Foot Innovation Project, which enhanced the role of MDTs in diabetes-related foot management, saw a reduction of up to 64% in amputation rates and 24% in average length of stay in hospital<sup>103</sup>. A recent retrospective study conducted in South Western Sydney Local Health District found that of 156 patients admitted to hospital for diabetes-related foot complications, 116 (74.7%) had no contact with the multidisciplinary high risk foot service. This suggests that patients who do not access multidisciplinary services are at a higher risk of hospitalisation<sup>104</sup>.

**A recent systematic review of multidisciplinary foot clinics found that amputation rates decreased in every study involving the implementation of a multidisciplinary foot care team<sup>105</sup>.**

A multidisciplinary foot care team should optimally include “medical, surgical, nursing, podiatry and other allied health professionals”<sup>106</sup>. The involvement of such a team has been shown to enhance the healing of existing ulcers, and decreases hospitalisations and amputations relating to DRFD<sup>107</sup>. A multidisciplinary approach comprising a team of

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<sup>99</sup> Shan M Bergin et al, “Australian Diabetes Foot Network: management of diabetes-related foot ulceration- a clinical update”, *Medical Journal of Australia* 197, no.4 (2012): 226-229, 228.

<sup>100</sup> Apelqvist and Larsson, “Most effective way to reduce amputation”, 79.

<sup>101</sup> CJ McCabe et al, “Evaluation of a Diabetic Foot Screening and Protection Programme”, *Diabetic Medicine* 15(1998): 80-84, 82.

<sup>102</sup> Singh et al, “Preventing Foot Ulcers”, 224.

<sup>103</sup> Peter Lazzarini et al, “Standardising practices improves ambulatory diabetic foot management and reduced amputations: The Queensland Diabetic Foot Innovation Project, 2006-2009”, *Journal of Foot and Ankle Research Supplementary 1*, (2011): 1-2.

<sup>104</sup> D Plusch et al, “Primary care referral to multidisciplinary high risk foot services- too few, too late”, *Journal of Foot and Ankle Research*, 62, no.8 (2015): 1-6, 3.

<sup>105</sup> E Quinlivan et al, “Reduction of amputation rates in multidisciplinary foot clinics – a systematic review”, *Wound Practice and Research* 22, no. 3 (2014): 155-162, 162.

<sup>106</sup> Bergin et al, “A Clinical Update”, 228.

<sup>107</sup> *ibid.*

varying health professionals acknowledges that no one health professional has all of the required skills to successfully address DRFD<sup>108</sup>.

In NSW, the standards for High Risk Foot Services indicate that all of these services should include a MDT comprising of a podiatrist, nurse and physician as a minimum, with the addition of an endocrinologist, wound care nurse, vascular surgeon, orthopaedic surgeon, diabetes educator, dietitian, and orthotist as best practice<sup>109</sup>. The core clinical staff attend team meetings, and hold case conferences with the whole MDT if the case is complex. The patient's management plan is communicated to the GP, members of the MDT, and importantly with the patient themselves. Case conferencing is important for MDTs because it allows health professionals to discuss shared aims and future directions for the patient<sup>110</sup>.

### **The Role of Podiatrists**

Podiatric care for patients with diabetes is essential to addressing the burden of DRFD. Podiatrists have a key role in providing preventative screening, patient education and management of foot conditions<sup>111</sup>. Apelqvist and Larsson note that the "special skills" possessed by podiatrists are required for screening and education, as well as the treatment of foot conditions such as calluses, dry skin and nail deformities, which is essential in the primary prevention of DRFD<sup>112</sup>. Specific treatments for established DRFD such as debridement (removal of non-viable tissue from wound site), wound dressing, pressure off-loading, the use of appropriate footwear, and accurate prescription of antibiotics have been recommended as effective treatments for DRFD, with podiatrists central to this treatment<sup>113</sup>.

A systematic review found that patients with diabetes who received podiatric care fared better in terms of DRFD outcomes than those who did not<sup>114</sup>. The review found that regular podiatric care reduced the risk of re-ulceration for patients with previous ulceration, decreased pressure on the sole of the foot (therefore reducing the risk of injury), and lessened the seriousness of infections when they did occur<sup>115</sup>.

Additionally, podiatrists are central to the efficacy of multidisciplinary foot clinics. An 'ideal' multidisciplinary foot care team includes a podiatrist<sup>116</sup>. Within MDTs, podiatrists provide important care by recognising and correcting the cause of infection, caring for

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<sup>108</sup> Department of Health Western Australia, *High Risk Foot Model of Care*, 14.

<sup>109</sup> NSW Agency for Clinical Innovation, *Standards for High Risk Foot Services (HRFS) in NSW*, (Chatswood: ACI Endocrine Network, 2014).

<sup>110</sup> Kristien Van Acker, "Establishing a Multidisciplinary/Interdisciplinary Diabetic Foot Clinic", in *Contemporary Management of the Diabetic Foot*, Sharad Pendsey (New Delhi: Jaypee Brothers Medical Publishers, 2014), 191-198, 197.

<sup>111</sup> Quinlivan et al, "Reduction of amputation rates", 156.

<sup>112</sup> Apelqvist and Larsson, "Most effective way to reduce amputation", 76.

<sup>113</sup> Bergin et al, "A Clinical Update", 226-227.

<sup>114</sup> Singh et al, "Preventing Foot Ulcers", 222-224.

<sup>115</sup> *ibid*.

<sup>116</sup> J Apelqvist et al, "Practical guidelines on the management and prevention of the diabetic foot", *Diabetes/Metabolism Research and Reviews* 24, Suppl.1 (2008): 181-187.

established wounds and preventing re-ulceration<sup>117</sup>. Although there is a long list of possible inclusions to a multidisciplinary foot care teams, podiatrists are consistently considered to be “essential components”<sup>118</sup>. Increased involvement of podiatrists in foot care teams in South-Eastern Sydney was associated with fewer emergency department presentations and reduced hospital admissions for patients with DRFD<sup>119</sup>.

Better use of podiatrists in DRFD treatment has been shown to have cost benefits for the health system. Implementing best practice care for DRFD, including involving podiatrists as a central component in care, can reduce costs by 50 to 85%<sup>120</sup>. Additionally, economic studies have shown that investing in best practice teams and tools for DRFD care remains economically beneficial even if only 25% of amputations are prevented<sup>121</sup>.

## Addressing Diabetes in Indigenous Communities

Successful approaches to addressing diabetes in Indigenous communities have taken various forms, but share some common characteristics. This section will discuss several case studies of projects that have been successful in improving community attitudes and health outcomes around diabetes in Indigenous communities.

### Goorie Diabetes Complication and Assessment Clinic

<b>Funded By:</b>	Primary Health Care Network funded by NSW Health
<b>Participants:</b>	AMS staff, North Coast Area Health Service staff, private specialists
<b>Status:</b>	Initial pilot program completed but ongoing project apparent

#### Key elements:

- Multidisciplinary coordinated care available in one visit
- Involvement of AHWs
- Community consultation

**Success indicators:** Increase in clinic attendance.

The initial Goorie Diabetes Complication and Assessment Clinic was conducted in 2004 in four locations around the town of Casino in NSW<sup>122</sup>. It was developed after a community consultation period. The multidisciplinary clinic involved a physician, GP, ophthalmologist,

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<sup>117</sup> Bauer E Sumpio, “The role of interdisciplinary team approach in the management of the diabetic foot: A joint statement from the Society for Vascular Surgery and the American Podiatric Medical Association”, *Journal of Vascular Surgery* 51, no.6 (2010): 1504-1506.

<sup>118</sup> *ibid*, 1505.

<sup>119</sup> NSW Department of Health, *NSW Chronic and Complex Care Programs Progress Report* (Sydney, 2003), 55.

<sup>120</sup> Peter Lazzarini and Shan Bergin, “How Australia can reduce diabetes-related amputations”, *The Conversation*, October 4 2012, <http://theconversation.com/how-australia-can-reduce-diabetes-related-amputations-9791>.

<sup>121</sup> *ibid*.

<sup>122</sup> Joanne Cooper et al, “Partnership Approach to Indigenous primary health care and diabetes: a case study from regional New South Wales”, *Australian Journal of Rural Health* no.15 (2007): 67-70.

AHWs, Aboriginal health education officers, diabetes educator, dietitian, podiatrist, lab scientist and renal nurse, and functioned on a monthly rotating basis. Team conferences were held after each clinic and clinic personnel communicated with each patient's GP. AHWs were vital to the clinic's success, providing a comfortable and culturally safe environment, as well as clinical assistance.

The main advantage of the program for local Indigenous residents was that they could access a full multidisciplinary team in one visit to the clinic, and receive immediate blood test results.

The clinic drew on existing community structures and maintained formal and informal ties within the community. Importantly, the clinic model was developed in line with the local request that it not be a "generic" model used in other communities. In total the clinic saw 167 patients, 52 of whom had more than one visit. This represented a huge increase in participation, as the local Aboriginal Medical Service's (AMS) diabetes service had seen only 15 patients in the preceding year.

It appears that this program is now a regular ongoing program coordinated by the Bulgarr Ngaru Medical Aboriginal Corporation<sup>123</sup>. The ongoing program is free for Indigenous clients, but the funding structure is unknown.

### The Better Living Diabetes Project

<b>Funded By:</b>	Federal Government Department of Health and Ageing
<b>Participants:</b>	Goondir ATSI Corporation for Health Services, Southern Queensland University
<b>Key elements:</b>	<ul style="list-style-type: none"><li>• Holistic approach addressing lifestyle factors</li><li>• Community involvement</li><li>• Training and involvement of AHWs</li></ul>
<b>Success indicators:</b>	Improved access, community driven.

The Better Living Diabetes Project was first implemented in 2001 by the Goondir Aboriginal and Torres Strait Islander (ATSI) Corporation for Health Services, based in Dalby, Queensland<sup>124</sup>. The project targets people with diabetes within the region's Indigenous population of approximately 10,000 residents. It was developed in consultation with the local community and is a holistic approach addressing both education and clinical support. Education is provided to participants through twice-monthly cooking classes and the distribution of a newsletter detailing relevant project and general diabetes news. The project

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<sup>123</sup> Australian Indigenous HealthInfoNet, "Goorie diabetes complication and assessment clinics", accessed April 14 2016. <http://www.healthinfonet.ecu.edu.au/key-resources/programs-projects?pid=647>.

<sup>124</sup> Susanne Pearce et al, "The Better Living Diabetes Project", *Aboriginal and Islander Health Worker Journal* 29, no.1 (2005): 4-6.

also involved the training of local healthcare staff in diabetes self-management and risk assessment, with some health workers undergoing additional training for the 'Healthy Weight Program'. In addition to local upskilling, visiting clinicians were recruited and provided more accessible and regular foot and eye checks.

Diabetes Liaison Officers were recruited from the participant pool and provided an important link between participants and healthcare staff; informing them of clinician visiting times, providing transport and organising activities. In general, the program has success in increasing access to health services, and improving patients' ability to control their diabetes.

The community responded well to the program as it was developed with community consultation and "provides what the clients said they wanted, in the way they said they wanted it", which is proposed as a key reason for the success of the project<sup>125</sup>.

### The Laramba Diabetes Project

<b>Funded By:</b>	Territory Health Services and the National Heart Foundation
<b>Participants:</b>	Public health project officer, local AHWs, Centre for Remote Health
<b>Status:</b>	Completed
<b>Key elements:</b>	<ul style="list-style-type: none"><li>• Community involvement and leadership</li><li>• Health promotion focused on existing networks</li></ul>
<b>Success indicators:</b>	Increase in healthy food purchases

The Laramba Diabetes Project was conducted over a two year period from 1999-2000 in Laramba, a remote community in the Central Desert of the NT<sup>126</sup>. The project involved training local health workers in diabetes care, as well as organising visits from visiting health professionals and providing community education on diabetes and its associated risk factors. Health promotion and education activities were conducted at the local school and in liaison with the local store. A public health officer oversaw the project and the community championed the project, establishing a local steering committee and regular meetings which were also attended by community members and elders.

The steering committee was successful in an application for continued funding of the project by the Commonwealth Government. Despite there being no evidence of "improved biomedical control of existing diabetic conditions", the project was successful in terms of health promotion<sup>127</sup>. Healthy purchases at the local store increased, with an 81% increase in fruit purchasing, an 11% increase in vegetables, a 175% increase in low-fat tinned meat and

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<sup>125</sup> *ibid*, 4.

<sup>126</sup> Marg Tyrrell et al, "Laramba Diabetes Project: an evaluation of a participatory project in a remote Northern Territory community", *Health Promotion Journal of Australia* 14, no. 1 (2003): 48-53.

<sup>127</sup>*ibid*, 49.

vegetables, and a 65% decrease in sugar purchases. The number of healthy items available at the store increased from 44 to 66. In addition, a large community garden was established and increased support for sport and recreation activities was recorded.

### Wurli-Wurlinjang Diabetes Day Program

<b>Funded By:</b>	Wurli-Wurlinjang Health Service's Gudbinji Clinic
<b>Status:</b>	Ongoing
<b>Key elements:</b>	
	<ul style="list-style-type: none"><li>• Multidisciplinary coordinated care available in one visit</li><li>• Focus on self-management and patient participation</li><li>• Cultural appropriate space</li></ul>
<b>Success indicators</b>	Increase in social / emotional wellbeing, improved clinical outcomes (blood sugar, blood pressure, cholesterol).

The Wurli-Wurlinjang Diabetes Day Program was first implemented in 2008 in Katherine, NT<sup>128</sup>. It provides multidisciplinary diabetes care every Thursday morning at the Wurli-Wurlinjang Health Service's Gudbinji Clinic. The program staff includes a GP, AHW, diabetes educator/renal nurse, nurse and dietitian/health promoter. The program aims to support patients with diabetes to better manage their Type 2 diabetes and related conditions including obesity and renal disease. The day program involves developing a diabetes diary for each patient, self-management training, food preparation and cooking advice, an education program on co-morbidities, and the development of GP-led management plans.

The program has had positive outcomes including in terms of improving the social and emotional wellbeing of patients, as well as their clinical outcomes. It has provided a supportive and culturally appropriate space in which clients feel comfortable, and can access holistic and multidisciplinary care in one location. Clinical results collected between 2010 and 2011 indicated that patients for whom a GP management plan was developed had an improvement of 47.5% in terms of diabetes management. Among patients who attended the day program during this period, blood sugar levels, blood pressure and cholesterol management all improved.

### Principles for Addressing Indigenous Health Conditions

The research conducted for this report revealed that successful approaches to Indigenous health conditions should focus not only on clinical methods but address health from a holistic perspective. Several elements were identified as significant contributors to the success of Indigenous health programs.

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<sup>128</sup> Entwistle, Phil et al, *Wurli-Wurlinjang Diabetes Day Program*, Evaluation Report prepared for the Centre for Remote Health, (Katherine, 2011).

Primarily, it was recommended that any health program should involve a high level of community participation and ownership. The involvement of local communities in the design of programs is important in avoiding “one size-fits-all approaches”, which may be inappropriate and therefore likely to be unsuccessful<sup>129</sup>. Advice and program development from Indigenous people is also useful in harmonising programs with cultural norms and ways of life<sup>130</sup>. Overall, involving Indigenous people in decision-making means that programs are more likely to be suitable, thus encouraging participation and retention of community members. Programs such as the Bundjalung Diabetes Clinic<sup>131</sup> and the Laramba Diabetes Project<sup>132</sup> show that community contribution and leadership have been associated with successful outcomes.

Building trust with the community has also been identified as a key element to the success of Indigenous health programs. This should be built on an individual level, between a patient and health practitioner, and at a community level, between the health program and the local population<sup>133</sup>. It is recommended that the process of establishing trust with patients should be led by an Indigenous person, as they are likely to have “an established presence in the community”<sup>134</sup>. This process may involve taking time to get to know patients, providing holistic, non-judgemental and culturally sensitive care, working within an Indigenous-specific clinic, communicating openly and honestly, working within local customs, and working with AHWs<sup>135</sup>.

Health programs for Indigenous people are most effective if they are delivered close to home. The National ATSI Health Plan recognises that “removal from one’s homeland and culture can also have a detrimental impact on wellbeing” for Indigenous people<sup>136</sup>. A hesitation to leave home, especially related to disempowerment, fear of hospital and ‘high-tech’ treatments, cultural alienation, loneliness and communication barriers, means that Indigenous people may be hesitant to access treatment or programs delivered external to their communities.

This recommendation corresponds with another that Indigenous health programs are best delivered through primary health care services. Primary health care is often the first point of contact Indigenous people have with the health system<sup>137</sup>. Additionally, primary health services are located locally, and in areas where the Indigenous population is widely

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<sup>129</sup> Dale Halliday and Leonie Segal, *What Works in Indigenous primary health care health reform? A review of the evidence*, Research paper prepared for the Health Economics and Social Policy Group, University of South Australia, (Adelaide: 2012), 2.

<sup>130</sup> Robert A Griew, *The link between primary health care and health outcomes for Aboriginal and Torres Strait Islander Australians*, Report prepared for the Office for Aboriginal and Torres Strait Islander Health, Department of Health and Ageing, (Sydney, 2008), 76.

<sup>131</sup> Cooper et al, “Partnership Approach”.

<sup>132</sup> Tyrell et al, “Laramba Diabetes Project”.

<sup>133</sup> NSW Health, *Clinical Services Redesign Program: Chronic Care for Aboriginal People*, (Sydney: NSW Department of Health, 2010), 34.

<sup>134</sup> *ibid.*

<sup>135</sup> *ibid.*, 35-37.

<sup>136</sup> Australian Government, *ATSI Health Plan*, 21.

<sup>137</sup> Halliday and Segal, *Indigenous primary health care*, 2.

dispersed, primary health care services may be “the only real option” for delivering health programs<sup>138</sup>.

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<sup>138</sup> Ewald et al, “Hospital Separations”, 278.



## Section Three: Workforce Approaches

### Workforce Approaches to Diabetes Related Foot Disease

Much of the literature focusing on the prevention and management of DRFD comes from a 'model of care' approach. As discussed in Section Two, this involves research on the most effective intervention strategies for DRFD. The following section will discuss several examples of interventions with clear workforce elements, and outline the role of specific workforces in the prevention, management and treatment of DRFD.

#### The Indigenous Diabetic Foot Program

**Funded By:** Australian Government Department of Health and Ageing (Rural Health Support, Education and Training Program)

**Participants:** Local AHWs, privately and publicly employed podiatrists

**Status:** Completed

**Key elements:**

- Culturally appropriate resources, and culturally competent staff
- Upskilling of AHWs in foot care
- Involvement and championing by AHWs
- Leadership and training by Podiatrists
- Development of referral pathways for high-risk feet

**Success indicators:** Limited evaluation conducted. In NSW increased confidence of AHWs and increased access of podiatry services.

The Indigenous Diabetic Foot Program (IDFP)<sup>139</sup> was a national project first implemented in 2005. It aimed to provide culturally appropriate foot education for Indigenous people suffering from diabetes, and educate AHWs about important foot screening techniques.

The first stage of the project involved the compilation of education resources, in consultation with Indigenous groups and health workers, podiatrists working in rural areas, and other health professionals. The resources developed are mainly visual aides and include images of Indigenous feet and stories of Indigenous people, and are easy to use. The self-management resources include several posters, a CD ROM, videos, an educational card set and other educational resources for consumers. Resources for the use of health workers include a Diabetic Foot Assessment of Risk (DART) form, and a workshop training book. The second stage of the project involved the delivery of workshops to AHWs.

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<sup>139</sup> Jason Warnock , *An Educational Tool to Assist with Identification and Management of the Indigenous Diabetic Foot*, Report prepared for Services for Australian Rural and Remote Allied Health, 2006.

At these workshops, AHWs were taught how to implement the DART screening method, provided with key self-management information to pass on to patients (including the provision of project resources), given a chance to practice foot screens on volunteer patients, and informed of necessary referral pathways to utilise if foot disease is detected. Another element of the project involved delivering 'train-the-trainer' workshops to podiatrists, where they were taught to deliver the workshops to AHWs in their own areas<sup>140</sup>.

One element of the project was delivered specifically in NSW. The NSW IDFP<sup>141</sup> involved extending and developing the initial resources for a NSW audience, including adding individual stories to the CD. Additionally, the four rural Area Health Services (AHS) in NSW nominated 18 health leaders to attend a workshop in Sydney and become IDFP trainers themselves. When they returned to their AHS the trainers delivered IDFP workshops to more than 20 AHWs.

The IDFP involves the participation of two key workforces: podiatrists and AHWs. In this example, AHWs have a vital role to play in the screening and primary prevention of DRFD. Through the upskilling they received from the workshops, participants were better able to advise patients in their communities on self-management techniques, as well as complete regular checks for foot abnormalities.

An evaluation of the project found that the AHWs who attended workshops felt more confident in providing education and screening after the workshops<sup>142</sup>. The role of AHWs in the IDFP was importantly limited to a "screening process", with the aim of identification of high and low risk feet<sup>143</sup>. The main role of podiatrists in the IDFP was to educate AHWs on the importance of foot screening and a specific technique for its implementation. As noted in the report, "podiatrists are the most qualified health professionals to manage foot conditions", and thus an important element of the project was the creation of referral pathways, so that when a high risk foot was identified, that person was able to be seen by a podiatrist for further assessment<sup>144</sup>.

An evaluation of the project's success in NSW found that the confidence and knowledge of AHWs was improved immediately following the workshop<sup>145</sup>. This evaluation also found that AHWs maintained their improved knowledge of foot screening and risk factors after a 6-month follow up questionnaire. AHWs reported increased referral to podiatrists, and one ACCHO began employing a podiatrist after the workshop. In addition, the occasions of service for Indigenous people accessing podiatry services within the local area increased from 7% to 11% following the workshop, although this cannot be directly attributed to the

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<sup>140</sup> Jason Warnock, Interview by Virginia DeCourcy and Anne Buck, (Canberra, March 29 2016).

<sup>141</sup> Jason Warnock, *The production of the Indigenous Diabetic Foot Project resource for rural communities in NSW*, (2008).

<sup>142</sup> Jason Warnock, *Mount Isa's Indigenous Diabetic Foot Project*, Report prepared for the Primary Health Care Access Program, 2006.

<sup>143</sup> Warnock, *An Educational Tool*, 18.

<sup>144</sup> *ibid*, 16, 18.

<sup>145</sup> Esther Townsend. *Evaluation of NSW Indigenous Diabetic Foot Program for Health Workers whose primary role is with Aboriginal People in the Lower Mid North Coast*, Report prepared for Clinical Education and Training Institute, (Taree, 2012).

project. This evaluation was focused on one Area Health Service in NSW but a widespread evaluation of the project has not been conducted. Generally, the IDFP evaluated all training delivered and, overwhelmingly, the training increased the confidence of AHWs to undertake the screening process. Unfortunately, there has been no evaluation of the IDFP's impact in terms of patient outcomes/rates of DRFD.

### Moorditj Djena Foot Care Program, Perth

**Funded By:** National Partnership Agreement for Closing the Gap  
**Participants:** Derbarl Yerrigan Health Service, WA Department of Health  
**Status:** Ongoing

**Key elements:**

- Flexible location and easy access for local community
- Involvement of AHWs and Podiatrists
- 'Culturally secure' approach including culturally competent staff
- Partnership between A, WA Department of Health and Local Community

**Success indicators:** Limited evaluation. High attendance by Indigenous patients

The Moorditj Djena program is a foot care and diabetes education clinic that was launched in metropolitan Perth in 2012<sup>146</sup>. 'Moorditj Djena' means 'strong feet' in the local Noongar language, and aims to identify, manage and prevent DRFD, and improve patient self-management for diabetes<sup>147</sup>. It is a cooperative approach and involves integration of the local AMS (Derbarl Yerrigan Health Service), and the WA Department of Health. The clinic targets those people within the metropolitan Indigenous community with high-risk feet (i.e. those with a history of foot complications, presence of PVD or PN, or with poorly controlled diabetes). There are eight separate clinic sites, including mobile clinics, which are equipped with a "fully-fitted podiatry van"<sup>148</sup>.

Two key workforces are involved in this project, podiatrists and AHWs. The clinic employs two podiatrists, one Aboriginal diabetes educator, and an AHW. Over the first 2.5 years, podiatrists delivered the most occasions of service at 1,914, the AHW delivered 885, and the diabetes educator 715. Services were provided to 702 clients, almost all of whom identified as Indigenous.

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<sup>146</sup> Stay on Your Feet WA, "Mobile foot clinic gets in step with Aboriginal health", *Stay On Your Feet WA e-Bulletin*, February 2012. [https://www.iccwa.org.au/useruploads/files/stay\\_on\\_your\\_feet\\_wa\\_e-bulletin\\_issue\\_no\\_9.pdf](https://www.iccwa.org.au/useruploads/files/stay_on_your_feet_wa_e-bulletin_issue_no_9.pdf).

<sup>147</sup> Teresa Ballestas et al, "A metropolitan Aboriginal podiatry and diabetes outreach clinic to ameliorate foot-related complications in Aboriginal people", *Australian and New Zealand Journal of Public Health* 38, no.5 (2014): 492-493, 492.

<sup>148</sup> *ibid.*

Although the initial review does not extrapolate on the roles of each workforce, it emphasises that cultural appropriateness is at the heart of the workforce element of the project. The employment of Indigenous staff, and development of the model in consultation with the local Indigenous community, are vital to the 'culturally secure' ethos of the project. The non-Indigenous staff (podiatrists) received cultural training. Overall, the clinic staff collaborate to provide a holistic approach, assisting patients with not just diabetes-specific care but also transport, assistance on social issues and medication reviews. High attendance levels and regard for the program amongst the local community are evidence of the program's early success.

### TRIEPodD UK Podiatry Competency Framework

#### Key elements:

- Clear delineation of workforce roles
- Podiatrists to review at-risk and high-risk patients
- Assistants / other health workers to review low-risk patients

#### Success indicators:

No evaluation conducted

The Podiatry Competency Framework for Integrated Diabetic Foot Care<sup>149</sup>, developed in 2012, is a British report outlining the roles of health professionals in the identification, management and treatment of DRFD. It identifies the risk stratification for DRFD among British people with diabetes (low-risk: 70%, at-risk: 20%, high-risk: 4-8%, and active DRFD: 1-4%). Low-risk patients are defined as those with no evidence of PVD or PN, and no history of DRFD. Those at risk of DRFD are those with evident PVD or PN, but no history of DRFD. Patients at a high-risk of DRFD are those who have had at least one prior incidence of DRFD (including amputation). The framework suggests that those at low risk of DRFD "do not require routine podiatry care", but rather annual foot screening and education by an appropriately skilled clinician<sup>150</sup>.

TRIEPodD lists necessary competencies for non-podiatrists (healthcare technicians and podiatry assistants) mainly surrounding screening, ulcer prevention, wound care, and health improvement. According to the framework, non-podiatrists involved in DRFD care should be competent in carrying out a number of basic tasks. These include:

- Basic screening.
- Assigning a risk score.
- Recording results.
- Communicating with the patient.
- Detecting risk for foot ulcers.
- Changing dressings as appropriate.
- Encouraging the use of pressure-relieving devices.
- Understanding the importance of education.

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<sup>149</sup> TRIEPodD- UK, *Podiatry Competency Framework for Integrated Diabetic Foot Care: A User's Guide*, (London, 2012).

<sup>150</sup> *ibid*, 7.

Much of their role in other foot care areas, and within screening, involves timely and appropriate referrals to suitably qualified health professionals (usually podiatrists). Podiatrists have a more advanced role in each sector. This includes:

- Vascular and neuropathy assessment.
- More specific knowledge of pathologies.
- Advice on footwear and pressure-relieving devices appropriate to each patient.
- Carrying out debridement and wound management techniques.
- Knowledge of national guidelines and policies.
- Carrying out detailed patient education and evaluation, amongst other competencies.

Specific implications of the implementation of this competence strategy are not evident. However, the report posits that the redirection of low-risk patients from podiatrists to non-podiatrists will allow podiatrists the time to “deliver more clinically complex care”<sup>151</sup>.

### **Nursing and Allied Health Scholarship and Support Scheme**

In Australia, a central workforce strategy for podiatry is the provision of scholarships to those undergoing study to become a podiatrist, or existing podiatrists wanting to further their education. Although this strategy is not specific to DRFD, its focus on the podiatry workforce warrants its inclusion in this report.

Governments at the Commonwealth and State levels have deployed a range of strategies to ensure an adequate supply of health professionals to meet the health care needs of the community. One such strategy is the use of scholarships to support people to become a health professional. SARRAH has managed allied health scholarships funded by the Australian Government for a number of years. The current program, the Nursing and Allied Health Scholarship and Support Scheme (NAHSSS) aims to increase the allied health workforce and address geographic areas and profession shortages. It is a national program providing scholarships for 23 allied health professions. Scholarships are offered for undergraduate and postgraduate study, for students undertaking a clinical placement as part of their course of study and continuing professional development activities. In 2015, 3% of applications for NAHSSS allied health scholarships have been from podiatrists or podiatry students, nationally. Over the 6 year period, 142 scholarships were awarded to podiatrists or podiatry students, of which 31 were based in NSW.

No formal evaluation of the NAHSSS has been undertaken, although an internal program review undertaken by SARRAH in 2015 found that the demand for scholarships by profession tend to reflect external trends, such as the availability of courses<sup>152</sup>. It also found that the scholarships were targeted to rural and remote applicants<sup>153</sup>.

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<sup>151</sup> *ibid*, 8.

<sup>152</sup> Project to review the outcomes of SARRAH administered NAHSSS scholarships. FINAL REPORT November 2015, unpublished.

<sup>153</sup> Project to review the outcomes of SARRAH administered NAHSSS scholarships. FINAL REPORT November 2015, unpublished.

**Table: Podiatry applications compared to all allied health professions in 2015**

	Podiatry		All Allied Health Professions	
	Applications	Scholarships Awarded	Applications	Scholarships Awarded
Clinical placement	42	12	1454	261
Undergraduate	24	3	665	166
CPD	20	6	686	169
Post graduate	12	8	402	203
<b>Total</b>	<b>98</b>	<b>29</b>	<b>3,207</b>	<b>799</b>

Source: SARRAH, NAHSSS program administration data, unpublished.

**Table: Podiatry applications and scholarships funded by the NAHSSS 2011 to 2016.**

	Nationally		NSW only	
	Applications	Scholarships Awarded	Applications	Scholarships Awarded
Clinical placement	179	40	82	15
Undergraduate	161	39	38	10
CPD	67	23	7	1
Post graduate	71	40	11	5
<b>Total</b>	<b>478</b>	<b>142</b>	<b>138</b>	<b>31</b>
<b>Success rate</b>		<b>30%</b>		<b>22%</b>

Source: SARRAH, NAHSSS program administration data, unpublished.

## Workforce Approaches to Indigenous Health Conditions

Several programs addressing health conditions specifically within the Australian Indigenous community also had a strong workforce focus. This section will discuss these programs, as well as general findings around workforce issues pertaining to Indigenous health in Australia.

### NSW Aboriginal and Maternal Infant Health Service

<b>Funded By:</b>	NSW Health
<b>Participants:</b>	Multiple AMSs, Community Health Services, Maternity Units
<b>Status:</b>	Ongoing
<b>Key elements:</b>	<ul style="list-style-type: none"> <li>• Training and involvement of AHWs</li> <li>• Partnership between midwives and AHWs</li> <li>• Community consultation and participation</li> <li>• Integration with existing services</li> </ul>
<b>Success indicators:</b>	Increased attendance at antenatal visit, improvement in rate of premature and low weight births, community appreciation for program

The NSW Aboriginal and Maternal Infant Health Service (AMIHS) is an ongoing project first implemented in 2001<sup>154</sup>. The project aims to address the disproportionately high rates of perinatal morbidity and mortality faced by Indigenous women in NSW compared to non-Indigenous women. In 2000, the perinatal mortality rate for NSW Indigenous women was 17.9/100,000 compared with 9.7/100,000 for non-Indigenous women<sup>155</sup>. A reason posited for this discrepancy was an under-utilisation of antenatal and postnatal services.

AMIHS programs in communities across the state are developed after community consultation, and focus on cultural respect, participation and collaboration with Indigenous people. The programs are collaborative in nature, and work closely with local government, NGOs and the community controlled health sector.

The project involves two workforces: midwives and AHWs. Midwives provide clinical care for expectant and new mothers, and AHWs are vital in allowing for a culturally supportive and welcoming environment. AHWs also provide an important link with other community agencies, and utilise existing community resources. A major workforce element of this project is the partnership between midwives and AHWs, who “work together to provide maternity service”<sup>156</sup>. State-wide training programs are delivered to midwives and AHWs, and promote resource sharing and relationships between different programs. A high level of staff retention was mentioned as an overall strength of the project.

Early results of the project indicate success. The attendance rate at first antenatal visit increased from 65% before the program to 78% in 2004. The rate of low birth-weight babies decreased, the proportion of premature births decreased from 20% to 11%, and breastfeeding rates increased. Importantly, Indigenous women accessing the programs reported that they trusted the service providers, especially due to the presence of an AHW, and appreciated the wider support system offered by the programs including transport to and from appointments, appointment reminders, and home visits.

### Regional Family Birthing and Anangu BiBi Birthing Program, South Australia

<b>Funded By:</b>	Federal Alternative Birthing Program <sup>156</sup>
<b>Participants:</b>	AMIC workers, midwives
<b>Status:</b>	Completed
<b>Key elements:</b>	<ul style="list-style-type: none"> <li>• Training of AHW to become AMICs</li> <li>• Partnership between midwives and AMICs</li> <li>• Cultural learning and partnership between Indigenous and non-Indigenous staff</li> <li>• Community consultation</li> </ul>
<b>Success indicators:</b>	Community satisfaction, high rate of antenatal visit attendance

<sup>154</sup> Elizabeth Murphy and Elizabeth Best, “The Aboriginal Maternal and Infant Health Service: a decade of achievement in the health of women and babies in NSW”, *NSW Public Health Bulletin* 23, no.3-4 (2012): 68-72.

<sup>155</sup> *ibid*, 68.

<sup>156</sup> *ibid*, 69.

A somewhat similar program to the NSW AMIHS was implemented in the two South Australian Indigenous communities of Whyalla and Port Augusta<sup>158</sup>. The voluntary program offered women in each community care from their enrolment in the program until 6-8 weeks after giving birth. The service delivery model was developed in consultation with local communities, especially expert advice from a group of Indigenous female elders.

Notably, this project involved a partnership between non-Indigenous midwives and Aboriginal Maternal and Infant Care Workers (AMICs). The AMICs involved in the program were previously AHWs but had received extra training in antenatal, birthing and postnatal care<sup>159</sup>. Midwives provided clinical care along with AMICs. AMICs also provided social and emotional support to patients, including contraception advice, housing and finance advice, culturally sensitive treatment and health promotion encouragement. The AMICs were an important link between Indigenous patients and non-Indigenous staff, and attended births in the mainstream hospital, where they advocated for culturally safe care. The partnership between AMICs and midwives were mutually beneficial, allowing for cultural learning for the midwives, and the provision of further clinical education for the AMICs.

Women in each community expressed satisfaction with the service and grew comfortable with service provision from Indigenous and non-Indigenous staff. The program showed positive performance when compared with the state in general; only 15.6% of women accessing the program had fewer than seven visits, compared to 39% state-wide. Participants expressed support for the program model and encouraged its implementation for all women within the two communities.

### Healthy Smiles Oral Health Program, Northern Territory

<b>Funded By:</b>	NT Department of Health
<b>Participants:</b>	AHWs, visiting oral care team
<b>Status:</b>	Ongoing
<b>Key elements:</b>	<ul style="list-style-type: none"> <li>• Increased access to visiting oral care team</li> <li>• Training of AHWs in oral care clinical skills</li> <li>• Community consultation</li> </ul>
<b>Success indicators:</b>	Improved rates of caries among group that received treatment

<sup>157</sup> Ann Larson and David Lyle, *A Bright Future for Rural Health: Evidence-Based Policy and Practice in Rural and Remote Australian Health Care* (ARHEN, year unknown), 34.

<sup>158</sup> GE Stamp et al, "Aboriginal maternal and infant care workers: partners in caring for Aboriginal mothers and babies", *The International Electronic Journal of Rural and Remote Health Research, Education Practice and Policy* 8 (2008): 1-12.

<sup>159</sup> Georgie Stamp et al, *Regional Family Birthing and Anangu BiBi Birthing Program: The First 50 Births*, Research report prepared for Northern and Far Western Regional Health Service. (Adelaide: Spencer Gulf Rural Health School, 2007).



The Healthy Smiles Oral Health Program is the result of a randomised controlled trial conducted in 30 remote communities in the Northern Territory<sup>160</sup>. The trial aimed to address the high rate of dental decay among Indigenous children of a pre-school age, and included a 9 month period of community consultation. Children in 15 communities were part of the group that received treatment. The study personnel travelled to each community in this group five times within the study period, and dentists/dental therapists applied an average of five fluoride varnishes to pre-school aged children in the communities. The trial showed that among communities receiving treatment, children had an average of 24-36% less decay than those in 15 control communities.

The key workforces involved in this trial were dentists and dental therapists, who provided the vast majority of varnishes, and also provided caries education to parents and other community members. An important workforce element of the trial involved training primary health care workers (usually AHWs) in the treatment communities on how to apply the varnishes. However, AHWs provided only 17 of 1,190 varnishes throughout the two year period<sup>161</sup>. Reasons postulated for this include an existing heavy workload, and a high turnover of staff.

The 'Healthy Smiles' program has been implemented throughout the NT since the completion of the trial. It consists of a training package delivered to nurses and AHWs in the NT which provides them with "oral health background information, knowledge about childhood caries as well as prevention and management of oral disease"<sup>162</sup>. An evaluation of this program has not been completed.

### Brien Holden Vision Institute Aboriginal Vision Program

<b>Funded By:</b>	Federal Government Department of Health and Ageing, NT Government Department of Health, Rural Health Continuing Education
<b>Participants:</b>	Local AMSs, visiting eye care teams
<b>Status:</b>	Ongoing
<b>Key elements:</b>	<ul style="list-style-type: none"> <li>• Visiting eye care team functions through existing AMSs</li> <li>• Training of AHWs to become eye health coordinators and eye health workers</li> </ul>
<b>Success indicators:</b>	Increase in confidence of health workers providing eye checks, increased referral to necessary services, community approval

<sup>160</sup> GD Slade et al, "Effect of health promotion and fluoride varnish on dental caries among Australian Aboriginal children: results from a community-randomized controlled trial", *Community Dentistry and Oral Epidemiology* 39, (2011): 29-43.

<sup>161</sup> KF Roberts-Thomson et al, "A comprehensive approach to health promotion for the reduction of dental caries in remote Indigenous Australian children: a clustered randomised controlled trial", *International Dental Journal* 60(2010): 245-249.

<sup>162</sup> Northern Territory Government Department of Health, "Oral Health Promotion", accessed April 6 2016. [http://health.nt.gov.au/Oral\\_Health/Oral\\_Health\\_Promotion/index.aspx](http://health.nt.gov.au/Oral_Health/Oral_Health_Promotion/index.aspx)

The Aboriginal Vision Program is an ongoing program, first implemented in NSW in 1999 and then in the Northern Territory from 2006<sup>163</sup>. It has established and/or supports 111 rural and remote eye clinics in NSW and 80 in the NT. The program facilitates visiting optometry clinics, which partner with ACCHOs and are delivered within existing AMSs. There are currently 100 optometrists participating in the program. The clinics aim to overcome barriers for Indigenous access to optometry services, by operating within a culturally safe model and integrating with other primary health care services.

An important aspect of the program has been the training of Regional Eye Health Coordinators, and Aboriginal Eye Health Workers. The training program allows existing local health workers to conduct basic eye care, including providing community education, children’s vision screenings, glasses, and following up patients, as well as facilitating the visiting optometry clinics. The Brien Holden Vision Institute collaborated with the Vision Cooperative Research Centre to develop the Eye and Vision Care Toolkit in 2010<sup>164</sup>. Since the introduction of the toolkit and establishment of a new skill set for ATSI Eye Health Coordinators, 44 coordinators and 232 primary health care workers have been trained<sup>165</sup>. This has led to an increase in the proportion of primary health care staff confident in providing eye checks, from 50% to 92%. The toolkit has also resulted in increased retinal exams for patients with diabetes, more referrals to optometry and ophthalmology services, an increase in cataract surgery from 3% to 32%, and higher rates of community approval.

### Aboriginal Mental Health Worker Training Program

<b>Funded By:</b>	NSW Ministry of Health
<b>Participants:</b>	NSW Ministry of Health, Charles Sturt University, NSW LHDs, mental health clinics
<b>Status:</b>	Ongoing
<b>Key elements:</b>	<ul style="list-style-type: none"> <li>• Involvement of Indigenous people in the workforce</li> <li>• Tertiary training in mental health</li> <li>• Cooperation between LHDs, trainee program and NSW Health</li> </ul>
<b>Success indicators:</b>	Increase in cultural awareness in mental health services, increase in the Indigenous mental health workforce in NSW.

The NSW Aboriginal Mental Health Workforce Program is an example of a successful workforce strategy for Indigenous health. In recognition of the high burden of mental illness on the NSW Indigenous population, the program aims to provide culturally sensitive and

<sup>163</sup> Brien Holden Vision Institute, “Aboriginal Vision Program”, accessed April 7 2016.

<http://www.brienholdenvision.org/our-work/western-pacific/australia/aboriginal-eye-care-program.html>

<sup>164</sup> Brien Holden Vision Institute Academy, “Eye & Vision Care Toolkit”, accessed April 7 2016.

<https://learning.brienholdenvision.org/courses/126>.

<sup>165</sup> Vision Cooperative Research Centre, *Vision for Every Australian, Everywhere: Eye care for Indigenous Australians*. (Sydney, year unknown).

appropriate mental health care to Indigenous people, primarily through the growth of “a highly skilled and professional Aboriginal mental health workforce”<sup>166</sup>.

The state-wide program began in 2007, with NSW Health employing Aboriginal Mental Health Worker Trainees<sup>167</sup>. The trainees are required to study a university degree related to mental health, and concurrently work in a practical capacity to receive on-the-job training and experience. Currently trainees all attend Charles Sturt University and undergo the Bachelor of Health Science (Mental Health)<sup>168</sup>. Funding is allocated to LHDs to employ two Aboriginal Mental Health Workers, who begin as trainees and go on to become permanent employees of LHD mental health services. In 2013, 43 trainees had completed the program, 25 had left the program, and 30 were undergoing training<sup>169</sup>.

Strengths of the program cited include building community capacity, increasing the proportion of Aboriginal staff within the mental health workforce, and the contribution of Aboriginal employees to cultural awareness and advocacy within the mental health sector<sup>170</sup>. A 2013 review found that the program did face some difficulties in implementation<sup>171</sup>. These included a lack of preparation of health services to incorporate trainees, confusion about the clinical capabilities of trainees, and poor relationships between LHDs and ACCHOs. However, overall it found that the program is valued within LHDs for increasing awareness of Indigenous mental health, delivering appropriate services to Indigenous people, and providing an opportunity for Indigenous people to be trained and work within the mental health sector<sup>172</sup>.

## General Findings on Workforce Issues for Indigenous Health

The research conducted for this report revealed several general findings and recommendations for workforce approaches to Indigenous health.

The importance of the presence of AHWs in delivering healthcare for the Indigenous population is paramount. Of Indigenous people who reported not accessing health care when they needed to in 2012-2013, 22% reported it was because they disliked the service or professional, or are embarrassed or afraid<sup>173</sup>. With cultural safety posited as “the most significant barrier to access to health care” for Indigenous people, AHWs provide a vital role in making health services welcoming and culturally sensitive<sup>174</sup>.

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<sup>166</sup> ARTD Consultants, *Evaluation of the NSW Aboriginal Mental Health Worker Training Program: Final Report Executive Summary*, (North Sydney: NSW Ministry of Health, 2013), 3.

<sup>167</sup> Carol Watson and Nea Harrison, *New South Wales Aboriginal Mental Health Worker Training Program: Implementation Review*, (Darwin: Cooperative Research Centre for Aboriginal Health, 2009), 6.

<sup>168</sup> *Ibid.*

<sup>169</sup> ARTD Consultants, *Final Report Executive Summary*, 5.

<sup>170</sup> Watson and Harrison, *Implementation Review*, 5.

<sup>171</sup> ARTD Consultants, *Final Report Executive Summary*, 7-13.

<sup>172</sup> *ibid.*, 5.

<sup>173</sup> Australian Health Minister's Advisory Council, *ATSI Health Performance Framework*, 142.

<sup>174</sup> Health Workforce Australia, *Growing our Future*, 1.

Indigenous patients have been found to access health services more readily if AHWs are present. One study found that as well as a higher rate of attendance, patients were more likely to receive clinical exams, and adhere to the delivery of diabetes services when more AHWs were employed<sup>175</sup>. Another study postulated that the success of one community's primary health care could be attributed to the stability and high quality of the staff, including AHWs<sup>176</sup>. HealthInfoNet argues that the presence of more AHWs, as well as more Indigenous people within health professions, will render health services more accessible for Indigenous patients<sup>177</sup>.

It was suggested that AHWs were central in delivering care for Indigenous patients with diabetes<sup>178</sup>. Several sources specifically emphasised the role of AHWs in diabetes-related foot care. Ewald et al propose that AHWs could provide "first line treatment" including screening and recalls for patients with DRFD<sup>179</sup>. The NHMRC suggest the provision of foot examination kits to AHWs may improve the delivery of foot care in rural and remote communities<sup>180</sup>. Watson et al argue that foot care programs and 'discussions' are best initiated by AHWs in Indigenous communities<sup>181</sup>. Townsend recommends that AHWs should work "alongside podiatrists" in Indigenous communities in delivering DRFD care<sup>182</sup>.

There has been some evidence to question the effectiveness of AHWs in improving diabetes control. One recent study<sup>183</sup> found that intensive AHW management for Indigenous patients with poorly controlled diabetes achieved only modest improvements despite a large input of funding. However, the effect of other factors such as life stressors and socio-economic disadvantage was not measured and may explain the suboptimal outcome.

As well as the presence and participation of AHWs, an important workforce element for successful approaches to Indigenous health issues is the cultural training and competence of non-Indigenous staff. The third key performance indicator for the National Aboriginal and Torres Strait Islander Health Workforce Strategic Framework is a "competent workforce to meet Aboriginal and Torres Strait Islander needs", achieved through an increase in cultural knowledge and training for the current non-Indigenous workforce<sup>184</sup>. This is echoed by HealthInfoNet who list culturally competent non-Indigenous staff as a factor improving access to health services for Indigenous patients<sup>185</sup>.

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<sup>175</sup> Damin Si et al, "Aboriginal health workers and diabetes care in remote community health centres: a mixed method analysis", *Medical Journal of Australia* 185 (2006): 40-45.

<sup>176</sup> LJ Maple-Brown et al, "Diabetes care and complications in a remote primary health care setting", *Diabetes Research and Clinical Practice* 64(2007): 77-83, 82.

<sup>177</sup> Australian Indigenous HealthInfoNet, "Summary of Australian Indigenous Health 2014".

<sup>178</sup> D Atkinson et al, "Diabetes". In *Aboriginal Primary Health Care: An Evidence-Based Approach*, edited by Sophia Couzos and Richard Murray (South Melbourne: Oxford University Press, 2008), 544.

<sup>179</sup> Ewald et al "Hospital Separations", 278.

<sup>180</sup> NHMRC, *National Evidence-Based Guideline*, 37.

<sup>181</sup> Jennifer Watson et al, "Diabetic Foot Care: Developing Culturally Appropriate Educational Tools for Aboriginal and Torres Strait Islander Peoples in the Northern Territory, Australia", *The Australian Journal of Rural Health*, 9(2001): 121-126, 124.

<sup>182</sup> Townsend, *Evaluation of the NSW Indigenous Diabetic Foot Project*, 5.

<sup>183</sup> Leonie Segal et al, "Economic evaluation of Indigenous health worker management of poorly controlled type 2 diabetes in north Queensland", *Medical Journal of Australia*, 204, no.5 (2016): 196.

<sup>184</sup> Aboriginal and Torres Strait Islander Health Workforce Working Group, *National Aboriginal and Torres Strait Islander Health Workforce Strategic Framework 2011-2015*, (Australian Health Ministers' Advisory Council, 2011).

<sup>185</sup> Australian Indigenous HealthInfoNet, "Summary of Australian Indigenous Health 2014".

## Observations from Key Informant Interviews

The research for this report included three Key Informant interviews with Australian podiatrists specifically interested in DRFD. The following section will summarise the main workforce issues identified in these interviews.

### The Screening Process

A significant point addressed in each interview was the role of podiatrists in the screening of DRFD.

- The National Clinical Guidelines recommend that foot screening for DRFD can be undertaken by any suitably qualified health professional.
- One interviewee stressed the important role of non-podiatrists (such as AHWs) in the screening and assessment of low-risk feet, and indicated that this could allow podiatrists a stronger focus on high-risk feet.
- Another interviewee agreed with the guideline perspective that non-podiatrists should be practicing in screening feet, but expressed that this does not often happen in practice. In the experience of this interviewee, other health professionals do refer their patients with diabetes to a podiatrist, but often do not undertake a comprehensive risk assessment, meaning that much of the 'triage' for DRFD is still conducted by podiatrists. As podiatrists have feet as their first priority, they are the most appropriate health professional to advocate for foot care.
- A third interviewee expressed their support for the upskilling of non-podiatrists (such as AHWs and Allied Health Assistants) in screening for and assessing DRFD, and especially in educating patients about preventing ulceration. However, they also indicated that foot status needs to be considered and managed among the wider context of a patient's diabetes, and that podiatrists are more suited to delivering this more complex care.

### Podiatrists and High-Risk Feet

- All three interviewees expressed the view that podiatrists are vital in the management of high-risk feet, and that patients with active DRFD should have access to podiatry and multidisciplinary care.
- The role of podiatrists in screening for and measuring peripheral vascular disease was emphasised.
- Podiatrists were seen as central to care coordination for patients with DRFD, and their role in liaising with GPs to make appropriate referrals to other health professionals, such as vascular surgeons and orthopaedic surgeons, was pointed out.
- Access to podiatry care was seen as vital to patients with a history of DRFD, as the re-ulceration rate is around 50%.

- One interviewee mentioned that it is a “no-brainer” that patients with DRFD require immediate and unfettered access to multidisciplinary foot care, including podiatry care<sup>186</sup>.

### **Podiatrists in Rural and Remote Australia**

- Two interviewees mentioned issues with the podiatry workforce in rural and remote areas.
- It was mentioned that most podiatrists working in rural/remote areas work in a visiting, or fly-in-fly-out capacity.
- A lack of support networks for rural podiatrists was identified. The importance and success of a state-wide network of podiatrists, such as the one currently in place in Queensland, was mentioned.
- The high turnover of podiatrists in rural areas was mentioned and attributed to burnout, being overwhelmed, and feeling isolated.
- It was mentioned that the spread of podiatrists in NSW is highly variable and suggested that this needs to be made more equitable for DRFD to be adequately addressed.
- It was suggested that the residential podiatry workforce in rural/remote areas is often more junior than the general podiatry workforce. The lower numerical amount of foot complications they see may lead to difficulties in maintaining an adequate skill set to deal with high-risk feet.

### **Indigenous Access to Podiatry**

- All three interviewees noted barriers for access to healthcare for Indigenous people. These included:
- Unavailability of podiatry in rural/remote areas and the burden of travelling away from one’s comfort zone and family networks.
- Cultural issues including a fear of/hesitation to attend hospital.
- A perceived stereotype within the Australian healthcare system which places the onus of negative health outcomes on Indigenous people themselves rather than on wider social and systemic issues.
- Obligations to their communities and competing responsibilities meaning that Indigenous people are less likely to be ‘selfish’ about their own healthcare needs, including having responsibilities to their families, which generally have more children than non-Indigenous families.
- An erosion of trust between Indigenous people and care providers.
- Lack of Indigenous podiatrists in the workforce, who Indigenous people may be more comfortable seeing.
- The cost of private podiatrists, which is prohibitive for many Indigenous people, and the current funding model which allows for 10 allied health visits annually is

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<sup>186</sup> Vanessa Nube, Interview by Virginia DeCourcy and Anne Buck, (Canberra, March 30 2016).

not sufficient for patients with a chronic disease (who require multiple allied health services).

- A lack of education amongst the Indigenous population around what a podiatrist is and why they may need to see one.
- Indigenous people feeling separated from the health system and being 'put off' by the institution of health.
- Services not delivered in a well-understood language and presence of health jargon which is difficult to understand and unhelpful.

### **The Public/Private Podiatry Workforce**

- All three interviewees discussed to some extent the differences between the public and private podiatry workforces.
- Advantages of the private workforce identified included a wider scope of practice, being more cost-effective for the health system, and shorter waiting times.
- A major disadvantage of the private workforce identified was the prohibitive cost of private care for many Indigenous patients, particularly those who have a chronic condition and who require more than the 10 allied health visits per year allocated under the Medicare Benefit Scheme system.
- It was suggested that private podiatrists have a disincentive to see patients with complex needs, particularly those from a lower socio-economic background, because it is not financially feasible for the podiatrist to manage a caseload with a high proportion of patients with complex needs (i.e. they may have to devote a large amount of time to the patient but due to the patient's circumstances are not able to charge them a high fee).
- Advantages of the public workforce identified included their focus on patient outcomes and access based on clinical need. In addition, the podiatry workforce has specific skills in the management of diabetic foot complications.
- One interviewee suggested that there should be a more equitable distribution of podiatrists state-wide in the public health system, based on community needs.
- Disadvantages of the public workforce identified included long wait times or lack of services, and potentially overburdened staff.
- It was emphasised by all three interviewees that the optimum approach to DRFD would include an integrated public/private approach.

### **Collaboration with Community-Controlled Health Organisations**

- Each interviewee expressed the importance of podiatry services being integrated with community-controlled AMSs Services for effective service delivery to Indigenous people.
- An effective model in which a high-risk foot clinic worked with the local AMS was discussed. Podiatrists from the clinic travelled to the AMS weekly to see Indigenous patients there. When complications arose, high-risk patients attended the clinic itself. This enabled Indigenous patients to feel more comfortable receiving care.
- Two interviewees stressed the importance of communities taking a leading role in healthcare programs, and particularly having known local staff implementing the

care. One interviewee suggested that if an external health professional was needed, that they are “imported through the known health workers”<sup>187</sup>.

- One interviewee suggested that healthcare strategies for Indigenous people first address the existing health resources within the community, and “not having a third party from any organisation come into a community and try to implement change”<sup>188</sup>.

### **The Indigenous Health Workforce**

- AHWs were suggested by one interviewee as a key component of the DRFD screening process, especially in educating people with diabetes about how to take care of their feet.
- It was mentioned that in terms of DRFD, AHWs could be trained in basic clinical tasks including basic foot care, data collection, instrument sterilisation, note-taking and patient communication.
- It was mentioned by two interviewees that Indigenous health programs should include staff members from the local community, especially AHWs.
- One interviewee noted that adding clinical tasks to an AHW’s existing very high workload may be difficult.
- One interviewee noted that in their experience, some non-Indigenous health professionals place the onus of bad health upon Indigenous people themselves. For example, that the reason for their poor health outcomes is the fault of Indigenous people. The interviewee highlighted that this stereotype is not “conducive to improving the health of Aboriginal people”.
- AHWs were thought to be valuable because they have an ability to relate to Indigenous patients, as well as providing a link between the community and the health service by bringing local people to the health service.
- It was mentioned by one interviewee that engaging young Indigenous people to become members of the health workforce was important. So far efforts by the Australian health system have focused on doctors, and this has been successful, but more effort/funding is needed in the allied health sector.

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<sup>187</sup> Jason Warnock, Interview with Virginia DeCourcy and Anne Buck, (Canberra, March 29 2016) .

<sup>188</sup> Matthew West, Interview with Virginia DeCourcy (Canberra, April 5 2016).



## Discussion

This report provides a scan of evidence available on DRFD in the Indigenous population of NSW, and related workforce approaches. The evidence reviewed covers the prevalence of DRFD, interventions successful in addressing DRFD and Indigenous health conditions and workforce approaches to DRFD and Indigenous health. Several key themes have emerged as relevant to explore when considering the research questions used to guide this project.

### Podiatrists

Podiatrists are a vital workforce component in the treatment of DRFD. Their important role in secondary prevention and treating high-risk patients is widely agreed upon. Both the NHMRC's national guideline and the TRIEPodD podiatry competency framework recommend podiatry care for patients at a high risk of or with current DRFD. Regular podiatry care has been shown to reduce risk of re-ulceration, reduce pressure on the sole of the foot, and lessen the seriousness of infections in patients with DRFD. Podiatrists are also an important element of multidisciplinary teams treating patients with DRFD. Podiatrists played a key role in each of the workforce strategies addressing DRFD discussed in section three. Importantly, the involvement of podiatrists in foot care has been shown to decrease the cost of DRFD to the health system.

The role of podiatrists in screening patients at low risk of DRFD is less clear. Literature points to the "special skills" possessed by podiatrists in this regard<sup>189</sup>, and emphasises their role in preventative screening. However, national and international guidelines highlight that this low-risk screening role may be filled by non-podiatrists. While it is clear that other health workers have or can acquire the skills to undertake preventative screening, the challenge appears to be putting this into action. It was suggested that non-podiatrists "whose role it is to do those screenings don't seem to take them up unless there is very strong championing from podiatrists"<sup>190</sup>. Feet and foot care is core business for podiatrists, and the prime focus of their interaction with people with diabetes. For other health workers, screening for DRFD is likely to be just one component of the diabetes related treatment they provide. This should be taken into account when relying on non-podiatry workforces to undertake preventative screening.

There are significant data gaps about the size, geographic distribution and work setting of the NSW podiatry workforce. What is known is that there are fewer podiatrists in NSW, compared with other jurisdictions. The geographic distribution appears to be skewed towards urban areas, and the majority of podiatrists work in private practice<sup>191</sup>.

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<sup>189</sup> Apelqvist and Larsson, "Most effective way to reduce amputation", 76.

<sup>190</sup> Ibid.

<sup>191</sup> Health Workforce Australia, *Podiatrists in Focus*, 14.

In 2012, only 0.4% of podiatrists nationally reported that their main job was in an Aboriginal health service. Within the public sector in NSW, it was suggested there has been little growth or increase in podiatry positions and more podiatrists are needed.

This suggests that Indigenous people are likely to have difficulty in accessing podiatry services. The lack of podiatrists working in rural and remote areas of NSW is a barrier to access for Indigenous people living outside major cities. They may feel uncomfortable travelling away from country and family to access health care. Private podiatry services may be unaffordable for people with diabetes as it and other chronic diseases are associated with lower socioeconomic status<sup>192</sup>. This aligns with reports that cost was a common reason for Indigenous people failing to access health services, and the most common reason for not having private health insurance<sup>193</sup>. At the same time, there is some evidence that podiatry services are available through Aboriginal primary health-care services<sup>194</sup>. Developing a more comprehensive understanding of the distribution of the podiatry workforce across workforce settings and geographic areas is necessary to respond to the challenge of preventing and treating DRFD among Indigenous people.

There is a lack of Indigenous podiatrists in the Australian podiatry workforce. This is a concern as Indigenous podiatrists would be well placed to provide leadership in addressing DRFD among Indigenous people. Culturally responsive health care is important for Indigenous people<sup>195</sup> and an Indigenous staff is an important factor in whether or not Aboriginal and Torres Strait Islander people are able to effectively access health services<sup>196</sup>. Indigenous podiatrists could also play a critical role in developing effective approaches with Indigenous communities to prevent and manage DRFD.

This report did not explore the potential of the Podiatry Assistant role because of the dearth of evidence. However AHAs are commonly considered to provide potential to free up the allied health professional capacity by undertaking routine tasks. Further investigation of the effectiveness of these roles in other professions may be of assistance.

Potential strategies to increase and improve the distribution of the podiatry workforce include promoting podiatry as a career, providing support for studying podiatry as a career, mentoring for podiatrists working in rural and remote areas, and creating employment for podiatrists according to population need. Action is needed to increase the number of Indigenous podiatrists in particular, which should also include the above strategies.

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<sup>192</sup> Australian Institute of Health and Welfare. *Australia's Health 2014*. Canberra: AIHW, 2014.

<sup>193</sup> Australian Health Minister's Advisory Council, *ATSI Health Performance Framework*, 157.

<sup>194</sup> Australian Institute of Health and Welfare, *Access to health services for Aboriginal and Torres Strait Islander people*, (Canberra: AIHW, 2011), 9.

<sup>195</sup> Health Workforce Australia, "Growing our Future", 1.

<sup>196</sup> R Ivers, et al, *Issues Relating to Access to Health Services by Aboriginal and Torres Strait Islander People*, Discussion paper prepared for Department of Public Health and Community Medicine, University of Sydney (Sydney, 1997).

## Aboriginal Health Workers

The evidence demonstrates that AHWs are critical to providing health care to Indigenous people. They increase the likelihood of Indigenous patients accessing a service, and are important in bridging the gap between Indigenous patients and the Australian healthcare system. They are critical to providing culturally sensitive care and a safe space in which Indigenous patients feel comfortable accessing treatment. Of the successful case studies focused on Indigenous health, all involved AHWs at some level.

Providing training for AHWs to become specifically skilled in foot care is a potential approach to addressing the problem of DRFD amongst Indigenous people in NSW. The report includes successful models in which AHWs were trained in one specific health area, and went on to practice in it. An important factor appears to be providing the AHW as an additional resource and ensuring the AHW's role is focused on a specific area of practice.

Case studies outlined in the workforce section of this report indicate that the upskilling of AHWs in specific health areas is associated with positive health outcomes. The Regional Birthing and Anangu BiBi Birthing Program in SA showed that training AHWs in maternal and infant health resulted in a successful program, which local women found accessible and appropriate. Similarly, the training of AHWs to become eye health coordinators and eye health workers in the Aboriginal Vision Program led to positive patient outcomes. These included increased exams, referrals, cataract surgeries, and widespread community approval.

Training alone for AHWs to screen low-risk patients for DRFD is unlikely to be successful. Two of the case studies described in this report relied on training for AHWs without creating new roles of additional capacity. Both showed that AHWs had difficulty implementing extra training into their daily practice. The clinical trial preceding the Healthy Smiles Program found that although AHWs received training, they delivered very few fluoride varnishes. The Laramba diabetes project found that local health workers found "building health promotion into health centre practice" difficult. Both case studies suggested the pre-existing heavy workload carried by AHWs and high demand for other medical care was an issue. This corresponds with anecdotal evidence from a key informant, who suggested that AHWs may find it difficult to add foot screening to their list of clinical activities because they experience a very high daily workload<sup>197</sup>. Indeed, AHWs have been reported to work an average of 40.5 hours per week, the longest working week reported for any allied health workforce<sup>198</sup>.

This report has also identified a possible role for non-podiatrists to be involved in the screening of DRFD among low-risk patients with diabetes. The NHMRC national guideline and the TRIEPodD UK Competency Framework both suggest that non-podiatrists have the ability to assess low-risk patients for DRFD. The role of non-podiatrists in this regard is useful as it may allow the podiatry workforce to focus on more complex high-risk cases. This

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<sup>197</sup> Matthew West, Interview with Virginia DeCourcy, 5<sup>th</sup> April 2016.

<sup>198</sup> Australian Institute of Health and Welfare, *Allied Health Workforce 2012*, (Canberra: AIHW, 2013), xi.

suggests potential to use not only for AHWs but also Podiatry AHAs. However, the two roles have some important differences. One is that the Podiatry AHA works under the delegation of a podiatrist. Another difference is that the AHW role is focused on providing culturally appropriate care and involves a high degree of community engagement.

The demonstrable success of training AHWs in specific clinical tasks, as well as an identified role for non-podiatrists in DRFD screening, suggests that having AHWs as designated foot care workers would likely be a successful approach. This would be particularly useful in very remote areas, where the rate of AHWs is relatively high compared to podiatrists (26.6<sup>199</sup> compared to 7.7<sup>200</sup> FTE/100,000 population).

While the suggestion of creating an AHW foot care role has promise, there are some issues to be considered. There are only 107 AHWs in NSW who are registered with AHPRA as ATSIHPs. Additional ATSIHPs may need to be developed or the AHW foot care role may need to be designed to fall within the scope of other AHWs.

## Integrated Health Care

Tackling chronic disease has been described as the biggest health burden Australia faces<sup>201</sup>. It requires an integrated and coordinated health care system, particularly in primary health care<sup>202</sup>. It is not surprising that this report found evidence that integrated care is central to the delivery of both health programs for DRFD and health programs for Indigenous communities.

On a clinical level, guidelines for the management of DRFD recommend an integrated approach which comprises multiple strategies including foot care, patient education and the provision of appropriate footwear. Importantly, the most resounding finding on DRFD treatment is that care should be delivered in an integrated manner by a multidisciplinary foot care team, comprising a range of medical, nursing and allied health professionals<sup>203</sup>.

From a service delivery perspective, health strategies delivered in partnership with existing local institutions have been highly successful in providing effective services to Indigenous people. A significant proportion of the case studies discussed identified an integrated model of service delivery as central to the success of their program. Usually, this involved program teams working with and through existing AMSs/ACCHOs. Another important element of service integration was collaboration between public sector community and hospital based services, non-government organisations including Medicare Locals and private providers.

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<sup>199</sup> Australian Institute of Health and Welfare, *Detailed tables: Aboriginal and Torres Strait Islander Health Practitioner workforce 2014*, (Canberra: National Health Workforce Data Set, 2014).

<sup>200</sup> AIHW, *Podiatry Workforce 2014*.

<sup>201</sup> Australian Institute of Health and Welfare, *Australia's Health 2014*, (Canberra: AIHW, 2014).

<sup>202</sup> Primary Health Care Advisory Group, *Final Report Better Outcomes for People with Chronic and Complex Health Conditions*, (Canberra: Department of Health, 2016).

<sup>203</sup> Quinlivan et al, "Reduction of amputation rates".

Aboriginal controlled health services were central to the success of the case studies as they worked with other partners to identify the most practical and workable solutions to meet the needs of the local community. They also ensure the solutions are culturally sensitive. In addition, advantages of integrated approaches included convenient locations and familiar environments for Indigenous patients, multiple aspects of health care needs were managed by one service provider, a multidisciplinary team working towards the same goals for their patients, and shared learnings from other members of the multidisciplinary team.

The evidence suggests that managing DRFD among Indigenous people will require approaches that integrate services across multiple levels of the health care system. It is likely that funding models will greatly influence what is achievable. Information about the funding arrangements of the various case studies was not readily available but it is assumed that most initiatives depended on a mixture of ongoing and short term funding sources. The recently announced trial of bundled payments to general practice health care homes may develop into an appropriate and sustainable funding model for chronic disease management<sup>204</sup>. In the current environment, it is likely that funding will continue to be a limiting factor on the development of sustainable integrated approaches to manage DRFD.

When considering workforce strategies to address DRFD in the Indigenous population, the need for multidisciplinary team based care and care integrated across parts of the health system should be taken into account.

## Community Ownership

The fundamental importance of community ownership to healthcare programs for Indigenous communities has been a key finding of this report. Guidelines, case studies and anecdotal evidence agree that any program is unlikely to be successful unless it has support, participation and leadership from the local community.

An important aspect of this is that the community should shape the design of health care programs that are delivered to their community. In both the Better Living Diabetes Project and the Laramba Diabetes study, the community contributed to developing and designing the program. This community participation at the design stage allows local cultural customs to be integrated into the service, and community needs to be accommodated.

Other aspects of community ownership include enabling community members to be employed as program staff, with oversight from community leaders and elders. These features provide Indigenous leadership within the program. In the Laramba Diabetes study, the steering committee had a strong leadership role which intensified over the course of the project, eventuating in their successful application for continued project funding.

Observations from key informant interviews also emphasised the importance of community leadership for Indigenous health programs.

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<sup>204</sup> The Hon Susan Ley MP- Minister for Health, *New Medicare Payment Model for Chronically-ill Patients (Media Release)*, 31 March 2016.

One interviewee remarked that being “home owned” and involving known staff and services was the most effective model to lessen the burden of DRFD in Indigenous communities<sup>205</sup>. Another interviewee stressed the importance of the local community leading and implementing programs, and recommended against “having a third party...come into a community and try to implement change”<sup>206</sup>.

A community owned approach is strongly advised for any measures to address DRFD in Indigenous communities. A ‘one size fits all’ approach is extremely likely to be ineffective, which creates some challenges when developing workforce strategies which are more commonly deployed at a system wide level. The NSW AMIHS is an example of a successful state-wide approach to Indigenous health, in which separate programs have been developed across the state, in each case developed with community collaboration. Despite having core elements in common (such as the midwife/AHW partnership), programs differ in terms of institutional integration and specific service delivery. In developing a system or state-wide approach to DRFD in Indigenous communities, the success of this model should be noted. It may be necessary to identify a suite of workforce measures, and communities could draw on those that would best suit their requirements.

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<sup>205</sup> Jason Warnock, Interview with Virginia DeCourcy and Anne Buck, (Canberra: April 29 2016).

<sup>206</sup> Matthew West, Interview with Virginia DeCourcy, (Canberra: April 5 2016).

## Key Findings

- Available evidence indicates that DRFD among Indigenous people is more prevalent than non-Indigenous people in Australia.
- An absence of available data on the rate of DRFD among Indigenous people in NSW is problematic when gauging the scale of the problem, and thus determining appropriate solutions. There is a clear opportunity for research to be progressed in this area.
  - Data on amputations could be used to give a cost to the problem.
- AHWs can be trained to undertake foot screening of people with diabetes, helping prevent DRFD.
- Case studies have shown that AHWs, when upskilled or trained in a specific area, have a positive impact on patient outcomes when they are deployed as an additional resource in health services.
- Podiatrists are central to the treatment of DRFD.
- The podiatry workforce in NSW is small, especially in rural areas where the burden of DRFD is higher, and where a higher proportion of the population is Indigenous. Achieving a more equitable spread of podiatrists across NSW appears to be necessary to adequately address the issue of DRFD in Indigenous NSW.
- There is a very small number of Indigenous podiatrists in Australia. Indigenous podiatrists could provide Indigenous leadership to improve the prevention and management of DRFD among Indigenous populations.
- Best practice for the treatment of DRFD indicates that a multidisciplinary team is highly effective in treating established DRFD. This indicates that podiatrists and AHWs, although central to addressing this problem, are not the only workforces that need to be focused on when addressing this problem.
- Integrating with existing local health care providers, especially ACCHOs, is paramount to the delivery of successful healthcare programs for Indigenous people.
- Health programs focused on Indigenous health concerns are successful with Indigenous leadership, and a high level of community consultation and participation.
- It is evident that there have been efforts made to address the problem of DRFD within the Indigenous population. Approaches have been ad hoc and evaluation of their impact on health outcomes has been scant. There is an opportunity for future research in this area, especially the effect such programs have on clinical outcomes such as ulceration and amputation rates.

These findings suggest a range of strategies that may be useful in preventing and managing DRFD among Indigenous people in NSW. Further exploration of these strategies should be considered. These include:

- Creating a new role for AHWs as designated foot care workers.
- Increasing the number of Indigenous podiatrists.
- Increasing the number of podiatrists in general, and their distribution across NSW.
- Integrating podiatry services into Aboriginal controlled health services.

## Conclusion

Indigenous health is incredibly complex. There is no easy or 'one-size fits-all' solution. The disadvantage suffered by Indigenous people is deep-rooted and systemic.

Any approach addressing Indigenous health needs to place specific health problems faced by Indigenous people within the wider context of Indigenous social, political and economic disadvantage. It should also acknowledge that mainstream approaches to health and wellbeing may not be directly applicable to Indigenous communities. Solutions are unlikely to be successful if they are seen as external to the community, and should involve Indigenous institutions, clients and staff as active participants and contributors.

A larger and more evenly spread podiatry workforce will be necessary in addressing the problem of DRFD amongst the Indigenous population of NSW. However, a successful approach will likely involve a multidisciplinary team and other workforces, especially Aboriginal Health Workers.

Finally, the lack of research in the specific space of Indigenous DRFD in NSW, as well as evaluated workforce strategies targeting DRFD, should be addressed before any widespread program or workforce approach is implemented.



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