

# What about the soles: We need the primary data in Aboriginal and Torres Strait Islander foot health to 'Close the Gap'

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## Highlights

- This paper provides evidence to support the opinion that there needs to be more foot health screening and assessment in primary health to 'Close the Gap' on foot health for Aboriginal and Torres Strait Islander peoples.
- It is believed that this paper contributes to the understanding of foot health and preventing the complications of diabetes for Aboriginal and Torres Strait Islander peoples.
- It is believed that this paper will help reduce foot complication for Aboriginal and Torres Strait Islander peoples.

## Background

Aboriginal and Torres Strait Islander peoples have flourished in one of the harshest continents in the world for thousands of generations, with evidence of them being extremely fit and healthy, and a long life expectancy (Charles et al. 2020; Charles and O'Brien 2020). In the recent past, Aboriginal and Torres Strait Islander societies and communities have experienced significant impacts through the

arrival of Western cultures and dispossession (Dodson 2010; Reynolds 1974). This has resulted in substantial changes to Aboriginal health and wellbeing, and has affected every aspect of life; however they have remained a resilient and strong population through connection to family, culture, community and Country (McLennan 2015; Usher et al. 2021).

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The burden of disease caused by diabetes mellitus is well documented and is increasing in Aboriginal and Torres Strait Islander communities in Australia, with rates recorded at approximately eight per cent (Australian Bureau of Statistics 2019; Brand et al. 2009; Davis et al. 2006). Whilst there have been some improvements in life expectancy for Aboriginal and Torres Strait Islander peoples (ABS 2023), the incidence of diabetes compared with non-Aboriginal Australians is three to four times higher (Brand et al. 2009). Diabetes is one of the fastest growing chronic diseases globally (WHO 2016), with an estimated cost to the Australian health system of \$3 billion in 2018–19 (AIHW 2023a). Diabetes is the leading cause of lower limb amputation in Australia (Lazzarini et al. 2012a; Lazzarini et al. 2023), with foot health disease alone costing Australian taxpayers an estimated \$1.6 billion annually (Ahmed et al. 2021), which is over half the total cost of diabetes nationally.

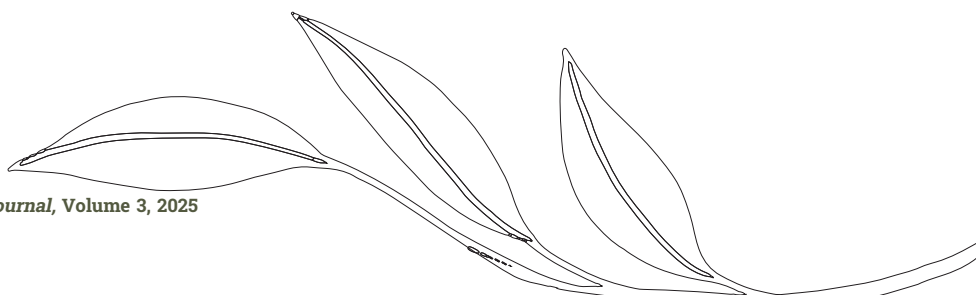
Historical and current deficits in modern healthcare for Aboriginal and Torres Strait Islander communities has led to a burden of disease that is 2.3 times the rate of non-Aboriginal Australians (Gerrard et al. 2021; Wong et al. 2005). Part of this burden relates to foot and lower limb health, with Aboriginal and Torres Strait Islander peoples having a three to six-fold increased risk of experiencing a foot complication related to diabetes, and up to a 38-fold higher rate of amputation (West et al. 2017; Zhang et al. 2021). There are limited foot care services for preventative care for Aboriginal and Torres Strait Islander communities, which has contributed to these complications (Norman et al. 2010; O'Rourke et al. 2013; West et al. 2016). Effects of ongoing distrust of healthcare systems linked to institutional and historical racism impact the health and wellbeing of Aboriginal and Torres Strait Islanders through diseases such as diabetes (Australian Institute of Health and Welfare 2017; Laverty et al. 2017; Menzies 2019; Paradies et al. 2008).

Developing culturally safe frameworks in healthcare requires the inclusion of local Aboriginal and Torres Strait Islander voices in the development and decision-making process (NATSIHWA 2016). Positive change to foot health outcomes can only be made with a more comprehensive understanding of Aboriginal and Torres Strait Islander perceptions and attitudes to good foot health. The experts in Aboriginal and Torres Strait Islander health are Aboriginal and Torres Strait Islander peoples (Sherwood and Edwards 2006).

Aboriginal and Torres Strait Islander peoples need to be heard. Policymakers need to listen to their perspectives and make changes that will allow them to be free from the burden of poor health and live long, healthy lives as they have in the past. The new diabetes foot health guidelines developed by Diabetes Feet Australia were the first to recognise that Aboriginal and Torres Strait Islander experts must be involved in developing guideline policy in foot health (Chen et al. 2022; Chuter et al. 2022; Commons et al. 2022; Fernando et al. 2022; Kaminski et al. 2022; Lazzarini et al. 2023). To help prevent foot health complications, Aboriginal and Torres Strait Islander foot health experts have suggested that more regular and opportunistic foot health assessment is required (Kaminski et al. 2022). Many Aboriginal and Torres Strait Islander organisations and individuals have asked for research to address Aboriginal and Torres Strait Islander inequality in foot health outcomes (Charles 2015; Charles 2017, 2018; Chuter et al. 2022), yet there are still limited primary data on foot health.

### **Establishing the need**

Early identification of risk is critical to the implementation of preventive management. There is evidence that Aboriginal and Torres Strait Islander peoples have different foot biomechanics than





non-Aboriginal Australians, particularly reduced dorsiflexion of the foot (equinus) due to tight gastrocnemius (Charles 2017, 2018; Charles et al. 2020). Equinus may contribute to increased forefoot pressure, causing greater risk of biomechanical injury and the development of callus and corn. This increased pressure can lead to forefoot ulceration, and diabetes may amplify this process (Charles 2017). Therefore, the authors recommend that a basic foot biomechanical assessment, including foot dorsiflexion, be regularly undertaken as part of a foot screening process to reduce the risk of diabetes foot complications (e.g. ulceration, infection and amputations), especially for those Aboriginal and Torres Strait Islander community members with diabetes.

Development of diabetes related complications such as retinopathy, nephropathy and neuropathy (Brand et al. 2009) is reported to often precede the diagnosis of diabetes itself for the Aboriginal and Torres Strait Islander community (NACCHO/RACGP 2018b). These complications are indicative of sustained hyperglycaemia (Nathan 1993). A recent systematic review demonstrated a three to six-fold increased risk in rates of diabetes-related foot complications for Aboriginal and Torres Strait Islander Australians compared with non-Aboriginal Australians (West et al. 2017). It is also reported that Aboriginal and Torres Strait Islander Australians experience lower limb amputation rates as high as 38 times that of non-Aboriginal Australians (West et al. 2017; Norman et al. 2010).

The lack of primary foot health data – that is, data on current foot health status collected in a primary health setting such as a community health clinic, Aboriginal community-controlled health organisation or Aboriginal medical service in a similar fashion to obtaining a blood pressure reading or a blood glucose

level as part of a routine check-up – is concerning and limits the understanding and identification of existing foot health problems in the community. At present, rates of diabetes-related foot disease and associated complications are captured in datasets provided by tertiary hospital settings, many in major capital cities, that provide services to people with diabetes-related foot complications through high-risk foot teams. This data capture focuses on presentations that are established and potentially life threatening rather than understanding the status of foot health in the community prior to development of such complications.

Diabetes Australia (2016) lists the top five locations for lower limb amputation, in a tertiary health setting event, across Australia (per 100,000 population) as remote areas of the Northern Territory, Queensland, South Australia, Western Australia and Darwin, all locations that have high proportions of Aboriginal and Torres Strait Islander residents (AIHW 2023c). The Diabetes Feet Australia 2021 Foot Care in Practice guidelines lists ‘assessing all people with diabetes and stratifying their risk of developing foot complications’ as the first key element to prevention (Diabetes Feet Australia 2021), which is a recommendation also made by Diabetes Australia in 2016 (Diabetes Australia 2016). Outcome One of the National Agreement on Closing the Gap 2019 is ‘Aboriginal and Torres Strait Islander people enjoy long and healthy lives’; the target under this outcome is to ‘Close the Gap in life expectancy within a generation, by 2031’ (Commonwealth 2020; National Indigenous Australians Agency 2020).

Considering diabetes as a stand-alone condition, and specifically diabetes-related foot disease, which are both conditions that disproportionately afflict Aboriginal and Torres Strait Islander peoples, the authors believe that Australia needs to build an evidence base of the true foot health problem: diabetes-related changes in





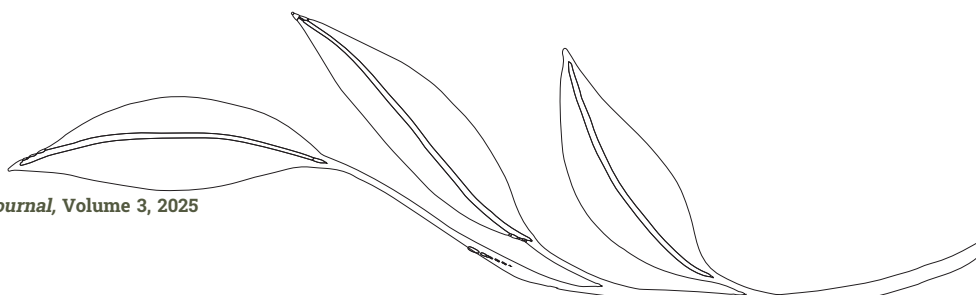
foot health such as peripheral vascular disease and peripheral neuropathy in addition to biomechanical presentations prior to developing an ulcer or other related acute complications. The authors believe that the best approach to achieving this is to conduct systematic foot screening in primary health in accordance with Diabetes Feet Australia Guidelines ([Diabetes Feet Australia 2021](#)). There are potential tools and system mechanisms to address these gaps in primary foot health data. The Medicare Benefit Scheme (MBS) Item 715 Aboriginal and Torres Strait Islander health check ([DHAC 2024](#)) offers an excellent mechanism for foot screening and assessment to be conducted on a regular basis. However, there is minimal mention of foot health in the MBS Item 715, which enquires whether the person has visited a podiatrist, rather than conducting an assessment and collecting valuable data. The authors believe that this is an oversight and the inclusion of a foot health assessment could help to address the inequity in Aboriginal and Torres Strait Islander foot health.

## Meeting minimum standards

The International Working Group on Diabetic Foot Disease Guidelines ([Schaper et al. 2023](#)) along with the Diabetes Feet Australia guidelines ([Diabetes Feet Australia 2021](#)), which are both evidence-based, advise the need to first identify the 'at risk foot' ([Diabetes Feet Australia 2021](#); [Schaper et al. 2023](#)) and state that the absence of symptoms does not preclude the presence of foot disease ([Schaper et al. 2023](#)). Some researchers have stated that the true rate of diabetes in the Aboriginal and Torres Strait Islander community may be much higher than what has been reported ([AIHW 2023a, 2023b](#)).

Behind the MBS 715 template ([DHAC 2024](#)) are two guiding documents: the National guidelines ([NACCHO/RACGP 2018a](#)) and the evidence base for the

development of these guidelines ([NACCHO/RACGP 2018b](#)). These documents are co-authored by the Royal Australian College of General Practitioners (RACGP) and the National Aboriginal Community Controlled Health Organisation (NACCHO) ([NACCHO/RACGP 2018a, 2018b](#)). Although there were many experts involved in these organisations and there was consultation and engagement with Aboriginal and Torres Strait Islander peoples, the authors believe that these documents have overlooked the importance of a foot health assessment to the holistic healthcare of Aboriginal and Torres Strait Islander communities. There is a growing body of evidence that diabetes foot disease is increasing globally, nationally and for Aboriginal and Torres Strait Islander peoples ([ABS 2013](#); [Australian Institute of Health and Welfare 2015, 2023a](#); [Lazzarini et al. 2012b](#); [Nathan 1993](#); [West et al. 2017](#); [WHO 2016](#)). Yet, despite there being numerous mentions of diabetes in both guideline and evidence documents ([NACCHO/RACGP 2018a, 2018b](#)), there is an absence of diabetes foot health assessment or screening. The conclusion drawn is that these documents are not meeting the minimum standards as prescribed by both the international and national guidelines on diabetes foot disease ([Chen et al. 2022](#); [Chuter et al. 2022](#); [Commons et al. 2022](#); [Fernando et al. 2022](#); [Kaminski et al. 2022](#); [Lazzarini et al. 2023](#); [Schaper et al. 2023](#)). Neuropathy caused by diabetes often precedes a diagnosis of diabetes in Aboriginal and Torres Strait Islander populations ([Charles 2017](#); [NACCHO/RACGP 2018a, 2018b](#)), meaning that foot risk is already elevated at diagnosis but not identified. Therefore, screening and assessment in primary healthcare with MBS Item 715, utilising the Diabetes Feet Australia guidelines at the initial diagnosis of diabetes and again at 3, 6 or 12 months, or even opportunistically, for evidence of peripheral vascular disease, peripheral neuropathy, history of foot wound(s) and biomechanical considerations, could



dramatically reduce the risk of developing diabetes foot disease.

### Identifying the opportunity

The latest RACGP MBS 715 health check templates, available online, which span the life course from infancy to healthy ageing, encourage downloading and adaptation of the templates to local needs (RACGP 2019). These templates are the national guiding tool, or baseline from which adaptation for use by general practitioners (GPs) and Aboriginal community-controlled health organisations (ACCHOs) occurs. However, these templates currently do not include foot-related checks or assessments (RACGP 2019).

In the financial year July 2021 to June 2022, a total of 203,842 MBS Item 715 (Table 1) fee-attracting health checks were billed nationally for Aboriginal and Torres Strait Islander peoples (Medicare 2023b). In the same period there were 11,424 billings to MBS Item 81340 (Table 1) (Medicare 2023a) for podiatry services to Aboriginal and Torres Strait Islander clients, which is an item code that requires a GP triggered referral to be billed to Medicare. This equates to 192,418 missed opportunities to conduct foot screening and assessment in a single year. Interestingly, a referral to podiatry, currently a tick box, only becomes part of the MBS 715 template for those aged >50 years (RACGP 2019). More than 65,000 Aboriginal and Torres Strait Islander adults, aged  $\geq 18$  years, are reported with diabetes (AIHW 2023a); however, it is known that for every one person diagnosed, there is another person undiagnosed (AIHW 2023b), putting more than 120,000 individuals at risk of diabetes-related foot complications. Including diabetes foot health checks in MBS Item 715 in primary health could help to identify undiagnosed diabetes and reduce rates of hospital discharge due to type II diabetes, which are 10 times higher for Aboriginal and Torres Strait Islander adolescents than non-Aboriginal adolescents

Year	item 715 - Total	item 81340 Total
2008/2009	37783	35
2009/2010	47162	409
2010/2011	71369	950
2011/2012	96579	1868
2012/2013	122161	3289
2013/2014	150354	5028
2014/2015	171786	6975
2015/2016	196759	7503
2016/2017	217678	8662
2017/2018	237849	10360
2018/2019	241941	12121
2019/2020	229847	12582
2020/2021	224638	12382
2021/2022	203842	11424

**Table 1: Billing by year of Medical Benefits Scheme for Item 715 and Item 81340**

(Azzopardi et al. 2018). The prevalence of diabetes in Aboriginal and Torres Strait Islander youth, at a younger age than non-Aboriginal youth, is higher (Titmuss et al. 2019). There are also reports of disturbing differences in the mechanics, and therefore the prognosis, of youth-onset diabetes (Titmuss et al. 2019). Considering the known trend of unidentified loss of protective sensation in the feet of newly diagnosed diabetes (NACCHO/RACGP 2018a, 2018b), this should be a trigger, in the way of a basic foot screening incorporated into *all* life stages of the MBS 715 templates.

### Finance

It is currently reported that 30% of care provided to patients living with diabetes-related foot ulcer in Australia adheres to the international evidence-based guidelines (Zhang et al. 2023). A cost analysis for implementing guideline-based care for those with diabetes foot disease investigated a percentage range of different hypothetical scenarios and the cost implication comparison across these scenarios (Zhang et al. 2023). This study demonstrated a direct proportional cost-effectiveness relative to the percentage of patients receiving guideline-based care,



with savings to the healthcare system estimated to be between AUD0.28 and 1.8 million over 3 years compared with current practice (Zhang et al. 2023). This work builds on earlier publications that also highlight the cost saving and effectiveness of implementing evidence-based guidelines in diabetes-related foot care (Cheng 2016; Lazzarini et al. 2012a).

The Australian Institute of Health and Welfare (AIHW 2023b) diabetes report 2017–18 shows that, for Aboriginal and Torres Strait Islander peoples, hospitalisation rates for type II diabetes is 4.3 times the rate than for non-Aboriginal Australians (AIHW 2023b). This rate, where type II diabetes is the principal or an additional diagnoses, was 2.5 times higher for people from remote and very remote areas compared with major cities (AIHW 2023b).

Lower leg peripheral artery disease (PAD) is an occlusive artery disease that increases with age and causes chronic pain, reduces quality of life and leads to major adverse foot events (Golledge 2022), including in Aboriginal and Torres Strait Islander populations (Alahakoon et al. 2023). There are approximately 20,000 hospital admissions per year due to PAD in Australia, which is one of the main causes of major amputation (Golledge 2022; Morbi et al. 2017), costing approximately AUD1 billion to Australian taxpayers (Australian Institute of Health and Welfare 2021; Smith et al. 2021). A systematic review by Hughes et al. (2020) stated that major amputations were double in Australia compared with any other country, and rates of amputation had increased more than many other similar countries (Hughes et al. 2020). Research showed that rates of major amputation are substantially higher in Aboriginal and Torres Strait Islander peoples and rural populations compared with non-Aboriginal Australians (Australian Commission on Safety and Quality in Health Care 2015; Stuart et al. 2021; West et al. 2017). An investigation

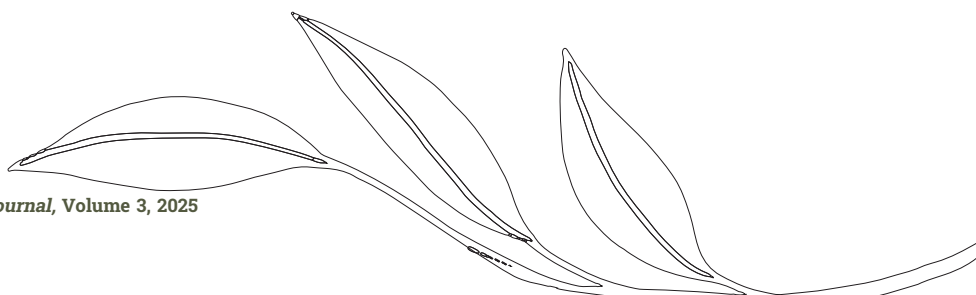
showed that a rural population in north Queensland had major amputation rates (2000–15) of double the Australian average, with a greater burden on disadvantaged populations (Singh et al. 2021). Identification of peripheral artery disease is part of foot screening; therefore, regular foot screening could improve the rates of chronic pain, improve quality of life and reduce rates of adverse foot events in addition to improved financial benefits to both individuals and the health system.

A study in 2014 of the cost benefits of increasing primary care from the Northern Territory showed that every additional dollar invested in primary care in remote Aboriginal and Torres Strait Islander communities equates to between AUD3 and 12 saving in hospital costs (Zhao et al. 2014). All figures presented in this paper do not consider the costs of patient transportation, or the cost of years of life lost or years of life living with disability (Zhao et al. 2014).

Lazzarini et al. 2012b, Zhao et al. (2014), Cheng et al. (2016) and Zhang et al. (2023) all highlight that investing in primary health evidence-based care is cost efficient. This is particularly relevant in rural and remote areas where distance dramatically compounds secondary and tertiary health costs. Additionally, the loss of productivity for individuals and their immediate communities due to diabetes foot disease creates economic decline for both the individual and their community, not to mention the cost burden of years of life lost or years of life living with disability.

## Conclusion

The authors believe that the inclusion of a basic foot check in the MBS 715 foundational documents for all life stages, as published by the RACGP, could greatly benefit enhanced screening and assessment for Aboriginal and Torres Strait Islander peoples living with



diabetes. The ultimate, or ideal, outcome would be that foot screening be completed as part of the minimum completion benchmark to attain the MBS fee. A reduced risk of developing diabetes-related foot complications through early detection and prevention, along with the development of a national dataset of foot screening and therefore foot disease rates, at the primary health level would be cost-effective for the broader health system. Establishing such a mechanism and building a database would facilitate great monitoring and meet outcome one of the National Agreement on Closing the Gap.

### Declaration of interest

The authors have no declaration of interest to declare.

### Author biographies

J.A. Charles is a Kaurna man from the Adelaide Plains, South Australia.

E. Tiernan is a Podiatrist with more than five years' experience providing clinical services in rural and remote Aboriginal communities.

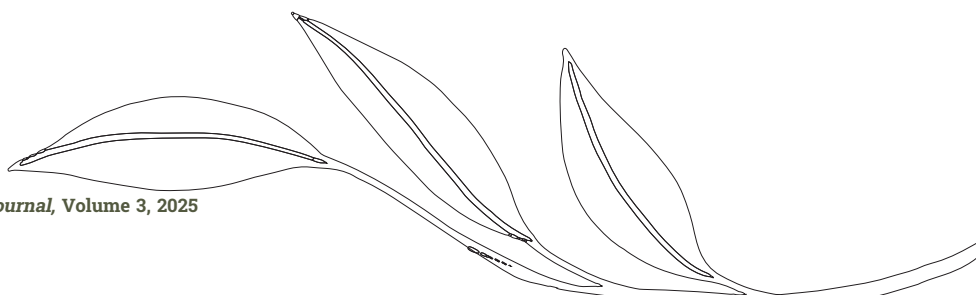
S. Jones is a Podiatrist with over twenty years' experience providing clinical services in remote Aboriginal communities.

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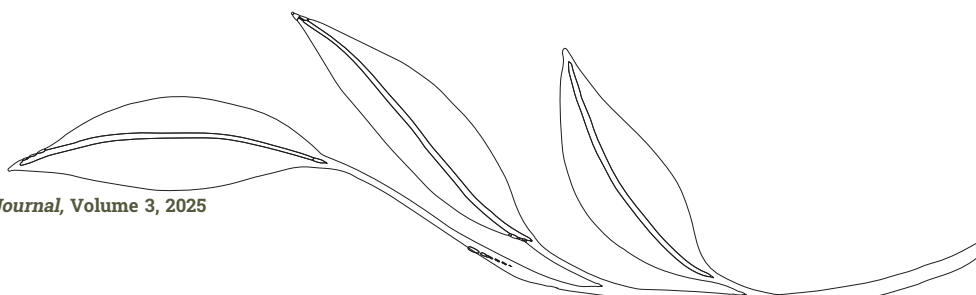
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