Evaluation of the Wound Management Pilot

Final Evaluation Report

11 October 2022



Nous Group acknowledges Aboriginal and Torres Strait Islander peoples as the First Australians and the Traditional Custodians of country throughout Australia. We pay our respect to Elders past, present and emerging, who maintain their culture, country and spiritual connection to the land, sea and community.

This artwork was developed by Marcus Lee Design to reflect Nous Group's Reconciliation Action Plan and our aspirations for respectful and productive engagement with Aboriginal and Torres Strait Islander peoples and communities.

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Executive summary

Chronic wounds are a challenging and under-recognised public health issue in Australia and can have serious and/or long-term impacts on patients living with chronic wounds: pressure injuries, venous leg ulcers, diabetic foot ulcers, artery insufficiency ulcers and atypical wounds. Wound management in Australia is predominantly provided in community-based care, general practice and other related primary care settings. In Australia, patients can access wound care in various settings and through providers who may have different sources of funding e.g., state-funded nurse services and Commonwealth-funded general practice services.

There is a lack of current, reliable data on the prevalence of chronic wounds in Australia.¹ Based on data from studies carried out in several high-income countries, it has been estimated that there are about 400,000 cases of chronic wounds in hospital and residential care settings in Australia each year. Despite the availability of regularly updated clinical guidelines, many Australians do not receive best practice care.

In response to the need to improve implementation of evidence-based, best practice wound care, the Australian Department of Health and Aged Care (the Department) has made a targeted investment of \$1.998 million over three years from 2019-2021 for the Wounds Management Pilot (the pilot) and has a broader portfolio of wound management programs underway or planned. The intent of the pilot is to improve the management of chronic wounds in the primary care sector by designing and testing wound management models through Primary Health Networks (PHNs).

Three PHNs, Gold Coast PHN, Nepean Blue Mountains PHN, and Western Victoria PHN, were successful in their application to develop and implement regionally tailored models for the pilot. The Department also engaged Wounds Australia to provide clinical expertise to PHNs during the implementation of their pilot models.

The Department engaged Nous Group (Nous) to conduct an independent, national evaluation of the pilot. The evaluation of the pilot was conducted between January 2021 and September 2022. This final Evaluation Report includes findings from a synthesis of evaluation data and a set of recommendations and strategic considerations.

The overall aim of the evaluation is to determine the most appropriate evidence-based models for driving access to high quality, integrated care for the treatment and management of chronic wounds.

Six key evaluation questions (KEQs) guide and structure the evaluation (Table 1). The KEQs were developed in collaboration with the Department and representatives of each of the PHNs, and feedback from Wounds Australia.

Overall evaluation question	What are the most appropriate evidence-based models for driving access to high quality, integrated care for the treatment and management of chronic wounds?
KEQ 1	What are the wound management pilot models and how well have they been designed and delivered across PHNs?
KEQ 2	How do the pilot models impact on quality of care for people living with chronic wounds?

Table 1 | High-level key evaluation questions

¹ Pacella RE, Tulleners R, Cheng Q, Burkett E, Edwards H, Yelland S, Brain D, Bingley J, Lazzarini P, Warnock J, Barnsbee L. Solutions to the chronic wounds problem in Australia: a call to action. Wound Practice and Research: Journal of the Australian Wound Management Association. 2018 Jun;26(2):84-98.

KEQ 3	How do the pilot models impact the upskilling and experience of providers of wound treatment?
KEQ 4	How do the pilot models impact the management of wounds at a system level?
KEQ 5	How cost effective are the different pilot models for Government, providers, and patients?
KEQ 6	What lessons have been learned through the PHN pilots that could support scalability and further roll out?

Summary of findings

The evaluation findings are presented in Table 2 as they relate to each KEQ. Section 3 of this report provides the detail underpinning each finding.

Table 2 | Summary of evaluation findings by key evaluation question

What are the wound management pilot models and how well have they been designed and delivered across PHNs? (KEQ 1)

- PHNs implemented tailored, evidence-based approaches to the management of chronic wounds in response to specific regional needs
- Timeframes for grant writing and program design limited opportunities for co-design and integration, particularly with state-funded services
- Implementation was interrupted by COVID-19. In some PHNs, this was mitigated by building in continuous improvement into their pilot design.

How do the pilot models impact on quality of care for people living with chronic wounds? (KEQ 2)

- There are indications that the pilot has contributed to enhanced access to quality care and improved quality of life for some patients, carers and families
- Stakeholders highlighted opportunities for improved patient education and knowledge about wound management.

How do the pilot models impact the upskilling and experience of providers of wound treatment? (KEQ 3)

- Providers have improved their skills and confidence in delivering chronic wound care due to the
 education activities through the pilot
- Stakeholders highlighted a lack of time and logistical challenges in bringing diverse health professionals together as key barriers to effective upskilling in wound management throughout the pilot
- Stakeholders reported that guidance for wound management provided through the pilot was valuable for provider and patient education, particularly when tailored to specific care settings.

How do the pilot models impact the management of wounds at a system level? (KEQ 4)

- PHNs played a critical role in providing capability uplift and training to providers to support evidencebased wound care
- PHNs played an important role in facilitating coordination and collaboration across the health system to support effective wound care
- PHNs found it challenging to develop fully integrated wound care pathways with state-funded wound care services.

How cost effective are the different pilot models for Government, providers, and patients? (KEQ 5)

- The varied distribution of costs across the PHN pilot models reflected key differences in pilot design and focus
- The pilot indicated that community-based wound care models with broad reach can be cost effective when ongoing support is provided by a regional wound care specialist.

What lessons have been learned through the PHN pilots that could support scalability and further roll out? (KEQ 6)

- There is opportunity to scale education, training and resources developed through the pilot nationally
- Stakeholders reported a range of barriers to the effective use of consumables as a part of best practice wound management and care
- There is opportunity to improve the application of the right consumables, including through the provision of evidence-based guidance for providers
- Stakeholders report the need for improved compensation of the time taken to deliver best practice wound care, particularly for practice nurses and potentially a consistent approach to funding consumables
- Treating wounds in community settings can reduce downstream health system costs.

Recommendations and strategic considerations

The evaluation presents one overarching recommendation, and four supporting recommendations that focus on lessons from the pilot and findings under the KEQs. The recommendations are framed flexibly in recognition of the considerable volume and complexity of intersecting wound care initiatives underway, including responses to the Medicare Benefits Schedule (MBS) Review Taskforce on Wound Management and the Final Report of the Aged Care Royal Commission.

The overarching recommendation and four specific recommendations are summarised in Figure 1.

Figure 1 | Summary of evaluation recommendations



Section 4 of this report provides supporting rationale and suggested actions under each recommendation. These recommendations are in part consistent with recommendations from previous reports (this alignment is mapped in Section 4).

Three strategic considerations are presented that relate to broader issues arising from the evaluation but are not directly within the scope of the evaluation's KEQs. They relate to systemic enabling factors that would support better access to high quality, evidence-based wound care in Australia. Most of the issues raised relate to work currently underway or planned. The intention of including strategic considerations in this report is to reinforce the value in systemic investment and continuing work to support sustainable change and progress in wound management.

The three strategic considerations are presented below and described in more detail in Section 4.2.

- 1. Invest in reliable prevalence data on chronic wounds to support the regionally appropriate, evidencebased design, targeting and implementation of wound care programs
- 2. Consider system levers to support a highly skilled wound management workforce
- 3. Continue to explore approaches to subsidise consumables and compensating the time taken to deliver wound care in general practice and in Residential Aged Care Facilities (RACFs).

1 Background and context

This section provides a summary of the challenges for people living with chronic wounds (informed by a literature scan² conducted in Stage 1 of the evaluation) and presents an overview of the Wound Management Pilot.

Chronic wounds are a challenging public health issue in Australia

Chronic wounds are an under-recognised public health issue in Australia and can have serious and/or long-term impacts on patients living with chronic wounds. Chronic wounds are those that do not heal in an orderly and timely manner, and include Pressure Injuries, venous leg ulcers, diabetic foot ulcers, artery insufficiency ulcers and atypical wounds.

There is a lack of current, reliable data on the prevalence of chronic wounds in Australia.³ Based on data from studies carried out in several high income countries identified through a literature review of the prevalence and incidence of chronic wounds, it has been estimated that there are about 400,000 cases of chronic wounds in hospital and residential care settings in Australia each year, with Pressure Injuries being the most common wound type (84%), followed by venous leg ulcers (12%), diabetic foot ulcers (3%) and artery insufficiency ulcers (1%).⁴ Importantly, this estimate likely underestimates the total number of wounds as it only includes wound in hospitals and residential care settings, and not wounds found in other settings such as general practice and community nursing or wounds that are not diagnosed.⁵ For a more detailed treatment of wound prevalence statistics see Appendix D.

The impact and cost of managing wounds is largely hidden and often not recognised

Chronic wounds are related to social determinants of health, and are more likely to occur in older people, those with chronic disease such as diabetes, obesity, hypertension, kidney disease and vascular disease. Furthermore, chronic wounds can have severe, ongoing impacts on quality of life, reduce working capacity and increase social isolation. There is also substantial individual out of pocket financial costs due to the costs of wound care consumables' (such as compression bandages) and limited access to items for specialists, nurse practitioners and allied health services on the Pharmaceutical Benefits Scheme (PBS) and Medicare Benefits Schedule.^{6 7}

Much of the financial cost of treating wounds is hidden because many health care professionals across a wide range of professions and care settings are involved, and so, the total cost is spread across many different budgets. As a result, the impact of time taken to treat wounds can be largely unrecognised by policy makers, is poorly understood by health care system decision makers and is seldom reported in the media.⁸⁹

² The literature summary in this section is based on the available evidence. Where possible, peer-reviewed and Australian studies have been used. However, at times the summary draws on perspectives from stakeholders in the sector including Wounds Australia and wound consumables manufacturers. Where these views have been presented, they have been verified with peer reviewed studies.

³ Pacella RE, Tulleners R, Cheng Q, Burkett E, Edwards H, Yelland S, Brain D, Bingley J, Lazzarini P, Warnock J, Barnsbee L. Solutions to the chronic wounds problem in Australia: a call to action. Wound Practice and Research: Journal of the Australian Wound Management Association. 2018 Jun;26(2):84-98. Accessed via: <u>https://journals.cambridgemedia.com.au/wpr/volume-26-number-2/solutions-chronic-wounds-problem-australia-call-action</u>

⁴ Graves N, Zheng H. The prevalence and incidence of chronic wounds: A literature review. Wound Practice and Research: Journal of the Australian Wound Management Association 2014; 22(1): 4-12, 4-9

⁵ Pacella RE, et al. Solutions to the chronic wounds problem in Australia: a call to action. Wound Practice and Research: Journal of the Australian Wound Management Association. 2018 Jun;26(2):84-98.

⁶ Norman RE, Gibb M, Dyer A, Prentice J, Yelland S, Cheng Q, Lazzarini PA, Carville K, Innes-Walker K, Finlayson K, Edwards H. Improved wound management at lower cost: a sensible goal for Australia. International wound journal. 2016 Jun;13(3):303-16.

⁷ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

⁸ Lindholm C, Searle R. Wound management for the 21st century: combining effectiveness and efficiency. International wound journal. 2016 Jul;13:5-15.

Wound management in Australia is predominantly provided in community-based care, general practice and other related primary care settings. Managing wounds is often one of the most important uses of nurse time – international studies estimate that over 50% - 60% of community nurses' time was spent on dressing change.^{10 11 12 13}

The evaluation did not find Australian studies looking at community nurse time on dressing changes. The demands on nurse time are expected to increase further because of earlier hospital discharge, ageing populations and increasing rates of morbidities associated with wounds.¹⁴ The increasing demands on nurse time will become unsustainable if the present trend continues, and health systems need to identify more efficient ways of managing the increased workload.

Figure 2 provides an overview of the impact of chronic wounds in Australia, noting there are challenges in current, reliable data on prevalence and costs.¹⁵





⁹ Smith and Nephew Foundation (2007). Skin breakdown – the silent epidemic. Smith and Nephew Foundation, Hull.

¹⁰ Lindholm, Christina, and Richard Searle. "Wound management for the 21st century: combining effectiveness and efficiency." International wound journal 13 (2016): 5-15.

¹¹ Jørgensen SF, Nygaard R, Posnett J. Meeting the challenges of wound care in Danish home care. J Wound Care 2013;22:540–2, 544-5.

¹² Drew P, Posnett J, Rusling L. The cost of wound care for a local population in England. Int Wound J 2007;4:149–55.

¹³ Srinivasaiah N, Dugdall H, Barrett S, Drew PJ. A point prevalence survey of wounds in north-east England. J Wound Care

^{2007;16:413-6, 418-9.}

¹⁴ Dowsett C, Bielby A, Searle R. Reconciling increasing wound care demands with available resources. J Wound Care 2014;23:552–62. doi: 10.12968/jowc.2014.23.11.552.

¹⁵ Weller, C.D., Gershenzon, E.R., Evans, S.M., Team, V., McNeil, J.J. (2017). Pressure injury identification, measurement, coding and reporting: Key challenges and opportunities. Int Wound J: 1-7.

¹⁶ Australian Centre for Health Services Innovation. (2017). Issues Paper: Chronic Wounds in Australia. Available <u>online</u>

¹⁷ Graves, Nicholas, and Henry Zheng. "Modelling the direct health care costs of chronic wounds in Australia." Wound Practice and Research: Journal of the Australian Wound Management Association 22.1 (2014): 20. Available <u>online</u>

Improving implementation of evidence-based, efficient wound care is a key focus area

Many clinical practice guidelines and care standards are available for general wound management and prevention¹⁸, for specific conditions including venous leg ulcers¹⁹, pressure injuries²⁰, diabetic foot ulcers²¹, arterial insufficiency ulcers²² and atypical wounds.²³ There are also guidelines for specific techniques and approaches to wound care such as team based wound care²⁴, managing wound infection²⁵, eHealth in wound care²⁶, use of oxygen therapies in wound healing²⁷ and aseptic technique in wound dressing procedure.²⁸ Guidelines and best practice consistently promote the importance of assessment and management, particularly:

- 1. A clear and definitive assessment process that makes an accurate diagnosis of the wound type, and;
- 2. Coordinated, multidisciplinary management of complex wounds or wounds for patients with complex comorbidities²⁹.

Research consistently concludes that the provision of coordinated evidence-based wound care can lead to better patient outcomes and reduced costs by impacting four interconnected drivers of the wound burden:

- Evidence-based care can reduce the onset or recurrence of avoidable wounds. Inadequate prevention and management of wounds was also identified as a major quality and safety issue in The Royal Commission into Aged Care Interim Report.³⁰ Moreover, up to 70% of chronic leg ulcers will recur in some patients for 15 years or more.³¹
- Evidence-based care can reduce wound healing time. This lowers nursing and dressing costs as well as the risk of complications. Several studies have shown that evidence-based care can significantly reduce wound-healing time and cost of treatment.³²
- Evidence-based care can reduce the frequency of unnecessary dressing changes. Higher dressing change frequency can lead to increased nursing costs, increased risk of complications because of the increased frequency of wound exposure as well as the inconvenience of multiple appointments for the patient.³³ Research indicates that advanced dressings can be more cost effective than traditional saline gauze in treating pressure ulcers as the advanced dressing reduces the required change frequency of the dressing.³⁴

¹⁸ Wounds Australia. Standards for Wound Prevention and Management. 3rd edition. Cambridge Media: Osborne Park, WA; 2016 Available <u>online</u>.

¹⁹ Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers. Available online

²⁰ Prevention and Treatment of Pressure Ulcers Injuries Clinical Practice Guideline 2019. Available online

²¹ Best practice guidelines: Wound management in diabetic foot ulcers. Available <u>online</u>

²² Hopf, Harriet W., et al. "Guidelines for the treatment of arterial insufficiency ulcers." Wound repair and regeneration 14.6 (2006): 693-

^{710.} Available <u>online</u>

²³ Atypical wounds: best clinical practices and challenges. Available online

²⁴ Exploring the concept of a Team Approach: Managing wounds as a team. Available online

²⁵ Wound Infection in Clinical Practice: Principles of Best Practice' (2016). Available <u>online</u>

²⁶ eHealth in Wound Care: from conception to implementation. Available <u>online</u>

²⁷ Use of oxygen therapies in wound healing: focus on topical and hyperbaric oxygen treatment. Available online

²⁸ Application of aseptic technique in wound dressing procedure - Third Edition. Available online

²⁹ QUT IHBI Wound Care guidelines (2019)– summary recommendations for evidence based care <u>online</u>

³⁰ Royal Commission into Aged Care Quality and Safety. (2019). Interim Report: Neglect. Volume 1. Available online

³¹ Edwards, Helen, et al. "Health service pathways for patients with chronic leg ulcers: identifying effective pathways for facilitation of evidence based wound care." BMC health services research 13.1 (2013): 86. Available <u>online</u>

³² Australian Centre for Health Services Innovation. (2018). Solutions to Chronic Wounds in Australia: a call to action. Available online

³³ Lindholm, Christina, and Richard Searle. "Wound management for the 21st century: combining effectiveness and efficiency." International wound journal 13 (2016): 5-15. Available <u>online</u>

³⁴ Payne WG, Posnett J, Alvarez O, et al (2009) A prospective, randomized clinical trial to assess the cost-effectiveness of a modern foam dressing versus a traditional saline gauze dressing in the treatment of Stage II pressure ulcers. Ostomy Wound Management 55(2): 50–5

 Evidence-based care can reduce the incidence of complications. This lowers costs associated with hospital admission and surgery.³⁵ Chronic wounds complications are common and harmful, every three hours, one Australian loses a lower limb as a result of a diabetes-related foot disease. With better access to evidence-based wound care, the frequency and severity of chronic would complications could be reduced.³⁶

Despite the availability of clinical guidelines, many Australians do not receive best practice care. For example, compression therapy is identified as best practice for treatment of venous leg ulcers, yet just over 2% of patients receive compression therapy in primary care settings.³⁷ Economic analysis demonstrates that appropriate compression therapy for venous leg ulcers could result in savings of \$166 million per annum to the Australian health care budget.³⁸

The barriers that prevent implementation of evidence-based approaches include:^{39 40}

- · poor incentives to invest in evidence-based wound care in the primary care sector,
- difficulty accessing wound care expertise, particularly in regional and remote areas,
- poor education and training in evidence-based practice, particularly for primary healthcare workers,
- poor coordination and communication across the health sector, meaning people can face multiple uncoordinated healthcare providers and treatment arrangements³²,
- high costs and inadequate reimbursement for wound services and products, and
- lack of awareness of the significance of chronic wounds, which can mean patients may self-manage their wounds instead of seeking care from a medical professional, or knowing the signs for escalation, with inappropriate self-management leading to increased hospital admissions.

Current evidence suggests improved treatment of wounds requires a coordinated, multidisciplinary GP and nurse-led approach that enables patient input into their care. This can be achieved through greater emphasis on prevention and early intervention, improved wound assessment and diagnosis, improved education and training for primary health care and aged care workforces, increased use of clinical practice guidelines, and appropriate and timely access to specialist wound care.⁴¹

Collection of timely, accurate data is critical to managing chronic wounds

The collection of appropriate data covering initial wound assessment, wound management planning and patient outcomes, including wound progression and healing, is identified as a critical activity for the effective monitoring and managing of chronic wounds⁴². Sex, age and language background have been identified as important demographic data items⁴³. Standard data collection tools promote the importance of capturing wound location and type, wound history, pressure reducing devices available, preventative interventions and strategies and documentation of current wound management⁴⁴. The Swedish Registry

³⁵ Wounds Australia. Standards for Wound Prevention and Management. 3rd edition. Cambridge Media: Osborne Park, WA; 2016 ³⁶ Bergin, Shan, et al. "A limb lost every 3 hours: can Australia reduce amputations in people with diabetes?." Medical Journal of Australia 197.4 (2012): 197-198. Available online

³⁷ Weller, C.D., Bouguettaya, A., Britt, H., and Harrison, C. (2020). Management of people with venous leg ulcers by Australian general practitioners: An analysis of the national patient-encounter data. Wound Rep Reg (28): 553 – 560.

 ³⁸ Australian Centre for Health Services Innovation. (2017). Issues Paper: Chronic Wounds in Australia. Available <u>online</u>.
 ³⁹ Ibid.

⁴⁰ Weller, C.D., Richards, C., Turnour, L., Patey, A.M., Russell, G., Team, V., (2019). Barriers and enablers to the use of venous leg ulcer clinical practice guidelines in Australian primary care: A qualitative study using the theoretical domains framework. Int. J. Nurs. Stud (103).

⁴¹ Australian Medical Association (AMA). (2019). Patients with chronic wounds need better support. Available online

⁴² QUT IHBI Wound Care guidelines (2019)– summary recommendations for evidence based care online

⁴³ Weller, C.D., Bouguettaya, A., Britt, H., and Harrison, C. (2020). Management of people with venous leg ulcers by Australian general practitioners: An analysis of the national patient-encounter data. Wound Rep Reg (28): 553 – 560.

⁴⁴ QUT IHBI Skin Integrity survey form <u>online</u>

minimum data set promotes the collection of additional data for Pressure Injuries, including impacts of pain, risk assessment and treatment interventions⁴⁵.

The Wound Management Pilot offers an opportunity to improve the management of chronic wounds in the primary health care sector

"The pilot presents opportunities to test new models of wound care that are nationally scalable, underpinned by strong regional collaboration and partnerships, and build on existing service delivery infrastructure and pathways." As part of its overall response to wound management and the need to improve implementation of evidence-based wound care, the Department made a targeted investment of \$1.998 million over three years from 2019 to 2021 for a pilot to improve the management of chronic wounds in the primary health care sector by testing wound management approaches through three PHNs in Australia.

The pilot is being implemented through Gold Coast PHN, Nepean Blue Mountains PHN, and Western Victoria PHN. These PHNs designed pilot models that aim to align with community needs, expectations and realities. The models incorporate various approaches to provider education and training in

The Department. August 2020.

wound management and different models of care for service delivery, among other activities.

The pilot models are being implemented in different settings and with different focuses as they are tailored to regional needs.

Gold Coast PHN features a nurse-led outreach model of care with a clinical nurse consultant providing care to patients in RACFs. The clinical nurse consultant provides onsite support and mentoring to RACF and general practice staff. The model also includes a localised wound management care pathway to improve patient coordination of care between patients' GP, RACF staff and other clinicians.

Nepean Blue Mountains PHN is delivering a Wound Management Collaborative which consists of a series of face-to-face and virtual learning workshops, to provide general practice, hospital and community clinicians with evidence-based information and the opportunity to share knowledge and experiences with peers. These are followed by activity periods where participating general practices can apply their learnings to better support patients living with venous leg ulcers.

Western Victoria PHN provide intensive general practice support, a workforce development program for practitioners that includes a training and needs analysis, and the development of resources for general practice including a suite of health information.

Detailed information about each of the PHN pilot models is captured in PHN pilot case studies in Appendix A of this document.

The Department engaged Nous to conduct an independent national evaluation of the Wound Management Pilot (the pilot). Section 2 of this report provides an overview of the aims and activities of the evaluation.

⁴⁵ Gunningberg, L, Sving, E, Hommel, A, Ålenius, C, Wiger, P, Bååth, C. (2019) Tracking pressure injuries as adverse events: National use of the Global Trigger Tool over a 4-year period. <u>online</u>

2 About the Wound Management Pilot Evaluation

This section provides an overview of the evaluation of the pilot, including its aims, key evaluation questions, activities and underpinning theory of change and program logic. It also outlines limitations to the evaluation, including limitations to the data informing the evaluation.

2.1 Aim of the evaluation and key evaluation questions

The overall aim of the evaluation is to determine the most appropriate evidence-based models for driving access to high quality, integrated care for the treatment and management of chronic wounds.

The pilot was designed by and implemented through three PHNs:

- Gold Coast PHN
- Nepean Blue Mountains PHN
- Western Victoria PHN.

Given the diversity between the PHN models, the evaluation takes a realist approach to the analysis across the three PHNs to capture what works, for whom, and in what context. The evaluation commenced in January 2021 (planning and design) and the evaluation team delivered an Evaluation Progress Report in June 2021. This Evaluation Report includes available data up to the end of September 2022.

Six key evaluation questions (KEQs) guide and structure the evaluation (Table 3). The KEQs were developed in collaboration with the Department and representatives of each of the PHNs, and feedback from by Wounds Australia. This Evaluation Report presents insights relating to each of the KEQs in Section 3.

Table 3 | High-level key evaluation questions

Overall evaluation question	What are the most appropriate evidence-based models for driving access to high quality, integrated care for the treatment and management of chronic wounds?			
KEQ 1	What are the wound management pilot models and how well have they been designed and delivered across PHNs?			
KEQ 2	How do the pilot models impact on quality of care for people living with chronic wounds?			
KEQ 3	How do the pilot models impact the upskilling and experience of providers of wound treatment?			
KEQ 4	How do the pilot models impact the management of wounds at a system level?			
KEQ 5	How cost effective are the different pilot models for Government, providers, and patients?			
KEQ 6	What lessons have been learned through the PHN pilots that could support scalability and further roll out?			

2.2 Overview of key activities

An overview of the evaluation methodology across three stages is presented in Figure 3. In response to lower-than-expected primary patient data being available to inform the evaluation, the evaluation team agreed adjustments to the evaluation methodology, aligned with the realist approach with the Department in April 2022. This is summarised Figure 3.

 STAGE 1 PLAN AND DESIGN January to May 2021 ✓ Initial Evaluation Plan (Jan 2021) ✓ Project Plan (Jan 2021) ✓ Final Evaluation Plan (May 2021) 	STAGE 2 CONDUCT June 2021 to June 2022 DELIVERABLES ✓ Progress Report 1 (June 2021) ✓ Draft Evaluation Report (Jun 2022)	STAGE 3 REPORT July 2022 to September 2022 ✓ Final Evaluation Report (Sept 2022) – this document
	KEY ACTIVITIES	
 Initiate project and establish project governance Complete initial desktop review Develop and deliver initial Evaluation Plan and Project Plan Conduct in-depth virtual interviews with representatives from the Department and three participating PHNs Hold virtual workshops with representatives from the Department, PHNs and other stakeholders Finalise Evaluation Plan, Project Plan and Data Collection Plan Agree on ethical approach. 	 Develop initial program case studies Deliver Progress Report 1 Submit ethics application Undertake analysis of program data provided by PHNs Conduct interviews of providers, PHNs and other stakeholders Undertake analysis of administrative data (as appropriate) Develop and distribute surveys and complete analysis Complete quantitative analysis of program data provided by PHNs Deliver Draft Evaluation Report. 	 Conduct interviews with patients, carers and their families Conduct additional consultations with practitioners, clinicians and others Hold half-day workshop (virtual or in-person) to test and refine evaluation insights and findings Deliver Final Evaluation Report.

Figure 3 | Summary of key project stages and activities

The evaluation team held an 'Evaluation Reset' meeting with the Department in April 2022. The purpose of the meeting was to discuss and agree adjustment of the evaluation method, given the lower-than-expected levels of primary patient data available for the evaluation (due to low levels of patient enrolment into the evaluation as discussed in Section 2.5). The evaluation team agreed with the Department the following:

- The evaluation will deliver insights at the provider and system level, relating to the effectiveness of the pilot as well as lessons learned for future and potential further rollout.
- The evaluation will explore potential drivers of low levels of patient enrolment into the evaluation (noting the implementation period coincided with the COVID-19 response in the health and ageing

sector).

A planned patient survey was not conducted. Instead, the evaluation team conducted additional
interviews with practitioners, clinicians and other referrers to understand the wound management
landscape in Australia, effective models of care for wound management and potential drivers of low
levels of patient enrolment into the evaluation.

These agreed adjustments to the evaluation have been incorporated in this Final Evaluation Report.

2.3 Data collection for the evaluation

The evaluation collected data under three streams:

- Literature and policy
- Consultations
- Data analytics.

Data collected under the three streams has been analysed and triangulated to assess key evaluation questions, as captured in Figure 4 below.





2.4 Theory of change and program logic

A theory of change describes, at a high level, how program activities will lead to intended outcomes. In the case of the pilot, the theory of change is that increasing support, education, and training of providers of wound care will lead to improved system capability for the treatment of wounds and improved clinical outcomes for patients.

The program logic provides more detail to the theory of change, and represents visually the links between activities, outputs, and outcomes. The program logic for the pilot (Figure 5) will help to identify and shape output and outcome measures and inform data collection.

Theory of change	: Increasing support, edu treatme	cation and training of pi ent of wounds and impro	oviders of wound care w oved clinical outcomes fo	ill lead to improv r patients.	ed system capa	bility for the
CONTEXT	INPUTS	ACTIVITIES	OUTPUTS	•	OUTCOMES	
Chronic wounds affect an	Department of Health	PHNs will test evidence-		SHORT-TERM	MEDIUM-TERM	LONG-TERM
estimated 400,000 Australians and reduce	funding of \$1.998m from	based, best practice	Patient	POTENTIAL PATIENT OUTCOMES		
quality of life and working capacity, and increase social	2019-20 to 2022-23	integrated approaches to wound management in primary health settings	Who are receiving services? What frequency/ dose?	Improved access to wound treatment	Improved quality of wound treatment	Faster wound healing times
Evidence-based wound	Department of Health coordination of PHN grant		enablers for accessing services?	Improved experience of wound care	Improved coordination of care	Improved quality o life
management can result in	application processNepean Blue MouWounds Australia play a central role in the design of pilots that enable targeted, best practice approachesNepean Blue MouTrial a Collaborativ approach to the ca venous leg ulcers incorporating a pla study, act approach	Nepean Blue Mountains: Trial a Collaborative	Blue Mountains: Collaborative Ich to the care of Provider leg ulcers What education, training rating a plan, do, support are clinicians ct approach receiving? Have clinicians improved their			
and significant cost savings to patients and the health system		approach to the care of venous leg ulcers incorporating a plan, do, study, act approach		Increased education and training opportunities	Increased understanding of evidence-based wound care	Increased workforce capacity
Barriers to implementing evidence-based wound care include: • Costs and poor incentives to invest in	across 3 PHNs Existing infrastructure and service models for wound	Gold Coast: Support people with chronic and complex wounds living in RACFs	knowledge and skills in best practice wound care? Are services provided in line with best practice & evidence?	Increased awareness and understanding of chronic wounds	Improved identification of chronic wounds	More consistent application of evidence-based wound care
evidence-based care	management including GP care, specialist care and community nurses	through a nurse-led		POTENTIAL SYSTEM OUTCOMES		
 Lack of awareness Difficulty accessing services Poor education and training 		Western Victoria: Build capacity and skills in primary care to improve wound management outcomes in Grampians area with a focus on the important role of practice nurses	System How have the pilot models integrated with the broader system? Has the pilot reduced cost of services?	Improved collaboration of health information services	Integrated care pathways for managing chronic wounds	Reduce impact on other health services (e.g. GP visits, ED
 Poor co-ordination and communication 				Build the knowledge base for the effective management of wounds	Service delivery is cost-effective and evidence-based	hospital admissions)

2.5 Evaluation limitations and data availability

Stakeholders reported a range of barriers and challenges that contributed to lower-thanexpected patient uptake of the Wound Management Pilot services

The COVID-19 pandemic impacted the pilots in various ways. There were many COVID-19 outbreaks in RACFs, affecting pilot implementation and patient uptake in the Gold Coast PHN region. In the Nepean Blue Mountains, general practices were challenged in their recruitment due to the prioritisation of COVID-19 responses and vaccine rollout. Western Victoria's PHN took an active role in supporting the COVID-19 response, affecting the implementation of nurse-led wound clinics in general practices.

Existing wound care services are being delivered in settings other than primary care and wound care service pathways are poorly coordinated, which limited referrals into some of the pilot services. In particular, there are challenges in ensuring integrated wound care pathways between state and Commonwealth-funded wound care services. Stakeholders reported that many patients are accessing existing hospital-based services for wound management.

Some stakeholders reported reluctance among some health professionals to refer patients into the pilot due to its temporary nature. Consultations highlighted concern among some stakeholders about the temporary nature of pilot services and did not want to send patients to these services if longer-term care could not be guaranteed.

There were low levels of patient enrolment into the pilot; approximately 136 patients engaged pilot services across the three pilot models.⁴⁶ The original evaluation methodology was designed for a pilot with several hundred patients in each PHN. Stakeholders reported a range of challenges and barriers that contributed to low levels of pilot uptake (and consent for the evaluation) among patients as outlined above.

As a result of lower-than-expected patient uptake of the pilot services, there is limited primary patient data available for the evaluation. The evaluation has largely drawn on secondary patient data, reported by providers and PHNs in consultations to understand the impact of the pilots on patients, their families and carers. There is patient level data available from the Gold Coast PHN presented in Section 3.1 of this report, along with available secondary patient data from all three PHNs.

The PHNs are delivering pilot models beyond the timeframe of the evaluation – insights presented in this report refer to data collected up to mid-2022

At the time of writing (September 2022), the three pilot models will continue to implement their pilot models until December 2022. This report reflects data collected up to August 2022 and the progress of pilot implementation to June 2022.

⁴⁶ This includes 65 documented patients for Western Victoria PHN, 20 patients enrolled into Nepean Blue Mountains PHN and 51 residents in Gold Coast PHN.

3 Key findings and insights

This section presents key evaluation findings and insights, organised by each key evaluation question (KEQ).

3.1 KEQ 1: What are the wound management pilot models and how well have they been designed and delivered across PHNs?

This sub-section presents insights relating to KEQ 1: What are the wound management pilot models and how well have they been designed and delivered across PHNs?

Summary:

- PHNs implemented tailored, evidence-based approaches to the management of chronic wounds in response to specific regional needs
- Timeframes for grant writing and program design limited opportunities for co-design and integration, particularly with state-funded services
- Implementation was interrupted by COVID-19. In some PHNs, this was mitigated by building in continuous improvement into their pilot design.

PHNs implemented tailored, evidence-based approaches to the management of chronic wounds in response to specific regional needs

Each PHN took a unique approach to the design of their pilot program, drawing on existing evidence. This includes design to focus on different target populations for each of the pilot programs and tailored response to the specific needs of the local area. Detailed case studies of each PHN model are captured in Appendix A and an overview is provided below.

Gold Coast PHN focused on Residential Aged Care Facility (RACF) residents through the development of a nurse outreach model of care and education and mentoring for RACF staff. The PHN has implemented evidence-based approaches to support better delivery of chronic wound care in primary care settings through the Wound Busters program, however, consistency of treatment within RACF settings was identified as a key gap and became the focus of the pilot.

Nepean Blue Mountains PHN established a Wound Management Collaborative, which was focused on building capability in primary care by combining face-to-face training with the establishment of a community of best practice and improved information sharing by practitioners. The pilot initially focused on the management of venous leg ulcers but has since broadened its focus to patients with any lower leg wounds that present as chronic or hard-to-heal in nature.

Western Victoria PHN focused on building capability in primary care with a focus on the Wimmera Grampians region, which has identified higher rates of chronic conditions (e.g., diabetes, smoking and obesity) and associated higher rates of chronic wounds. The pilot is focused on bringing wound management in primary care in-line with best practice through the updating of guidelines and wound management resources, accompanied by training and development. The Western Victoria pilot program is focused on supporting patients with venous leg ulcers and diabetic foot ulcers in a targeted rural area.

Table 4 presents an overview of the PHN pilot models regarding education and training; models of care delivery; target cohorts; and PHN management of the pilots.

	Gold Coast PHN	Nepean Blue Mountains PHN	Western Victoria PHN
Target patient cohort	 Patients living in residential aged care facilities in the Gold Coast with chronic wounds 	 Patients living with any lower leg wound that is chronic or hard-to-heal, particularly Venous Leg Ulcers 	 Patients living with Venous Leg Ulcers or Diabetic Foot Ulcers Patients living in the Wimmera Grampians region
Education and training	 A clinical nurse consultant with experience and knowledge in wound management delivers mentoring and support to RACF staff Face-to-face workshops for RACF staff about wound management 	 Learning workshops designed for practice nurses about wound management and quality improvement Development of resources for providers Provision of nurse scholarships, webinars and Community of Practice 	 Virtual and face-to-face workshops about wound management Development of resources for providers and patients Provision of scholarships for practitioners
Models of care delivery	 A nurse outreach model of care where a clinical nurse consultant supports RACF staff to assess and review patient needs Provision of specialist wound advice for residents in their place of residence, including through telehealth consultations 	• The pilot focuses on the upskilling of general practices, rather than implementing a model of care for service delivery to patients	• The pilot involves the establishment of a nurse- led clinic for wound management within general practices
PHN management	 Supports the pilot's collaboration with other stakeholders in the region including the Gold Coast Hospital and Health Service (HHS), Residential Aged Care Facility Support Service, etc. Supports integration of an overarching agreed model of care for wound management, developed in collaboration between Gold Coast PHN and GC HHS 	 Established an Expert Reference Panel (ERP) and co-designed the pilot Engages online with pilot participants through an engagement page that provides access to key documents and resources 	 Leveraged relationships with other organisations and subject matter experts to support the delivery of education and upskilling activities Developed resources for providers and patients

Table 4 | Overview of key features in the PHN pilot models

Timeframes for grant writing and program design limited opportunities for co-design and integration, particularly with state-funded services

PHNs were invited to submit applications through a grant funding round which opened on 17 December 2019 and closed on 21 January 2020 to develop and implement a wound management approach suited to the particular needs and circumstances of their region. Wounds Australia was contracted separately to provide expert advisory services to support the design of the pilot and work with PHNs on the design and implementation of the wound management approaches to be taken. PHNs were required to engage as appropriate with Wounds Australia regarding the design and implementation of their pilot.

PHNs noted timelines made it difficult to properly consult relevant state-government funded services in the early design of their projects. PHNs had less than a month to develop and write their grant applications and this fell over the Christmas and New Year period. Nepean Blue Mountains PHN and Western Victoria PHN noted that this made it difficult to establish strong working relationships with the local hospitals and state-funded community-based nursing clinics to establish clearly defined care pathways and splits of roles and responsibilities. This may have contributed to the time taken for the detailed design, relationship building and establishment of processes as implementation of the pilots commenced.

Wounds Australia noted difficulties in influencing the clinical design of pilots due to the timing of their engagement in the process

Wounds Australia noted due to the timing of their engagement to provide clinical advice to PHNs (after the PHNs were in the final stages of their design) there was limited opportunity to refine the direction of the pilot models. They were however able to provide guidance and expertise throughout the implementation phases of the models. PHN feedback on the advice and troubleshooting provided by clinical experts from Wounds Australia's network was positive and valued.

Implementation was interrupted by COVID-19. In some PHNs, this was mitigated by building in continuous improvement into their pilot design

All PHNs identified delays to the implementation of their pilot programs due to COVID-19 and the vaccine roll-out, as well as staff turnover within PHNs. This impacted PHNs in different ways:

Gold Coast. COVID-19 and the vaccine roll-out had a large impact in RACFs, due to the age and vulnerability of residents (the target cohort for the pilot). Safety precautions made it more difficult to access RACFs and many RACF staff were stood down due to vaccine mandates. This created challenges in building relationships with RACFs in the early stages of the pilot.

Nepean Blue Mountains. Nepean Blue Mountains progressed quickly through the design of their pilot model. However, they experienced lower than anticipated recruitment of general practices into the program (actual 6 vs expected 10), which has been attributed to the priority being given to the health system's COVID-19 response and vaccine roll-out over participation in a novel pilot program.

Western Victoria. The PHN took an active role in supporting the COVID-19 response, which deprioritised and delayed the implementation of training activity for practitioners. Additionally, the PHN managed the transition following the departure of key personnel.

The Nepean Blue Mountains PHN pilot model (the Wound Management Collaborative) is underpinned by a Collaborative methodology framework which aims to improve systems of care to achieve the implementation of incremental changes to wound management through 'waves'. This stepped approach involves education and training components, improvement measurements, data collection and information sharing. Under this methodology, the PHN was enabled to effectively adapt their approach in light of COVID-19 constraints and new data about what was working along the way. Some key adaptions included delivery of the quality improvement aspect of the pilot program in-house and incorporating other upskilling activities into the pilot design such as scholarships and a Community of Practice.

The ongoing adaptations to the Nepean Blue Mountains PHN pilot model are captured in Figure 6.

Figure 6 | Adaptations to NBMPHN pilot model



3.2 KEQ 2: How do the pilot models impact quality of care for people living with chronic wounds?

This sub-section presents insights relating to KEQ 2: How do the pilot models impact quality of care for people living with chronic wounds?

Summary

- There are indications that the pilot has contributed to enhanced access to quality care and improved quality of life for some patients, carers and families
- Stakeholders highlighted opportunities for improved patient education and knowledge about wound management.

There are indications that the pilot has contributed to enhanced access to quality care and improved quality of life for some patients, carers and families

Stakeholders report the pilot has contributed to improved quality of care for people living with wounds, largely due to enhanced access to providers who understand and can implement evidence-based wound management and care. There are indications that there has been an increased adoption of evidence-based strategies because of the pilot, such as the use of preventative equipment for patients living with pressure injuries. Providers also reported other positive outcomes for patients participating in the pilot, including:

- reduction in wound healing and wound closure time
- reduction in pain experienced by patients due to their wound
- improvement in skin integrity
- enhanced quality of life.47

The pilot has increased access to quality wound care for some

patients. For example, in the Gold Coast PHN, the introduction of the nurse outreach model of care has ensured patients are provided access to a specialist service that they would not have otherwise had

"People aren't waiting as long for care. Average wait time is 7-10 days. People are now getting specialist care for complex wounds within a week."

Provider, Gold Coast PHN

access to without the pilot. Similarly, the establishment of nurse-led clinics for wound management in Western Victoria PHN and the deepening of specialist knowledge in the nurse cohort has increased patient access to specialist services in the region. Figure 7 presents the story of a RACF resident in the Gold Coast PHN model who experienced a significant reduction in wound pain due to the pilot.

⁴⁷ The original evaluation data collection plan sought to obtain primary quality of life measures from patients involved in the pilot, however patient data was not collected consistently or comprehensively across the PHNs and is unavailable for the evaluation.

Figure 7 | Experience of a RACF resident participating in Gold Coast PHN's pilot

An 80-year-old resident was referred to the pilot service with a Stage 3 pressure injury on the heel of their foot. The wound had started developing three months prior to the resident engaging the service. The resident was using opioids to help manage the wound pain prior to the referral.

The resident attended six appointments with the pilot service within a period of less than three months. Through the pilot, the patient was able to access more advanced wound dressing products, appropriate pressure injury prevention and management strategies and appropriate wound interventions (such as the removal of devitalised tissue from the wound bed). Over this period, the resident saw a rapid reduction in wound exudate and pain associated with their wound. After the third appointment, they no longer needed to use opioids to help manage their pain.

The clinical staff involved in these consultations and patient care have reported immense satisfaction with the rapid improvement and support received to improve the residents' outcomes. Staff involved noted that they feel more confident in managing similar wounds in the future.



Data from Gold Coast PHN suggests that the pilot provided patients access to quality care, including for patients who had chronic wounds for over a year before the pilot.⁴⁸ The regional wound specialist team in Gold Coast PHN was able to collect pilot data for the patients that the team saw directly. However, this is a small fraction of all the patients impacted by the training and mentoring provided by the regional wound specialist team in Gold Coast PHN. As explained in Section 3.5, the Gold Coast PHN model focussed on upskilling RACF staff to better treat wounds independently. Given capacity and time constraints, RACF staff were unable to collect data on the wound patients they saw.

The regional wound specialist team provided primary consultations to 31 patients, of which 23 provided consent to provide data to the evaluation. The age range of patients was between 67 and 97 years old with an average age of 85-years-old. The gender of patients was fairly evenly split, with 13 females (56%) and 10 males (44%).

As shown in Figure 8, the most common wounds were Pressure Injuries (44%), followed by mixed arterial / venous ulcer (22%), venous leg ulcers (13%), incontinence associated dermatitis (9%), atypical wounds (4%), diabetic foot ulcer (4%) and malignancy – squamous cell carcinoma (4%).

"The majority of the patients we saw directly had chronic wounds for over three months without proper treatment. In some cases, the wound had not been diagnosed, in others the wound had been misdiagnosed and so the patient received inappropriate care.

Provider, Gold Coast PHN

⁴⁸ Adjustments to the evaluation methodology, including less of a focus on patient-level data, were made given the low levels of patient enrolment and consent into the evaluation. As such, only Gold Coast PHN pilot data has been included in this Evaluation Report, as they provided more patient-level data that was appropriate to analyse through the evaluation.



Figure 8 | Wound types seen by Gold Coast PHN regional wound specialist team (n = 23)

The regional specialist wound team was able to provide care to patients who had previously not been able to access treatment. As shown in Figure 9, 56% of 23 patients had been diagnosed with the chronic wound at least three months prior to accessing care from the regional specialist wound team. This includes 8% of 23 patients whose chronic wound had been active for over a year. As shown by the quote above, the regional specialist wound team indicated the reasons why these wounds had been active for so long, including no diagnosis, misdiagnosis and/or inappropriate care.





Service interaction data suggests that the regional specialist wound team provided high-quality care in-line with best practice guidelines. The regional wound specialist team conducted 74 service interactions for the 23 patients who provided consent for data collection. As shown in Figure 10, the regional wound specialist team consistently provided the key clinical activities in best practice guidelines, with over 95% of all 74 service interactions including care coordination or service navigation, patient or carer education, wound assessment, or diagnosis and/or wound treatment.



Figure 10 | Proportion of service interactions including key clinical activities (n = 74)

The regional wound specialist team also captured several wound-specific indicators for venous leg ulcers, pressure injuries and diabetic foot ulcers. These indicators represent activities recommended by best practice guidelines for that wound. Analysis of this data indicated very high adherence to best practice guidelines:

- 87% of the service interactions for venous leg ulcers included compression therapy
- 94% of the service interactions for pressure injuries included an assessment of the pressure wound in this session including location, class / stage, size, base tissues, exudates, odour, edge / perimeter, pain and an evaluation for infection
- 94% of the service interactions for pressure injuries included an assessment of the periwound skin to see if it was indurated, erythematous, macerated or healthy
- 94% of the service interactions for pressure injuries included treatment or patient / carer education to reduce or relieve wound pressure in this session (e.g., repositioning, using pressure-reducing surfaces such as pillows or protective dressings / compression)
- 100% of the service interactions for diabetic foot ulcers included a full assessment of the wound and definitively diagnosed the patient with a diabetic foot ulcer
- 100% of the service interactions for diabetic foot ulcers provided treatment or patient / carer education to offload the area to reduce pressure on the foot.

The following page presents the experience of a RACF resident participating in Gold Coast PHN's **pilot.** The resident's name has been changed for privacy. The resident's experience highlights:

- the value of the Gold Coast pilot service in supporting residents with wounds, and the quality collaboration between the pilot and other providers (in hospital and GP settings)
- opportunities to provide greater supports to purchase dressings, particularly for older people.

Jan's experience as an aged care resident receiving Gold Coast pilot services

Jan is living with two wounds that worsened after she moved into residential aged care

Jan has been living in a residential aged care facility in the Gold Coast for the past year and a half. Before she moved into the facility, she was living independently in the community and had a small wound. Jan was treating this wound in the community through weekly treatments, which helped to heal the wound over time.

After moving into the residential aged care facility, Jan's wound returned, and she now has two ulcers on either side of her right foot. During her interview, she highlighted how painful these were and noted that she has been taking strong pain medication to support her pain management.

Jan is receiving treatment from the nurses within the facility twice each week. Jan noted that the treatment is a lengthy process, given the severity of her wounds. It involves twice-weekly

dressing days where Jan starts preparing her wounds hours before the nurse arrives, including by soaking them. Jan highlighted the value of the nurses delivering care, particularly the quality of their services. However, she noted that not having consistent and regular nurses to deliver the care has been challenging. Jan shared a contrasting experience she had with her local General Practice (before moving into the facility), where she received care from the same practitioner.

Jan takes the initiative to coordinate her own wound care

Jan shared that she spends a lot of time coordinating and understanding best practice care for her wounds. She does her own research, including looking into which dressings are most appropriate and what diet is best to help manage her wounds. She is often coordinating and following up care from providers. She noted, "I'm lucky because I do a lot of the chasing up myself".

The coordination between the hospital in-reach service, facility chronic wound team and GP has helped Jan manage her chronic wounds

Jan also shared that the Residential Aged Care Facility Support Service (RaSS) delivered quality services when they visit her facility, and they work particularly well with the chronic wound team within the facility (pilot service). Staff take photos of Jan's

"85 per cent of my pension goes to

aged care and then I'm left with just

food. It's just not feasible to pay for wound care. Bandages can be \$5 a roll...I have to ask the hospital for

takeaway bandages."

\$200 a fortnight. I have to use that on

wounds once a fortnight and these are shared with other providers, including those in the hospital and the facility GP. The collaboration between the services meant that Jan did not have to re-explain her situation.

Jan asks for dressings from the hospital and highlighted that these can be unaffordable for many older people

Jan shared that facilities are often not equipped with the "correct dressings". She noted that when she is in hospital, she asks for takeaway packs with dressings as the hospitals tend to be stocked with the

appropriate dressings for her wounds.

Jan mentioned that purchasing her own dressings can be challenging, given limited pension funds and expenses associated with living in the facility.

"When they [RaSS] came to visit, they linked in with the facility nurses and knew what they were doing."

"I dread Mondays and Thursdays because they're wound dressing days – the following day you're in agony."

Stakeholders highlighted opportunities for improved patient education and knowledge about wound management

Consultations with PHNs and providers identified the need for improved patient education about wound management. Many stakeholders noted that patient understanding of how to manage and care for their wounds is varied and can sometimes be quite limited, which can contribute to adverse patient outcomes, particularly between appointments and consultations with practitioners / clinicians where patients can leave wounds unattended (leading to deterioration). Stakeholders noted the need for greater awareness-raising and education of consumers to improve understanding and the ability to care for wounds, from fundamental principles of wound care to more complex wound management skills.

"We have to rely on the patient doing the right thing when they leave the practice...when they come back, they've often done half of the things you told them to."

Provider, Nepean Blue Mountains PHN

Part of Western Victoria PHN's pilot model involved the development of resources that general practices could share with patients, to support patient wound management. These took the form of short videos, including:

- Patient stories about people living with chronic wounds and how they managed various parts of the wound care process (click <u>here</u> to view the patient stories)
- Educational videos with animations and explanations from a clinical nurse consultant covering tips and principles of wound management, e.g., good wound and skin hygiene; the importance of maintaining dressings; when to see a doctor (click <u>here</u> to view the educational videos).

The PHN emphasised that a key part of developing these resources was ensuring they were accessible (i.e., language levels to cater for varied health literacy), diverse (racial and ability diversity in patients depicted in the animations) and digestible (shorter videos) to maximise engagement and their coverage and impact.

There may be future opportunities to develop nationally scalable patient-facing resources that are accessible and relevant to patients of all health literacy levels. Opportunities to scale resources developed through the pilot are discussed further in Section 3.6 of this report.

Figure 11 summarises the experience of a patient receiving pilot services from a general practice in NBMPHN. The patient identified opportunities for patient education to support patients to self-manage their wounds and understand when they should seek care from health professionals.

Figure 11 | Experience of a patient receiving services from a general practice in Nepean Blue Mountains PHN⁴⁹

John* has had cellulitis for more than 10 years, which has left his left leg permanently swollen from his foot to his knee

John lives in Lawson, NSW and runs his own business. He has diabetes and is living with a wound on his lower leg. The wound has needed treatment over the past decade, and he was being treated by community nurses through daily treatments and dressings around 10 years ago. John developed an infection three months ago, and the wound has required daily dressing again.

John noted that his wound has significantly impacted his quality of life and has psychosocial impacts as well. For example, John avoids activities like bushwalking and gardening, which he previously enjoyed, because of the risk of infecting the wound. He also shared with the evaluation team that he wanted to enrol in a pool exercise program but decided against it because he was embarrassed by the appearance

⁴⁹ The patient's name has been changed for the purposes of this report.

of his wound.

John shared that the cost of seeing his GP and buying dressings, creams and other materials has been challenging

John was receiving care at a local general practice where the practice nurse would lead sessions to dress his wound and support with wound management. John then switched to community nursing once his wound started to heal. John shared that it was more convenient for the community nurse to visit his home, and was more cost-effective for him as well, given that the GP did not offer bulk billing.

John shared challenges with the cost of visiting his GP, as he noted that he often had to purchase the bandages and products for his wounds. He noted that the creams he needed to buy for his wounds could accumulate to more than \$3,000 each year, which is significant given his yearly income of around \$60,000. In contrast, that the community nurse was more likely to provide these dressings.

John identified opportunities for patient education to support self-care of wounds

John shared that a major concern for him is that he is often unsure if his wound is infected and worries about having to manage this on his own. He suggested that having educational materials, such as a pamphlet on how to monitor wounds and knowing when to see a doctor, would be beneficial. He also suggested opportunities to run information sessions for patients like himself with this information.

John shared, "they [general practice staff] are always so busy I feel guilty to ask about these things [self-care of wounds], especially the doctor. I try to keep it to the urgent things."

*John's name has been changed for privacy reasons

3.3 KEQ 3: How do the pilot models impact the upskilling and experience of providers of wound treatment?

This sub-section presents insights relating to patient-level outcomes observed to date, in relation to KEQ 3: How do the pilot models impact the upskilling and experience of providers of wound treatment?

Summary

- Providers have improved their skills and confidence in delivering chronic wound care due to the education activities through the pilot
- Stakeholders highlighted a lack of time and logistical challenges of bringing diverse health professionals together as key barriers to effective upskilling in wound management throughout the pilot
- Stakeholders reported that guidance for wound management provided through the pilot was valuable for provider and patient education, particularly when tailored to specific care settings

Providers have improved their skills and confidence in delivering chronic wound care due to the education activities through the pilot

Many stakeholders noted wide-spread limitations in evidence-based wound care knowledge and skills in the health and aging workforce, across many settings including general practices, residential aged care facilities and hospitals. Stakeholders reported there is substantial demand for workforce uplift in

effective wound care. For example, Gold Coast PHN reported that many RACFs have requested training and education through the pilot to cover foundational knowledge and skills in wound management, such as learning how to clean a wound and understanding how to select appropriate dressings. Wounds Australia indicated that there is a great need to improve the health and aged care workforces' ability to identify and manage wounds in accordance with evidence-based guidelines. A

"Often, GPs are not confident in guiding wound care...one patient had a wound for five months, needed revascularisation and their GP hadn't referred them to a vascular surgeon. They would've lost their leg [if it weren't for the pilot]."

Pilot PHN representative

specific suggestion from Wounds Australia is considering a more systematic approach to incorporating wound management knowledge into undergraduate nursing and medicine courses.

Providers noted key gaps in workforce knowledge and skills, particularly regarding identification of wounds and understanding when to escalate to specialists and delivery of ongoing wound care to patients. In particular, stakeholders reported a need to build knowledge and capability in evidence-based, effective wound care within general practice.

The PHN pilot models each incorporated different approaches to education and training to support upskilling in effective wound management. Across the PHN pilot models, there are a range of activities that support workforce upskilling of providers, as well as other practitioners and clinicians that the pilot services interacted with. These are captured overleaf in Table 5 and include a mix of:

- mentoring activities
- multi-stakeholder learning workshops on a range of topics, such as case-based wound dressing selection
- compression therapy and quality improvement

"It's much more than a clinical model of service delivery, it is about education, empowerment and support for the workforce."

Provider, Gold Coast PHN

- learning resources for providers
- scholarships for provider education in wound management.

The PHNs were critical in driving capability uplift and training to providers to support evidence-based wound care in these pilots.

Table 5 | Overview of provider upskilling activities in the PHN pilot models

Gold Coast PHN	 The pilot model supports upskilling of RACF staff: A clinical nurse consultant (CNC), with experience and knowledge in wound management, delivers onsite mentoring and support to RACF staff about effective wound management. The CNC supports RACF staff to assess and review patient needs and incorporate this into wound management care plans. Delivery of four face-to-face workshops where RACF staff can provide input into the topics covered in the workshops. The first workshop was held in April 2022 with 44 RACF staff in attendance and covered practical skills and wound management capabilities. 80-100 RACF staff have been involved in these education and training activities since March 2022.
Nepean Blue Mountains PHN	 The Wound Management Collaborative involves learning workshops designed for practice nurses involved in the care of patients with venous leg ulcers. These workshops have covered the following topics (among others): Compression therapy presented by the CNC from the LHD's Primary Care and Community Health Team Quality improvement, systems thinking and data presented by the Improvement Foundation Other topics delivered by guest speakers such as allied health, consumers with lived experience and a vascular surgeon. The pilot also provides: resources for providers, including a Model for Improvement document which outlines a structure to embed evidence-based wound management principles and practice with participating clinicians. nurse scholarships to attend a wound management pathway course workshops / webinars for nurse-led wound clinics in general practices a Community of Practice group to discuss quality improvement principles and implementation for wound management activities in general practice.
Western Victoria PHN	 Primary healthcare practitioners across four general practices were engaged in various virtual and face-to-face workshops, covering the following topics (among others): how to implement a nurse-led wound clinic in general practice, delivered by the Australian Primary Health Care Nurses Association (APNA) venous leg ulcers, diabetic foot ulcers and case-based dressing selection selecting and using wound dressings for different wounds.



The pilot also involved the development of resources, including resources for providers and patients.

The pilot model provided 23 scholarships for practitioners to learn about wound management at La Trobe University and William Light Education. The courses contribute to 50 hours of Continuing Professional Development (CPD) for health professionals.

Stakeholders highlighted the positive and significant impact of the pilot models on the upskilling and experience of providers of wound management. Consultations with providers, PHNs and other stakeholders identified the value of the training and upskilling pilot activities for a range of providers, including those participating in the pilot as well as other clinicians and referrers. Stakeholders reported the following, as reinforced by provider survey results in Figure 12:

- satisfaction with pilot learning activities that were relevant and useful to provider roles
- an increase in knowledge and understanding of evidence-based wound care management, which
 ranged from the more basic and fundamental elements of wound care to the delivery of more
 complex wound management (an example of increased knowledge as a result of the pilot is captured
 in Figure 13
- an enhanced ability to implement evidence-based wound care management and applying it in day-today practice
- improved confidence in delivering effective wound care for patients.

📕 Strongly disagree 📃 Disagree 📒 Neither a	agree or d	isagree	Agree	Strongly agree
The learning experience was relevant and useful to my role		40%		40%
The learning experience improved my understanding of evidence-based wound care management	40%		60%	
	nce has improved my ability to ased wound care management			
The learning experience has improved my ability to implement evidence-based wound care management			80)%
The learning experience has improved my confidence in applying evidence-based wound care management	20% 40%)%	40%
The learning experience has improved how consistently I apply evidence-based wound care management in my day to day practice)%	20%	40%

Figure 12 | Provider perspectives on pilot learning experiences (provider survey, n=6)

Figure 13 | Provider experience of a learning workshop delivered as part of Western Victoria PHN's pilot

Western Victoria PHN delivered a 2.5-hour face-to-face workshop called 'When to dress, with what', led by a local Professor, a clinical research and practice leader in wound management. The workshop was delivered in the evening, after hours and attended by a diverse group of 18 participants including GPs, nurses, physiotherapists, nursing home managers, district nurses, health services and palliative care managers. In the session, wound care products were presented and explained to participants, with many products in the room for participants to see.

Participants were highly engaged in the workshop, with the session running an hour over the scheduled time as practitioners had questions about wound management. The PHN reported that the general practice participants particularly valued the session, noting that they needed to "restock their entire treatment room" as they were not aware of best practice dressings and care for wound management.



Stakeholders highlighted a lack of time and logistical challenges bringing diverse health professionals together as key barriers to effective upskilling in wound management throughout the pilot

Some stakeholders identified barriers to provider uptake of the pilot training and education activities, including the time-poor health professionals and limited incentive to participate. Consultations highlighted how providers had limited time to participate in pilot upskilling, on top of their usual service delivery commitments. The COVID-19 pandemic exacerbated these capacity challenges, with many

providers and practitioners being re-directed to and/or taking on COVID-19 response roles, including the vaccine roll-out which further limited their time to commit to upskilling and training in wound management through the pilot.

While there are indications of high demand for upskilling in wound care, stakeholders identified limited incentives (for example, payment, backfill resources or continuing professional development recognition) for providers to participate in training activities can influence "One more thing [education] on top of COVID stuff... it's like education overwhelm."

Provider, Gold Coast PHN

participation. Nepean Blue Mountains PHN addressed these barriers to an extent by remunerating and backfilling for doctors and nurses who participated in learning workshops.

While it can be valuable to bring together different stakeholders through upskilling activities, there can be logistical and other challenges in doing so. In consultations, many highlighted the value of bringing together a multidisciplinary team of clinicians in learning workshops through the pilot, such as GPs, practice nurses, district nurses and allied health professionals, among others. Learning participants valued the ability to collaborate and learn from others in these workshops and noted how they contributed to the strengthening of working relationships. Where pilot learning activities were targeted to a specific stakeholder group (e.g., practice nurses), stakeholders reported that this could contribute to an

"Trying to get everyone on the same page at the same time in a time-poor world during COVID is really difficult. Perhaps an online education portal...is an easier way to get everyone involved so they can do it in their own time."

Provider, Nepean Blue Mountains PHN

environment where other providers felt "defensive" and created challenges to collaboration, highlighting the value of multi-stakeholder training activities.

Across the pilot models, PHNs brought together various health professionals through learning workshops and sessions, and some noted logistical challenges in bringing these stakeholders together. One provider suggested that virtual self-paced learning activities can help to address some of these logistical challenges. Providers and other PHNs also reported other barriers to training and upskilling in wound management that reflect broader system-level challenges.

Stakeholders reported that guidance for wound management provided through the pilot was valuable for provider and patient education, particularly when tailored to specific care settings

Some of the PHNs participating in the pilot developed resources to providers to support the delivery of best-practice wound management for patients. For example, Western Victoria PHN developed a suite of resources for general practices to support upskilling in knowledge of best practice wound care, including resources that can be shared with patients to support patient education. These were developed in the form of short and easily accessible video resources featuring animations, a clinical nurse consultant and stories from patients living with wounds (as captured below in Figure 14).

Stakeholders identified opportunities to create efficiencies by centralising resource development on evidence-based practice for wound management and sharing this more widely across the PHN network.

Opportunities to scale resources developed through the pilot, among other resources, are discussed further in Section 3.6 of this report.



Figure 14 | Western Victoria PHN's pilot resources for patients

3.4 KEQ 4: How do the pilot models impact the management of wounds at a system level?

This sub-section presents insights relating to provider-level outcomes observed to date, in relation to KEQ 4: How do the pilot models impact the management of wounds at a system level?

Summary

- PHNs played a critical role in providing capability uplift and training to providers to support evidence-based wound care
- PHNs played an important role in facilitating coordination and collaboration across the health system to support effective wound care
- PHNs found it challenging to develop fully integrated wound care pathways with state-funded wound care services.

PHNs played a critical role in providing capability uplift and training to support evidencebased wound care, addressing an unmet need in key settings

Consultations highlighted the critical role of PHNs in mitigating a range of system-level and broader workforce capability gaps and barriers to delivery of best practice care. Stakeholders noted that it is unclear who is responsible for educating and upskilling providers in delivering evidence-based wound

management, with health professionals often receiving education from various sources (e.g., online, professional colleges, courses) with diverse guidance and content. Stakeholders identified variability in education and training contributed to varied levels of knowledge and skill in wound management across the system. Where education is available to providers, many noted that it can be costly to access e.g., paid membership is required to access resources and training from some peak bodies. In addition, and as

"Nurses in primary care and RACFs generally have to fund their own training and education. It can become very costly..."

Pilot PHN representative

noted in Section 3.3 of this report, consultations highlighted other barriers to effective training and capability uplift in wound management, including time-poor health professionals and clinical best practice guidelines and best practice being outdated quickly, often requiring health professionals to be re-trained and educated every few months.

The pilot demonstrated that PHNs were also critical in addressing an unmet need for capability uplift of providers in key settings. Each PHN incorporated education and training activities into the design of their pilots and supported providers to access capability uplift activities and resources. Many stakeholders emphasised the value in the PHN taking on the role of educating and upskilling providers, particularly in settings where it was unclear what avenues providers could access training and education for example in RACFs and nurses in general practice.

PHNs were considerate of capacity constraints faced by health professionals by designing activities to accommodate time-poor staff and backfill for service delivery. This included developing online, up-to-date resources that could be accessed at the provider's own pace, and back-filling for doctors and nurses participating in learning workshops and conducting workshops after hours. PHNs also played a critical role in leveraging their relationships with stakeholders across the system to facilitate effective training activities with participation and expert contribution from multidisciplinary clinicians. This is explored further below.

PHNs played an important role in facilitating coordination and collaboration across the health system to support effective wound care

Wound management requires multidisciplinary teams to collaborate across the health system (e.g. acute and community services). The literature indicates that multidisciplinary teams that cooperate across the system are a key enabler for positive outcomes for patients living with chronic wounds. Research suggests that multidisciplinary teams must work closely with patients and their families to address the complex lifestyle, self-care and multiple treatment demands of patients who have chronic wounds.⁵⁰ Many stakeholders highlighted the importance of multidisciplinary wound care as well as the value of multidisciplinary clinicians coming together to participate in learning activities together (such as participating in multi-stakeholder learning workshops) where they have the opportunity to learn from each other and collaborate.

"We [the PHN] were able to get a podiatrist and vascular surgeon to come along to the learning workshops. Having local knowledge and the ability to bring people together is so important."

Pilot PHN representative

In Australia, patients can access wound care in various settings and through providers who may have different sources of funding e.g., state-funded nurse services and Commonwealth-funded general practice services. This is captured in Figure 15 which shows the various elements of the system that are available to support wound care. The breadth of services across the system highlights the need for coordination and collaboration, to ensure patients access effective, multidisciplinary wound care.



Figure 15 | Parts of the system available to support wound care in Australia

PHNs played a valuable role in brokering and maintaining relationships across the system to support effective wound care through the pilot models. Consultations highlighted the important role of PHNs in leveraging and maintaining relationships between parts of the system, including between general practice,

⁵⁰ Sibbald, R. Gary, Heather L. Orsted, and Patricia M. Coutts. "Best Practice Recommendations for." Wound Care Canada 4.1 (2006): 16.
RACFs, wound care experts, pharmacies, state-funded community and district nurses and hospitals. PHNs built and leveraged these relationships through the pilot to ensure:

- local referral pathways as well as communication and marketing activities were in place to ensure patients can access appropriate wound care in settings that are most appropriate for their circumstance. For example, Gold Coast PHN facilitated communication and collaboration between the private pilot provider and state-funded Gold Coast Hospital Health Service to ensure patients were appropriately referred into the pilot program.
- multidisciplinary health professionals and stakeholders attended learning and training activities, encouraging ongoing multidisciplinary care and strengthened relationships amongst

"[The PHN] has been proactive in helping break down barriers... they helped to facilitate meetings with the hospital and health services and stimulated a lot of action"

Provider, Gold Coast PHN

various local clinicians. For example, Western Victoria PHN and Nepean Blue Mountains PHN organised several learning workshops with attendance from various stakeholders such as GPs, nurses, physiotherapists, nursing home managers, district nurses, health services and palliative care managers.

Another example of a multidisciplinary learning workshop conducted by Western Victoria PHN is captured in Figure 16, highlighting the value of the PHN in connecting health professionals across the system in wound care education and training.

Figure 16 | Multidisciplinary learning workshop delivered by Western Victoria PHN

Western Victoria PHN delivered an education session that was attended by a diverse group of participants including pharmacists, physiotherapists, GPs, allied health practitioners and nurses. The session provided information and education about the recommended wound dressings appropriate for various wounds, how to use them and the costings of various products.

The PHN reported that a key outcome of the education session was broad agreement among participants on the dressings that providers will stock and use when delivering care to patients living with chronic wounds. The pharmacists that attended, which covered almost all pharmacies across the Horsham and Nhill region in Western Victoria, were critical in the decision-making to re-stock with best-practice dressings.

PHNs found it challenging to develop fully integrated wound care pathways with statefunded wound care services

Fully integrated care pathways with state-funded wound care services would provide clear roles and responsibilities for providers and patients. Many stakeholders noted a lack of clarity around roles and responsibilities in delivering wound care across the system, with some reporting confusion among providers about when to manage the wound, when to refer to a different setting and/or when to escalate to a higher-intensity service.

Stakeholders reported that this lack of clarity often leads to untimely referrals to services (i.e., patients presenting to hospital services with severe wounds that could have been avoided with earlier interventions in community care) and patients presenting in settings that are not

appropriate for their situation (e.g., hospital emergency departments). Consultations highlighted the need for integration across the system through coordinated pathways between Commonwealth and statefunded wound care services. Integration could be supported through empowering and training primary

"There's a missing middle between the hospitals and general practice. We have a regional wound specialist nurse in our region but they have no capacity."

Pilot PHN representative



care clinicians to deliver evidence-based wound care to patients, which can be highly cost-effective and prevent greater costs in acute/hospital care (as discussed further in Section 3.5). Wounds Australia noted the importance of having health care workers with expertise in wound care at a local level to support integration across wound care settings.

Information-sharing is key to enabling integrated wound care pathways. Providers consulted identified the need for a centralised portal capturing wound care service availability in the region. HealthPathways can play an important role in supporting these integrated pathways by enabling access to wound management pathways and referral advice into local health services. An overview of HealthPathways is summarised in Figure 17. Western Victoria PHN's pilot model involved the development of local resource and referral information for wound care services on HealthPathways, including community awareness and communications.

Figure 17 | HealthPathways as a potential tool to support integrated wound care pathways

HealthPathways is a web-based portal designed to support GPs, practice nurses, and hospital and primary care clinicians in the community to plan patient care through primary, community and secondary health care. The portal provides access to clinical management pathways and referral advice into local health services. By using this information, clinicians are equipped to make informed decisions about patient treatment, providing them with the right care, in the right place at the right time.

HealthPathways includes management and treatment options for clinical conditions; educational resources for patients; and referral information for local services and specialists.



PHNs, providers, health services and RACFs participating in the pilots found it challenging to develop integrated wound care pathways with state-funded wound care services and hospitals - in part due to

limitations in the authorising environment and resources in hospitals. Many stakeholders reported challenges and barriers when trying to collaborate and coordinate with other health professionals across the system, particularly when engaging Local Health Networks (LHNs) and hospitals. PHNs reported challenges to work with LHD staff during pilot implementation, due to a range of factors including a perception that patients were being "taken away from existing state services" and potentially posing a risk to demand for their service. Additionally, LHN staff were often working at capacity as a result of the impacts of the COVID-19 pandemic on hospitals and did not have time.

"It was almost like 'us versus them' [with the state-funded hospital services]...We had a barrier there. They might have assumed we were taking away their patients and felt a bit threatened."

Pilot provider

There is opportunity to develop clear agreements between PHNs and state-funded services on funding, roles and responsibilities to provide LHNs and others with confidence to collaborate effectively in a patient-centred way on wound management. There is a need to provide stakeholders with assurance that they would be supported to enter such agreements, including by clearly communicating how such PHN activities could support, complement and work in alignment with existing LHN activities and priorities.

PHNs indicated that the separate pilot program, for the Movement Disorder Nurse Specialist pilot being delivered by Western NSW PHN demonstrates the potential value of PHN and LHN collaboration. Western NSW PHN's pilot model is being delivered in Local Health District services, where state-employed nurses are upskilled and can leverage existing clinical governance to deliver models of care in their communities (see Figure 18).

Figure 18 | Western NSW PHN Movement Disorder pilot model targets state-funded nurses

Western NSW PHN has designed and is delivering a pilot model for the Movement Disorder Specialist Nurse Pilot that focuses on building the skills and confidence of Registered Nurses who are already working within the PHN region, employed by the state-funded Local Health District. The model targets patients living with Parkinson's Disease in rural and remote NSW and is being implemented in community settings and general practice.

Nurses are working on implementing tailored models of care in their communities across the region. This includes testing and refining these models with the PHN. Nurses have been able to leverage existing processes and clinical governance in the LHD services to deliver models of care which provides a sustainable approach once the pilot concludes.



3.5 KEQ 5: How cost effective are the different pilot models for Government, providers, and patients?

This sub-section presents insights relating to system-level outcomes observed to date, in relation to KEQ 5: How cost effective are the different pilot models for Government, providers, and patients?

Summary

- The varied distribution of costs across the PHN pilot models reflected key differences in pilot design
 and focus
- The pilot indicated that community-based wound care models with broad reach can be cost effective when ongoing support is provided by a regional wound care specialist

The varied distribution of costs across the PHN pilot models reflected key differences in pilot design and focus

PHN spend across the three pilots was distributed across workforce development, model of care development, administration and service delivery. The distribution of spend across these elements varied across PHNs, as seen in Figure 19. For example, spend on workforce development ranged from 14% to 49% of total costs across the PHNs. This reflects differences in the focus of the pilot models e.g., a core feature of Western Victoria PHN's pilot was the development of educational resources and the delivery of learning workshops for providers.

It should be noted that Nepean Blue Mountains PHN and Western Victoria PHN did not record service delivery spend because the pilots focused on delivering education and training to providers to support improvement in general practice wound care through quality improvement activities. In contrast, Gold Coast PHN hired a regional wound specialist team including wound nurse specialists to deliver services within RACFs (while also mentoring and training RACF and general practice staff).



Figure 19 | Distribution of PHN pilot costs⁵¹

⁵¹ Approximately \$19,000 worth of funding is not captured in the distribution of costs. Western Victoria PHN agreed with the Department to use these funds to deliver further education sessions to the Western Victorian region beyond the timeline of this evaluation.

There is likely opportunity in future to standardise and centralise resource content development for education and training on best practice wound care (i.e. workforce development) to allow resources to be shared (and potentially facilitated locally as appropriate). This should generate cost-efficiencies within or across PHNs or nationally (see further discussion in Section 3.6).

The pilot indicated that community-based wound care models with broad reach can be cost effective when ongoing support is provided by a regional wound care specialist

PHN pilots suggest that community-based wound care models with broad reach can be cost effective when ongoing support is provided by a regional wound care specialist. A key question for the pilot was to determine the right scope and scale for PHN-supported wound management models. The cost effectiveness of a wound care model relies on striking the right balance between three competing objectives:

- delivering high-quality, appropriate and evidence-based wound care for all of the in-scope wounds
- providing the right level of training education and support to general practices and RACF staff to ensure they have the skills and knowledge to deliver high-quality, appropriate and evidence-based wound care for all of the in-scope wounds
- having a sufficiently broad reach of patients to gain the most benefit from the high fixed cost of providing training, education, support, and escalation avenues for providers.

To test this balance, each PHN model had different geographical coverage, in-scope wounds and approaches to supporting general practices and RACFs to deliver wound care as summarised in Table 6. These variations are valuable as they enable comparison of what supports are required to enable the delivery of effective, quality care at different scales. The PHN models fit into two categories:

- Broad scope with ongoing clinical support from a regional wound care specialist. Gold Coast PHN included all main chronic wound types in their scope and covered a large geographic area of RACFs. This meant that the potential patient pool for Gold Coast PHN's pilot model was relatively higher than the other PHNs. The ongoing clinical support from a regional wound care specialist was critical to being able to support such a large geographic area and such a broad scope of wounds. Further detail on the Gold Coast PHN model is provided below and in the case study in Appendix A.1.
- Targeted scope with focussed learning and development opportunities via workshops, resources and scholarships for wound management education. The pilot models for Nepean Blue Mountains PHN and Western Victoria PHN had a more targeted scope by limiting the geographic area and the inscope wounds. Nepean Blue Mountains PHN focused on the relatively populous Penrith Local Government Area and venous leg ulcers were the only in-scope wounds. Western Victoria PHN focussed on two specific wound types (venous leg ulcers and diabetic foot ulcers) in the sparsely populated West Wimmera. As these models did not include ongoing clinical support from a regional wound care specialist, the scope was limited to ensure that general practices were sufficiently upskilled to effectively manage the in-scope wounds independently.

Gold Coast PHN's pilot included a regional wounds specialist team which supported RACFs across a wide geographic area to provide wound care and management for a wide range of chronic wounds. Under this arrangement, the regional wounds specialist team was able to save their onsite visits for the most complex wounds. The regional wounds specialist team is comprised of clinical nurse consultants with specialist expertise in chronic wound care. It has three key functions:

- 1. Develop and deliver wound management education and training for RACF staff including Registered Nurses, Enrolled Nurses and support workers
- 2. Provide secondary telehealth consultations to RACF staff including Registered Nurses, Enrolled Nurses and support workers in identifying and managing wounds

"We had 211 review cases and only had 20 onsite visits. [Telehealth] can be a really cost effective model."

Provider, Gold Coast PHN

3. Provide specialist wound care to a small portion of RACF residents with the most complex wounds.

A visual summary of the Gold Coast PHN model is shown in Figure 20. The regional wounds specialist team upskilled RACF staff so that they could manage the vast majority of wounds independently, or with limited secondary telehealth consultation support from the regional wounds specialist team.

The Gold Coast PHN model is aligned with evidence that suggests telehealth for wound management is cost effective due to:^{52 53 54}

- better access to wound expertise results in earlier identification of wounds and faster healing time
- reduced travel time for patients and providers
- less low-value care (e.g., less use of unnecessary antibiotics).

Figure 20 | Gold Coast PHN's model enabled the delivery of the full range of wound care services in a safe and high-quality manner at scale through ongoing clinical support



 ⁵² Le Goff-Pronost M, Mourgeon B, Blanchère JP, Teot L, Benateau H, Dompmartin A. Real-world clinical evaluation and costs of telemedicine for chronic wound management. International journal of technology assessment in health care. 2018;34(6):567-75.
 ⁵³ Chen L, Cheng L, Gao W, Chen D, Wang C, Ran X. Telemedicine in chronic wound management: systematic review and meta-analysis. JMIR mHealth and uHealth. 2020 Jun 25;8(6):e15574.

⁵⁴ Brain D, Tulleners R, Lee X, Cheng Q, Graves N, Pacella R. Cost-effectiveness analysis of an innovative model of care for chronic wounds patients. PloS one. 2019 Mar 6;14(3):e0212366.

Table 6 | Comparison of scope and support model for PHN models

PHN	Geographic scope and population (2021)	In-scope wounds			Types of support provided for general practices or RACFs				
		Pressure injuries	Venous leg ulcers	Diabetic foot ulcers	Artery insufficiency ulcers	Workshops on specific topics	Resources for providers (e.g. guidelines, videos)	Scholarships for wound management education	Ongoing support from regional wound specialist
Gold Coast	Area: PHN-wide 2021 Area Population: 651,000 ⁵⁵	\bigcirc	\bigcirc	\bigcirc	\bigcirc	\bigcirc			\bigcirc
Nepean Blue Mountains	Area: Penrith LGA 2021 Area Population: 219,173 ⁵⁶		\bigcirc			\bigcirc	\bigcirc	Planned for late 2022	
Western Victoria	Area: West Wimmera sub- region (Ararat LGA, Horsham LGA, Hindmarsh LGA, Northern Grampians LGA, West Wimmera LGA, Yarriambiack LGA) 2021 Area population: 59,029 ⁵⁷		\bigcirc	\bigcirc		\bigcirc	\bigcirc	\bigcirc	

There is a lack of current, reliable data on the prevalence of chronic wounds in Australia to plan targeted services and support.⁵⁸ The best estimates can be derived from systematic reviews of prevalence rates. To illustrate the potential reach, Appendix D.2 includes an estimate of the approximate total patient pools for each PHN model based on the geographic scope of the pilot, the inscope wounds and estimated prevalence rates of each wound type. As such, these estimates are derived by applying a lower and upper prevalence estimate for each in-scope wound type to the estimated residential populations for each PHN's geographic area of focus.

⁵⁵ Gold Coast PHN Annual Report 2020-2021

⁵⁶ Australian Bureau of Statistics, Estimated Residential Population statistics FY2020-21, accessible here

⁵⁷ Australian Bureau of Statistics, Estimated Residential Population statistics FY2020-21, accessible <u>here</u>

⁵⁸ Pacella RE, Tulleners R, Cheng Q, Burkett E, Edwards H, Yelland S, Brain D, Bingley J, Lazzarini P, Warnock J, Barnsbee L. Solutions to the chronic wounds problem in Australia: a call to action. Wound Practice and Research: Journal of the Australian Wound Management Association. 2018 Jun;26(2):84-98.

Having a large total patient pool optimised efficiencies and sustainably allowed for capacity to provide a full range of functions at an appropriate level of safety and quality. Given the relatively high fixed cost of the pilots which focused on education and training of key professionals (as shown in Figure 19), expanding the number of patients eligible for a wound management program was a key way to support cost-effectiveness.

Larger potential patient numbers for wound care models promote cost effectiveness and appropriate scale to provide safe and quality specialised wound care on a continuum of wound complexity. Optimal healthcare for individual patients requires collaboration and can rarely be delivered by a single practitioner, or in one discrete area or service provider. Ideally, primary care providers and settings (including general practices and RACFs) should be adequately skilled to independently deliver most wound care. For patients with more complex wounds, specialist wound care providers need to be available to provide secondary telehealth support to primary care providers and, in rare cases, to deliver care directly to patients with the most complex wounds. This approach aligns with evidence that concentrating specialist wound care in a small number of highly trained providers promotes safe and high-quality care,⁵⁹ and presents a range of other benefits:

- for patients by improving access to wound care, minimising referrals and wait times⁶⁰
- for providers by empowering them to deliver care within their scope of practice through adequate training and support⁶¹
- for the health system by delivering care in a cost-effective manner, keeping specialist wound care service capacity free to manage the most complex wounds.^{62 63}

⁵⁹ Duckett S, Cuddihy M, Newnham H. Targeting zero. Supporting the Victorian hospital system to eliminate avoidable harm and strengthen quality of care. Report of the Review of Hospital Safety and Quality Assurance in Victoria. 2016. Accessible here ⁶⁰ Tulleners R, Brain D, Lee X, Cheng Q, Graves N, Pacella RE. Health benefits of an innovative model of care for chronic wounds patients in Queensland. International Wound Journal. 2019 Apr;16(2):334-42.

⁶¹ Wounds Australia. Standards for Wound Prevention and Management. 3rd edition. Cambridge Media: Osborne Park, WA; 2016

 ⁶² Rivolo M, Staines K. Cost effectiveness of a specialist wound care service. Journal of Wound Care. 2021 Sep 2;30(9):685-92.
 ⁶³ Al-Gharibi KA, Sharstha S, Al-Faras MA. Cost-effectiveness of wound care: a concept analysis. Sultan Qaboos University Medical Journal. 2018 Nov;18(4):e433.

3.6 KEQ 6: What lessons have been learned through the pilots that could support scalability and further roll out?

This section presents insights relating to KEQ 6: What lessons have been learned through the pilots that could support scalability and further roll out?

Summary

- There is opportunity to scale education, training and resources developed through the pilot nationally
- Stakeholders reported a range of barriers to the effective use of consumables as a part of best practice wound management and care
- There is opportunity to improve the application of the right consumables, including through the provision of evidence-based guidance for providers
- There is a need for improved compensation of the time taken to deliver wound care, particularly for practice nurses and potentially a consistent approach to funding consumables
- Treating wounds in community settings can reduce downstream health system costs

There is opportunity to leverage education and training activities and resources developed for health professionals and patients through the pilot nationally

The three pilot models clearly demonstrate that there is an unmet need for education and training in wound care and opportunity to leverage upskilling activities across Australia to support improved access to best practice wound care. As highlighted by providers, PHNs, RACFs and health professionals, there is opportunity to scale and roll out education, training and resources developed through the pilot

across Australia, to support equity of access to best practice wound care and management. Many stakeholders identified challenges in finding and accessing guidelines and resources for best practice wound management (outside of the pilot), with some providers reporting that they could only find relevant educational materials from overseas about evidence-based wound care. There is a clear need to develop and roll out resources, education and training (including leveraging those developed through the pilot) that is tailored to the Australian health system as well as to different care settings (e.g., RACFs, general practices, hospitals). Providers highlighted the need for targeted advice and guidelines for the various environments in which they work across health and aged care settings.

"When I tried to look into best practice wound management, I found a document from New Zealand...it feels like there's not much [guidance] really tailored for us"

Provider, Nepean Blue Mountains PHN

Providers and PHNs also highlighted the need for guidance on consumables and how to use dressings as part of best practice wound care. This is discussed further in the following section.

Providers and PHNs highlighted opportunities to develop a centralised online portal for education and training in best practice wound management (for both providers and patients). Providers identified a need for access to self-paced learning resources about wound care that is easily accessible for multidisciplinary clinicians, similar to the national <u>COVID-19 vaccine education portal</u>. This would help to accommodate the busy schedules of health professionals and support independent learning and development of care providers. While some stakeholders acknowledged that peak bodies or professional colleges provide some resources via an online portal, they highlighted barriers to access as paid membership is required.

Western Victoria PHN's pilot model involved educational resource development for both providers and patients, as discussed in Section 3.3 including:

- resources for providers to support upskilling these resources were shared across general practices via USB
- resources for patients to support self-management of wounds and patient education these video resources were shared to other PHNs who had contracts with the platform Healthily (a technology company specialising in patient education).

There is opportunity to generate cost-efficiencies by standardising resource content development for education and training on best practice care and to ensure resources can be shared nationally to both providers and patients.

Stakeholders reported a range of barriers to the effective use of consumables as a part of best practice wound management and care

Barriers reported by stakeholders consulted include:

- limited and inconsistent knowledge and awareness among health professionals and RACF staff regarding which consumables to use for different wounds or circumstances and how best to use them
- a lack of appropriate consumables in RACFs, general practices and pharmacies where there is often limited and/or inappropriate consumables stocked in these settings
- a lack of agreement among health professionals across the system about which consumables to use and how best to use them
- the cost of accessing consumables borne by providers and patients.

"There is a lack of basic stuff out there, whether it's a dressing pack or basic equipment like good mattresses for patients... it's a real barrier to implementation of best practice."

Provider, Gold Coast PHN

The challenges around the procurement, application, use and cost

of wound products and consumables are interrelated. There cannot be one simple solution, for example some stakeholders in the sector have proposed that all consumables should be "free". However, even if the cost of consumables were covered or reimbursed, the appropriate application and use of products differs for specific wounds, so education and training is required. The barriers to evidence-based care linked to consumables can be addressed through multifaceted approaches that consider guidance for health professionals, and consideration of funding support – the following two sections deal with these themes, respectively.

There is opportunity to improve the use, procurement and application of the right wound products and consumables, including through the provision of evidence-based guidance for providers

Improving the knowledge about and appropriate application and use of consumables will support enhanced access to best practice wound management and care, greater economies of scale and cost efficiencies across the health and aged care systems, and improved patient quality of life.

There are two key opportunities to improve the application and use of consumables to increase access to in best practice wound care:

• Develop nationally standardised guidance about the range and mix of consumables that should be stocked in different settings i.e., a non-branded, generic product formula tailored to different wounds and care settings.

 Deliver education, training and guidelines regarding the use of consumables in different settings for different wounds.

These are explored further below.

There is opportunity to develop nationally standardised guidance about the range and mix of consumable products that should be stocked in different settings such as general practices, RACFs and hospitals.

Providers consulted as part of the evaluation reported that care settings such as RACFs, general practices, pharmacies and hospitals, do not always stock an appropriate mix of consumables that are needed for best practice wound management and care, thereby limiting the availability of consumables at the point of care. There is high demand for greater guidance about what consumables should be provided in different settings. In response to this demand, a clinical expert in wound management involved in the Western Victorian pilot developed product formulas (non-branded) and example brands for health professionals in their region.

Developing nationally standardised guidance creates the opportunity to ensure consistent and cost-effective application of consumables. The use of less expensive dressings at the commencement of "What is an appropriate and basic stock [of consumables] that RACFs and general practices should keep? They [RACFs] need guidance for the most common wounds and what is recommended."

Pilot PHN representative

treatment has been shown to increase overall costs to the health system in the long run because of the increased risk of complications requiring hospitalisation.⁶⁴ However, general practices and RACFs controlling their own budgets may find it difficult to invest in more expensive evidence-based wound products, particularly if they are not certain that the more expensive product will have a meaningful benefit on outcomes.⁶⁵

There is opportunity to develop a product formula to guide the selection and stock of consumables for different wounds in different settings. Consultations highlighted key considerations for this product formula guidance:

- the product guidance should be broad in the type of products recommended including consumables beyond just dressings i.e., they should include preventative equipment (such as air mattresses), body wash, moisturisers, etc.
- the product guidance should be evidence-based and supported by other clinical tools and resources required to deliver best practice wound care
- the product guidance should not be brand specific. Stakeholders identified that specifying brands in product formulas in the past has led to poor uptake of the guidelines (some providers may disagree with the brands specified, or stockists may have preferences)
- the product guidance should be freely available and ideally be reviewed or endorsed by a noncommercial, professional body as well as a Government body to ensure neutral commercial interests and national standardisation and alignment
- where regional wound specialist teams are supporting health professionals, the product guidance should be used when directing and overseeing care.

There is a need for education, training and guidelines regarding the use of consumables in different settings for different wounds. Providers, PHNs, health professionals and RACFs highlighted variability in the level of knowledge and skill of providers and care staff to effectively use consumables as part of

⁶⁴ Barrett M, Larson A, Carville K, Ellis I. Challenges faced in implementation of a telehealth enabled chronic wound care system. Rural Remote Health 2009;9:1154.

⁶⁵Norman RE, Gibb M, Dyer A, Prentice J, Yelland S, Cheng Q, Lazzarini PA, Carville K, Innes-Walker K, Finlayson K, Edwards H. Improved wound management at lower cost: a sensible goal for Australia. International wound journal. 2016 Jun;13(3):303-16.

wound care for patients. There is opportunity to develop guidelines and deliver education and training to support the use of consumables in best practice care; this should be tailored to different care settings (hospitals, RACFs, general practice, etc.) as well as to different types of wounds. Some stakeholders suggested that there is opportunity to build these guidelines, education and training into quality standards in different care settings. Upskilling in effective consumables use can contribute to improved product utilisation which supports enhanced quality of care for patients and cost-efficiencies for the system.

Stakeholders report the need for improved compensation of the time taken to deliver best practice wound care, particularly for practice nurses and potentially a consistent approach to funding consumables

The MBS contains no items to compensate nurse time for wound management and care which can contribute to inefficient use of GP time. Since the removal of MBS item 10996 – wound care service provided by a practice nurse – there are no wound-specific MBS items. Health care professionals use a range of professional attendance MBS items for wound care episodes and claim these as fees for service. For example, GPs in the Pilot indicated that they are able to claim MBS item 23, Professional attendance by a GP lasting less than 20 minutes, which pays \$39.10.⁶⁶ These reimbursement arrangements create

perverse incentives to involve GPs in care that could be delivered by practice nurses, which is an inefficient use of resources.

The MBS Wound Management taskforce asserted that "additional MBS items are not required specifically for the management of wounds for General Practitioners (GPs), practice nurses and other health professionals. The management of wounds by GPs is already covered by existing MBS items. Wound care provided by practice nurses is currently funded through the Workforce Incentive Program (WIP)." As such the Taskforce has recommended that the WIP be reviewed to better support appropriate wound care.

"We try to involve doctors so that we can claim [MBS items] but it takes away from the entire purpose of the nurseled model. Having our time reimbursed could help a lot."

Nurse practitioner, Western Victoria PHN

Current reimbursement arrangements for wound management in general practice appear to not be financially sustainable – general practices reported not recouping the actual cost of wound care delivery.

General practices participating in Nepean Blue Mountains PHN and Western Victorian PHN pilots indicated that the MBS rebate does not cover its costs for wound management. One provider noted "We do not even recoup the cost of nurse time using MBS item 23 when dressing a wound. It is not financially sustainable for us to continue providing wound care after the pilot." This is corroborated by a number of Australian studies^{67 68} which indicate "the total costs of wound care in most cases were greater than the total income, resulting in a net loss to the general practice." However, there appears to be low awareness of available funding such as the Practice Incentive Payment.

With no wound-specific MBS item numbers, and the inability to access reimbursement for nurse time and consumables through the MBS, there are limited financial or time-saving incentives for general practices to become actively involved in evidence-based wound care.⁶⁹ As evidence-based wound assessment and management can be particularly time consuming (particularly for practice nurses), consultations are based

⁶⁶ Norman RE, Gibb M, Dyer A, Prentice J, Yelland S, Cheng Q, Lazzarini PA, Carville K, Innes-Walker K, Finlayson K, Edwards H. Improved wound management at lower cost: a sensible goal for Australia. International wound journal. 2016 Jun;13(3):303-16.
⁶⁷ Whitlock E, Morcom J, Spurling G, Janamian T, Ryan S. Wound care costs in general practice: a cross-sectional study. Australian family physician. 2014 Mar;43(3):143-6.

⁶⁸ Norman RE, Gibb M, Dyer A, Prentice J, Yelland S, Cheng Q, Lazzarini PA, Carville K, Innes-Walker K, Finlayson K, Edwards H. Improved wound management at lower cost: a sensible goal for Australia. International wound journal. 2016 Jun;13(3):303-16.
⁶⁹ Barrett M, Larson A, Carville K, Ellis I. Challenges faced in implementation of a telehealth enabled chronic wound care system. Rural Remote Health 2009;9:1154.

on the presenting problem with little opportunity for preventive measures.⁷⁰ While there are MBS items available for longer GP consultations, participating general practices indicated that after the initial diagnosis, practice nurses spend the bulk of the time managing and dressing wounds which allows GPs to see their other patients. As such consulted general practices indicated that charging for a longer consult is typically not possible and not an effective use of GP time.

Consumables represent significant out-of-pocket costs for patients treated in general practices and RACFs, which can be a barrier to evidence-based wound care. Chronic wounds patients can spend between \$3000 (estimate for diabetic foot ulcers)⁷¹ and\$4,000 (estimate for venous leg ulcers) on out-ofpocket costs per year⁷², which can represent significant financial pressure for people with low incomes, or those over 65 who are often retirees and pensioners. Public hospital outpatient wound clinics and statefunded community nursing clinics are typically provided at no cost to the patient and often also cover the cost of consumables.⁷⁰ However there is no equivalent mechanism to fund consumables in general practices and RACFs, leaving the patient to pay for consumables out-of-pocket. Stakeholders highlighted the NHS's prescription model for wound consumables as an approach Australia could consider. In the NHS model, GPs can prescribe wound consumables and patients can purchase them for a subsidised fee.

Reimbursing consumables is in line with the MBS Review Taskforce recommendation on wound management consumables:

"Taskforce recommends that a wound care consumables scheme be developed in line with Recommendation 24 of the Wound Management Working Group.

• This scheme will ensure that wound care is financially sustainable for patients and providers, with patients having access to appropriate and evidence-based wound care products with reduced out of-pocket costs.

This scheme would be available to practices that: are accredited or registered for accreditation against the Royal Australian College of General Practitioners (RACGP); and who maintain a minimum of one person within the practice (e.g. GP, nurse or allied health professional) who has completed appropriate wound management training⁷⁷³

Treating wounds in community settings can reduce downstream health system costs

There is strong evidence that community-based wound care can improve downstream health system costs, particularly hospital admissions. Care provided in community settings through skilled general practitioners, RACF staff, community nurses, allied health workers such as podiatrists, Aboriginal health workers and community pharmacists, is a critical component of evidence-based wound management.^{74 75} An effective and well-coordinated community-based wound care system has a range of health benefits to patients including earlier diagnosis of chronic wounds, timely access to evidence-based wound treatment, and faster healing times. This model also has financial benefits to the broader health system due to fewer hospital admissions, readmissions and amputations⁷⁰

⁷⁰ Norman RE, Gibb M, Dyer A, Prentice J, Yelland S, Cheng Q, Lazzarini PA, Carville K, Innes-Walker K, Finlayson K, Edwards H. Improved wound management at lower cost: a sensible goal for Australia. International wound journal. 2016 Jun;13(3):303-16.

⁷¹ Brain, D., Tulleners, R., Lee, X., Cheng, Q., Graves, N. and Pacella, R., 2019. Cost-effectiveness analysis of an innovative model of care for chronic wounds patients. PloS one, 14(3), p.e0212366.

⁷² Smith, E. and W. McGuiness, 'Managing venous leg ulcers in the community; Personal financial cost to sufferers', Wound Practice and Research, 18(3): 134-139, 2010.

⁷³ Medicare Benefits Schedule Review Taskforce, Taskforce Findings Wound Management. 2020. Available here

⁷⁴ Edwards H, Finlayson K, Courtney M, Graves N, Gibb M, Parker C. Health service pathways for patients with chronic leg ulcers: identifying effective pathways for facilitation of evidence based wound care. BMC Health Serv Res 2013;13:86

⁷⁵ PMG Commissioned by Australian Wound Management Association . An economic evaluation of compression therapy for venous leg ulcers, 2013. Available <u>here</u>

Two specific examples of how community-based wound care can provide health system benefits and savings are presented below for:



Diabetic foot ulcers



Venous leg ulcers



There is potential for between \$170 million and \$270 million in cost savings over 5 years due to avoided hospital admissions with improved community-based care for diabetic foot ulcers.

Although there are national and international evidence-based guidelines on the best practice management and prevention of diabetic foot ulcers,^{76 77} many Australian patients with diabetes do not receive best practice care. ^{78 79} Reasons include lack of knowledge among health care providers and decision makers, low patient compliance and high costs and lack of reimbursement for recommended interventions.⁸⁰ Australia's failure to successfully implement evidence-based recommendations for diabetic foot ulcers has coincided with a national diabetes-related amputation rate that increased by 30% between 1998 and 2011 and was reported to be one of the worst in the developed world.^{81 82}

In other developed nations where evidence-based strategies for diabetic foot ulcers have been systematically implemented, these national costs have been significantly reduced.^{83 84 85} Similarly, local studies of the implementation of evidence-based care in regions of Australia have shown considerably reduced diabetic foot ulcer-related hospitalisation, amputation and overall burden.^{86 87}

Table 7 provides an overview of the estimated potential cost savings in health care service delivery by improving access to best practice community-based wound care for diabetic foot ulcers, based on cost modelling conducted by the evaluation team. The modelling aims to provide a contemporary estimate of potential cost savings that could be accrued by increasing the reach of best practice, community-based wound care for diabetic foot ulcers. The modelling accounts for the service costs associated with increasing provision of best practice, community-based wound care and the costs of avoidable hospitalisations associated with diabetic foot ulcers.

⁷⁶ National Health and Medical Research Council (NHMRC) Guidelines. National evidence-based guideline on prevention, identification and management of foot complications in diabetes (Part of the guidelines on management of type 2 diabetes). Melbourne: Baker IDI Heart and Diabetes Institute; 2011.

⁷⁷ Internal Clinical Guidelines. National Institute for Health and Care Excellence: Clinical Guidelines. Diabetic foot problems: prevention and management. London: National Institute for Health and Care Excellence 2015.

⁷⁸ Edwards H, Finlayson K, Courtney M, Graves N, Gibb M, Parker C. Health service pathways for patients with chronic leg ulcers: identifying effective pathways for facilitation of evidence based wound care. BMC Health Serv Res 2013;13:86.

⁷⁹ Quinton T, Lazzarini P, Boyle F, Russell A, Armstrong D. How do Australian podiatrists manage patients with diabetes? The Australian diabetic foot management survey. J Foot Ankle Res 2015;8:16.

⁸⁰ Quinton T, Lazzarini P, Boyle F, Russell A, Armstrong D. How do Australian podiatrists manage patients with diabetes? The Australian diabetic foot management survey. J Foot Ankle Res 2015;8:16.

⁸¹ Lazzarini PA, Gurr JM, Rogers JR, Schox A, Bergin SM. Diabetes foot disease: the Cinderella of Australian diabetes management? J Foot Ankle Res 2012;5:24.

⁸² Bergin SM, Alford JB, Allard BP, Gurr JM, Holland EL, Horsley MW, Kamp MC, Lazzarini PA, Nube VL, Sinha AK, Warnock JT, Wraight PR. A limb lost every 3 hours: can Australia reduce amputations in people with diabetes? Med J Australia 2012;197:197–8.

⁸³ Canavan RJ, Unwin NC, Kelly WF, Connolly VM. Diabetes- and non-diabetes-related lower extremity amputation incidence before and after the introduction of better organized diabetes foot care: continuous longitudinal monitoring using a standard method. Diabetes Care 2008;31:459–63.

⁸⁴ Witso E, Lium A, Lydersen S. Lower limb amputations in Trondheim, Norway. Acta Orthopaedica 2010;81:737–44.

⁸⁵ van Houtum WH, Rauwerda JA, Ruwaard D, Schaper NC, Bakker K. Reduction in diabetes-related lower-extremity amputations in The Netherlands: 1991–2000. Diabetes Care 2004;27:1042–6.

⁸⁶ Lazzarini PA, O'Rourke SR, Russell AW, Derhy PH, Kamp MC. Reduced Incidence of foot-related hospitalisation and amputation amongst persons with diabetes in Queensland, Australia. PLoS One 2015;10:e0130609.

⁸⁷ Kurowski JR, Nedkoff L, Schoen DE, Knuiman M, Norman PE, Briffa TG. Temporal trends in initial and recurrent lower extremity amputations in people with and without diabetes in Western Australia from 2000 to 2010. Diabetes Res Clin Pract 2015;108:280–7.

The core methodology for the analysis has been adapted from a rigorous cost-effectiveness analysis of implementing best practice community-based wound care for diabetic foot ulcer in Australia.⁸⁸ The evaluation's modelling includes updated population data⁸⁹ and hospitalisation cost data from 2020.⁹⁰ The evaluation has incorporated conservative sensitivity analysis for key epidemiological parameters to reduce the risk of overstating potential benefits given the lack of reliable data on wound prevalence.

The modelling analysis centres around assessing the impact of changing the levels of access to best practice, community-based care for diabetic foot ulcers (referred to as 'best practice care') as compared the current typical care delivery (referred to as 'current care'). Under current practice, individuals receive a mix of largely uncoordinated services in the community. Best-practice care was defined as care that follows the set of recommendations from the National Guideline for the Prevention, Identification and Management of Foot Complications in Diabetes.⁹¹ The best available evidence suggests that currently, 30% of people with diabetic foot ulcers receive best practice care.⁹² The evaluation's modelling explores intervention scenarios where the proportion of people with diabetic foot ulcers accessing best practice, community-based care increases to 50%, 70% and 90% (lower bound, midpoint and upper bound scenarios respectively).

A comprehensive overview of the conceptual approach, scope, methodology and assumptions of the modelling as well as a detailed presentation of results can be found in Appendix D.3.1. This includes definitions of the scope of care costed in the current care and best practice care scenario. Patient education & self management support is incorporated into the best practice care scenario.

The results in Table 7 indicate that increasing access to best practice, community-based care for diabetic foot ulcers could result in cost savings of between \$171 million and \$272 million over five years. Increasing access to best practice diabetic foot ulcer care increases the cost of community-based care, however these are offset by the substantially larger savings from reduced hospital admissions.

Benefits over five years	Lower bound	Midpoint	Upper bound
Total cost savings (\$AUD rounded to the nearest \$million)	\$171 million	\$234 million	\$272 million
Number of additional people receiving best-practice community care (people)	15,630	51,334	110,425
Number of hospitalisations avoided (separations)	6,769	11,717	17,733

Table 7 | Estimated 5-year cost savings from avoided hospital admissions through the implementationof best practice community-based Diabetic Foot Ulcer treatment from FY2023-24 until FY2027-28

based care on the future burden. School of Public Health and Social Work Faculty of Health Queensland University of Technology. 2022

⁸⁸ Cheng Q, Lazzarini PA, Gibb M, Derhy PH, Kinnear EM, Burn E, Graves N, Norman RE. A cost-effectiveness analysis of optimal care for diabetic foot ulcers in Australia. International wound journal. 2017 Aug;14(4):616-28.

⁸⁹ Australian Bureau of Statistics, Population Projections Australia. 2020. Available here

⁹⁰ Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. Accessible here

⁹¹ National Health & Medical Research Council Guidelines. National evidence-based guideline on prevention, identification and management of foot complications in diabetes Melbourne: Baker IDI Heart & Diabetes Institute; 2011.

⁹² Zhang, Y. The burden of diabetes-related foot disease: estimating the existing burden and the impact of implementing guideline-



There is a potential for between \$120 million and \$430 million in health system cost savings over 5 years due to avoided hospital admissions with improved community-based care for venous leg ulcers.

Venous leg ulcers are expensive to treat and impair quality of life of affected individuals. Although improved healing and reduced recurrence rates have been observed following the introduction of evidence-based guidelines, a significant evidence-practice gap exists,^{93 94} due to a lack of information, skills and reimbursement in community-based settings.^{95 96} Compression is the recommended first-line therapy for treatment of venous leg ulcers and can be effectively delivered in community settings.⁹⁷ Unlike some other developed countries, the Australian health system does not subsidise compression therapy or systematically train and provide ongoing clinical support to community-based service providers to deliver compression therapy.⁹⁸

Table 8 provides the estimated potential cost savings from reduced hospital admissions for improved community-based wound care for venous leg ulcers. The modelling aims provide a contemporary estimate of potential cost savings that could be accrued by increasing the reach of best practice, community-based wound care for venous leg ulcers. The modelling accounts for the service costs associated with increasing provision of best practice, community-based wound care and the costs of avoidable hospitalisations associated with venous leg ulcers.

The modelling analysis centres around assessing the impact of changing the levels of access to best practice, community-based care for venous leg ulcers (referred to as 'best practice care') as compared the current typical care delivery (referred to as 'current care').

Current care refers to a scenario where individuals do not receive all the components of guideline-based care listed under best practice care. Since a small proportion of Australians are currently receiving compression therapy, the modelling assumes current care would include a proportion of patients receiving compression therapy but with partial adherence, and no reimbursement of consumables (i.e. assuming out-of-pocket costs).

Best-practice care was defined as care that follows the set of recommendations from the Australian and New Zealand Clinical Practice Guideline for Prevention and Management of venous leg ulcers.⁹⁹ The specific approach to care delivery that was modelled is through specialist wound clinics led by nurse practitioners with wound expertise together with a team of allied health professionals and specialists. The specific detail of the assumed care that was costed in each scenario is outlined in Figure 27. The definitions 'current care' and 'best practice care' were drawn from Cheng et al. (2018).¹⁰⁰

The core methodology for the analysis has been adapted from a rigorous cost-effectiveness analysis of implementing community-based compression therapies for venous leg ulcers in Australia, which uses

⁹³ Kruger AJ, Raptis S, Fitridge RA. Management practices of Australian surgeons in the treatment of venous ulcers. ANZ J Surg. 2003;73(9):687–91.

⁹⁴ Woodward M: Wound Management by Aged Care Specialists Primary Intention: The Australian Journal of Wound Management 2002, 10(2):70–71, 73–76.

⁹⁵ Coyer FM, Edwards HE, Finlayson KJ. National Institute for Clinical Studies Report for Phase 1, Evidence Uptake Network : Best Practice Community Care for Clients with Chronic Venous Leg Ulcers. In: Queensland University of Technology Brisbane, QLD; 2005.
⁹⁶ Norman RE, Gibb M, Dyer A, Prentice J, Yelland S, Cheng Q, Lazzarini PA, Carville K, Innes-Walker K, Finlayson K, et al. Improved

wound management at lower cost: a sensible goal for Australia. Int Wound J. 2016;13(3):303–16. ⁹⁷ Australian Wound Management Association, New Zealand Wound Care Society: Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers; 2011.

⁹⁸ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

⁹⁹ Australian Wound Management Association, New Zealand Wound Care Society: Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers; 2011.

¹⁰⁰ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

population data and hospitalisation cost data from 2015.¹⁰¹ The analysis includes updated population data¹⁰² and hospitalisation cost data from 2020¹⁰³ as well as a range of prevalence estimates (as detailed in Appendix D).

A comprehensive overview of the conceptual approach, scope, methodology and assumptions as well as a detailed presentation of results can be found in Appendix D.3.2. This includes definitions of the scope of care costed in the current care and best practice care scenarios. Patient education & self management support is incorporated into the best practice care scenario.

The results in Table 8 indicate that increasing access to best practice, community-based care for venous leg ulcers could result in cost savings of between \$123 million and \$433 million over five years. These cost savings are a result of avoided hospital admissions as well as lowered overall community-based care costs due to a substantial reduction in infection and recurrence rates, faster healing times as well as less frequent dressing changes. Best practice can include fewer dressing changes with the use of higher quality four layered compression bandages, which require less nurse time and are therefore more cost effective.

Table 8 | Estimated 5-year cost savings from avoided hospital admissions through the implementation of best practice community-based venous leg ulcer treatment

Benefits over five years	Lower bound	Midpoint	Upper bound
Total cost savings (\$AUD rounded to the nearest \$million)	\$123 million	\$256 million	\$433 million
Number of additional people receiving best-practice community care (people)	35,034	90,030	170,512
Number of hospitalisations avoided (separations)	5,285	9,567	14,717

¹⁰¹ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

¹⁰² Australian Bureau of Statistics, Population Projections Australia. 2020. Available here

¹⁰³ Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. Accessible here

¹⁰⁴ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

4 Recommendations and strategic considerations

This section presents recommendations based on the evaluation findings, and provides broader, strategic considerations for future Department initiatives in wound care.

4.1 Recommendations

This section outlines the evaluation's overarching recommendation, and four supporting recommendations focused on lessons from the wound management pilot and KEQs.

The evaluation has specifically framed the recommendations flexibly in recognition of the considerable volume and complexity of intersecting wound care initiatives underway, including responses to the MBS Review Taskforce on Wound Management and the Final Report of the Aged Care Royal Commission.

The recommendations are intended to enable the Department to make informed decisions about whether and how to implement cognisant of the broader strategic, policy and fiscal context in this active policy area. Recommendations are mapped for alignment with previous findings or recommendations from the:

- MBS Review Taskforce on Wound Management¹⁰⁵
- Solutions to the Chronic Wounds Problem in Australia: A Call to Action,¹⁰⁶ a seminal, peer reviewed
 paper developed by the Chronic Wounds Solutions Collaborating Group (a team of leading clinicians
 and academics with support from government)
- Final Report of the Royal Commission into Aged Care Quality and Safety.¹⁰⁷

The recommendations are summarised in Table 9 and suggested actions associated with each recommendation are outlined in the following pages.

Overarching recommendation:	Continue to focus on initiatives to enhance access to best practice, community-based wound care.
1. Models of care	Consider scaling the regional wound specialist model of care in RACFs
2. Integration	Support the development and implementation of evidence-based, integrated wound care pathways
3. Education and training	Improve access to wound management education, training and guidance materials for health professionals and consumers
4. PHN role	Focus on supporting local integration and education and training initiatives

Table 9 | Evaluation recommendations

¹⁰⁵ MBS Taskforce on Wound Management (2020). Accessible here

¹⁰⁶ Pacella RE, Tulleners R, Cheng Q, Burkett E, Edwards H, Yelland S, Brain D, Bingley J, Lazzarini P, Warnock J, Barnsbee L. Solutions to the chronic wounds problem in Australia: a call to action. Wound Practice and Research: Journal of the Australian Wound Management Association. 2018 Jun;26(2):84-98 Accessible <u>here</u>

¹⁰⁷ Royal Commission in Aged Care Quality and Safety (2021). Accessible here

Overarching recommendation | Continue to focus on initiatives to enhance access to best practice, community-based wound care

Rationale: The evaluation confirms the known or existing challenges in chronic wound care and management in Australia, providing support for continued efforts and ongoing programs in this area. The evaluation findings suggest:

- there remains unmet need for community-based wound care, with inconsistencies in the availability, quality and integration of existing community-based wound care services
- where best practice, specialist wound care is available and accessed there is clear benefit and improved outcomes, often life-changing improvements, for consumers and their families
- the potential efficiency and cost savings of providing best practice community-based wound care and avoiding hospitalisations related to wound care is considerable (see Section 3.6 and Appendix D.3 for projections and associated assumptions based on available data).

Most chronic wound care is delivered by community nurses, hospital nurses, and to a lesser extent general practice nurses. The provision of wound care occurs in state and territory health services, primary care and aged care – responsibility is across state and federal governments. Availability of state- or territory-based specialist wound clinics is variable, and many state- or territory-funded hospital or community nurses are at capacity and have no remit into residential aged care. Workforce and capacity pressures on general practice/primary care coupled with out-of-pocket costs for patients can limit timely access to wound care.

The Department has a portfolio of wound management programs underway or planned that should continue.¹⁰⁸

Alignment to previous reports:

Chronic Wounds Solutions Collaborating Group Call to Action:

- <u>Page 19:</u> Make policies and funding for evidence-based initiatives that focus on the prevention and treatment of chronic wounds a priority, involving all relevant stakeholders.
- <u>Page 19</u>: Recognise that chronic wounds cause a significant burden to the national health budget, as well as a deeply negative impact on patients and their families/carers

¹⁰⁸ Department programs underway or in development include:

[•] Development of wound consumables schemes to ensure wound care is financially sustainable for patients and providers (in response to Recommendation 3 of the MBS Review Taskforce on Wound Management)

a review of Aged Care Quality Standards including wound care (in response to Recommendation 19 of the Royal Commission into Aged Care Quality and Safety); and

[•] work conducted through the National Wound Initiative by the Western Australian Health Translation Network which aims to better understand actual costs of best practice care, develop new guidelines, develop an integrated training and education framework and a coordinated program of research.

Recommendation 1 | Model of care: Consider scaling the regional wound specialists'

model of care in RACFs

Rationale: The evaluation findings suggest that the regional specialist model delivered via the Gold Coast PHN was effective in supporting access to high quality, evidence-based wound care in RACFs. There is limited and variable availability of wound specialist nurses to provide advice and expertise to RACF staff to manage chronic wounds in aged care residents. Existing hospital- and community-based wound specialists have limited or no capacity, remit or scope to support wound management in RACFs.

Suggested actions:

1.1 Support regional wound specialist models of care for RACFs

- The evaluation indicates a regional wound specialist (or wound expert) for a catchment of RACFs provides:
 - ongoing training and education to RACF staff
 - secondary telehealth consultations to support identification and management of wounds, and
 - hands-on specialist wound care to a small portion of residents with the most complex wounds.
- There are options to support scaling-up this model, including collaborative co-commissioning or cost sharing with states and territories both complex arrangements with benefits and drawbacks, that are best considered in the context of the broader wound management portfolio.
- If scaled, continuous improvement and review mechanisms should be built into the regional specialist model initiative to ensure it remains fit for purpose and effective for the region and RACFs.
- 1.2 Explore the viability of a pilot of a regional wound specialist model in general practice
- The evaluated PHN models in general practice settings (based in upskilling practice nurses and GPs) did not provide evidence for scalability and had limited patient reach. There may be opportunity to trial the regional wound specialist model in general practice.
- General practice staff consulted in the evaluation noted that providing wound care was not financially
 viable under current funding arrangements. There appears to be low awareness of available funding
 such as the Practice Incentive Payment. A better understanding of the financial viability of wound care
 and management in general practice under current funding arrangements should be established prior
 to exploring viability of a pilot or trial of regional specialist model in general practice or primary care
 settings (see also Strategic Consideration 3).

Alignment to previous reports:

Chronic Wounds Solutions Collaborating Group Call to Action:

- <u>Page 19:</u> Support integrating health service approaches to prevention and management with an emphasis on primary health care to help people manage their health across the life course.
- <u>Page 19</u>: Improve the coordination of services through development of an efficient interface across wound care providers to drive down the number of avoidable hospital admissions.

MBS Review Taskforce Wound Management:

- <u>Recommendation 4</u>: Taskforce recommends a stepped care model be adopted for the management of wounds. Specifically:
 - The Taskforce supports GPs being upskilled to correctly diagnose and manage chronic wounds and those at high risk of becoming chronic, with referral to appropriate expertise when required.
 - This includes developing a referral pathway to ensure appropriate access to an identified wound care expert

Alignment to previous reports:

when a wound is not healing, for example locally via Primary Health Networks or remotely via telehealth.

- Where appropriate, consultation with identified wound care experts should authorise/enable patient access to specific additional dressings that are tailored to the wound and the individual patient.
- Consultation with identified wound care experts should also authorise/enable patient access to specific additional services from appropriately trained allied health professionals, where required.
- <u>Recommendation 12</u>: Taskforce recommends improving education and training of RACF staff. This recommendation proposes considering introducing mandatory quality indicators for education and training of RACFs staff, including the management of skin injuries, chronic wounds and ulcers, in accreditation and monitoring processes of RACFs under the Aged Care Quality Standards. RACF staff include registered and enrolled nurses, assistants in nursing, personal care workers and Aboriginal and Torres Strait Islander health practitioners and health workers.
- <u>Recommendation 14:</u> Access to wound care experts in RACFs. The Working Group recommends improved access to wound experts, including service teams (on-site or telehealth-enabled, where appropriate), to assist RACF staff to provide evidence-based wound management of chronic wounds for residents.

Final Report Royal Commission into Aged Care Quality and Safety:

• <u>Recommendation 58:</u> Access to specialists and other health practitioners through Multidisciplinary Outreach Services. The key features of the model should include ... embedded escalation to other specialists (including endocrinologists, cardiologists, infectious disease specialists and wound specialists).

Recommendation 2 | Integration: Support the development and implementation of evidence-based, integrated wound care pathways

Rationale: Strengthened cooperation, joint service planning and mechanisms for collaboration between primary care services and RACFs, and state or territory health services, including state regional health networks, are needed to avoid gaps in care, duplication, and ensure coverage and access to best practice wound care across Australia.

Suggested actions:

2.1 Engage in a national co-design process to establish evidence-based, integrated wound care pathways

- Integrated wound care pathways should provide guidance about points of entry to receive wound care, the clinical capability expected within service providers and care escalation pathways at different levels of wound severity as well as referral criteria and processes.
- Service providers in the integrated wound care pathways should include (but not be limited to) wound specialists, general practice, pharmacies, state-funded community wound care, hospitals and paramedic services.

2.2 Consider the best approach for coordinated delivery of jurisdictional community wound care and community-nursing teams

 Integrated wound care pathways should be designed based on a nationally agreed clinical guidance (suggested action 2.1), and agreements within each state and territory concerning the role of statefunded community services.

Alignment to previous reports:

Chronic Wounds Solutions Collaborating Group Call to Action:

- <u>Page 19:</u> Support integrating health service approaches to prevention and management with an emphasis on primary health care to help people manage their health across the life course.
- <u>Page 19</u>: Improve the coordination of services through development of an efficient interface across wound care providers to drive down the number of avoidable hospital admissions.

MBS Review Taskforce Wound Management:

- <u>Recommendation 4:</u> Taskforce recommends a stepped care model be adopted for the management of wounds.
- <u>Recommendation 5:</u> Increase the number of allied health services available for patients with chronic wounds or wounds deemed at high risk of becoming chronic, additional to those available under Team Care Arrangements (TCAs).

Recommendation 3 | Education and training: Improve access to wound management education, training and guidance materials for health professionals and consumers

Rationale: Evaluation findings suggest there is a need for development of and access to:

- education and training for health professionals (including but not limited to practice nurses, GPs, pharmacists and RACF staff) to better identify and manage wounds
- patient education and knowledge about wound management to support effective self-care, early intervention and prevention of chronic wounds.

Suggested actions:

3.1 Consider what education and guidance materials for health professionals and consumers (developed in the pilot) could be accessed nationally

- Each PHN in the pilot provided education or training for health professionals in wound management.
- Some PHNs developed online resources for health professionals and consumers. These resources, particularly the online materials, could be scaled to other regions or made nationally available, once reviewed for quality and appropriateness.

3.2 Consider developing national evidence-based guidance on the range and mix of consumables that should be stocked in different settings, for different wounds.

- Consumables are accessed through various settings including general practice, pharmacies, community services, hospital inpatient and outpatient services and there is an opportunity for each setting to regularly stock typical products tailored to their consumer needs.
- The evaluation identified that there is a considerable gap in knowledge about basic wound care including which products are suitable for specific wounds, and how to apply and replace them for optimal patient outcomes and reduced cost.
- Guidance should be generic (brand-agnostic), based on rigorous cost-effectiveness analyses and tailored to settings.

3.3 Provide training scholarships for specialist wound management education programs

 Provision of training scholarships for specialist university courses and formal continuing professional development (CPD) activities in wound management would both upskill relevant health professionals and promote awareness of the need for specialist knowledge required for best practice care and improved patient outcomes.

Alignment to previous reports:

Chronic Wounds Solutions Collaborating Group Call to Action:

- <u>Page 19</u>: Focus on knowledge translation and disseminate evidence on the cost-effectiveness of guidelinebased wound management and ensure end users of research (policy-makers and healthcare professionals) are involved in the research process from design to dissemination.
- <u>Page 19</u>: Ensure the availability of skilled healthcare professionals with adequate education and training in evidence-based wound management.

MBS Review Taskforce Wound Management:

• <u>Recommendation 3:</u> Taskforce recommends an education program be developed for healthcare providers, including wound specific Continuing Professional Development (CPD) activities.

Alignment to previous reports:

• Recommendation 12: Taskforce recommends improving education and training of RACF staff.

Final Report Royal Commission into Aged Care Quality and Safety:

- <u>Recommendation 79:</u> Review of certificate-based courses for aged care - As part of any such review, the Aged Services Industry Reference Committee, working with the Australian Government Human Services Skills Organisation as required, should consider if any of the following additional units of competency should be included as core competencies: personal care modules, including trauma-informed care, cultural safety, mental health, physical health status, wound care, oral health, palliative care, falls prevention, first aid, monitoring medication and dysphagia management.
- <u>Recommendation 114:</u> Immediate funding for education and training to improve the quality of care. Eligible education and training should include... continuing education and training courses (including components of training courses, such as 'skill sets' and 'micro-credentials') relevant to direct care skills, including, but not limited to, dementia care, palliative care, oral health, mental health, pressure injuries and wound management.

Recommendation 4 | PHN role: Focus on supporting local integration and education and training initiatives

Rationale: PHNs have built strong relationships across the health system in their region. They are well placed to coordinate education and training and facilitate local partnerships across the system to support integration. This aligns with the key roles PHNs define for themselves in the Supporting Healthy Ageing: The Role of PHNs White Paper¹⁰⁹ including: "system coordination and integration" and "primary health care education, training and workforce development".

Suggested actions

4.1 PHNs could focus on building local partnerships, relationships and networks, and connect stakeholders across the jurisdictional system

• Ideally, PHNs could facilitate the implementation of nationally agreed wound care pathways, helping to support integration and coordination locally (see Recommendation 2).

4.2 PHNs could coordinate the implementation of, and access to education and training in their region

• This may involve various learning activities for example, self-directed online learning modules, learning workshops with multidisciplinary clinicians and others, mentoring from other wounds specialists, hosting of online resources, or administration of scholarships (see Recommendation 3).

Alignment to previous reports

Chronic Wounds Solutions Collaborating Group Call to Action:

<u>Page 19</u>: Provide stronger leadership and coordination for the prevention and management of chronic wounds.

MBS Review Taskforce Wound Management:

- <u>Recommendation 4</u>: Taskforce recommends a stepped care model be adopted for the management of wounds. Specifically:
 - This includes developing a referral pathway to ensure appropriate access to an identified wound care expert when a wound is not healing, for example locally via Primary Health Networks or remotely via telehealth.

4.2 Strategic considerations

This section outlines three strategic considerations that relate to broader issues arising from the evaluation, not directly within the scope of the KEQs of the evaluation. They relate to systemic enabling factors that would support better access to high quality, evidence-based wound care in Australia. Most of the issues raised here relate to work currently underway or planned. The intention of including strategic considerations in this report is to reinforce the value in systemic investment and continuing work to support sustainable change and progress in wound management.

The strategic considerations are outlined below and mapped for alignment with previous reports.

1. Invest in reliable prevalence data on chronic wounds to support the regionally appropriate, evidencebased design, targeting and implementation of wound care programs

There is very limited reliable, quality data on chronic wound prevalence in Australia. This makes it difficult to plan for and budget wound management programs, monitor progress into the prevention and treatment of chronic wounds and conduct health service improvement research into the quality and safety of wound care in Australia. This aligns with a Department research project currently underway through the National Wound Initiative by the Western Australian Health Translation network.

Alignment to previous reports

Wounds Solutions Collaborating Group Call to Action

• <u>Page19:</u> Fund research into chronic wounds particularly to strengthen data collection and surveillance and support a national wound prevalence survey for monitoring progress in prevention and treatment" and "Drive the establishment of a national wound registry.

2. Consider system levers to support a highly skilled wound management workforce

Aside from the suggested actions presented in Recommendation 3 regarding education and training, stakeholders indicated other possible levers that could support a highly skilled workforce. These include:

- working with professional accrediting bodies (such as the Nursing and Midwifery Board of Australia and Royal Australian College of General Practitioners) to improve the availability of CPD points for courses in wound management, and;
- introducing quality indicators for education and training in wound management of health professionals, particularly general practice and RACF staff.

Alignment to previous reports

See alignment to reports flagged above under Recommendation 3 as well as the following more specific recommendations from the following reports:

MBS Review Taskforce Wound Management

- <u>Recommendation 3:</u> Taskforce recommends an education program be developed for healthcare providers, including wound specific Continuing Professional Development (CPD) activities. An education program should be developed to assist GPs and other health professionals providing wound care to patients, including those providing services within RACFs.
- <u>Recommendation 12:</u> Education and training of RACF staff. This recommendation proposes considering introducing mandatory quality indicators for education and training of RACFs' staff, including the management of skin injuries, chronic wounds and ulcers, in accreditation and monitoring processes of RACFs under the Aged Care Quality Standards. RACF staff include registered and enrolled nurses, assistants in nursing, personal care workers and Aboriginal and Torres Strait Islander health practitioners

Alignment to previous reports

and health workers.

The Final Report of the Royal Commission into Aged Care Quality and Safety

• <u>Recommendation 19:</u> Urgent review of the Aged Care Quality Standards - requiring best practice oral care, medication management, pressure injury prevention, wound management, continence care, falls prevention and mobility, and infection control, and providing sufficient detail on what these requirements involve and how they are to be achieved.

3. Continue to explore approaches to subsidise consumables and compensating the time taken to deliver wound care in general practice and in RACFs

Consumers and health practitioners indicated that the cost of wound consumables can be a barrier to equitable access to evidence-based, high quality wound care. Feedback from health professionals in general practice and RACFs as well as academic literature discussed in Section 3.6 indicate current funding arrangements need to be bolstered to viably sustain delivery of evidence-based, high quality wound care.

Alignment to previous reports

Some possible actions aligned with the recommendations of the **MBS Review Taskforce on Wound Management** include:

- Develop an approach to funding wound care consumables as per <u>Recommendation 3</u>: Taskforce recommends that a wound care consumables scheme be developed in line with Recommendation 24 of the WMWG. This scheme will ensure that wound care is financially sustainable for patients and providers, with patients having access to appropriate and evidence-based wound care products with reduced out of-pocket costs.
- Review the practice nurse funding under the Workforce Incentive Program to better support appropriate wound care as per the <u>Recommendation 1</u>: The Taskforce asserts that additional MBS items are not required specifically for the management of wounds for General Practitioners (GPs), practice nurses and other health professionals. The management of wounds by GPs is already covered by existing MBS items. Wound care provided by practice nurses is currently funded through the Workforce Incentive Program (WIP). Taskforce recommends that the WIP be reviewed to better support appropriate wound care.
- Review the funding for the management of complex wounds in aged care, for example via the Aged Care Funding Instrument as per the <u>Recommendation 13</u>: Review funding for chronic wounds in RACF This recommendation proposes reviewing funding for the management of complex wounds in aged care, for example via the Aged Care Funding Instrument. This should include consideration of both time and personnel required in caring for complex wounds, including complex venous, arterial and diabetic and neuropathic foot ulcers in residents, as well as the provision of appropriate consumables.

These considerations also align with recommendations from **Chronic Wounds Solutions Collaborating Group Call to Action**:

- <u>Page 19</u>: Increase financial support for evidence-based wounds products and services to harvest appropriate economic savings and improve outcomes.
- <u>Page 19</u>: Subsidise wound management procedures and products outside the hospital setting, particularly in areas such as compression therapy and negative pressure therapy to reduce hospital admissions.

Appendix A PHN pilot model case studies

This appendix presents case studies of the three PHN pilot models:

- Gold Coast PHN
- Nepean Blue Mountains PHN
- Western Victoria PHN

The case studies are informed by information and data provided to the evaluation team by each PHN, as well as consultations with PHN representatives..

The case studies include the following information:

- target cohort
- key features of the pilot model such as education and training, model of care delivery and PHN management of the pilot
- pilot outcomes and achievements
- enablers for success
- challenges faced and how they have been overcome.

It should be noted that the case studies reflect the PHN pilot models' progress to June 2022. The pilot models will continue implementation across all three PHNs beyond the date of this evaluation report.

A.1 Gold Coast PHN

Gold Coast PHN's pilot model adapted key elements of the Chronic Disease Wound Management Clinic being run in Gold Coast general practice and supported people with chronic and complex wounds living in residential aged care facilities. The pilot built the capacity of RACF staff to deliver evidence-based care. It involved a nurse-led outreach model of care, in which a regional wounds specialist team (led by a nurse practitioner and clinical nurse consultants) delivered care to residents and provided onsite support and mentoring to RACF staff. The pilot aimed to support localised wound management and care, develop care pathways to improve coordination of care between general practice, RACF staff and other treating clinicians.



Target cohort

The pilot model aimed to support people with chronic and complex wounds living in 27 RACFs in the Gold Coast PHN region.

Key features of the pilot model

Gold Coast PHN's pilot involved a regional wounds specialist team which comprised of a nurse practitioner with specialist expertise in chronic wound care, and clinical nurse consultants. The team's key functions were to deliver wound management education and training for RACF staff, provide secondary telehealth consultations to RACF staff and provide specialist wound care to a small portion of RACF residents with more complex wounds. The model involved the development of a local wound management care pathway.

The key features of the pilot model are explained further below.

Education and training

The regional wounds specialist team provided onsite support and mentoring to 80-100 RACF staff. This involved education and training about healing and effective wound management, with a focus on

implementing protocols to prevent wounds from reoccurring. RACF staff were supported by the regional wounds specialist team to assess and review patient needs and incorporate needs into wound management care plans on an ongoing basis. Education and training delivered to RACF staff aimed to embed best practice wound management within RACF environments.

The regional wound specialist team's approach to upskilling RACF staff was to empower staff by providing ongoing coaching, practical problem-solving advice and uplifting skills and confidence to ensure RACF staff could confidently and independently (where appropriate) support patients living with chronic wounds. "It's about education, empowerment and support for the workforce... [as a result of the pilot] the workforce are more empowered and have permission to implement interventions. It's about giving them the skills and knowledge to provide care."

Provider, Gold Coast PHN pilot

The service provider (Wound Specialist Services) who participated in the pilot were eligible for and encouraged to apply for formal credentialing from Wounds Australia.

Model of care delivery

The pilot model features a nurse-led outreach model of care. While the aim of the pilot was to support RACF staff to manage most wounds independently within the RACF, the regional wounds specialist team provided specialist care for some residents with chronic or complex wounds in their place of residence. These were often delivered through onsite visits for more complex wounds. The outreach model also allowed specialist clinical nurse consultants (as part of the wounds specialist team) to provide support to

"We came across a lot of barriers early on and took the concerns to Katie and the PHN. They have been proactive in helping break down barriers – facilitating meetings with HHS and finding out the situation and stimulating a lot of action. Katie and PHN's awareness of the unique needs and challenges faced by the geographic population has really helped."

Provider, Gold Coast PHN pilot

patients via telephone and electronic messaging.

PHN management of the pilot

Design of the pilot model | Gold Coast PHN developed a model of care for wound management in collaboration with Gold Coast Health and Hospital Services (HHS) – the Gold Coast Integrated Care Alliance (ICA) Wound Management Model of Care. The PHN aligned the pilot design with this overarching model of care for wound management. **Collaboration with other stakeholders |** The PHN coordinated with other stakeholders to support pilot implementation, including coordinating guidance and advice from Wounds Australia, GC HHS, GPs with special interest/expertise in wound management in the region, RACF staff, Gold Coast Health vascular team and Residential Aged Care Facility Support Service (RaSS).

Pilot outcomes and achievements

The pilot increased access to specialist care for residents in residential aged care facilities, meeting an unmet need in demand. With the introduction of the pilot, RACF residents in the Gold Coast were provided access to an additional specialist service that did not exist before the pilot program. Providers and the PHN reported that existing services had limited capacity to care for patients living with chronic wounds and that there were limited options for care delivered in community and residential settings. In particular, the pilot helped to address a clear need for specialist wound services within residential aged care facilities – providers reported that approximately half of residents in facilities will have skin integrity or wound problems.

Providers and the PHN reported that the pilot has supported improved patient outcomes for residents:

- reduced waiting times for patients to access specialist care for complex wounds
- reduced pain for some patients living with chronic wounds
- improved symptom control and healing time for some wounds.

The regional wound specialist team in Gold Coast PHN was able to collect pilot data for the patients that the team saw directly. However, this is a small fraction of all the patients impacted by the training and mentoring provided by the regional wound specialist team in Gold Coast PHN. The regional wound specialist team provided primary consultations to 31 patients, of which 23 provided consent to provide data to the evaluation. The age range of patients was between 67 and 97 years old with an average age of 85-years-old. The gender of patients was fairly evenly split, with 13 females (56%) and 10 males (44%). The most common wound were pressure injuries (44%), followed by mixed arterial / venous ulcer (22%), venous leg ulcers (13%), Incontinence Associated Dermatitis (9%), atypical wounds (4%), diabetic foot ulcer (4%) and malignancy – squamous cell carcinoma (4%). The regional specialist wound team was able to provide care to patients who had previously not been able to access treatment; 56% of patients had been diagnosed with the chronic wound at least three months prior to accessing care from the regional specialist wound team. This includes 8% of patients whose chronic wound had been active for over a year. The regional specialist wound team indicated the reasons why these wounds had been active for so long, included no diagnosis, misdiagnosis and/or inappropriate care. Further detail is provided in Section 3.2 of this report.

The pilot supported the effective upskilling of RACF staff to confidently deliver evidence-based wound

care to residents. Consultations highlighted that RACF staff expressed a strong interest and excitement in the pilot onboarding process, particularly regarding opportunities to improve confidence in delivering wound care. Table 10 presents the RACF staff engaged in training and development activities through the pilot. The PHN reported positive provider outcomes as a result of the pilot mentoring, education and training:

 improved confidence among RACF staff (including Registered Nurses, Enrolled Nurses and other care staff) to deliver wound care "Clinical staff involved in consultations and patient care have reported immense satisfaction with the rapid improvement and support received to improve resident outcomes. Staff involved stated they feel more confident in managing similar wounds in the future."

PHN Pilot Representative

 increased adoption among RACF staff of evidencebased strategies, including the use of preventative equipment for residents with pressure injuries and other wounds • improved quality of referrals throughout the pilot, with useful information provided by RACFs to support comprehensive, holistic assessment and support.

Table 10 | Training and development delivered through the pilot

Description	Number of RACF staff	
RACF staff engaged with the Skin and Wound Action Team (learning and training activity delivered by the regional wounds specialist team)	58 RACF staff across 18 RACFs, including 54 Registered Nurses and 4 Enrolled Nurses	
RACF staff engaged in a face-to-face workshop focused on enhancing practical skills and wound management capabilities	44 RACF staff attended	
Total RACF staff engaged:	102 RACF staff	

Enablers for success

Relationships and collaboration with other stakeholders, facilitated by the PHN, has been critical to the pilot's success. The PHN and providers reported that relationships with key stakeholders, including GPs, allied health professionals, families/carers, Gold Coast Health teams including RaSS, Wound Care and Geriatric Emergency Department Intervention (GEDI), Supportive and Specialist Palliative Care Service (SPACE) and other stakeholders, were critical to supporting pilot implementation and improving referral and care pathways for residents. In particular, the provider reported that "the Hospital and Health Service are embracing the pilot service". Collaboration has been enabled by:

- regular and consistent communication with referrers across the sector
- having regular contact people, including at least two key contact persons in residential aged care facilities
- clear and shared understanding of the benefits of the pilot model of service.

Embedding the pilot model in residential aged care has supported implementation and coordination. Providers reported that they were able to build credibility with the residential aged care workforce as a

result of working within the RACF settings (as opposed to being hospital-based, like the existing acute in-reach wound clinic).

Challenges faced and how they have been overcome

COVID-19 pandemic presented challenges to delivery of the pilot within RACF settings. Restrictions were imposed on RACFs during COVID-19 outbreaks, which

"Our experiences in aged care have helped. Because we go out to aged care and know their challenges and relate to them, it's made a big difference."

Provider, Gold Coast PHN

sometimes limited the ability for the regional wound specialist team to deliver specialist wound care within the RACFs. In addition, COVID-19 created many challenges within RACFs, contributing to exhaustion, burnout and staff churn amongst the RACF workforce as well as contributing to challenges engaging the aged care workforce in training and education activities for wound management.

Challenges within RACFs, including resource limitations and the medical model of care, created barriers to implementation of the pilot. The PHN and providers reported IT challenges within many RACFs, including limited Wi-Fi connectivity, access to mobile devices and limited technical proficiency (among staff and residents) which created barriers to the use of telehealth through the pilot. Providers also noted RACFs lacked access to equipment and resources for skin care and the prevention of pressure injuries. In addition, pilot providers reported a medical model of care and service delivery within RACFs, where there

is a reliance on GPs to guide assessment and management of wounds. This contributed to challenges in supporting and empowering RACF staff to lead and manage wound care for residents. More broadly, time constraints within facilities meant that there was sometimes limited availability of personnel to participate in wound management appointments for residents.

There were some barriers to patient uptake of the pilot including reliance on the acute care sector for wound care and limited awareness of referral pathways to the pilot. Currently, wound management services are being delivered through the in-reach Gold Coast Health Wound clinic. Providers and the PHN reported that there is a reliance on these existing services, however, there is a rapidly increasing uptake of the pilot services with increased awareness in recent months. Providers noted, *"there has been an increased number of facilities contacting us, as well as GPs too. There is a level of confidence building in the pilot service"*.

A.2 Nepean Blue Mountains PHN

Nepean Blue Mountains PHN's pilot model was delivered through a collaborative approach – the Wound Management Collaborative (WMC) – until July 2022. The program was delivered by Nepean Blue Mountains PHN, in partnership with Wounds Australia and advised by an expert reference group. It aimed to support general practices to implement incremental changes in their practice to improve their systems and capacity to manage complex and chronic wounds in the general practice setting, particularly venous leg ulcers. Pilot participants engaged in learning workshops then used 'The Model for Improvement' tool, which include Plan-Do-Study-Act cycles, whereby participants implemented and tested change ideas.



NUMBER OF PATIENTS SEEN THROUGH THE PILOT TO MAY 2022:

20 patients have been enrolled into the program in total (3 patients have since un-enrolled)

PILOT ENABLERS FOR SUCCESS:

- The PHN built strong working relationships with key stakeholders including Wounds Australia and their Clinical Excellence Group and NBM LHD
- The clinical background of the PHN lead contributed to the PHN building trust quickly with key stakeholders
- The PHN has revised the pilot design and methodology to adapt and respond to ongoing external changes/factors.

CHALLENGES FACED:

- The COVID-19 pandemic, as well as natural disasters in the region (bushfires, floods, severe weather events), impacted recruitment of practices and patients to the pilot. These challenges also impacted the substantive workload and priorities of providers.
- Some practices lacked the appropriate physical spaces and wound dressings to deliver effective wound care to patients.
- The Improvement Foundation was no longer able to work with NBM PHN from April 2021.

Target cohort

The pilot model aimed to support patients living with any lower leg wound that is chronic or hard-to-heal, particularly venous leg ulcers. Initially, the program targeted practices in the eastern region of Penrith, however, the program then expanded to all practices across the Blue Mountains, Hawkesbury, Lithgow and Penrith LGAs.

Key features of the pilot model

The Nepean Blue Mountains PHN pilot model is underpinned by a Collaborative methodology which aims to improve systems of care to achieve the implementation of incremental changes to wound management through 'waves'. This stepped approach involves education and training components, improvement measurements, data collection and information sharing. These pilot features are outlined below and the Collaborative 'wave' methodology is captured in Figure 21.



Figure 21 | Collaborative methodology

Education and training

The pilot model includes the provision of learning workshops for clinical and administrative general practice staff. These learning workshops aimed to provide staff with evidence-based information as well as the opportunity for staff to share knowledge and experiences with their peers. The workshops were supported by guest speakers such as vascular surgeons, podiatrists and exercise physiologists, among

others. The PHN also worked with Nepean Blue Mountains LHD staff to implement a Compression Therapy Workshop during the orientation period of each wave for practice nurses from participating practices. The aim was for the LHD to also provide in-person follow-up training to providers; however the COVID-19 lockdown of 2021 prevented this portion of the training from occurring.

Participants also used a Participant Handbook, which combines evidence-based guidance with practical examples to support providers address challenges faced in delivering quality care for patients with venous leg ulcers. The Benchmarque Group's Wound Management Pathway aims to support practice nurses (Registered Nurses and Enrolled Nurses) and general practitioners (including registrars) through face-to-face workshops, in-class activities, workplaceobserved practice and online assessments. The Pathway aims to expand knowledge and skills required to identify wound types and apply appropriate dressings to support wound healing in a primary health environment. Participating practices were also provided with a Wounds Australia membership for access of wound care and wound management resources.

For the remaining 7 months of the program beyond this evaluation report, the PHN has revised the pilot approach to ensure the opportunity for capacity-building across the region in wound management, including:

- nurse scholarships to complete The Benchmarque Group's Wound Management Pathway course
- attendance at two half-day workshops online for nurse-led wound clinics in general practices, in partnership with the Australian Primary Health Care Nurses Association (APNA)
- attendance at the Wounds Australia 2022 Conference (with registration fees covered by Nepean Blue Mountains PHN)
- participation in a Community of Practice group to discuss general practice quality improvement principles and implementation for wound management activities.

Model of care delivery

Following learning workshops, pilot participants implemented learnings during 2-3 month 'activity periods'. During activity periods, participating practices completed the *Model for Improvement* document, in which participants develop a goal for the period, measures for tracking the goal and ideas that are tested to achieve the goal. This approach is designed to support primary healthcare providers to incrementally improve the quality of care they provide to patients.

PHN management of the pilot

Nepean Blue Mountains PHN established an Expert Reference Panel (ERP), with the support of the Improvement Foundation. The ERP involved a range of clinical and implementation experts, as well as a consumer with lived experience. Nepean Blue

Mountains PHN and the ERP co-designed the Wound Management Collaborative, including establishing the aims, change principles and measures underpinning the model.

Nepean Blue Mountains PHN engaged online with pilot participants through an engagement page where participating practices can access key documents and resources, as well as participate in discussion forums.

Pilot outcomes and achievements

Nepean Blue Mountains PHN undertook a design

"We [the PHN] were able to get a podiatrist and a vascular surgeon to come to the workshops. Local knowledge is so important. Within the PHN, we had a good balance of knowledge and experience"

Pilot PHN representative, Nepean Blue Mountains PHN

process informed by clinical and implementation expertise, as well as local knowledge, to develop the collaborative model, and recruited practices into the pilot. Two programs have been implemented as part of the Wound Management Collaborative.

The PHN reported that the pilot has contributed to greater collaboration and communication across the system, including between Nepean Blue Mountains PHN, the Primary Care and Community Health team at the Nepean Blue Mountains LHD, Wounds Australia's Clinical Excellence Group, as well as other key stakeholders. The PHN highlighted the strong working relationship established between the PHN and LHD as a key achievement, demonstrated in the joint delivery of the Compression Therapy Workshop for practice nurses.
Enablers for success

Nepean Blue Mountains PHN has built strong working relationships with key stakeholders, including Wounds Australia and their Clinical Excellence Group and NBM LHD, which has been key to the pilot's effective implementation. The PHN has played an important role in bringing together a range of stakeholders, including through the Expert Reference Panel which features General Practitioners, Practice Nurses, Practice Managers, Wound Management Clinical Nurse Consultants, the Greater Western Aboriginal Health Service and a consumer with lived experience. The clinical background of the PHN lead

has contributed to the PHN's ability to develop strong, trusting relationships with stakeholders.

The PHN revised the pilot design and methodology throughout implementation to adapt and respond to changing factors in the operating environment. The PHN's agility and flexibility throughout implementation, including revising pilot activities, has enabled the effective navigation of challenges. Nepean Blue Mountains PHN ultimately engaged 6 practices and they had planned to initially engage 20 practices. The PHN redesigned the pilot during the last 7 months of delivery to further support training and education of practice clinicians. "With the redesign of the pilot, there is potential to be huge upskilling in our local area...with potentially 30-36 nurses with formal qualifications in wound management. They will have access to online education and on-the-job assessments."

Pilot PHN representative, NBMPHN

Challenges faced and how they have been overcome

The COVID-19 pandemic, as well as natural disasters in the region (bushfires, floods and severe weather events), impacted recruitment of practices and patients to the pilot. The COVID-19 pandemic contributed to workforce burnout and exhaustion, as well as staff redirection to other COVID-19 responses including vaccination rollout. This impacted the substantive workload and priorities of providers.

In addition, the Nepean Blue Mountains region was significantly impacted by natural disasters during pilot implementation. Severe storms and flooding meant that the Blue Mountains, Hawkesbury, Lithgow and Penrith LGAs were declared natural disaster areas five times during the implementation of the pilot program. These disasters have contributed further to workforce burnout and exhaustion, which has impacted engagement with the pilot.

The pandemic and the natural disasters also contributed to ongoing challenges to recruit practices and patients to the pilot program. For example, the PHN anticipated that a third Wound Management Collaborative program would commence in April 2022, however, only two practices expressed interest in participating following an extensive drive to encourage uptake.

The PHN reported that some practices lacked the appropriate physical spaces and resources to deliver effective wound care to patients. This includes appropriate space in the treatment room to attend to patient dressings as well as access to appropriate wound consumables to provide adequate patient care. The PHN highlighted how the concentration of low socio-economic households in the region exacerbate these challenges. Practices identified costs involved with providing complex wound management in general practice, specifically with regard to low socio-economic groups. This was further compounded by MBS rules for bulk billing which limit the ability for practitioners to apply additional charges for services such as wound consumables.

The Improvement Foundation were no longer able to work with NBMPHN from April 2021. The Improvement Foundation brought expertise in the design and delivery of quality improvement interventions, including using the Collaborative methodology. The Improvement Foundation's final work with Nepean Blue Mountains PHN involved upskilling of PHN staff to take on the Collaborative methodology training role when working with practices in the program.

A.3 Western Victoria PHN

Western Victoria PHN's pilot model focused on building capability in primary care with a focus on the Wimmera Grampians region, which has identified higher rates of chronic conditions (e.g., diabetes and obesity) and associated higher rates of chronic wounds. The pilot focused on bringing wound management in primary care in-line with best practice through the updating of guidelines and wound management resources, accompanied by training and development. The Western Victoria pilot program focused on supporting patients with venous leg ulcers and diabetic foot ulcers in a targeted rural area.



Target cohort

The pilot model aimed to support people with living with venous leg ulcers and diabetic foot ulcers in the Wimmera Grampians region, a rural area with higher rates of chronic conditions and associated higher rates of chronic wounds in the Western Victoria PHN region.

Key features of the pilot model

Western Victoria PHN's pilot involved the delivery of intensive general practice support for four general practices in the Wimmera Grampians region. This support included a workforce development program for practitioners as well as the development and provision of resources for general practice.

The practices undertook an audit of wound management policy and procedures in their clinic which was used to develop two quality improvement activities in each General Practice. Practices received a doppler machine, with intensive training and support around its use.

The key features of the pilot model are explained further below.

Education and training

The pilot involved a workforce development program delivered to a range of practitioners in the Wimmera Grampians region. This included education in the form of face-to-face workshops as well as online seminars. This also included the provision of scholarships for primary health care practitioners to undertake studies in wound care management to embed sustainability beyond the life of the pilot program. Table 11 summarises the education and training activities made available through the pilot program. "We delivered a 2.5-hour education session and they [GPs] asked questions for an hour afterwards. We had all the products there and they loved it. The GPs said they needed to re-stock their entire treatment room because they had outdated products and didn't know best practice."

PHN pilot representative

Activity	Description / Purpose
• 2-day workshop with Australian Primary Health Care Nurses Association (APNA)	• To educate participants on the steps to implement a nurse- led wound clinic in general practice
• 1-1 training with <u>MediCoach</u> (a training organisation to support health professionals)	To develop quality improvement activities in general practice
• 3 x 1-hour online webinars facilitated by Jan Rice, a Registered Nurse with specialist experience in wound care	• To deliver evidence-based wound care for patients living with Venous Leg Ulcers, Diabetic Foot Ulcers as well as case-based dressing selection
• Online and face-to-face education sessions on the use of Doppler	• To understand how to use Doppler in wound assessments
 2.5-hour education session on 'When to dress and with what', delivered by Professor Geoffrey Sussman 	• To support a range of health professionals including district nurses, GPs, allied health professionals, health services and palliative care managers to understand different dressings to use for various wound types
 Scholarships with LaTrobe University and William Light Scholarships 	 Including 14 total scholarships with LaTrobe University in Wound Management Courses (which contribute to CPD for

Table 11 | Workforce development provided through Western Victoria PHN's pilot

Activity	Description / Purpose
	participants), as well as 19 William Light Scholarships in wound management
Quality improvement activities	• Each practice developed two quality improvement cycles for wound management. These have been made accessible for other practices wanting to focus on wounds as a quality improvement activity
 Development of a Wound Management QI Toolkit 	 Provides guidance on Plan Do Study Act approach to Quality Improvement with a focus on wound management in general practice
• Expansion of education session across WVPHN region	• After success of first education session, requests for further education have resulted in a further 6 sessions across the WVPHN catchment, regional and rural centres, focusing on best practice wound management

The pilot also involved the development and provision of resources for general practice. Practitioners were provided with:

- templates, workflow mapping and business cases to support evidence-based wound management
- quality improvement toolkit
- Department of Veteran Affairs wound care guide
- resources aimed at supporting patient education in wound management including: (1) patient stories
 about people living with chronic wounds and how they managed various parts of the wound care
 process (click here to view the patient stories); and (2) educational videos with animations and
 explanations from a clinical nurse consultant covering tips and principles of wound management, e.g.,
 good wound and skin hygiene; the importance of maintaining dressings; when to see a doctor (click
 here to view the educational videos)
- Doppler machine and relevant software with training on use.

Some of the resources aimed at supporting patient education and self-management developed for the pilot are captured in Figure 22 and were made possible via the PHN's use of the Healthily platform.



Figure 22 | Western Victoria PHN's pilot resources via GoShare Healthcare

Model of care delivery

The pilot model featured nurse-led wound clinics to deepen specialist knowledge within general practice. Western Victoria PHN recruited and supported four general practices, offering them the option to participate in a 12-month quality improvement activity or to establish a nurse-led clinic within general practice for wound management. One of the four practices has established a nurse-led wound clinic that operates one day per week in the general practice. Two more general practices intend to establish a nurse-led wound clinic that operates one the impacts of the COVID-19 pandemic subside.

PHN management of the pilot

Design of the pilot model | Western Victoria PHN designed the pilot model, including conducting a training needs analysis to inform the design of the workforce development program and resources aimed to support primary care practitioners. A clinical audit further shaped the design of the training needs within the participating general practices.

Development of educational resources | The PHN produced a suite of educational resources for general practice and patients through <u>Go Share Healthcare</u> (an online tool that allows for the dissemination of appropriate, timely educational resources to patients).

Collaboration with other stakeholders | The PHN coordinated with other stakeholders to support pilot implementation, including coordinating with Wounds Australia, Australian Primary Nurses Association as well as general practices, pharmacies, allied health organisations and practitioners within the Wimmera Grampians region.

Pilot outcomes and achievements

The pilot increased access to specialist care for patients living with chronic wounds in the Wimmera Grampians region. With the introduction of the pilot, residents in the rural area of Wimmera Grampians have been provided access to an additional service that did not exist before the pilot program. This includes the establishment of the nurse-led wound clinic with upskilled nurse practitioners in the region. The PHN reported that patients were able to access wound care at their local general practice, reducing the need to travel long distances for some patients. The PHN also reported a reduction in the number of preventable presentations to urgent care centres for wound care.

The pilot supported the effective upskilling of primary care practitioners and other health professionals to confidently deliver evidence-based wound care. Consultations with providers and the PHN highlighted positive provider outcomes as a result of the pilot education, training and resource development:

- improved confidence among general practice staff to deliver best practice wound care
- enhanced understanding of referral pathways for wound care in the region
- improved understanding of how to establish models of care in general practice for wound management, including nurse-led wound clinics, as well as an enhanced understanding of the relevant MBS items to use in wound care.

Enablers for success

Relationships and collaboration with other

"The resources we got were amazing. The products, links, resources were all very helpful. The whole program has been amazing and I feel very lucky to have been involved."

Provider, Western Victoria PHN

stakeholders, facilitated by the PHN, has been critical to the delivery of effective education and training activities. The PHN and providers reported that relationships with key stakeholders were critical to supporting pilot implementation – particularly in regard to the education and training activities delivered through the pilot. The PHN leveraged and developed relationships with key subject matter experts in the region (including with Wounds Australia), which supported the delivery of very well-received education sessions that were delivered in person to many multidisciplinary practitioners. The PHN's relationships with various health professionals, including general practitioners, allied health professionals, district nurses and pharmacists, among others, supported multidisciplinary participation in education sessions in the pilot program.

The delivery of accessible education opportunities and resources that allowed for self-paced learning

supported the effective upskilling of practitioners. The PHN reported that offering education across multiple sectors and delivering sessions after hours supported widespread uptake of the workshops and sessions. In addition, the development and provision of resources to pilot participants supported self-paced learning which was particularly helpful to accommodate the busy schedules of time-poor practitioners.

Primary care practitioners were able to leverage specialist support from the district nurses in the delivery of evidence-based wound care. While some providers reported that the relationship with district nursing was "There is a wound clinic in the hospital. I needed their advice for a few wounds that were a bit more complex. They'd give me their opinion on the wound and we were then able to deliver care and got the wounds to heal really well."

Provider, Western Victoria PHN

challenging throughout the pilot implementation (this is explored further in the body of this report in Section 3.4), other providers suggested that they were able to leverage the expertise of district nurses through secondary consultations.

Challenges faced and how they have been overcome

The COVID-19 pandemic presented challenges to the delivery of the pilot. The PHN took an active role in supporting the COVID-19 response which deprioritised and delayed the implementation of training activity for practitioners. There were some face-to-face training activities that could not be delivered inperson due to COVID-19 restrictions. In response to these challenges, the PHN delivered some of the early education sessions as online webinars, rather than face-to-face sessions. As the effects of the COVID-19 pandemic have subsided, the PHN has pivoted back to delivering face-to-face education activities for participants.

The PHN and some providers reported challenges with engaging district nurses. The PHN and providers reported challenges and barriers to engaging some Health Service staff during pilot implementation, due

to a range of factors including a perception that patients were being "taken away from existing state services" and potentially posing a risk to demand for their service. Additionally, Health Service staff were often working at capacity as a result of the impacts of the COVID-19 pandemic on hospitals and did not have time. Pilot providers suggested opportunities to improve collaboration with district nursing in future:

• jointly participating in education and training activities e.g., workshops that aim to support primary care practitioners as well as district nurses

"It was almost like 'us versus them' [with the state-funded hospital services]...We had a barrier there. They might have assumed we were taking away their patients and felt a bit threatened."

Provider, Western Victoria PHN

 developing clear agreements on roles and responsibilities to support collaboration in wound management.

The PHN worked to facilitate collaboration with the Health Service and district nurses. This supported pilot participants to develop relationships with the district nurses. Some providers reported that relationships with the district nurses supported the delivery of wound care for patients with more complex wounds, as general practice staff could ask district nurses for specialist advice.

Appendix B Stakeholders consulted

This appendix captures the stakeholders consulted as part of the Evaluation to September 2022. These are presented in the table below. Note some stakeholders were consulted multiple times and several individuals were involved in the consultations.

Stakeholder group	Stakeholders
Primary Health Network	Gold Coast PHN
representatives	Nepean Blue Mountains PHN
	Western Victoria PHN
Service Providers	Wound Specialist Service (Gold Coast PHN)
	Lawson Medical Practice (Nepean Blue Mountains PHN)
	Riverview Medical Practice (Nepean Blue Mountains PHN)
	Tristar Medical Group (Western Victoria PHN)
	Lister House (Western Victoria PHN)
Wound Care experts	Carolina Weller, research director of the Wound Research Program at Monash University and Fellow of Wounds Australia
	Helen Jetz and Geoff Sussman from Wounds Australia
	Dr Keagan Werner-Gibbings, vascular surgeon from Nepean Hospital
Consumers	3 x consumers from Nepean Blue Mountains PHN and Gold Coast PHN

Table 12 | Stakeholder groups consulted to June 2022

The evaluation team has also held workshops with the Department to test and refine recommendations and insights for the final Evaluation Report.

Appendix C Survey of Wound Management Pilot providers

This appendix presents the survey distributed to providers of the Wound Management Pilot in April 2022.

Introduction

Thank you for taking the time to complete this survey. The survey should take between 10-15 minutes to complete.

The Australian Government Department of Health and Aged Care (the Department) has engaged Nous Group (Nous) to conduct an independent evaluation of the Wound Management Pilot (the pilot). The evaluation activity commenced in January 2021 and will finish in January 2023.

The specific focus of this project is to determine the most appropriate evidence-based models for improving access to appropriate care for the long-term management of chronic wounds.

The project is interested in your feedback on the pilot and your learning experience from the pilot. It is **not** a measure of your performance.

With your help, at the end of this evaluation, the Department will:

understand your perspectives on your learning experience from the pilot, the key skills and knowledge you have gained and how you have applied this to the care you provide

gather care providers views on whether and how the pilot models have impacted access to care and quality of life for those living with chronic wounds

identify challenges faced and lessons learned that could support ongoing implementation of the pilot models.

Should you have any questions about this survey, please contact Jack Marozzi, Project Manager, Nous on +61 3 7002 3140 or jack.marozzi@nousgroup.com.au

I understand the information above. Note that if you click 'No' you will be taken to a thank you page and the survey will end.

Yes

No

I understand that by clicking next, I agree to participate in this survey. Note that if you click 'Finish survey' you will be taken to a thank you page and the survey will end.

Next

Finish survey

Survey questions

· · ·	
Question	Response type
	Demographic and background questions
1. What is your role?	General Practice: General practitioner; Practice Manager (GP clinic) Aged care: Personal Care Worker; Facility Manger Nurses: Assistant in Nursing; Enrolled Nurse; Registered Nurse; Registered Midwife, Clinical Nurse Specialist; Clinical Midwife Specialist; Clinical Nurse Consultant; Clinical Midwife Consultant; Nurse Educator/Clinical Nurse Educator;

Question	Response type
	Nurse Unit Manager; Nurse Practitioner Other: please specify
2. Which state do you work in?	Victoria; New South Wales; Queensland
3. Where are you located?	Metro; Regional; Rural; Remote
4. Under this pilot, what service do you provide wound management care in?	General Practice, Residential Aged Care Facility; Pharmacy Principal referral hospital or specialist hospital; Major hospital; District hospital; Community facility (with or without a surgery); Speciality facility; palliative care facility; rehabilitation; Other (please specify)
5. How many years of experience do you have in your profession overall?	Less than 1 year; 1-2 years; 2-5 years; 5-10 years; 10-20 years; More than 20 years
	Your learning experience of the pilot
6. Participating in the Pilot improved your awareness or understanding of chronic wounds	5-point Likert Scale Strongly Disagree to Strongly Agree
7. Which training, support or capacity building activities have you participated in during the Pilot?	Formal accreditation and/or scholarships; online module; on-the-job learning; mentorship; community of practice/collaborative, other; I have not completed training, support or capacity building activities (please specify why) Logic: If respondents select the last response, they will not have to complete the following questions about training, support and capacity building.
8. The length of the learning was	3-point Likert Scale Too short; just right; Too long; N/A
9. The learning content was easy to understand	5-point Likert Scale Strongly Disagree to Strongly Agree
10. The learning experience was interesting and engaging	5-point Likert Scale Strongly Disagree to Strongly Agree
11. The learning experience improved my understanding of evidence-based wound care management	5-point Likert Scale Strongly Disagree to Strongly Agree
12. The learning experience was relevant and useful to my role	5-point Likert Scale Strongly Disagree to Strongly Agree
13. The content of the learning was	5point Likert Scale Too basic; Somewhat basic; Just right; Somewhat complex; Too Complex
14. The learning experience has improved my ability to implement evidence-based wound care management	5-point Likert Scale Strongly Disagree to Strongly Agree
15. The learning experience has	5-point Likert Scale

Question	Response type
improved my confidence in applying evidence-based wound care management	Strongly Disagree to Strongly Agree
16. The learning experience has improved how consistently I apply evidence-based wound care management in my day- to-day practice	5-point Likert Scale Strongly Disagree to Strongly Agree
	Barriers and enablers
17. Did you face any barriers to using evidence-based wound care at work?	 18. Tick all that apply: (select all that apply) I have not had opportunity or patients presenting to apply evidence-based wound care The learning experience was not relevant to my service delivery or care provision I wasn't sure how to apply the new knowledge and skills to the real-life situation at work Another type of barrier was encountered: Open field.
19. What supports, resources or improvements would enable you to provide better wound care?	Open text field
20. Patient recruitment for the Wound Management Pilot has been challenging. What were the main barriers to patient recruitment?	 Select all that apply: Our service didn't receive many wound patient referrals from other providers Our service had to prioritise our COVID-19 response (e.g., vaccinations, supporting testing) over recruiting patients We did not have enough staff to provide chronic wound care Chronic wound patients are being cared for in other health services in my region (e.g., hospitals) My patients weren't interested in participating in the evaluation There are not many patients requiring chronic wound care in my area Another type of barrier was encountered: Open field.
21. Rank the challenges to patient recruitment in order of importance	 Our service didn't receive many wound patient referrals from other providers Our service had to prioritise our COVID-19 response (e.g., vaccinations, supporting testing) over recruiting patients We did not have enough staff to provide chronic wound care My patients weren't interested in participating in the evaluation There are not many patients requiring chronic wound care in my area
22. Do you have any further comments?	Open text field

Appendix D Methodology and detailed outputs for calculations referenced in KEQ 6 including prevalence estimates

This appendix explains the sources and rationale for the prevalence estimates of common wound types and details the methodology for the calculations referenced in Section 3.6 including the potential total pool of patients for each PHN pilot model and potential cost savings from reduced hospitalisations.

D.1 Prevalence estimates

There is a lack of current, reliable data on the prevalence of chronic wounds in Australia.¹¹⁰ The best estimates can be derived from systematic reviews of prevalence rates. The prevalence ranges in Table 13 show the most appropriate prevalence ranges from academic literature for the purposes of deriving chronic wound estimates from residential population estimates. Hence, where possible, we have prioritised studies which provide the wound prevalence in the general population over studies which provide wound prevalence in specific care settings (e.g., prevalence among hospital patients, residential care patients or community health settings).

Table 13 | Wound prevalence estimate ranges

Chronic Wound	General population prevalence range	Explanation and source
Pressure injuries	0.72% - 2.41%	An Australian study ¹¹¹ estimated that in 2012, there were between 164,456 and 547,874 cases of Pressure Injuries in Australian hospitals and residential care settings (e.g., nursing homes and respite care). The prevalence rate can be derived by dividing the estimated Pressure Injury case numbers by the total Australian residential population in 2012. Given the estimated Australia's residential population was 22,733,465 in 2012 ¹¹² , the prevalence range for pressure injuries is between 0.72% - 2.41%. This prevalence range may underestimate the number of Pressure Injuries in Australia as it does not account for Pressure Injuries in the community (including those in general practice). However, hospitals and residential facilities are the most common settings for Pressure Injuries (given they are acquired through long periods of immobilisation). As such, the estimate is plausible.
Venous leg ulcers	0.15% - 0.33%	Accurate prevalence of venous leg ulcers in Australia is difficult to estimate due to a range of methodologies used in prevalence studies, accuracy of reporting and the range of methods and inconsistent definitions of ulcers of venous aetiology. ¹¹³ Most Australian and international population-based

¹¹⁰ Pacella RE, Tulleners R, Cheng Q, Burkett E, Edwards H, Yelland S, Brain D, Bingley J, Lazzarini P, Warnock J, Barnsbee L. Solutions to the chronic wounds problem in Australia: a call to action. Wound Practice and Research: Journal of the Australian Wound Management Association. 2018 Jun;26(2):84-98.

¹¹¹ Graves N, Zheng H. Modelling the direct health care costs of chronic wounds in Australia. Wound Practice and Research: Journal of the Australian Wound Management Association. 2014 Mar;22(1).

¹¹² Australian Bureau of Statistics, Estimated Residential Population statistics FY2020-21, accessible here

¹¹³ Kapp S and Sayers V. McCosker L, Tulleners R, Cheng Q, Rohmer S, Pacella T, Graves N, Pacella R. Chronic wounds in Australia: a systematic review of key epidemiological and clinical parameters. International wound journal. 2019 Feb;16(1):84-95. Preventing venous leg ulcer recurrence: a review. Wound Practice and Research 2008; 16(2):38–47

Chronic Wound	General population prevalence range	Explanation and source
		studies of venous leg ulcers estimate between 1.5 and 3.3 in 1000 people have active leg ulcers. ¹¹⁴ ¹¹⁵ ¹¹⁶ ¹¹⁷ ¹¹⁸ This translates to a prevalence rate of 0.15% - 0.33%.
Diabetic foot ulcers	0.06% - 0.13%	In Australia, 4.9% (95% CI 4.6% - 5.2%) of the population have diabetes. ¹¹⁹ Australian studies indicate that the prevalence of diabetic foot ulcers in all people with diabetes ranges from 1.2% to 2.5%. ¹²⁰ Hence, the estimated total population prevalence of people with diabetic foot ulcers ranges between 0.06% (calculated by 4.6% multiplied by 1.2%) and 0.13% and 5.2 (calculated by 5.2% multiplied by 2.5%). This approach of deriving diabetic foot ulcer prevalence has been used as it is likely to provide a better estimate for diabetic foot ulcer prevalence in Australia than other commonly cited studies ¹²¹ ¹²² which only consider diabetic foot ulcers in residential care settings and/or hospitals. These studies tend to underestimate prevalence as diabetic foot ulcers are commonly treated in community settings. ¹²³
Artery insufficiency ulcers	Range: 0.01% - 0.03%	There is very limited data on artery insufficiency ulcers. Most studies estimate prevalence rates of between 0.01% and 0.03% in the general population. ¹²⁴

D.2 Estimation of total patient pools in each PHN

The calculations presented below are intended to support the discussion in Section 3.5 on cost effectiveness about the trade-off between:

- delivering quality, appropriate and evidence-based wound care for all of the in-scope wounds
- providing the right level of training education and support to GPs and RACFs to ensure they have the skills and knowledge to deliver high-quality, appropriate and evidence-based wound care for all of the in-scope wounds

¹¹⁴ Nelson EA, Adderley U. Venous eg ulcers. BMJ clinical evidence. 2016;2016.

¹¹⁵ Kapp S and Sayers V. McCosker L, Tulleners R, Cheng Q, Rohmer S, Pacella T, Graves N, Pacella R. Chronic wounds in Australia: a systematic review of key epidemiological and clinical parameters. International wound journal. 2019 Feb;16(1):84-95. Preventing venous leg ulcer recurrence: a review. Wound Practice and Research 2008; 16(2):38–47

¹¹⁶ Baker SR, Stacey MC, Jopp-McKay AG, Hoskin SE, Thompson PJ. Epidemiology of chronic venous ulcers. Journal of British Surgery. 1991 Jul;78(7):864-7.

¹¹⁷ Kolluri R, Lugli M, Villalba L, Varcoe R, Maleti O, Gallardo F, Black S, Forgues F, Lichtenberg M, Hinahara J, Ramakrishnan S. An estimate of the economic burden of venous leg ulcers associated with deep venous disease. Vascular Medicine. 2022 Feb;27(1):63-72.

¹¹⁸ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

¹¹⁹ Australian Institute of Health and Welfare. Diabetes [Internet]. Canberra: Australian Institute of Health and Welfare, 2020 [cited 2022 Jun. 21]. Available <u>here</u>

¹²⁰ McCosker L, Tulleners R, Cheng Q, Rohmer S, Pacella T, Graves N, Pacella R. Chronic wounds in Australia: a systematic review of key epidemiological and clinical parameters. International wound journal. 2019 Feb;16(1):84-95.

¹²¹ Graves N, Zheng H. Modelling the direct health care costs of chronic wounds in Australia. Wound Practice and Research: Journal of the Australian Wound Management Association. 2014 Mar;22(1).

¹²² Pacella, Rosana E., et al. "Solutions to the chronic wounds problem in Australia: a call to action." Wound Practice and Research: Journal of the Australian Wound Management Association 26.2 (2018): 84-98.

¹²³ Reardon R, Simring D, Kim B, Mortensen J, Williams D, Leslie A. The Diabetic Foot Ulcer. Australian Journal of General Practice. 2020 May;49(5):250-5.

¹²⁴ Graves N, Zheng H. The prevalence and incidence of chronic wounds: a literature review. Wound Practice and Research: Journal of the Australian Wound Management Association. 2014 Mar;22(1).

• having a sufficiently broad reach of patients to gain the most benefit from the high fixed costs of providing training, education and support to providers.

The calculations for the total potential patient pools for each PHN are shown in Table 14 and are intended to be an indicative illustration of the reach of each PHN pilot model in their current design. These are calculated by applying the lower and upper bounds of prevalence ranges in Table 13 for each in-scope wound to the estimated residential population for each PHN's geographic area of focus As discussed in Section 3.5, the variation in the scale and scope of pilot models is beneficial as they enable comparison of what supports are required to enable the delivery of effective and high-quality care at different scales. As such, a smaller total patient pool should **not** be taken as an assessment of the quality or appropriateness of the pilot design in and of itself, as a key aim of the pilot was to gain insights into the best model to deliver wound care.

Caveats

As noted previously, there is a lack of current, reliable data on the prevalence of chronic wounds in Australia, the prevalence estimate ranges are based on best available evidence from academic literature.

The estimates are based on a national average prevalence estimate and do not take into account regional variations in the prevalence of chronic wounds due to varying levels of risk factors. As discussed in Section 1, chronic wounds are related to the social determinants of health and are more likely to occur in older people, those with chronic disease such as diabetes, obesity, hypertension, kidney disease and vascular disease.

The estimates below do not take into account the setting of care for each PHN pilot model and as such may overor under-estimate the true total potential patient pool for each PHN pilot model.

Table 14 | Calculations for estimated total patient pools in each PHN

PHN	Geographic area of focus	Estimated Residential Population	Total potential patient pool125	Breakdown by wound type (lower bound prevalence estimate – upper bound prevalence estimate)	Lower bound prevalence estimate (lower bound prevalence estimate x estimated residential population)	Upper bound prevalence estimate (upper bound prevalence estimate x estimated residential population)
Gold Coast PHN				Pressure Injuries (LB: 0.72% - UB: 2.41%)	4687.2	15,689.1
		651,000	(110 10 070	Venous Leg Ulcers (LB: 0.15% - UB: 0.33%)	976.5	2148.3
	All of Gold Coast Phin	651,000	0119 - 18,878	Diabetic Foot Ulcers (LB: 0.06% - UB: 0.13%)	390.6	846.3
				Artery Insufficiency Ulcers (LB: 0.01% - UB: 0.03%)	65.1	195.3
Nepean Blue Mountains PHN	Penrith LGA	219,173	329 – 723	Venous Leg Ulcers (LB: 0.15% - UB: 0.33%)	328.8	723.3
Western Victoria PHN	West Wimmera sub-region (Ararat LGA, Horsham LGA, Hindmarch LGA, Northorn	Vest Wimmera sub-region Ararat LGA, Horsham LGA,		Venous Leg Ulcers (LB: 0.15% - UB: 0.33%)	88.5	194.8
	Grampians LGA, Worthern Grampians LGA, West Wimmera LGA, Yarriambiack LGA)	55,025	124 – 272	Diabetic Foot Ulcers (LB: 0.06% - UB: 0.13%)	35.4	76.7

¹²⁵ These are rounded to the nearest whole person

D.3 Estimation of potential cost savings due to avoided hospital admissions with improved communitybased care for diabetic foot ulcers and venous leg ulcers

D.3.1 Diabetic foot ulcers

This section details the methodology used to arrive at the calculations in Table 7 and discussion in Section 3.6 about the potential system savings from increasing access to best practice community-based care for diabetic foot ulcers.

Aim of the modelling

The modelling presented in Section 3.6 aims to provide a contemporary estimate of potential cost savings that could be accrued by increasing the reach of best practice, community-based wound care for diabetic foot ulcers. The modelling accounts for the service costs associated with increasing provision of best practice, community-based wound care and the costs of avoidable hospitalisations associated with diabetic foot ulcers.

The core methodology has been adapted from a rigorous cost-effectiveness analysis by Cheng et al. (2017) that implemented best practice, community-based wound care for diabetic foot ulcers in Australia.¹²⁶ The evaluation has updated that analysis to include recent Australian population projections¹²⁷ from the ABS and hospital admission cost data from 2020 as well as more conservative sensitivity analysis for epidemiological parameters.¹²⁸

Conceptual approach to the modelling

The modelling analysis centres around assessing the impact of changing the levels of access to best practice, community-based care for diabetic foot ulcers (referred to as 'best practice care') as compared the current typical care delivery (referred to as 'current care'). Under current practice, individuals receive a mix of largely uncoordinated services in the community. Best-practice care was defined as care that follows the set of recommendations from the National Guideline for the Prevention, Identification and Management of Foot Complications in Diabetes.¹²⁹ The specific detail of the assumed care that was costed in each scenario is outlined in Figure 23. The definitions 'current care' and 'best practice care' were drawn from Cheng et al. 2017.¹³⁰

¹²⁶ Cheng Q, Lazzarini PA, Gibb M, Derhy PH, Kinnear EM, Burn E, Graves N, Norman RE. A cost-effectiveness analysis of optimal care for diabetic foot ulcers in Australia. International wound journal. 2017 Aug;14(4):616-28.

¹²⁷ Australian Bureau of Statistics, Population Projections Australia. 2020. Available here

¹²⁸ Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. Accessible <u>here</u>

¹²⁹ National Health & Medical Research Council Guidelines. National evidence-based guideline on prevention, identification and management of foot complications in diabetes Melbourne: Baker IDI Heart & Diabetes Institute; 2011.

¹³⁰ Cheng Q, Lazzarini PA, Gibb M, Derhy PH, Kinnear EM, Burn E, Graves N, Norman RE. A cost-effectiveness analysis of optimal care for diabetic foot ulcers in Australia. International wound journal. 2017 Aug;14(4):616-28.

Figure 23 | Differences in community-based care for current care and best practice care for Diabetic Foot Ulcers¹³¹

Current community-based care delivery

was defined as the continuation of current practice. Under current practice, individuals receive a mix of largely uncoordinated set of services in the community, often facing substantial outof-pocket costs. The amalgamation of these services represents usual care. This included the following:

- patients with an uncomplicated diabetic foot ulcer receive a one-off initial assessment by GP for risk of amputation
- patients undergo medical checks by a GP twice a week
- patients receive absorbent dressing changes twice a week and postoperative boots
- once the ulcer healed, patients would receive no further care.
- if patients developed complicated diabetic foot ulcer with infection, they receive pathology services to determine the pathogen that caused infection and received topical and systemic antimicrobial.



BEST PRACTICE CARE

Best practice community-based care delivery was defined according to the National Guidelines for the Prevention, Identification and Management of Foot Complications in Diabetes and includes the following:

- all patients with an uncomplicated diabetic foot ulcer receive a one-off initial assessment to grade the severity of the diabetic foot ulcer by both podiatrist and GP
- patients receive debridement (a thorough cleaning of the wound) each week
- patients receive dressings consisting of soft-gelling cellulose fibre and polyurethane foam twice a week
- patients receive an irremovable pressure offloading device during the treatment
- patients receive at least weekly multidisciplinary care from both podiatrist and GP trained in wound management.
- After the ulcer heals, for the prevention of further complications, patients would visit a podiatrist every 2 months and receive education and one pair of extra-depth footwear per year.
- if patients developed complicated diabetic foot ulcer with infection, they receive pathology services to determine the pathogen that caused infection and received topical and systemic antimicrobials
- diagnostic imaging would be applied to evaluate suspected osteomyelitis.

Scenario modelling: baseline and interventions

The evaluation has modelled the impact of increasing access to best practice, community-based care for diabetic foot ulcers to different levels. Figure 24 visualises the proportions of best practice care modelled in the baseline scenario and the three intervention scenarios. These differing proportions of best practice care have important effect on the cost projections as best practice care has higher community-based care costs, but fewer hospital admissions. The detailed assumptions are discussed in the methods, assumptions and parameters in the section below. The assumption that currently 30% of care is best-practice care was derived from a detailed analysis of clinical records for a prospective cohort of patients with diabetic foot ulcers attending multi-site outpatient Diabetic Foot Services in the Australian state of Queensland, between 1st July 2011 and 1st June 2016.¹³²

¹³¹ Cheng Q, Lazzarini PA, Gibb M, Derhy PH, Kinnear EM, Burn E, Graves N, Norman RE. A cost-effectiveness analysis of optimal care for diabetic foot ulcers in Australia. International wound journal. 2017 Aug;14(4):616-28.

¹³² Zhang, Y. The burden of diabetes-related foot disease: estimating the existing burden and the impact of implementing guidelinebased care on the future burden. School of Public Health and Social Work Faculty of Health Queensland University of Technology. 2022

The lower bound, mid point and upper bound intervention scenarios are entirely hypothetical and policy makers should choose the most feasible scenario given the scale of intervention proposed. The proportion of people getting access to best-practice vs. current care is a national average. As such in considering which scenario is most applicable, policy makers should consider what level is improvement is feasible nationally on average. For example if policy makers choose the mid-point intervention scenario, this assumes that there is variation in improvement rates (i.e. higher access in metropolitan areas compared to rural and remote areas).



Figure 24 | Overview of the proportions of current versus best practice community-based care in the baseline and intervention modelling scenarios for Diabetic Foot Ulcers

Interpretation caveats and scope

The modelling analysis centres around assessing the impact of changing the levels of access to best practice, community-based care for diabetic foot ulcers (referred to as 'best practice care') as compared to the current typical care delivery (referred to as 'current care'). Under current practice, individuals receive a mix of largely uncoordinated services in the community. Best-practice care was defined as care that follows the set of recommendations from the National Guideline for the Prevention, Identification and Management of Foot Complications in diabetes.¹³³

The evaluation has incorporated more conservative sensitivity analysis for key epidemiological parameters to reduce the risk of overstating potential benefits given the lack of reliable data. The evaluation's modelling includes more conservative sensitivity analyses than the original Cheng et al. (2017) study with lower bound, mid-point and upper bound estimates for:

- the prevalence of diabetic foot ulcers (discussed in Appendix D1)
- the uptake of best practice, community-based wound care. The intervention scenario in the original study by Cheng et al. (2017) assumes 100% of people with diabetic foot ulcers will get access to best practice community-based wound care. The evaluation's analysis applies more conservative sensitivity analysis of 50%, 70% and 90% access to best practice, community-based wound care for the lower bound, midpoint and upper bound scenarios respectively.
- hospitalisation rates under usual care in the baseline scenario
- change in hospitalisation rates with best practice, community-based wound care

¹³³ National Health & Medical Research Council Guidelines. National evidence-based guideline on prevention, identification and management of foot complications in diabetes Melbourne: Baker IDI Heart & Diabetes Institute; 2011.

This conservative sensitivity analysis aims to reduce the risk of overstating potential benefits by better recognising the uncertainty and lack of reliable evidence in key parameters about diabetic foot ulcers.

The scope and limitations of the evaluation's cost modelling are critical to appropriately interpreting the results. The modelling aims to capture the direct health care service costs and benefits of increased access to best practice, community-based wound care. The model includes:

- costs associated with hospitalisations due to diabetic foot ulcers the evaluation has included updated hospital cost data 2020 in the modelling (described in more detail below)
- service delivery costs of best practice, community-based wound care for diabetic foot ulcers. The community-based care cost estimates are taken from the Cheng et al.¹³⁴ 2017 study, and as such may be outdated. While the fundamentals of best practice community-based diabetic foot ulcer care has not changed since 2017, the service delivery costs may have increased due to inflation (described in more detail below); and

The model <u>does not</u> quantify the broader benefits of improving access to best practice, community-based wound care for diabetic foot ulcers such as:

- the improvement in quality of life associated with reduced burden of disease. This analysis by Cheng et al.¹³⁵ estimates the improvement in quality-adjusted life years associated with improving access to best practice, community-based wound care for diabetic foot ulcers; and
- the benefits associated with improved labour productivity, and reduced mortality associated with diabetic foot ulcers.

The modelling <u>does not</u> include a range of implementation costs that would enable the health system to improve access to best-practice, community-based wound care for diabetic foot ulcers. Some costs that are <u>not included</u> in the modelling include:

- administrative costs associated with the developing new policies and programs to improve access to best practice community-based care for diabetic foot ulcers
- costs associated with education and training of health professionals in evidence-based best practice
- costs associated with establishing new wound care clinics.

Finally, the modelling does not attempt to split out cost savings across the Federal Government and the state and territory governments.

Method, assumptions and parameters

The modelling includes updated population data¹³⁶, a set of epidemiological parameters as well as cost parameters for community-based care and diabetic foot ulcer-related hospital admissions. Further detail on the epidemiological and cost parameters are discussed below.

As noted above, the modelling incorporates conservative sensitivity analysis for the key epidemiological parameters to reduce the risk of overstating potential benefits given the lack of reliable data. As shown in Figure 25, a lower bound, mid-point and upper bound estimate was included for each of the key epidemiological parameters including diabetes and diabetic foot ulcer prevalence, hospitalisation rates for major amputation, minor amputation and infected diabetic foot ulcers with current care as well as the reductions in hospitalisations with best practice care.

¹³⁴ Cheng Q, Lazzarini PA, Gibb M, Derhy PH, Kinnear EM, Burn E, Graves N, Norman RE. A cost-effectiveness analysis of optimal care for diabetic foot ulcers in Australia. International wound journal. 2017 Aug;14(4):616-28.

¹³⁵ Cheng Q, Lazzarini PA, Gibb M, Derhy PH, Kinnear EM, Burn E, Graves N, Norman RE. A cost-effectiveness analysis of optimal care for diabetic foot ulcers in Australia. International wound journal. 2017 Aug;14(4):616-28.

¹³⁶ Australian Bureau of Statistics, Population Projections Australia. 2020. Available here

The model includes cost parameters for community-based care and diabetic foot ulcer-related hospital admissions. The costs of community-based care in the current care scenario and the best practice care were derived from estimates in Cheng et al. 2017¹³⁷. The study presents the average five-year cost of community-based care for patients in the current care scenario and best practice care scenario. In this analysis we have converted these into an annual average cost. The average annual community-based costs used in this analysis are:

- Current care \$5022 (AUD) per year
- Best practice care \$7624 (AUD) per year

The cost of hospital admissions was calculated using 2020 data from IHPA.¹³⁸ The average cost per separation for the relevant AR DRG codes were used. Where there are multiple relevant codes, the weighted average cost per admission was calculated as shown in Table 15.'

¹³⁷ Cheng Q, Lazzarini PA, Gibb M, Derhy PH, Kinnear EM, Burn E, Graves N, Norman RE. A cost-effectiveness analysis of optimal care for diabetic foot ulcers in Australia. International wound journal. 2017 Aug;14(4):616-28

¹³⁸ Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. Accessible <u>here</u>

Figure 25 | Overview of key epidemiological parameters and sensitivity analysis for Diabetic Foot Ulcers

		\frown		
PARAMETER	SOURCE	LOWER BOUND (LB)	(→) MID-POINT (MID)	UPPER BOUND (UB)
Prevalence of diabetes in Australia	AIHW ⁵	4.6%	4.9%	5.2%
Proportion of diabetic patients with DFU ¹	McCosker et al. ⁶	1.2%	1.85%	2.5%
Proportion of DFU patients receiving current care hospitalised for major amputation ²	95% confidence intervals calculated for number of major amputation separations as a proportion of total DFUs (midpoint) in 2020 from IHPA ⁸	2.62%	2.62% 2.624%	
Reduction in hospitalisations for major amputation ² for patients receiving best practice care	95% confidence intervals calculated from Lazzarini et al. ⁷	44.53%	44.95%	45.31%
Proportion of DFU patients receiving current care hospitalised for minor amputation ³	95% confidence intervals calculated for number of minor amputation separations as a proportion of total DFUs (midpoint) in 2020 from IHPA ⁸	3.72%	3.96%	4.22%
Reduction in hospitalisations for minor amputation ² for patients receiving best practice care	95% confidence intervals calculated from Lazzarini et al. ⁷	37.31%	37.50%	37.53%
Proportion of DFU patients hospitalised receiving current care for complicated DFU with infection ⁴	95% confidence intervals calculated for number of complicated DFU with infection separations as a proportion of total DFUs (midpoint) in 2020 from IHPA ⁸	7.08%	7.41%	7.75%
Reduction in hospitalisations for complicated DFU with infection ⁴ for patients receiving best practice care	95% confidence intervals calculated from Lazzarini et al. ⁷	43.51%	43.66%	43.71%

1 The modelling looked at the rates of diabetic foot ulcers as a proportion of the diabetic population to align with the methodology in Cheng et al. 2017

2 Major amputation includes the AR-DRG codes F13A/F13B

3 Minor amputation includes the AR-DRG codes F11A/ F11B

4 Complicated DFU with infection AR-DRG code K01B

5 Australian Institute of Health and Welfare. Diabetes [Internet]. Canberra: Australian Institute of Health and Welfare, 2020 [cited 2022 Jun. 21]. https://www.aihw.gov.au/reports/diabetes/diabetes

6 McCosker L, Tulleners R, Cheng Q, Rohmer S, Pacella T, Graves N, Pacella R. Chronic wounds in Australia: a systematic review of key epidemiological and clinical parameters. International wound journal. 2019 Feb;16(1):84-95.

6 Lazzarini PA, O'Rourke SR, Russell AW, Derhy PH, Kamp MC. Reduced incidence of foot-related hospitalisation and amputation amongst persons with diabetes in Queensland, Australia. PLoS One. 2015 Jun 22;10(6):e0130609.

7 Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. https://www.ihacpa.gov.au/resources/national-hospital-cost-data-collection-nhcdc-public-hospitals-round-24-financial-year-2019-20

Diabetic foot ulcer admission type	DRG code	DRG description	Total cost for DRG admission	DRG code as a proportion of all DRGs in admission type	Weighted average cost for diabetic foot ulcer admission type	
	K01A	General Interventions for Diabetic Complications, Major Complexity	\$54,993	13%		
General Interventions for Diabetic Complications	K01B	General Interventions for Diabetic Complications, Intermediate Complexity	\$25,242	24%	\$17,113 Calculation: (\$54,993 x 13%) + (\$25,242 x 24%) + (\$6090 x 63%)	
	K01C	GIs for Diabetic Complications, Minor Complexity	\$6,090	63%		
Minor amputations (defined as those amputation procedures at or below the ankle)	F13A	Amputation, Upper Limb and Toe, for Circulatory Disorders, Major Complexity	\$38,415	43%	\$26,339 Calculation: (\$38,415 x 43%) + (\$17,399 x 57%)	
	F13B	Amputation, Upper Limb and Toe, for Circulatory Disorders, Minor Complexity	\$17,339	57%		
Major amputations (defined as those amputation procedures above the ankle)	F11A	Amputation, Except Upper Limb and Toe, for Circulatory Disorders, Major Comp	\$84,833	41%	\$60,592 Calculation: (\$84,833 x	
	F11B	Amputation, Except Upper Limb and Toe, for Circulatory Disorders, Minor Comp	\$43,402	59%	41%) + (\$43,402 x 59%)	

Table 15 | Calculations for weighted cost of diabetic foot ulcer admissions FY19-20

Results

This section presents the detailed results of the cost modelling for diabetic foot ulcers. The modelling includes five key stages as shown in Figure 26. In summary the modelling begins with Australian population projections, then applies a range of prevalence estimates which informs the volume and cost estimates for community care and hospital admissions. These calculations result in a range of total cost savings from increasing access to best practice, community based care by calculating the cost differences in the baseline and intervention scenarios with lower bound, midpoint and upper bound estimates for sensitivity analysis.



Figure 26 | Summary of modelling process

Australian population and prevalence

Table 16 below presents step 1 and 2 of the modelling process, which translates the Australian population projections to prevalence estimates for diabetes and diabetic foot ulcers.

Financial Australia year populatio	Australian	Prevalence of diabetes		Prevalence of diabetic foot ulcers			
	population	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	27,829,520	1,280,158	1,363,646	1,447,135	15,362	25,227	36,178
2024-25	28,311,405	1,302,325	1,387,259	1,472,193	15,628	25,664	36,805
2025-26	28,796,151	1,324,623	1,411,011	1,497,400	15,895	26,104	37,435
2026-27	29,283,507	1,347,041	1,434,892	1,522,742	16,164	26,545	38,069
2027-28	29,773,492	1,369,581	1,458,901	1,548,222	16,435	26,990	38,706
	TOTAL	6,623,728	7,055,709	7,487,692	79,484	130,530	187,193

Table 16 | Detailed estimates of diabetes and diabetic foot ulcer prevalence

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Community care

The next four tables provide the calculations for community-based care. Table 17 providing detailed estimates for the number of people receiving best practice and current care. Table 18 provides detailed cost estimates for community-based care across the baseline and intervention scenarios. Table 19 provides summarised community-based care data across the baseline and intervention scenarios. Finally, Table 20 presents the lower bound, midpoint and upper bound estimates for the total cost differences between the baseline and intervention scenario. For diabetic foot ulcers, the intervention scenarios result in higher costs than the baseline scenarios, but these are offset by the substantially larger savings from reduced hospital admissions.

Table 17 | Detailed estimates of the number of people receiving best practice and current community-based care for Diabetic Foot Ulcers in the baseline and intervention scenario, with sensitivity analysis

Financial	Baseline scenario # people receiving best practice care		Baseline scenario # people receiving current care		Intervention scenario # people receiving best-practice care			Intervention scenario # people receiving current care				
year	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	4,529	7,438	10,666	10,568	17,355	24,888	7,549	17,355	31,999	7,548	7,437	3,555
2024-25	4,609	7,568	10,854	10,753	17,659	25,325	7,681	17,659	32,561	7,680	7,568	3,617
2025-26	4,688	7,699	11,041	10,940	17,965	25,763	7,814	17,965	33,124	7,813	7,699	3,680
2026-27	4,769	7,831	11,230	11,127	18,273	26,204	7,948	18,273	33,691	7,947	7,831	3,743
2027-28	4,849	7,964	11,421	11,315	18,582	26,648	8,082	18,582	34,262	8,082	7,963	3,806
TOTAL	23,444	38,500	55,212	54,703	89,834	128,828	39,074	89,834	165,637	39,073	38,500	18,404

Financial	Baseline scenario \$AUD cost for best practice care		Baseline scenario \$AUD cost for current care		Intervention scenario \$AUD cost for best-practice care			Intervention scenario \$AUD cost for current care				
year	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	\$34,530,190	\$56,705,828	\$81,321,099	\$53,068,980	\$87,150,418	\$124,981,294	\$57,550,316	\$132,313,598	\$243,963,296	\$37,906,414	\$37,350,179	\$17,854,471
2024-25	\$35,135,726	\$57,700,246	\$82,747,182	\$53,999,621	\$88,678,726	\$127,173,021	\$58,559,544	\$134,633,908	\$248,241,545	\$38,571,158	\$38,005,168	\$18,167,574
2025-26	\$35,744,123	\$58,699,361	\$84,179,999	\$54,934,658	\$90,214,252	\$129,375,099	\$59,573,538	\$136,965,176	\$252,539,998	\$39,239,041	\$38,663,251	\$18,482,157
2026-27	\$36,356,131	\$59,704,408	\$85,621,324	\$55,875,245	\$91,758,894	\$131,590,251	\$60,593,552	\$139,310,284	\$256,863,971	\$39,910,889	\$39,325,240	\$18,798,607
2027-28	\$36,971,435	\$60,714,866	\$87,070,408	\$56,820,897	\$93,311,854	\$133,817,330	\$61,619,058	\$141,668,020	\$261,211,225	\$40,586,355	\$39,990,794	\$19,116,761
TOTAL	\$178,737,605	\$293,524,709	\$420,940,012	\$274,699,401	\$451,114,144	\$646,936,995	\$297,896,008	\$684,890,986	\$1,262,820,035	\$196,213,857	\$193,334,632	\$92,419,570

Table 18 | Detailed costs for community-based care for Diabetic Foot Ulcers in the baseline and intervention scenarios with sensitivity analysis

Table 19 | Summarised community-care costs for Diabetic Foot Ulcers in the baseline and intervention scenarios with sensitivity analysis

Financial year	\$AUD cost for bot	Baseline scenario h best practice care and cu	rrent care patients	Intervention scenario \$AUD cost for both best practice care and current care patients			
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	
2023-24	\$87,599,170	\$143,856,245	\$206,302,393	\$95,456,730	\$169,663,777	\$261,817,767	
2024-25	\$89,135,348	\$146,378,972	\$209,920,203	\$97,130,702	\$172,639,076	\$266,409,119	
2025-26	\$90,678,780	\$148,913,613	\$213,555,098	\$98,812,579	\$175,628,426	\$271,022,155	
2026-27	\$92,231,376	\$151,463,302	\$217,211,575	\$100,504,441	\$178,635,525	\$275,662,578	
2027-28	\$93,792,332	\$154,026,719	\$220,887,738	\$102,205,413	\$181,658,814	\$280,327,987	
TOTAL	\$453,437,006	\$744,638,851	\$1,067,877,007	\$494,109,865	\$878,225,618	\$1,355,239,606	

Financial year	Cost difference (\$AUD) between baseline and intervention						
Financial year	Lower Bound	Midpoint	Upper Bound				
2023-24	\$7,857,561	\$25,807,532	\$55,515,374				
2024-25	\$7,995,354	\$26,260,104	\$56,488,916				
2025-26	\$8,133,799	\$26,714,814	\$57,467,056				
2026-27	\$8,273,065	\$27,172,223	\$58,451,003				
2027-28	\$8,413,081	\$27,632,095	\$59,440,248				
TOTAL	\$40,672,860	\$133,586,768	\$287,362,597				

Table 20 | Total additional community-based care costs in the intervention scenario with sensitivity analysis (calculated by cost difference = intervention – baseline)

Hospital admissions

The next five tables present the volume and cost calculations for hospital admissions:

Table 21 shows the number of hospitalisations by admission type for diabetic foot ulcers in the baseline scenario.

Table 22 shows the number of hospitalisations by admission type for diabetic foot ulcers in the intervention scenario.

Table 23 shows the reduction in hospitalisations by admission type in the intervention scenario.

Table 24 presents the detailed cost savings associated with a reduction in hospitalisations.

Finally, Table 25 presents a summary of cost savings across the lower bound, midpoint and upper bound scenarios.

Financial year	# hospitalisations with infection	Baseline scenario	o diabetic foot ulcers	B # hospitalisa	aseline scenaric itions for minor) amputation	Baseline scenario # hospitalisations for major amputation		
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	1,069	1,837	2,756	562	983	1,500	562	983	1,500
2024-25	1,088	1,869	2,804	571	1,000	1,527	571	1,000	1,527
2025-26	1,106	1,902	2,852	581	1,017	1,553	581	1,017	1,553
2026-27	1,125	1,934	2,901	591	1,035	1,580	591	1,035	1,580
2027-28	1,144	1,967	2,950	601	1,052	1,606	601	1,052	1,606
TOTAL	5,532	9,509	14,263	2,906	5,087	7,766	2,906	5,087	7,766

Table 21 | Number of hospitalisations for complicated diabetic foot ulcers with infection, minor amputation and major amputation for the baseline scenario

Table 22 | Number of hospitalisations for complicated Diabetic Foot Ulcers with infection, minor amputation and major amputation for the intervention scenario

Financial year	In # hospitalisations with infection	tervention scena for complicated	irio diabetic foot ulcers	Inte # hospitalisa	ervention scenar tions for minor	rio amputation	Intervention scenario # hospitalisations for major amputation		
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	465	802	1,204	210	369	563	210	369	563
2024-25	473	816	1,226	213	375	573	213	375	573
2025-26	481	830	1,247	217	382	583	217	382	583
2026-27	490	844	1,268	221	388	593	221	388	593
2027-28	498	859	1,290	224	395	603	224	395	603
TOTAL	2407	4151	6235	1085	1909	2915	1085	1909	2915

Table 23 | Total reduction in hospitalisations for complicated Diabetic Foot Ulcers with infection, minor amputation and major amputation in the intervention scenario

Financial year	Reduction in hosp foo	pitalisations for c ot ulcers with infe	omplicated diabetic	Reduction in hosp	vitalisations for	minor amputation	Reduction in hospitalisations for major amputation		
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	604	1,035	1,551	352	614	937	352	614	937
2024-25	614	1,053	1,578	358	625	954	358	625	954
2025-26	625	1,071	1,606	364	636	970	364	636	970
2026-27	636	1,090	1,633	371	647	987	371	647	987
2027-28	646	1,108	1,661	377	658	1,004	377	658	1,004
TOTAL	3125	5357	8029	1822	3180	4852	1822	3180	4852

Table 24 | Detailed cost savings associated with a reduction in hospitalisations for complicated Diabetic Foot Ulcers with infection, minor amputations and major amputations

Financial year	\$AUD cost savings from reduction in hospitalisations for complicated diabetic foot ulcers with infection			\$AUD cost savings for	from reduction i minor amputation	in hospitalisations on	\$AUD cost savings from reduction in hospitalisations for major amputation		
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	\$10,332,720	\$17,711,800	\$26,543,627	\$9,272,878	\$16,178,662	\$24,688,309	\$21,331,910	\$37,218,409	\$56,794,535
2024-25	\$10,513,919	\$18,022,402	\$27,009,108	\$9,435,491	\$16,462,378	\$25,121,254	\$21,705,996	\$37,871,088	\$57,790,509
2025-26	\$10,695,974	\$18,334,471	\$27,476,787	\$9,598,872	\$16,747,434	\$25,556,243	\$22,081,849	\$38,526,848	\$58,791,187
2026-27	\$10,879,110	\$18,648,392	\$27,947,242	\$9,763,224	\$17,034,182	\$25,993,816	\$22,459,933	\$39,186,502	\$59,797,806
2027-28	\$11,063,231	\$18,964,004	\$28,420,231	\$9,928,460	\$17,322,475	\$26,433,744	\$22,840,052	\$39,849,708	\$60,809,844
TOTAL	\$53,484,954	\$91,681,069	\$137,396,995	\$47,998,925	\$83,745,131	\$127,793,366	\$110,419,740	\$192,652,555	\$293,983,881

Einencial voor	Cost savings associate	Cost savings associated with reduced hospitalisations (intervention scenario)						
Filldlicial year	Lower Bound	Midpoint	Upper Bound					
2023-24	\$40,937,508	\$71,108,870	\$108,026,470					
2024-25	\$41,655,406	\$72,355,867	\$109,920,871					
2025-26	\$42,376,695	\$73,608,753	\$111,824,217					
2026-27	\$43,102,266	\$74,869,077	\$113,738,864					
2027-28	\$43,831,743	\$76,136,187	\$115,663,820					
TOTAL	\$211,903,618	\$368,078,754	\$559,174,242					

Table 25 | Summary of cost savings associated with reduced hospitalisations in the intervention scenario

Total cost savings

Table 26 brings together the changes in cost for community-based care and hospitalisation to present the total cost savings in the intervention scenarios with a lower bound, midpoint and upper bound estimate.

Table 26 | Total cost savings in the intervention scenarios for Diabetic Foot Ulcers (including cost savings from reduced hospital admissions and increased costs from best practice community-based care)

Financial year	Total cost savings in the intervention scenario							
Financial year	Lower Bound	Midpoint	Upper Bound					
2023-24	\$33,079,947	\$45,301,339	\$52,511,096					
2024-25	\$33,660,052	\$46,095,763	\$53,431,954					
2025-26	\$34,242,896	\$46,893,939	\$54,357,161					
2026-27	\$34,829,201	\$47,696,854	\$55,287,861					
2027-28	\$35,418,662	\$48,504,092	\$56,223,572					
TOTAL	\$171,230,758	\$234,491,988	\$271,811,644					

D.3.2 Venous leg ulcers

This section details the methodology used to arrive at the calculations in Table 8 and discussion in Section 3.6 about the potential system savings from increasing access to best practice community-based care for venous leg ulcers.

Aim of the modelling

The modelling presented in Section 3.6 aims to provide a contemporary estimate of potential cost savings that could be accrued by increasing the reach of best practice, community-based wound care for Venous Leg Ulcers. The modelling accounts for the service costs associated with increasing provision of best practice, community-based wound care and the costs of avoidable hospitalisations associated with venous leg ulcers.

The core methodology for the analysis has been adapted from a rigorous cost-effectiveness analysis by Cheng et al. 2018 of implementing community-based compression therapies for venous leg ulcers in Australia, which uses population data and hospitalisation cost data from 2015.¹³⁹ The evaluation has updated that analysis to include recent Australian population projections¹⁴⁰ from the ABS and hospital admission cost data from 2020 as well as more conservative sensitivity analysis for epidemiological parameters¹⁴¹

Conceptual approach to the modelling

The modelling analysis centres around assessing the impact of changing the levels of access to best practice, community-based care for venous leg ulcers (referred to as 'best practice care') as compared the current typical care delivery (referred to as 'current care').

Current care refers to a situation where individuals do not receive all the components of guideline-based care listed under optimal care. Since a small proportion of Australians are currently receiving compression therapy we modelled a situation where usual care would also include a proportion of patients receiving compression therapy but with partial adherence and no reimbursement hence incurring substantial out-of-pocket costs.

Best-practice care was defined as care that follows the set of recommendations from the Australian and New Zealand Clinical Practice Guideline for Prevention and Management of venous leg ulcers.¹⁴² The specific approach to care delivery modelled is through a specialist wound clinic led by nurse practitioners with wound expertise together with a team of allied health professionals and specialists. The specific detail of the assumed care that was costed for in each scenario is outlined in Figure 27. The definitions 'current care' and 'best practice care' were drawn from Cheng et al. 2018.¹⁴³

Unlike in the diabetic foot ulcer example, the cost of best practice community-based care for venous leg ulcers is lower than the cost of current community-based care for venous leg ulcers due to a substantial reduction in infection and recurrence rates, faster healing times as well as less frequent dressing changes. Best practice can include fewer dressing changes with the use of higher quality four layered compression bandages, which require less nurse time and are more cost effective.¹⁴⁴

¹³⁹ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

¹⁴⁰ Australian Bureau of Statistics, Population Projections Australia. 2020. Available here

¹⁴¹ Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. Accessible <u>here</u>

¹⁴² Australian Wound Management Association, New Zealand Wound Care Society: Australian and New Zealand Clinical Practice Guideline for Prevention and Management of Venous Leg Ulcers; 2011.

¹⁴³ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

¹⁴⁴ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

Figure 27 | Differences in community-based care for current care and best practice care for venous leg ulcers



Scenario modelling: baseline and interventions

The evaluation has modelled the impact of increasing access to best practice, community-based care for venous leg ulcers to different levels. Figure 28 visualises the proportions of best practice care modelled in the baseline scenario and the three intervention scenarios. These differing proportions of best practice care have important effect on the cost projections as best practice care for venous leg ulcers has lower community-based care costs as well as fewer hospital admissions. The baseline proportion of 54% is an estimate cited in Cheng et al 2018 based on Australian evidence indicating that 40-60% of venous leg ulcers in Australia did not receive adequate compression therapy despite guidelines recommending the use of compression therapy for both treatment and prevention of venous leg ulcers.¹⁴⁵

¹⁴⁵ Kruger AJ, Raptis S, Fitridge RA. Management practices of Australian surgeons in the treatment of venous ulcers. ANZ J Surg. 2003;73(9):687–91

The lower bound, mid point and upper bound intervention scenarios are entirely hypothetical and policy makers should choose the most feasible scenario given the scale of intervention proposed. The proportion of people getting access to best-practice vs. current care is a national average. As such in considering which scenario is most applicable, policy makers should consider what level is improvement is feasible nationally on average. For example if policy makers choose the mid-point intervention scenario, this assumes that there is variation in improvement rates (i.e. higher access in metropolitan areas compared to rural and remote areas).





Interpretation caveats and scope

The evaluation has incorporated more conservative sensitivity analysis for key epidemiological parameters to reduce the risk of overstating potential benefits given the lack of reliable data. The evaluation's modelling includes more conservative sensitivity analyses than the original Cheng et al. (2018) study with lower bound, midpoint and upper bound estimates for:

- the prevalence of venous leg ulcers (discussed in Appendix D1)
- the uptake of best practice, community-based wound care. The intervention scenario in the original study by Cheng et al. (2018) assumes 100% of people with venous leg ulcers will get access to best practice community-based wound care.¹⁴⁷ The evaluation's analysis applies more conservative sensitivity analysis of 70%, 80% and 90% access to best practice, community-based wound care for the lower bound, midpoint and upper bound scenarios respectively.
- hospitalisation rates under usual care in the baseline scenario
- change in hospitalisation rates with best practice, community-based wound care

This conservative sensitivity analysis aims to reduce the risk of overstating potential benefits by better recognising the uncertainty and lack of reliable evidence in key parameters about venous leg ulcers.

The scope and limitations of the evaluation's cost modelling are critical to appropriately interpreting the results. The modelling aims to capture the direct health care service costs and benefits of increased access to best practice, community-based wound care. The model includes:

¹⁴⁶ Woodward M: Wound Management by Aged Care Specialists Primary Intention: The Australian Journal of Wound Management 2002, 10(2): 70–71, 73–76.

¹⁴⁷ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

- service delivery costs of best practice, community-based wound care for venous leg ulcers. The
 community-based care cost estimates are taken from the Cheng et al. 2018 study, and as such may be
 outdated. While the fundamentals of best practice community-based diabetic foot ulcer care has not
 changed since 2017, the service delivery costs may have increased due to inflation (described in more
 detail below); and
- costs associated with hospitalisations due to venous leg ulcers (described in more detail below).

The model <u>does not</u> quantify the broader benefits of improving access to best practice, community-based wound care for venous leg ulcers such as:

- the improvement in quality of life associated with reduced burden of disease. To see an analysis of quality of life, see Cheng et al. 2018 study which estimates the improvement in quality-adjusted life years associated with improving access to best practice, community-based wound care for venous leg ulcers¹⁴⁸; and
- the benefits associated with improved labour productivity, and reduced mortality associated with venous leg ulcers.

The modelling <u>does not</u> include a range of implementation costs that would enable the health system to improve access to best-practice, community-based wound care for venous leg ulcers. Some costs that are <u>not included</u> in the modelling include:

- administrative costs associated with the developing new policies and programs to improve access to best practice community-based care for venous leg ulcers
- costs associated with education and training of health professionals in evidence-based best practice
- costs associated with establishing new wound care clinics.

Finally, the modelling does not attempt to split out cost savings across the Federal Government and the state and territory governments.

Method, assumptions and parameters

The modelling includes updated population data¹⁴⁹, a set of epidemiological parameters as well as cost parameters for community-based care and venous leg ulcer-related hospital admissions. Further detail on the epidemiological and cost parameters are discussed below.

As noted above, the modelling incorporates conservative sensitivity analysis for the key epidemiological parameters to reduce the risk of overstating potential benefits given the lack of reliable data. As shown in Figure 29, a lower bound, mid-point and upper bound estimate was included for each of the key epidemiological parameters including venous leg ulcer prevalence, hospitalisation rates for venous leg ulcers with current care as well as the reductions in hospitalisations with best practice care.

The model includes cost parameters for community-based care and venous leg ulcer-related hospital admissions. The costs of community-based care in the current care scenario and the best practice care were derived from estimates in Cheng et al. 2018¹⁵⁰. The study presents the average five-year cost of community-based for patients in the current care scenario and best practice care scenario. In this analysis we have converted these into an annual average cost. The average annual community-based costs used in this analysis are:

• Current care \$2948 (AUD) per year

¹⁴⁸ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

¹⁴⁹ Australian Bureau of Statistics, Population Projections Australia. 2020. Available here

¹⁵⁰ Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

• Best practice care \$1731 (AUD) per year

The cost of hospital admissions was calculated using 2020 data from IHPA.¹⁵¹ The average cost per separation was calculated using the weighted average cost for AR DRG codes J12A and J12B as shown in Table 27.

PARAMETER	SOURCE		→ MID-POINT (MID)	(UPPER BOUND (UB)
Prevalence of VLUs in Australia	Nelson & Adderly¹, Kapp et al.², Baker et al.³, Kolluri et al.⁴, Cheng et al.⁵	0.15%	0.24%	0.33%
Proportion of VLU patients receiving current care who are hospitalised for VLU- related complications ⁶	95% confidence intervals calculated for number of major amputation separations as a proportion of total VLUs (midpoint) in 2020 from IHPA ⁷	3.03%	3.17%	3.31%
Reduction in hospitalisations for VLU- related complications ⁶ for patients receiving best practice care	95% confidence intervals calculated from Barwell et al. ⁸ and Walker et al. ⁹ which were the studies cited by Cheng et al. ⁵	82%	89%	95%

Figure 29 | Overview of key epidemiological parameters and sensitivity analysis for Venous Leg Ulcers

1 Nelson EA, Adderley U. Venous leg ulcers. BMJ clinical evidence. 2016;2016.

2 Kapp S and Sayers V. McCosker L, Tulleners R, Cheng Q, Rohmer S, Pacella T, Graves N, Pacella R. Chronic wounds in Australia: a systematic review of key epidemiological and clinical parameters. International wound journal. 2019 Feb;16(1):84-95. Preventing venous leg ulcer recurrence: a review. Wound Practice and Research 2008; 16(2):38–47

3 Baker SR, Stacey MC, Jopp-McKay AG, Hoskin SE, Thompson PJ. Epidemiology of chronic venous ulcers. Journal of British Surgery. 1991 Jul;78(7):864-7. 4 Kolluri R, Lugli M, Villalba L, Varcoe R, Maleti O, Gallardo F, Black S, Forgues F, Lichtenberg M, Hinahara J, Ramakrishnan S. An estimate of the economic burden of venous leg ulcers associated with deep venous disease. Vascular Medicine. 2022 Feb;27(1):63-72.

5 Cheng Q, Gibb M, Graves N, Finlayson K, Pacella RE. Cost-effectiveness analysis of guideline-based optimal care for venous leg ulcers in Australia. BMC Health Services Research. 2018 Dec;18(1):1-3.

 $6~\mbox{VLU}$ admissions includes the AR-DRG codes J12A and J12B

7 Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. https://www.ihacpa.gov.au/resources/national-hospital-cost-data-collection-nhcdc-public-hospitals-round-24-financial-year-2019-20

 Barwell JR, Davies CE, Deacon J, Harvey K, Minor J, Sassano A, Taylor M, Usher J, Wakely C, Earnshaw JJ, Heather BP. Comparison of surgery and compression with compression alone in chronic venous ulceration (ESCHAR study): randomised controlled trial. The Lancet. 2004 Jun 5;363(9424):1854-9.
 Walker N, Rodgers A, Birchall N, Norton R, MacMahon S. Leg ulcers in New Zealand: age at onset, recurrence and provision of care in an urban population. The New Zealand Medical Journal (Online). 2002 Jun 21;115(1156).

Table 27 | Calculations for weighted average cost of venous leg ulcer admission FY19-20

DRG code	DRG description	Proportion of venous leg ulcer admissions	Total cost per admission	Weighted average cost for venous leg ulcer admissions
J12A	Lower Limb Interventions W Ulcer or Cellulitis, Major Complexity	33%	\$28,237	\$15 296
J12B	Lower Limb Interventions W Ulcer or Cellulitis, Minor Complexity	67%	\$8,923	Calculation (\$28,237 x 0.33) + (\$8,923 x 0.67)

¹⁵¹ Independent Hospital Pricing Authority. National Hospital Cost Data Collection Report: Public Sector, Round 24 Financial Year 2019-20 Appendix. 2021. Accessible <u>here</u>
Results

This section presents the detailed results of the cost modelling for venous leg ulcers. The modelling includes five key stages as shown in Figure 30. In summary the modelling begins with Australian population projections, then applies a range of prevalence estimates which informs the volume and cost estimates for community care and hospital admissions. These calculations result in a range of total cost savings from increasing access to best practice, community-based care by calculating the cost differences in the baseline and intervention scenarios with lower bound, midpoint and upper bound estimates for sensitivity analysis



Figure 30 | Summary of modelling process

Australian population and prevalence

Table 28 below presents step 1 and 2 of the modelling process, which translates the Australian population projections to prevalence estimates for venous leg ulcers.

Financial year	Australian population	F Lower Bound	Prevalence of venous leg Midpoint	g ulcers Upper Bound
2023-24	27,829,520	41,025	65,640	90,255
2024-25	28,311,405	41,744	66,791	91,837
2025-26	28,796,151	42,467	67,947	93,428
2026-27	29,283,507	43,194	69,111	95,027
2027-28	29,773,492	43,925	70,280	96,636
	TOTAL	212,355	339,769	467,183

Table 28 | Detailed estimates of Venous Leg Ulcer prevalence with sensitivity analysis

Community-based care

The next four tables provide the calculations for community-based care. Table 29 provides detailed estimates for the number of people receiving best practice and current care. Table 30 provides detailed cost estimates for community-based care across the baseline and intervention scenarios. Table 31 provides summarised community-based care data across the baseline and intervention scenarios. Finally Table 32 presents the lower bound, midpoint and upper bound estimates for the total cost differences between the baseline and intervention scenario. For venous leg ulcers, the intervention scenarios result in lower costs than the baseline scenarios for community-based care.

Table 29 | Detailed estimates of the number of people receiving best practice and current care for venous leg ulcers in the baseline and intervention scenario, with sensitivity analysis

Financial # pyear	Baseline scenario # people receiving best practice care		Baseline scenario # people receiving current care		Intervention scenario # people receiving best-practice care		Intervention scenario # people receiving current care					
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	21,949	35,119	48,288	19,076	30,521	41,966	28,717	52,512	81,229	12,307	13,128	9,025
2024-25	22,334	35,735	49,135	19,410	31,056	42,702	29,221	53,433	82,654	12,523	13,358	9,184
2025-26	22,721	36,354	49,986	19,746	31,594	43,442	29,727	54,358	84,085	12,740	13,589	9,343
2026-27	23,110	36,976	50,842	20,084	32,135	44,185	30,236	55,289	85,525	12,958	13,822	9,503
2027-28	23,501	37,602	51,702	20,424	32,679	44,933	30,748	56,224	86,972	13,178	14,056	9,664
TOTAL	113,615	181,786	249,953	98,740	157,985	217,228	148,649	271,816	420,465	63,706	67,953	46,719

Financial	Baseline scenario al \$AUD cost for best practice care		Baseline scenario \$AUD cost for current care		Intervention scenario \$AUD cost for best-practice care			Intervention scenario \$AUD cost for current care				
year	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	\$37,995,438	\$60,792,701	\$83,589,963	\$56,243,924	\$89,990,278	\$123,736,632	\$49,711,341	\$90,900,737	\$140,612,078	\$36,288,348	\$38,707,571	\$26,611,455
2024-25	\$38,661,743	\$61,858,788	\$85,055,834	\$57,230,242	\$91,568,388	\$125,906,533	\$50,583,101	\$92,494,813	\$143,077,914	\$36,924,717	\$39,386,364	\$27,078,125
2025-26	\$39,331,194	\$62,929,911	\$86,528,627	\$58,221,219	\$93,153,950	\$128,086,681	\$51,458,978	\$94,096,417	\$145,555,394	\$37,564,090	\$40,068,363	\$27,547,000
2026-27	\$40,004,620	\$64,007,393	\$88,010,165	\$59,218,078	\$94,748,925	\$130,279,773	\$52,340,055	\$95,707,529	\$148,047,584	\$38,207,260	\$40,754,411	\$28,018,658
2027-28	\$40,681,672	\$65,090,676	\$89,499,679	\$60,220,306	\$96,352,489	\$132,484,672	\$53,225,876	\$97,327,316	\$150,553,193	\$38,853,893	\$41,444,153	\$28,492,855
TOTAL	\$196,674,667	\$314,679,469	\$432,684,268	\$291,133,769	\$465,814,030	\$640,494,291	\$257,319,351	\$470,526,812	\$727,846,163	\$187,838,308	\$200,360,862	\$137,748,093

Table 30 | Detailed costs for community-based care for venous leg ulcers in the baseline and intervention scenarios with sensitivity analysis

Table 31 | Summarised community-care costs for venous leg ulcers in the baseline and intervention scenarios with sensitivity analysis

Financial year	\$AUD cost for bot	Baseline scenario h best practice care and cu	rrent care patients	\$AUD cost for bo	Intervention scenario th best practice care and c	urrent care patients
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound
2023-24	\$94,239,362	\$150,782,979	\$207,326,596	\$85,999,689	\$129,608,308	\$167,223,533
2024-25	\$95,891,985	\$153,427,176	\$210,962,367	\$87,507,817	\$131,881,177	\$170,156,039
2025-26	\$97,552,413	\$156,083,861	\$214,615,308	\$89,023,068	\$134,164,780	\$173,102,394
2026-27	\$99,222,699	\$158,756,318	\$218,289,937	\$90,547,315	\$136,461,940	\$176,066,242
2027-28	\$100,901,978	\$161,443,165	\$221,984,352	\$92,079,769	\$138,771,469	\$179,046,048
TOTAL	\$487,808,437	\$780,493,499	\$1,073,178,560	\$445,157,658	\$670,887,674	\$865,594,256

Financial year	Cost difference (\$AUD) between baseline and intervention						
Financial year	Lower Bound	Midpoint	Upper Bound				
2023-24	\$8,239,673	\$21,174,670	\$40,103,063				
2024-25	\$8,384,168	\$21,545,999	\$40,806,328				
2025-26	\$8,529,345	\$21,919,081	\$41,512,914				
2026-27	\$8,675,384	\$22,294,378	\$42,223,696				
2027-28	\$8,822,209	\$22,671,696	\$42,938,304				
TOTAL	\$42,650,779	\$109,605,824	\$207,584,305				

Table 32 | Total cost saving in community-based care in the intervention scenario with sensitivity analysis (calculated by cost difference = baseline - intervention)

Hospital admissions

The following two tables show the number of venous leg ulcer-related hospitalisations in the baseline and intervention scenarios (Table 33) as well as the total in venous leg ulcer-related hospitalisations and the associated cost savings (Table 34).

Table 33 | Number of venous leg ulcer-related hospitalisations in the baseline and intervention scenarios including sensitivity analysis

Financial	B # of venous leg	aseline scena g ulcer-relatec	rio I hospitalisation	Intervention scenario # of venous leg ulcer related hospitalisation			
year	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	
2023-24	1,243	2,082	2,987	222	233	144	
2024-25	1,265	2,118	3,040	226	237	146	
2025-26	1,287	2,155	3,092	230	242	149	
2026-27	1,309	2,192	3,145	234	246	152	
2027-28	1,331	2,229	3,199	238	250	154	
TOTAL	6,435	10,776	15,463	1,150	1,208	745	

Financial year	Reduction in #	# of venous le hospitalisatio	g ulcer-related	Cost saving \$AUD due to reduction in # of venous leg ulcer-related hospitalisations			
	Lower Bound	Midpoint	Upper Bound	Lower Bound	Midpoint	Upper Bound	
2023-24	1,021	1,848	2,843	\$15,617,345	\$28,271,498	\$43,493,519	
2024-25	1,039	1,881	2,893	\$15,891,217	\$28,767,279	\$44,256,241	
2025-26	1,057	1,913	2,943	\$16,166,383	\$29,265,402	\$45,022,565	
2026-27	1,075	1,946	2,994	\$16,443,183	\$29,766,483	\$45,793,438	
2027-28	1,093	1,979	3,044	\$16,721,473	\$30,270,261	\$46,568,462	
TOTAL	5,285	9,567	14,717	\$80,839,601	\$146,340,923	\$225,134,225	

Table 34 | Total reduction in venous leg ulcer-related hospitalisations and the associated cost saving including sensitivity analysis

Total cost savings

Table 35 brings together the changes in cost for community-based care and hospitalisation to present the total cost savings in the intervention scenarios with a lower bound, midpoint and upper bound estimate.

Table 35 | Total cost savings in the intervention scenario for Venous Leg Ulcers (including cost savings from reduced hospital admissions and cost savings from best practice community-based care)

Financial waar	Total cost savings in the intervention scenario						
Financial year	Lower Bound	Midpoint	Upper Bound				
2023-24	\$23,857,018	\$49,446,168	\$83,596,582				
2024-25	\$24,275,385	\$50,313,278	\$85,062,569				
2025-26	\$24,695,728	\$51,184,483	\$86,535,479				
2026-27	\$25,118,567	\$52,060,861	\$88,017,134				
2027-28	\$25,543,682	\$52,941,957	\$89,506,766				
TOTAL	\$123,490,380	\$255,946,747	\$432,718,530				



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