

# Future-proofing diabetes foot services in remote and rural health settings post COVID-19

Sandra Jones and Sandra MacRury

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## Key words

- Accessibility
- Service pathways
- Remote and rural
- Skilled workforce
- Team working,
- Technology enhanced care and learning

## Article points

1. The Highland Health Board is one of the largest and most sparsely populated health boards in the UK.
3. There are specific geographic and demographic challenges, compounded by staff capacity, to ensuring equity of access for people living with diabetes to podiatry services in rural communities.
2. COVID-19 encouraged the podiatry and multidisciplinary diabetes foot teams to innovate and advance the service delivery options.
4. A well-developed virtual approach should be attainable, with innovations to team-building, service redesign and education delivery.

## Authors

Details on p2

**This article discusses how a remote and rural Scottish health board has adapted, and continues to adapt, to delivering multidisciplinary diabetes foot services. The COVID-19 pandemic has exacerbated the challenges that were already experienced on a daily basis and has encouraged the podiatry team and the multidisciplinary diabetes foot team to innovate and advance the service delivery options.**

**T**he diverse rural terrain of the Scottish Highlands presents challenges in delivering services, including a difficult landscape, rugged coastlines, many remote and rural areas, inhabited islands, limited transport and poor communications infrastructure.

The Highland Health Board covers an area >40% of the Scottish land mass and is spread over 32,500 km<sup>2</sup>, making it one of the largest and most sparsely populated health boards in the UK (*Figure 1*).

The COVID-19 pandemic has exacerbated the challenges for delivering healthcare in the region, with some particular problems being the restricted ability to travel for both patients and healthcare professionals, patients and healthcare professionals who were shielding, the demographic profile and the restricted service provision.

## Background and challenges

### Population

The population of the North and South Highland health board area is around 345,382. The Highland Council area has experienced a 13% population increase in the last 20 years, with a 55% increase in people aged 65–74 years and a 63% increase in those aged ≥75 years, compared with 30% and 34% for Scotland as a whole, respectively. Numbers for the ≥75 age group are projected to increase by 34% within the next 10 years. Life expectancy is also higher than the Scottish average (National Records of Scotland, 2019).

### Rurality

Rural area classification across Scotland is based upon two main criteria: population, as defined by National Records of Scotland, and accessibility, based on drive time analysis to differentiate between accessible and remote areas in Scotland (Scottish Government 2018a; *Figure 2*).

There are higher costs associated with the larger distances people and goods need to travel. Research suggests that people in rural areas spend £100 per month more on fuel than people living in urban areas (Scottish Government, 2018b). There is also a significant lack of transport infrastructure.

### Connectivity

Connectivity remains a barrier to optimal communication in rural areas, with 4G indoor coverage in 81% of households Scotland-wide, but only 56–70% in rural areas and 42% access to gigabit broadband, falling to 13% in rural areas. Overall, 17% of rural households do not have access to decent broadband (Ofcom, 2020).

### Diabetes

NHS Highland has a diabetes population of 19,532 (NHS Scotland, 2019). In terms of type of diabetes, 88% have type 2, with age being a major risk factor. This is reflected in the crude prevalence of diabetes in Highland region at 5.8% adjusted to 5.1%. In Highland, prevalence of diabetes increases to 14.4% in those over 65 years of age (NHS Scotland, 2019).



Figure 1. Scottish terrestrial health board regions, with NHS Highland in dark purple.

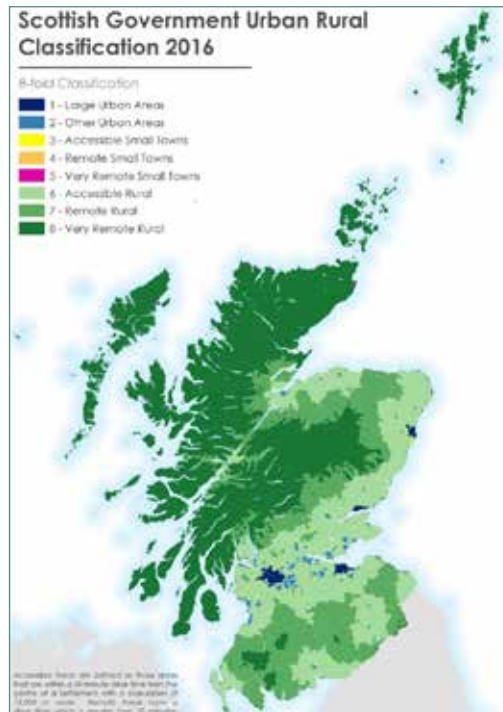


Figure 2. The Scottish Government's classification highlights the remote rural nature of NHS Highland.

In addition, prevalence is higher in regions at a significant distance from the specialist centre; for example, the largest practice in the far north of the Highland Health Board region has a prevalence of 6.2%, compared with 4.9% in the largest Inverness city practice (SCI-Diabetes, 2021).

### Staffing

Shortly before the COVID-19 pandemic struck, a comparison was undertaken of podiatry staffing per head of population within several Scottish Health Boards (Stewart and Wells, 2019). NHS Highland figures show the lowest whole time equivalent per head of population per square kilometre (Table 1). Using the formula of staff per 1,000 patients is not appropriate to determine how many podiatrists are required for safe and effective practice, even with improved technology; no account is taken of variables such as travel distance and time, practitioners' skill set and access to facilities. Stewart and Wells made no reference to any private podiatric practice network availability.

A search for private podiatric practitioners registered with the College of Podiatry revealed

107 practices in Scotland, with five of those within the NHS Highland region (College of Podiatry, 2021). The authors acknowledge there are other professional bodies where private practices may be registered.

Staffing levels have not improved during COVID-19 with staff on long-term sick leave and redeployment, and a range of vacant podiatry posts. How do we work together to have a positive impact on the outcomes for patients and service users? With people living longer, we need to adapt and find new ways to support people living with complex health and care needs, including empowering communities to offer local support. We also need to work with partners to support the workforce into the future (NHS Highland, 2013; College of Podiatry, 2017). Partnerships between health, education and professional bodies must be continued to support the workforce into the future.

### Overcoming challenges

#### New pathways

Podiatrists are adept at keeping populations mobile and active and also at preventing conditions from

### Authors

Sandra Jones is Diabetes Specialist Podiatrist and Podiatry Diabetes Co-ordinator, NHS Highland, Scotland, UK; Sandra MacRury is Consultant Diabetologist, Raigmore Hospital, Inverness, NHS Highland, Scotland, UK

**Table 1. Whole time equivalent NHS podiatric staff in five Scottish health board areas with NHS Highland split into three distinct regions (Stewart and Wells, 2019).**

Area	NHS podiatric staffing establishment	NHS podiatric staff per head of population	P-value
North and West Highland (Caithness and Sutherland; Lochaber and Skye; and Lochalsh and Wester Ross)	10.6 WTE	118,789 = 1 podiatrist to 11,206	0.152
South and Mid Highland (Inverness, Badenoch and Strathspey; Nairn, Mid Ross and Easter Ross)	13.3 WTE	141,188 = 1 podiatrist to 10,944	0.774
Argyll and Bute Highland (Oban, Lorne and the Isles; Mid Argyll, Kintyre and the Islands; Cowal and Bute; and Helensburgh and Lomond) (6,905 km <sup>2</sup> )	11.7 WTE	85,405 = 1 podiatrist to 7,230	0.165
Greater Glasgow and Clyde	161.5 WTE	1,137,970 = 1 podiatrist to 7,046	0.984
Dumfries & Galloway (642.6 km <sup>2</sup> )	24.0 WTE	148,790 = 1 podiatrist to 6,199	0.485
Shetland (1,468.5 km <sup>2</sup> )	3.6 WTE	24,000 = 1 podiatrist to 6,666	0.379
Western Isles (3,056 km <sup>2</sup> )	6.6 WTE	27,500 = 1 podiatrist to 4,154	0.064
WTE = whole time equivalent			

deteriorating (College of Podiatry, 2017). Podiatrists as first contact practitioners are being promoted by the College of Podiatry (2020). Through its Vascular Infection Pressure (VIP) pathway, NHS Highland has been advising podiatry as first point of contact for all high-risk/active foot disease patients since 2019.

Since COVID-19 hit early in the roll-out process of the VIP pathway, it was necessary to reconsider how the first point of contact might look. Patients continued to self-refer; electronic referrals tended to come from other healthcare professionals to several locations in the region; triaging happened in a timely manner in community/primary care settings, particularly where podiatry colleagues were shielding and/or working from home and could telephone patients.

The lower-limb amputation prevention guidance from Foot in Diabetes UK (2020) supported the VIP pathway. This allowed us to triage whether a face-to-face appointment was needed or if a phone or video consultation was suitable. Video appointments are via the NearMe consultation (<https://www.nearme.scot>).

Many remote and rural centres were not well equipped to deal with the rapid changes that were required to deal with the changing face of

consultations. NHS Highland e-health department worked incredibly hard to ensure IT hardware was enabled to work securely and safely from home where necessary. Clinicians had to adapt to and learn new systems to enable them to become proficient in transforming consultations and communication methods.

Contact was made with our multidisciplinary team (MDT) utilising e-clinic facilities for patients with high-risk severity for limb loss (severe infection or severe ischaemia). Patients with moderate risk severity for limb loss (infection or ischaemia) are treated in outpatient facilities where possible and homecare services are planned. Patients with less severe lesions (no infection) are given a telemedicine contact with pictures and/or video call, including caregivers or family if necessary. Generic email addresses have been used in each locality to allow contact to be made with podiatry services; photographs have been emailed to the service as part of an agreed care plan with patients/carers/families.

There are practitioners working remotely and rurally, at a distance from specialist multidisciplinary centres, who have advanced practice knowledge and skill and, through this pathway, become an integral member of the specialist MDT.

## Technology

A particular example in Highland of how the technology advances described above can be utilised and encompass the principle of a unified generalist/specialist podiatry approach in a widely distributed rural area was the Reducing Amputations In Diabetes (RAPID) project (MacRury et al, 2018; Main et al 2021). Briefly, this technology-enabled care (TEC) approach was trialled over several phases to optimise it. A new service pathway was developed based on a triage system for notification of diabetes foot ulceration to the specialist team, and decision support with options for a home video conferencing consultation with the diabetes foot MDT facilitated by the community podiatry team. The service evaluated well, improved skill level in the generalist podiatry team and raised the potential for cost savings in the management of diabetic foot ulceration and amputations, with early intervention and access to the diabetes MDT service.

Implementing non-hospital care across our vast area requires a well-established network of individual clinicians working together with agreed-upon referral arrangements (in person or via telemedicine). NHS Highland Podiatry Service has been fortunate in that there is such a network within the four localities — Argyll and Bute, Caithness and Sutherland, Skye and Lochaber and Lochalsh, and South and Mid Highland.

There has been a stable workforce for several years; however, we are reaching a point now where highly skilled and experienced practitioners are retiring from the service and from the profession. There are also very strong working links with care homes, community nursing and practice nursing. Shared care of patients features highly in remote and rural areas, and we and the patients rely on that inter-dependence.

Workforce planning and workforce capability is going to play a significant part in NHS Highland Podiatry Service delivery with the right people at the right time in the right place.

## The future

### Technology-enabled care and learning

Virtual consultations are here to stay. The major shift seen in the use of video conferencing has been reflected across healthcare delivery nationally and internationally. In general podiatry, practice has witnessed large changes in the use and acceptance of

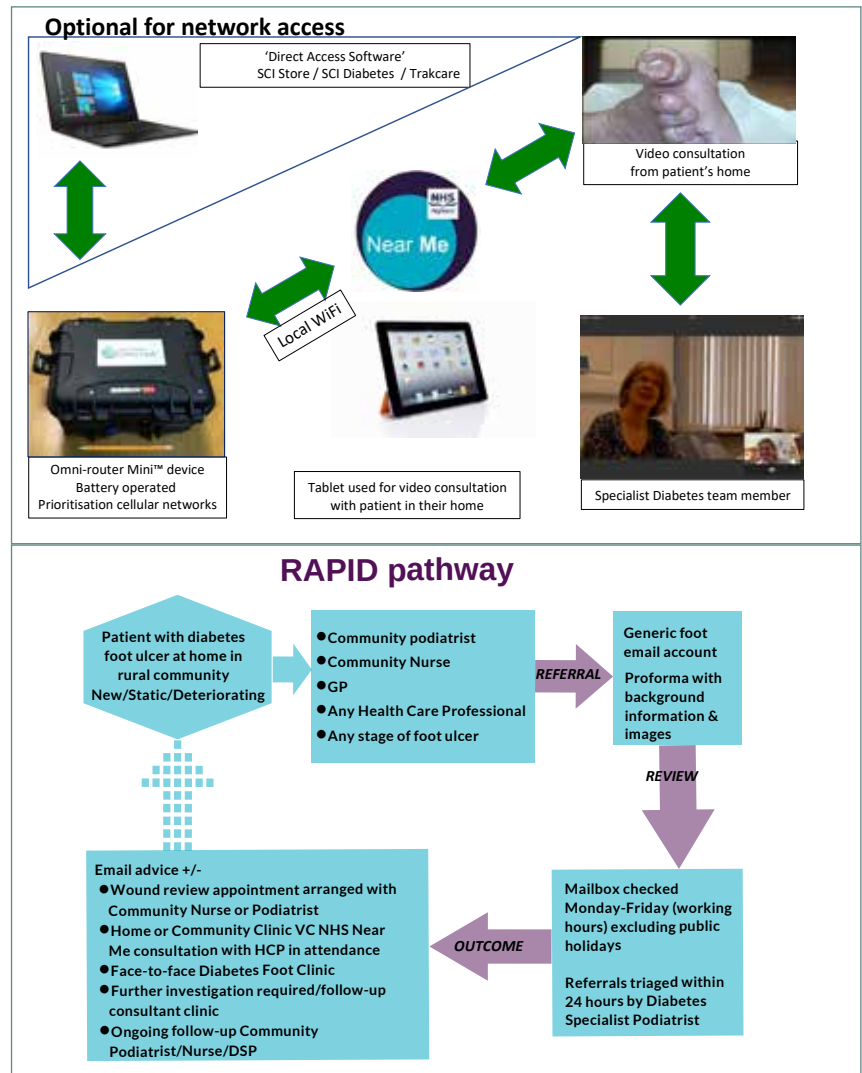


Figure 3. The Highland service pathway.

video consultations, even in urban areas (Exposito et al, 2020). The main advantages have been reduction in travel for staff and patients, improved staff efficiency and cost savings.

A high satisfaction level was reported by patients with the service pathway and technology, at 99% and 96% respectively (Main et al, 2021). The model can be extended to the 'hospital-at-home' approach, with new paradigms such as the Highland RAPID programme currently being rolled out in both north and south Highland as a service pathway to support all of our rural communities initially (Figure 3). There is also the opportunity to extend it to urban areas and explore its use in other podiatry services, non-podiatry disciplines and outside the region.

Despite the traditional ‘hands on’ approach to podiatry services, the technology revolution will complement and enhance practice through both TEC and technology-enabled learning (TEL). Telemedicine will underpin changes in practice already implemented during COVID-19, with the caveat that upscaling of platforms, education and knowledge need to include guidance and — importantly — governance for the workforce using TEC (Chadwick et al, 2020). The use of smart wearables and other telehealth technologies, such as cameras, sensory and heat detection devices, robotics and artificial intelligence, will aid remote monitoring and will maximise the workforce value (Health Education England, 2019).

TEL incorporating elements of virtual and simulated learning will allow for a wide geographical and equitable distribution for training and supporting a range of healthcare professionals, and other workers in remote and rural areas.

However, connectivity remains a barrier to optimal TEC and TEL in rural areas. The Scottish Rural Network programme is working with the Scottish Government and the Scottish 4G Infill Programme to expand coverage. Satellite may offer a potential solution, although mobile access is expensive. We are exploring the use of fixed satellite for service delivery in key spots with remote general practitioner premises in Highland.

### Team working

The formalising of locality MDTs, led by organisational change, should ensure the patient experience is optimised, and is patient-centred in all aspects. Scottish Care Information Diabetes (SCI Diabetes), a multidisciplinary patient record, will ensure optimal communication within the diabetes team, including the patient, who is central to the team.

MyDiabetesMyWay is the NHS Scotland interactive diabetes website to help support people who have diabetes and their family and friends; patients can sign up to gain access to their own test results, clinic letters and treatment plans (<https://www.mydiabetesmyway.scot.nhs.uk>).

The workforce requirements and capabilities can be measured and developed by applying the *Capability Framework for Integrated Diabetic Lower Limb Care* in assessing individual and team requirements (Short-life Working Group, 2019). As highlighted, community practitioners work remotely and rurally and have advanced practice knowledge and skill. A second useful resource for developing clinicians is the NHS Education for Scotland (2021) Multidisciplinary Rural Advanced Practice Capabilities Framework Primary and Community Care, in particular Capability 6: Collaborative working to provide evidence based, quality assured, person-centred care enabling self-management and wellbeing throughout the care journey.

In addition, working with the College of Podiatry, we are exploring innovations for reskilling, for example, through foundation or graduate apprenticeships which will complement our skills base and ensure an agile and capable workforce going forward.

### Conclusion

There are specific geographic and demographic challenges, compounded by staff capacity, to ensuring equity of access for people living with diabetes to podiatry services in rural communities. However, a well-developed virtual approach should be attainable, and alongside or complemented by with innovations to team building, service redesign and education delivery will allow staff to utilise their skills to the full extent, while enjoying the benefits of and fulfilment that working in one of the most beautiful rural areas in the UK has to offer. ■

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