What is the published research evidence base for models of rural primary care, nationally or internationally?

A rapid response to an inquiry from Scottish Government

Background

This review is to support a Scottish Government convened task force led by Sir Lewis Ritchie. Rural areas have lower population densities and less infrastructure than non-rural areas, thus creating challenges to the delivery and organisation of primary care. We have been asked to review the literature on models of rural primary care which could be applied in areas of Scotland. In particular, the group were interested in multidisciplinary team working in rural primary care.

The following question was scoped

What is the published evidence base for models of rural primary care (or components of models), nationally or internationally? In particular, what evidence exists around multidisciplinary working in rural primary care?

The Scottish Government describe primary care as ‘...the first point of contact with the NHS. This includes contact with community-based services such as General Practitioners (GPs) or Community Nurses. It can also be with Allied Health Professionals such as Physiotherapists and Occupational Therapists, Midwives and Pharmacists.’

Literature search

The primary literature was systematically searched on 26/02/19 using the following databases: Medline, Embase, and Cinahl. Results were limited to publications in English from 2008 onwards. Key websites were searched for guidelines, policy documents, clinical summaries and economic studies. Websites of organisations related to this topic, for example Health Foundation, King’s Fund, Nuffield Trust, were also searched. Concepts used in all searches included: rural primary care, telemedicine, multidisciplinary teams, expanding roles of team members. A full list of resources searched and terms used are available on request.

Evidence base

The literature search identified a range of evidence sources, including systematic reviews, primary studies, case studies and a commentary. Included evidence is summarised in Table 1.
Table 1. Included evidence sources

<table>
<thead>
<tr>
<th>Publication type</th>
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<td>3,4</td>
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<td>Qualitative study</td>
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<td>5-8</td>
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<tr>
<td>Commentary</td>
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<td>17</td>
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<tr>
<td>Ongoing study</td>
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Findings

In this report, we describe the relevant literature in the following categories: models of care, interventions to support rural healthcare and ongoing work. Please note no critical appraisal of methodological quality of the included studies was conducted.

Models of care

Two systematic reviews\(^1\,2\) and one review\(^3\) looked at models of care in rural areas; two Australian, one American. These reviews covered guiding principles for primary health care services and innovative models.

An Australian systematic review\(^1\) of innovative models of comprehensive primary health care (PHC) in rural and remote Australia aimed to describe what health service models were reported to work, where they worked and why. This well-conducted systematic review was supported by a Reference Group of 11 recognised experts in rural and remote health, health economics, consumer issues, evaluation, PHC service provision and government policy-making, together with two health services researchers. They extracted data from 93 papers and produced a typology of five categories of models; discrete services (rationale is to form a sustainable workforce/delivered from an identifiable site within the community); integrated services (provide single point of access to a range of services/health professionals); comprehensive care (aim is to improve access to services and to address underlying social determinants of health, these models are broader in scope than the integrated service models); outreach models (periodic supply of services from an area with services, to an area without services); virtual outreach models (aim is to use information technology to increase access and sustain services to small communities). The authors noted that certain models suited specific geographical contexts in terms of population size and remoteness; the larger rural communities are able to support a greater variety of local, discrete, specialised services, while the smaller, more remote communities require more integrated and comprehensive primary health services. The authors highlighted ‘environmental enablers’ (supportive policy, state relations, community readiness) and ‘essential service requirements’ (workforce, funding, governance/management/leadership, linkages, infrastructure) that were important across all models.
A US review of organisational models designed to improve the availability of health services to rural areas, described a number of models to improve healthcare in a large US state. They suggested a number of models to meet rural needs: the rural interdisciplinary medical home model, the spoke and wheel model, medical centre/community linkages, technology-based outreach modalities, part-time physician care and expanding the role of health education centres. The full text of this article was not available.

A recent Australian (2018) systematic review included 20 papers (mainly descriptive papers with some limited evaluations) which looked at the principles that should guide visiting primary health care services (described as ‘fly-in fly-out’ or ‘drive-in drive-out’) in rural and remote communities. Services were broadly described as ‘hub-and-spoke’ (when visiting health professional travel frequently to a community from a central base) or as a mobile clinic (involving travel between communities). There was a wide range of health professionals described in the papers and continuity of staff as an important factor in care was a common theme. While the initial objective of the review was to describe a typology of models of health services, the heterogeneity of the included studies led the authors to conclude that a set of guiding principles would be more helpful for policy development and decision making. They listed a set of principles, which they state should form the basis of service design. The following seven principles were proposed: justification (what is the justification for the visiting service?); scheduling (are the frequency and duration of visits meeting needs?); coordination (are the visiting services coordinated with existing primary care services and how is this managed?); scope (is the visiting service adequately comprehensive and targeted to meet needs?); continuity (do the same providers visit regularly?); support (is there a resident primary care team in place to support visiting staff and do the visiting staff support the resident staff?); review (are there plans in place to regularly review the service to ensure needs are being met?).

Interventions to support rural healthcare

There were a number of papers related to the potential of health workers as well as the community, to support rural healthcare delivery, in particular, the expanded role of the nurse and the paramedic. One narrative review examined the impact of interventions to retain healthcare workers. The search also identified: five papers on the role of the paramedic or nurse in rural care, a qualitative study on the role of the GP in mild/moderate depression in rural care, a case study on the use of practice assistants to support GP caseload, a pilot case study on the use of behavioural health practitioners in the US, a case study on the integration of the emergency department and primary care services, a German paper on the views of local politicians on supplementary care models, two studies (one evaluation, one case study) on sustaining primary care services in rural areas and a case study on the role of the community in supporting rural healthcare.

Health workers

A narrative review from 2010 described evaluations of interventions to attract and retain health workers in remote and rural areas. The authors found 27 relevant studies and summarised them under four themes (attractiveness, recruitment, retention and impact). The included studies assessed different outcomes and varied in methodological quality. Almost all showed increases in attraction, recruitment, retention and impact following the intervention.

Attractiveness: 12 studies evaluated interventions that had attracted students to work in rural areas, the majority being educational interventions. Studies showed that those previously from
rural areas were more likely to practice in rural areas, clinical rotations in a rural area may encourage decisions to work in a rural area and appropriate educational preparation adds interest to those who may work in rural areas. Financial incentives, a personal support programme, a programme providing rural clinical experience and continuing professional development had also proved effective.

**Recruitment:** Seven studies investigated the effect of interventions on recruitment rates. Two US educational programmes showed increases in recruitment in rural areas. An Australian funding scheme for post-graduate medical students increased the percentage of rural workers. Other types of intervention produced lower rates of recruitment; a South African compulsory service, a financial incentive scheme in the Niger targeted at doctors, pharmacists and dental surgeons, and a scheme to help doctors set up their own practice in Mali.

**Retention:** Length of service was assessed, with one study reporting 15 months (doctors within a network of rural academic family practice) and another, an average of 4 years’ service in the ‘medicalisation of rural areas’ programme in Mali. The proportion of health workers varied widely; remaining in rural areas was 20% for a funded US programme, 86% for a financial incentive programme in Australia, 70% of medical graduates remaining in post 6 years after their compulsory service in Japan, while 66% of medical students stayed in family medicine for 11-16 years in the physician Shortage Area Programme.

**Impact:** Ten studies reported on the impact of retention interventions. Five evaluations reported increased job satisfaction following an intervention, four studies reported improved quality of care, reduced referrals and reduced waiting times and two studies reported increases in certain competencies of health workers.

There were a number of papers on supplementing the role of the GP in primary practice in rural areas.

**Paramedic:** The role of the rural paramedic in Australia has expanded. Through advanced medical training in primary health care, the rural paramedic can provide pre-hospital, hospital and primary health care. A 2017 commentary on the evolving role of Australian rural paramedics described how this will decrease the over-reliance on hospitals and primary health care systems for sub-acute and after-hours care and will also support the integration of paramedics into local communities and local health care systems.

A case study examined the evolution of rural paramedic practice and described key characteristics, roles and the expected outcomes for a Rural Expanded Scope of Practice (RESP) model. Interviews with paramedics, volunteer ambulance officers and other health professionals were thematically analysed. Results showed that paramedics were becoming first line primary healthcare providers with additional professional responsibilities. Using the data, the authors developed a model to support the evolution of the rural paramedic; the RESP model has four components: rural community engagement, emergency response, situated practice and primary health care.

A further paper examining the expanded role of the rural paramedic determined what factors facilitate this role. Using semi-structured interviews (n=17), observation and document reviewing, results revealed paramedics have developed a multidisciplinary and community based approach to health care. Specifically, the changes in roles and required paramedic attributes are evident at the following levels; community involvement, organisational support, professional support, and appropriate education and training.
**Nurse:** Nurse practitioners can be valuable additions to the rural primary care team. A mixed methods investigation of the outcomes of the collaboration between GPs and nurse practitioners in rural Canada was undertaken. Interviews, documents and before and after data were collected from three case studies. The results showed that collaboration between the GPs and nurses, led to more time with patients, development of a team approach with inter-professional collaboration, improved staff satisfaction and increased patient appointment availability. Harder-to-serve populations had greater access to primary care and new links between the practice and the community were created. There was a decrease in emergency services use and hospital admission and the doctors were more likely to want to remain in post.

In a Welsh, qualitative study, the views of specialist nurses on their contribution to healthcare in rural Wales was gathered using the Delphi technique with a view to developing quality care metrics. The nurses felt their educational expertise was vital in their role. Their views on caring for patients centred on four main areas: developing appropriate criteria for referral into the service, collaborative working, education, and advocacy roles.

**GP role in treatment of mild/moderate depression:** A small qualitative Australian study (n=10) investigated the factors that influence access to mental health services for people with mild to moderate depression in rural areas. Thematic analysis of semi-structured interviews suggested that GP management of depression in a rural setting had advantages including better doctor-patient relationships, continuity of care and the proximity of services. Due to the rural barriers to accessing mental health services, GPs often self-managed patients in addition to referring patients to other mental health services providers.

**Qualified medical assistants:** A German exploratory case study examined whether delegating GP home visits to qualified medical practice assistants could support GPs by decreasing GP workload and allowing them to provide care for more patients in a wider rural area (assessed by number of patients in the practice). The practice assistants perform non-medical tasks and coordinate workflow in the practice, but can also qualify for more specialised medical tasks. The GP selected patients suitable for visits from practice assistants. In the four participating GP practices, the number of patients in the practice increased by an average of 133 patients/quarter. Around 90% of GPs (n=53) reported reduced workload and the evaluation indicated that GPs believed more than 92% of patients received the usual standard of care.

**Mental health assistants:** A US pilot project investigated the effect of placing behavioural health providers into primary care in rural areas in three test clinics. Patient use of medical services for two of the three clinics declined (authors reported ‘very large’ effect sizes) over the following 6 months, resulting in a cost offset. The full text for this article was not available.

A successful integration of a small rural hospital and primary care services is described in a US case study. As emergency departments are often the most accessible source of primary care in rural areas, they are often staffed by emergency care and primary care workers. The hospital chosen for the case study had emergency care rooms, primary care rooms and space for specialists. On arrival, in order to improve patient flow, patients are screened to determine what care they need. There is a patient navigator and behavioural health and care coordination services. The hospital maintains a community focus and responds to community needs. For example, the hospital offers a van service to address the missed appointments due to patient transport difficulties. The local schools, churches and major employers are used to help determine the community’s needs. The authors propose a health care delivery model based on the partnership between emergency
medicine and primary care. This model includes community needs assessment, provision of emergency and primary care as well as the consideration of social and mental health needs.

**Views on supplementary care models**

A German exploratory study, carried out in 2017, assessed the views of local politicians on the suitability of supplementary care models (use of trained medical assistants, patients’ buses (organised public transport from the patient’s residence to doctors’ offices, either as a demand-based on-call bus or as a scheduled service bus with voluntary or vocational drivers), mobile doctors’ offices, and telemedicine) for rural areas in Germany. The response rate for the questionnaire was 72% (323/449). Results showed 72% supported the use of trained medical assistants, 49% supported patients’ buses, 22% supported mobile physicians’ offices and 14% voted for telemedicine.

**Sustaining rural primary care**

A 6-year longitudinal evaluation (the paper examines the first 4 years of this planned evaluation) looked at the performance, quality and sustainability of a primary health service in rural Australia. Evaluation data included an audit of service indicators, community surveys, in-depth interviews with key stakeholders and focus groups. The service was developed with community engagement, strong leadership and strategic relationship building. It is a single-point-of-entry comprehensive service offering medical services which includes after-hours care and community health services. In order to remain sustainable in a changing environment, the service has pro-actively taken opportunities to develop the service (for example, by seeking grant funding for service expansion and better integration, by the ongoing monitoring of sentinel service indicators, maintaining community involvement and succession planning) and implemented practical solutions to risks and threats (for example the service broadened its funding stream when there were top-down changes in funding which threatened the service).

A case study of a primary healthcare facility in rural US provided preliminary findings associated with a low-overhead patient-centred medical-home practice (PCMH) model in North Carolina. The core of the practice was a Web-based portal connected to an integrated electronic health record and practice management system. Through this system, patients can complete many routine requests and administrative tasks themselves. Other features included: new models of care (e-visits, telephone visits, group visits, team-based care) and proactive care (patients advised to prepare for their visit, screening for barriers, joint health-goal setting, systemic care reminders, panel management). Preliminary findings suggested higher uptake of health services, better health outcomes and positive patient feedback.

**Community involvement**

A small Australian case study (12-bed hospital) investigated the key enablers of change in re-orienting a remote acute care model to a comprehensive primary healthcare service. Five senior leaders involved in the development of the service were interviewed and transcripts thematically analysed. A community-driven, ‘bottom up’ approach was described and a hierarchy of major themes were outlined including: community participation, community readiness and desire for self-determination; linkages in the form of a government community controlled health service partnership; leadership; adequate infrastructure; enhanced workforce supply; supportive policy; and primary healthcare funding.
Ongoing work

A UK, Health Foundation funded study\textsuperscript{18} will look at the use of a Patient Aligned Care Team (PACT) to support patient need in rural Wales and Shropshire. The aim is to ‘increase access to timely, appropriate primary care, reduce secondary care demand, improve the patient experience and increase GP availability. Introducing PACT teams and a technology enabled way of working that allows expert clinical opinion to be provided at the time of need and as close to the patient’s home as possible.’ The patient-driven, personalised approach aims to improve safety, clinical outcomes and staff satisfaction. The project ran from January 2017 to April 2018.

Summary and conclusions

It is not possible to comprehensively summarise the findings as the evidence base for models of rural care was fairly piecemeal, comprising a variety of study types (although mainly case studies), aims, outcomes and geographical areas. The evidence suggests that decision makers should follow general principles of service design, adapting them to needs, as opposed to applying specific models to practice. Much of the evidence described in this report relates to specific socioeconomic and geographic conditions associated with rurality in Australia and America, care must be taken when considering these research findings in the Scottish context.

References


