

RESEARCH ARTICLE

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Building general practice training capacity in rural and remote Australia with underserved primary care services: a qualitative investigation

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Abstract

Background: Australians living in rural and remote areas have access to considerably fewer doctors compared with populations in major cities. Despite plentiful, descriptive data about what attracts and retains doctors to rural practice, more evidence is needed which informs actions to address these issues, particularly in remote areas. This study aimed to explore the factors influencing General Practitioners (GPs), primary care doctors, and those training to become GPs (registrars) to work and train in remote underserved towns to inform the building of primary care training capacity in areas needing more primary care services (and GP training opportunities) to support their population's health needs.

Methods: A qualitative approach was adopted involving a series of 39 semi-structured interviews of a purposeful sample of 14 registrars, 12 supervisors, and 13 practice managers. Fifteen Australian Medical Graduates (AMG) and eleven International Medical Graduates (IMG), who did their basic medical training in another country, were among the interviewees. Data underwent thematic analysis.

Results: Four main themes were identified including 1) supervised learning in underserved communities, 2) impact of working in small, remote contexts, 3) work-life balance, and 4) fostering sustainable remote practice. Overall, the findings suggested that remote GP training provides extensive and safe registrar learning opportunities and supervision is generally of high quality. Supervisors also expressed a desire for more upskilling and professional development to support their retention in the community as they reach mid-career. Registrars enjoyed the challenge of remote medical practice with opportunities to work at the top of their scope of practice with excellent clinical role models, and in a setting where they can make a difference. Remote underserved communities contribute to attracting and retaining their GP workforce by integrating registrars and supervisors into the local community and ensuring sustainable work-life practice models for their doctors.

Conclusions: This study provides important new evidence to support development of high-quality GP training and supervision in remote contexts where there is a need for more GPs to provide primary care services for the population.

Keywords: General practice training, Family Physician Training, Primary Care Services, Rural Health, Remote Underserved Communities, Medical Workforce Shortage, Health Care Equity, Qualitative Research, Thematic Analysis

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Background

Approximately 29% percent of the Australian population lives in rural and remote areas [1] where their health status is worse than those living in major centres, with higher mortality rates for chronic disease, injury and poorer access to and use of health services [2]. Australians living in rural and remote areas have access to 274 doctors per 100,000 in remote/very remote areas compared with 433 doctors per 100,000 in major cities [3]. The health sector employs more people than any other industry in Australia, but the maldistribution of health workers continues to be problematic and undermines the capacity to achieve health improvements for rural and remote people whose cultures, lives, and livelihoods are based in these towns [4, 5].

Access to primary care services is particularly concerning for ensuring early intervention, continuity of care, and managing important health needs. However, in terms of more nuanced targeting of primary care workforce development, it is critical to identify communities where primary care training and primary care services need to be built up to adequately address population health needs. This includes understanding how to increase General Practice (GP), or family physician training posts in these specific communities. This paper describes the culmination of such work, undertaken in the context of north-western remote Queensland, Australia.

McGrail et al. [6] undertook a quantitative analysis in 2017 to explore the distribution of GP supervisors and registrars (doctors training in non-hospital community-based training posts to become GPs) relative to general practice (GP) workforce supply measures (GP billing data) and population needs according to defined rural and remote sub-regions and towns of north-western Queensland. Multiple standardised workforce indicators: supply, rurality, and other indicators, including population size, Australian Standard Geographical Classification – Remoteness Areas (ASGCRA; [7]), Modified Monash Model (MMM; [8]), Registrar count [6], aggregated Districts of Workforce Shortage (DWS) ratings [8–10], Index of Access (IA; [11–14]), Socio-Economic Indexes for Areas (SEIFA; [15]), and Indigenous population were applied to this evaluation.

A range of communities ($n = 11$), pre-identified from the McGrail et al. [6] study, were purposively sampled for the current study with the aim of more in-depth exploration of these contexts to understand the nature of work, supervision, and how to build general practice (GP) training capacity in these specific communities.

Building GP training capacity in these communities has enormous potential to provide additional primary health care services for populations in need of more services. GP registrars increase the available pool of local doctors seeing patients. Providing training in these settings is essential to develop GP registrars with relevant skills for the scope of practice required by remote communities. There

is also the potential that registrars may stay in these communities after they complete their vocational training [16]. Rural-based GP training has been shown to increase the likelihood of GPs practising in these areas for at least five years [17]. Other research has shown that both rural background [18–20] and extended rural placements during medical school [21, 22] positively influence rural practice in early career. However, there is very little contextual information about the rich range of background factors related to working and undertaking supervised postgraduate medical training in such communities, making it hard to implement solutions.

This project was led by James Cook University's (JCU) GP training program, Generalist Medical Training (GMT), which operates as one of nine decentralised regional GP training organisations across Australia. It provides GP training across over 90% of the large state of Queensland, much of it in rural and remote locations. In Australia, GP training can be commenced as early as the second year of postgraduate medical practice (after internship to achieve full registration). JCU's goal is to provide training to build a distributed medical workforce with the skills to meet the population health needs of the large rural and remote catchment population. Hence, this project had high practical application to JCU and it was done in an academically rigorous way to inform the international evidence-based literature.

Methods

Participants

Eleven purposively selected towns were chosen for this study. They had been delineated as underserved for general practitioners as well as GP supervisor and registrars, relative to their assessed population need as per the McGrail et al. [6] study. These included towns with populations of < 15,000 people or were more than 10 km from the nearest regional centre with a population of 15,000 or more. Most had a district hospital (small rural hospital with selected generalist services) as a major referral site for surrounding communities and at least one general practice clinic in the town. Queensland remote areas has a higher than average proportion of Indigenous population and this was notable in several of the communities studied. The characteristics of the towns sampled are outlined in Table 1.

Within these towns all GP supervisors, GP registrars, and practice managers were invited to participate in a semi-structured interview face to face or remotely by phone, about supervising or receiving GP training in the context of their town. The basis for selecting these participants was to understand the factors from different perspectives as these can vary between GPs-in-training, longer term GPs, and those working in a business context. Interviews were conducted from mid-November 2017 to

Table 1 Selected Regions and Towns relative to population needs*

Region	Number of Towns Included	Population (2011)**	ASGC-RA	MMM	DWS 2007-2017	IA	SEIFA
North West	5	<15000	5	7	4	4	4
Central West	4	<15000	4-5	7	4	4	2-3
South West	2	<15000	5	7	4	4	3

* Individual towns, registrar count, and indigenous population are not identified in this table for the purposes of adhering with ethical requirements and to keep towns and participants unidentified

** Population of 2011 as per the Australian Bureau of Statistics 2011 Census [23]

mid-February 2018, digitally recorded, transcribed verbatim, and entered into NVivo 11 Plus (QSR International Pty) for analysis. All transcripts were sent to participants for checking and confirmation prior to analysis.

Data analysis

Qualitative data from semi-structured interviews underwent thematic analysis using a three-level qualitative approach [24]. Transcripts were read in full and coding of identified themes was confirmed using shared coding sessions and theme generation by two researchers (LY, RP) with consensus used to resolve discrepancies. Inter-coder reliability was undertaken by three researchers (LY, RP, BO'S) on half of a random selection of the transcripts to ensure consensus of themes and integrity of coding. Authors discussed and reached consensus about the final main themes and sub-themes (level 1 and level 2) as they emerged, further analysing and discussing the data over a period of six months. In addition to thematic coding, quantification as a mixed methods approach that allows the numerical translation, transformation or conversion of qualitative data, was applied to determine the importance and occurrence of each theme [25]. For this, qualitative verbal comments in sentence units were transferred into numerical form to show commonality of themes and to aid interpretation as to the weight of the data in each theme. Some verbatim illustrative quotes were selected from these sentence units and were included in the textual presentation of results (in italics).

Results

Overall 39 participants (19 males, 20 females) were interviewed including 14 GP registrars, 12 GP supervisors, and 13 practice managers. All participants were aged from 20 to 50 years. There were 15 Australian Medical Graduates (AMG) and 11 International Medical Graduates (IMG). See Table 2.

Insight from all participants interviewed is presented across four key themes: 1) supervision in underserved communities, 2) impact of working in small, underserved,

remote contexts, 3) work-life balance, and 4) fostering sustainable remote practice. (See Table 3).

Theme 1 - supervision in pre-identified underserved communities

Most comments related to perceptions of supervision and emphasised the impact of supervision for providing mentorship and support during registrar training. One registrar commented they chose to train in the location for the quality of supervision available across the community – “It is the reason I came out”. Another registrar noted, however, that supervisors were busy in the remote practice context though they found ways to stay in touch with registrars during busy daily routines, including methods to stay in touch through a “*quick text*”. For trainees needing more support and to develop the resilience for remote practice, supervisors recognised the need to be available “*on the ground*”, and “*on the run*” including the middle of the night for on-call work. Over a quarter of responses raised the issue of sufficient supervision through “*being able to have access to good supervision in the general practice and at the hospital*”. To a lesser extent, some raised issues of remote areas having inexperienced supervisors who are “*not much more experienced than you are - junior people*”. Although most participants discussed the supervision schedule at an operational level, there was no clear consensus about an optimal model of supervision, including the best arrangements for scheduled versus unscheduled “teaching-learning” time outside of delivering the much-needed clinical services in these communities. Additionally, options of using remote supervision and co-supervision models were only raised by a couple of participants, rather than being noted as a possible option for building capacity in different communities. Table 4 exemplifies a range of other comments by various participants.

Theme 2 - impact of working in small, underserved, and remote context

The impact of working in small, underserved, and remote communities was discussed in relation to the

Table 2 Demographic Profile of Interviewed Participants

Professional Categories	Participants' Demographics (N = 39)					
	Registrars		Supervisors		Practice Managers	
	14		12		13	
Age Range	20 – 40 (86%)		41 - 50 (50%)		41 - 50 (62%)	
Gender	Male	Female	Male	Female	Male	Female
	6 (43%)	8 (57%)	10 (83%)	2 (17%)	3 (20%)	10 (80%)
Doctor's Background*	AMG		AMG		IMG	
	8 (57%)		7 (58%)		5 (42%)	
	Rural Background	Metropolitan Background	Rural Background	Metropolitan Background	IMG	IMG
	6 (43%)	2 (14%)	6 (43%)	2 (18%)	4 (36%)	5 (45%)
Years of Medical Practice**	Not applicable		<i>M</i>		<i>SD</i>	
	Not applicable		20.09		8.51	
	Range: 8 - 37					

* The doctors' background was asked as two demographic questions: "Did you experience rural/remote living prior to moving to this community?" and "Was that pre high-school, during high-school, during medical school, or while working as a doctor?"

** Years of medical practice relate to years since graduating from basic medical degree.

community, its health service quality, and the unique learning experiences it offered for registrars. The presence of registrars in these communities was perceived by both registrars and supervisors to contribute to health outcomes and continuity of practice to "make a difference". One practice manager also noted the centrality of medical care to the community "if we didn't have a doctor, we wouldn't have a community". Community trust and to a lesser extent community engagement emerged as important. Registrars who started a community triathlon club in their community are an example community participation. From the health service perspective, having registrars training in the town facilitated patient-centred care, a positive medical teaching and learning environment, "quality of service", and reputation for good healthcare, improving the perception of the community having skilled doctors, and facilitated inter-professional team-focussed care. The substantial skill demands required were observed by a practice manager who stated that "some of

them [/registrars/] come out – they think it's a small sleepy town...don't realise the emergency experience that they need". Undertaking supervised practice in these communities, registrars were noted to work across an increased scope of practice, develop professional and personal resilience and increase their professional confidence. A registrar noted "you've got real ability to just practice at the top of your level". Additionally, a supervisor noted that extensive team work is an important lesson for GP registrars - "the team is everything". Overall, in remote underserved communities could focus on engaging registrars and supervisors and promote sustainable work-life practice models for their doctors. Table 5 exemplifies a range of other comments on this theme.

Theme 3 - work-life balance

The importance of work life balance in these underserved communities was strongly emphasised. Issues which came up for both supervisors and registrars were

Table 3 Summary of Themes and Sub-themes

Theme Levels	Theme 1 Supervision in pre-identified underserved communities (Number of Quotes/Weight)	Theme 2 Impact of working in small, underserved, and remote context (Number of Quotes/Weight)	Theme 3 Work-life balance (Number of Quotes/Weight)	Theme 4 Fostering sustainable practice (Number of Quotes/Weight)
Level 1	<ul style="list-style-type: none"> Perception of Supervision (53, 59%) Models of Supervision (37, 41%) 	<ul style="list-style-type: none"> Community Connection (75, 57%) Quality of Health Care Services (39, 30%) Unique Learning Experience for Registrars (18, 14%) 	<ul style="list-style-type: none"> Importance of Work-Life Balance (65, 59%) Barriers to Work-Life Balance (45, 41%) 	<ul style="list-style-type: none"> Building Remote Workforce Capacity (49, 29%) Community Involvement in Medical Training (43, 25%) Building Workplace Sustainability in Remote Practice (43, 25%) Orientation for Registrars (34, 21%)
Level 2	<p><u>Perceptions of Supervision:</u></p> <ul style="list-style-type: none"> Mentorship and Support (23, 43%) Sufficient Supervision (15, 28%) Satisfactory Supervision (10, 19%) Inexperience Supervisors (5, 10%) <p><u>Models of Supervision:</u></p> <ul style="list-style-type: none"> Scheduled vs Unscheduled Supervision Time (29, 78%) Remote Supervision (6, 16%) Co-Supervision (2, 6%) 	<p><u>Community Connection:</u></p> <ul style="list-style-type: none"> Continuity of Practice (29, 39%) Community Trust (28, 37%) Community Engagement (18, 24%) <p><u>Quality of Health Care Services:</u></p> <ul style="list-style-type: none"> Patient Centred Care (18, 46%) Positive Medical Reputation (14, 36%) Interprofessional Team Focused Care (7, 18%) <p><u>Unique Learning Experience for Registrars:</u></p> <ul style="list-style-type: none"> Increased Scope of Practice (9, 50%) Resilience (5, 28%) Professional Confidence (4, 22%) 	<p><u>Importance of Work-Life Balance:</u></p> <ul style="list-style-type: none"> Balanced Workload (29, 44%) Time for Family and Friends (14, 22%) Sporting and Leisure Activities (14, 22%) Community Involvement (8, 12%) <p><u>Barriers to Work-Life Balance:</u></p> <ul style="list-style-type: none"> Work Spill-Over and Boundaries with Patients (30, 67%) Workload, On Call, Study Load, and Shortage of Staff (12, 27%) Burn-out (3, 7%) 	<p><u>Building Remote Workforce Capacity:</u></p> <ul style="list-style-type: none"> Early and Repeated Exposure (18, 37%) Quality Supervision (11, 23%) Upskilling and Innovating (8, 16%) Flexible and Balanced Workload (7, 14%) Developing Leadership (5, 10%) <p><u>Community Involvement in Medical Training:</u></p> <ul style="list-style-type: none"> Community Support and Integration (43, 100%) <p><u>Building Workplace Sustainability in Remote Practice:</u></p> <ul style="list-style-type: none"> Self-Care (24, 56%) Opportunities for Professional Development and Career Progression (11, 25%) Managing Workload (8, 19%) <p><u>Orientation for Registrars:</u></p> <ul style="list-style-type: none"> Prepare for the Role (13, 38%) Support from Peers (13, 38%) Support from Family and Friends (8, 24%)
Total Statements	90	132	110	169
Total Weight (%)	18	26	22	34

Table 4 Theme 1 - Supervision in pre-identified underserved communities

Sub-themes Level 1	Sub-themes Level 2
<p>Perceptions of Supervision Insights regarding supervision practices.</p>	<ul style="list-style-type: none"> • Mentorship and Support • Insufficient Supervision • Satisfactory Supervision • Inexperienced Supervisors
<p><i>"It is so helpful to have a senior doctor look over your shoulder and go 'hey, you are doing well' or someone available by phone who you can pick up and say 'Can you come in? I am just worried.' Someone you can use to grow and develop rather than being stranded." (Registrar)</i> <i>"Teaching the factors that are involved in resilience often occur in the middle of the night, and it's teaching on the run, when you've got a crying registrar who's just not coping with on call fatigue, mounting patient pressure and mounting expectations. So just helping them through that by being on the ground with them is the way that they learn to cope. Leading by example, I think is - modelling good behaviour and how to deal with that is probably what we try to do the most. " (Supervisor)</i> <i>"Being able to have access to good supervision both here and in the general practice and at the hospital is so important – it is the reason I came out." (Registrar)</i> <i>"The biggest limitation to supervision is busyness." (Registrar)</i> <i>"If I'm supervising someone for whatever reason, I flick them a quick text message, a supportive little push." (Supervisor)</i> <i>"Anyone who's working on call is more than happy to take a call at any time." (Registrar)</i> <i>"Your supervisors are people who are not much more experienced than you are - junior people." (Registrar)</i></p>	
<p>Models of Supervision Types of supervision models applied to rural and remote contexts.</p>	<ul style="list-style-type: none"> • Scheduled X Unscheduled Supervision Time • Remote Supervision • Co-Supervision
<p><i>"We set time aside at least two or three or four times a week. Our handovers are every morning and every night. " (Supervisor)</i> <i>"I supervise one registrar and I do it remotely on blackboard collaborate and phone." (Supervisor)</i> <i>"With co-supervision it makes it a bit easier for me to go away." (Supervisor)</i></p>	

trying to balance workload, time for family and friends, sporting and other leisure activities, and community involvement. Supervisors perceived that they were role models of these factors for registrars. Challenges to achieving a work life balance were mainly mentioned by registrars and supervisors and included the problem of work spill-over into time off and boundaries with patients seen in the community, as well as workload, on-call, study load and a shortage of clinical staff. A few participants also mentioned burnout as having the potential to impact their retention and registrars recognised the importance of maintaining and role-modelling the balance of work for sustainability. Some of the key factors driving work life balance in these communities were the amount of quality time with family, doing other activities in the community and workload expectations including on-call requirements. Table 6 exemplifies a range of other comments on this theme.

Theme 4 - fostering sustainable practice

Sustainable practice was a strong theme noted by registrars, supervisors, and practice managers impacting the attraction, training, and retention of GPs. Developing the overall local and visiting workforce capacity, engaging community involvement in recruitment and orientation and promoting sustainable workforce practices were all thought to enhance sustainability. Early and repeated exposure of medical students and junior doctors to these communities and fostering the positive aspects of a remote lifestyle were thought to contribute

to building a local critical mass and attract more GPs to remote practice. Other ways to potentially increase registrar supply are to foster the quality of supervision in remote medical practice by retaining and supporting supervisors who have remote experience, provide supportive mentors and enhance supervision through co-supervision models. To maintain the current remote GP supervisor workforce, many who were reaching mid-career considered it important to ensure opportunities to upskill and maintain existing skills.

In terms of the learning model in these remote towns, the practice managers specifically suggested building a flexible and balanced workload for both registrars and supervisors to allow for teaching time. Teaching opportunities could be facilitated in the busy environment by more dedicated “educational resource”. The health service leadership in the town was also considered important for supporting sustainable practice by the local GPs, thereby enabling their active engagement in supervision and leadership roles. One registrar explained that it “*makes a big difference in a country hospital having an established administration staff with strong leadership*”. Further, a supervisor explained that “*trying to build leadership and executive structure within our rural medical workforce is something that is needed*”. Having time off and becoming part of the community were also important elements for sustainable practice, and therefore for attracting registrars and retaining supervisors and registrars.

Table 5 Theme 2 - Impact of Working in small, underserved, and remote context

Sub-themes Level 1	Sub-themes Level 2
<p>Community Connection Impact of medical care on local communities.</p>	<ul style="list-style-type: none"> • Continuity of Practice • Community Trust • Community Engagement
<p>"Seeing their bubs as they grow, or tricky diagnoses that come through the year, and then seeing patients on and off again, here or at the practice, it's really nice following them up in the community. That's very fulfilling - just living the dream, really!" (Registrar). "Being able to make a difference in a needy community and form connections with people." (Supervisor) "It's not just your patient. You're invested in the community as a whole." (Supervisor) "If we didn't have a doctor, we wouldn't have a community. We are so lucky to have the doctors that we have and the quality of doctors that have come and stayed in our town and been here has just been remarkable." (Practice Manager) "I would like to think I've made a contribution to helping improve the health of the community, reduce the chronic disease burden, delivered some babies, and saved some lives during a couple of emergencies." (Supervisor) "Being involved with the local sporting clubs. We have so many here that the doctors currently are involved in. I think the GPs up at the hospital were a big part of getting a triathlon group started." (Practice Manager)</p>	
<p>Quality of Health Care Services</p>	<ul style="list-style-type: none"> • Patient Centred Care • Positive Medical Reputation • Inter-professional Team Focused Care
<p>"You're more involved in patients' care." (Registrar) "That sort of holistic view and the broad practice, all that stuff is probably what keeps me there." (Supervisor) "Some of them come out and they think it's a small sleepy town. They don't realise the emergency experience that they need." (Practice Manager) "The team is everything" (Supervisor) "There's a certain amount of affinity for the type of people that you work with in these places." (Supervisor)</p>	
<p>Unique Learning Experience for Registrars</p>	<ul style="list-style-type: none"> • Increased Scope of Practice • Resilience • Professional Confidence
<p>"The sheer variety and skills I get to do in my role – I don't think you can get it living in the city." (Registrar) "You get to do a bit more yourself – Not a referral service." (Registrar) "The diversity of patients you get to see." (Practice Manager) "You've got real ability to just practice at the top of your level." (Registrar) "I've become more confident in my ability to deal with uncertainty. I've become more resilient. I think I'm a much better doctor than I was when I came here. I think I probably have grown as a person. I think I'm probably a much better person than when I started here. I was probably arrogant, somewhat, and over-sensing abilities when I first came here." (Supervisor) "It's been exciting to teach some of the stuff they often don't get to access in the teaching hospital environments." (Supervisor)</p>	

Inherent to registrar learning in the remote setting were developing self-care strategies, enabling opportunities for professional development and career progression relative to personal career interests, and exploring strategies for managing the workload. More registrar orientation to the clinical practice environment was thought to be helpful by a practice manager who explained that *"it would be really beneficial if people came out before and had a look"*. Alternatively, having peer support from other registrars working in a similar role and supervisors engaging with them prior to and throughout their training. It was also important that registrars had mechanisms to receive support and comradery from family, friends, and a broader social network. A supervisor stated *"we have got two guys who have moved there, and the wives are friends and the two boys are great friends from university years. It's a thumping success"*. The remote underserved communities could focus on engaging registrars and

supervisors and promote sustainable work-life practice models for their doctors. Table 7 exemplifies a range of other comments on this theme.

Discussion

This study provides important new insights into the factors that relate to developing GP training capacity in remote areas that need more primary care services for their population's needs. Four main themes provide guidance as to the direction of investment needed to build general practice workforce and training opportunities in this context. Firstly, supervision is of high quality in this context and supervisors are important role models and mentors, but supervisors are busy working across the community. It was apparent that there was no consistent framework for supervision across the various remote communities. It is important to tailor supervision models to the needs of individual communities including considering options such as remote and co-supervision models, as a means of enabling regular

Table 6 Theme 3 - Work-life balance

Sub-themes Level 1	Sub-themes Level 2
Importance of Work-Life Balance	<ul style="list-style-type: none"> • Time for Family and Friends • Sporting and Leisure Activities • Balanced Workload • Community Involvement
<p><i>"I think one of the good things about remote areas is you have got families and friends close by. If you feel that you have had a hard day at work, you can drop in at a friend's or family's house, or home, and sit down and have a chat about something not related to work at all. It takes your mind out of a lot of stressors." (Supervisor)</i></p> <p><i>"For me, being able to spend time with my family is the most important thing. Where I do that, I don't really mind as long as I am able to have some quality time with my family." (Supervisor)</i></p> <p><i>"Work/life balance is learning to have a good amount of work that keeps you busy and interested, but it is not dragging you to the point where you're constantly exhausted. I think it is important to have a balance, otherwise you'll burn out." (Registrar)</i></p> <p><i>"You need to have an interest in the community, so join a sporting club or do exercise or have interesting Toastmasters, Lions, or something like that." (Supervisor)</i></p>	
Barriers to Work-Life Balance	<ul style="list-style-type: none"> • Work Spill-Over and Boundaries with Patients • Workload, On Call, Study Load, and Shortage of Staff • Burn-out
<p><i>"There have been times here where I have felt trapped between my commitment to see the health service of the community continue but really feeling that it was consuming my life but if I left it would leave the community in a dire situation." (Supervisor)</i></p> <p><i>"The trickiest thing is dealing with the on-call. When I first started out here I would sleep in my clothes and I wouldn't sleep very well whilst I was on call." (Registrar)</i></p> <p><i>"A close colleague of mine that I worked with for 14 years, I saw him develop a serious burnout situation and become a completely different person." (Supervisor)</i></p>	

access to supervisors, particularly in this setting where registrars work at the top of their skills and supervisors are time pressured due to clinical demands [26, 27]. To some extent, registrar selection for remote placements may overcome this issue. The registrars in this study were functioning at high levels and knew when to ask for help, however, this may not lead to consistent supervision, depending on the registrar and their willingness to ask for help.

Remote towns provide a unique teaching and learning context for registrars to learn about GP practice through the lens of a community connection seeing the impact of their work on the quality of health care services and on people who really need their services. Providing GP training in remote communities who need more primary care services is good for the community and provides a "richness" of experience for the learners with remote exposure enhancing their scope of practice, feeling of accomplishment, and resilience.

Having a critical mass of doctors was a key issue enabling balanced and flexible work schedules to be modelled by supervisors resulting in attracting and retaining registrars and a sustainable remote supervision model. Critical mass could be developed encouraging groups of medical students and registrars to train together, including early and repeated training opportunities in remote communities as multiple placements throughout medical school, in the early postgraduate years, and during vocational training [22]. Retaining remote supervisors through their careers requires upskilling provisions and

innovative work and supervision models to promote career diversification whilst sustaining work in the same remote community [28]. The quality of remote supervision and registrar learning opportunities is potentially a key attractor for medical students and registrars. However, equally important is enhancing this quality by investing in supervisor up-skilling and supporting sustainable working conditions.

Practice managers, in particular, recommended ensuring flexible and balanced workloads for both registrars and supervisors to mitigate the local GP medical workforce shortage. Maintaining doctor's well-being is an important consideration [29, 30]. Also, it is important that educators and supervisors foster leadership skills in their registrars due to its importance in rural and remote communities [30].

Registrars benefit from the challenge of remote practice and become resilient through optimising opportunities to increase their scope of practice and accelerate their careers [28]. Preparing registrars for their role as rural GPs by engaging with and exploring the community prior to re-locating and having support from other registrars and supervisors prior to and throughout their training is also important as is the support of family and friends.

Encouraging local communities to participate in inducting and integrating registrars and supervisors into the local lifestyle through community inductions, community integration, non-monetary incentives, and cultural training is a critical strategy for success. Overall, the findings from this study, although extracted from interviews in

Table 7 Theme 4 - Fostering Sustainable Practice

Sub-themes Level 1	Sub-themes Level 2
Building Remote Workforce Capacity	<ul style="list-style-type: none"> • Early and Repeated rural and remote Exposure • Quality Supervision • Upskilling and Innovating • Flexible and Balanced Workload • Developing Leadership
<p><i>"If you have the right supervisor just explaining their experiences and how they did it and why things are the way they are." (Practice Manager)</i> <i>"At the moment, I sit in when the other supervisor teaches the registrars. The chance to step up will come to me, if I do that enough and engage with the registrars." (Supervisor)</i> <i>"Something that makes a big difference in a country hospital is having an established administration staff with strong leadership." (Registrar)</i> <i>"Trying to build leadership and executive structure within our rural medical workforce is something that is needed." (Supervisor)</i></p>	
Community Involvement in Medical Training The importance of community involvement to build sustainable workforce in local rural and remote areas.	<ul style="list-style-type: none"> • Community Support and Integration
<p><i>"The most important thing in rural remote areas is that we need the community to come on board – it's not something that we can drive as an organization. The community and the council and whoever in each community needs to become involved." (Practice Manager)</i> <i>"Being involved in the community. There are a lot of good community events. Getting to know people on a personal level, you get a lot of connections. We have a lot of people that have come and really enjoyed the family lifestyle." (Practice Manager)</i> <i>"We have got two guys who have moved there, and the wives are friends and the two boys are great friends from university years. It's a thumping success. They are feeding each other socially, emotionally, intellectually, everything is going really well." (Supervisor)</i> <i>"We wanted our kids to get really involved as soon as they got here, and they have, so they enjoy it. The way you sell it to kids is you just make it if you are looking forward to something and are excited about a move, and it's a pretty big move for them, then they get excited." (Registrar)</i></p>	
Building Workforce Sustainability in Remote Practice Important personal considerations for medical practitioners working in rural and remote communities.	<ul style="list-style-type: none"> • Self-Care • Opportunities for Professional Development and Career Progression • Managing Workload
<p><i>"Learning how to handle the on-calls and maximizing my time off – really enjoying myself and having a lot of down time." (Registrar)</i> <i>"If we had a dedicated educational resource for primary care out this side of the western divide, then I think the rest of the opportunities would span that model that we already have embedded where we do bespoke and nuanced development plans for each of our registrars." (Supervisor)</i> <i>"There needs to be some ability for mandatory release times for upskilling, whereas at the moment we are just given three weeks of professional development leave every year, and we are told to take in that." (Supervisor)</i> <i>"People hit a spot in their careers and can't move on. When I hit 30, I already had [multiple qualifications], I am the Director of Medical Services. How do I move forward and stay in the district?" (Registrar)</i></p>	
Preparation and Orientation for Registrars	<ul style="list-style-type: none"> • Prepare for the Role • Support from Peers • Support from Family and Friends
<p><i>"It would be really beneficial if people came beforehand and had a look. We have had so many people promise - they have either promised to move the family or the family get here and the family are not happy. If the family is not happy, then no one is happy. Just for them to have a look at and experience." (Practice Manager)</i> <i>"Probably more the collegiality - The ability to interact with peers." (Registrar)</i> <i>"It's something that I thought of, it is something that I planned, with my family, with my wife. She understands it. My children know that we were going remote so that was not an issue for them." (Supervisor)</i></p>	

Australian rural and remote communities, may apply to the needs of rural areas worldwide as a way of developing GP training capacity and increasing the workforce in underserved areas.

Limitations

The scope of the present study is restricted to the communities and stakeholders where the interviews were undertaken. However, these communities were all pre-identified as needing more GP services to address population health needs, and so this paper contributes to the literature on this topic. Towns were sampled in different geographic areas to overcome this potential weakness and the characteristics of these towns is presented. Themes were triangulated by using a range of supervisor-registrar-practice stakeholders until saturation was reached.

Conclusion

This study provides the first empirical data exploring how supervised general practice training capacity in

communities that are underserved may be enhanced. Key factors are: building tailored supervision systems/frameworks across the remote community which include supervisor training, engaging registrars in the unique learning experience of working in these locations, managing work-life balance, and building registrar resilience while ensuring sustainable practice models. This study provides evidence for building capacity in general practice training settings in remote areas which require more primary care services for their population.

Abbreviations

Australian Medical Graduates (AMG): Doctors who completed basic medical training in an Australian medical school; Australian Standard Geographical Classification – Remoteness Areas (ASGC-RA): A geographical classification system which defines locations on a scale with respect to their remoteness (physical distance to nearest service centre with 1 classified as Major City, 2 as Inner Regional, 3 as Outer Regional, and 4-5 as Very Remote.; Districts of Workforce Shortage (DWS): Areas classified as having less general practice services than the population average, based on Medicare data; General Practitioners (GPs): Doctors or physicians who are qualified (fellowed with a specialist medical college following specific post-graduate training) to work in primary care and/or hospitals; Generalist Medical Training (GMT): A GP training organisation which operates as one of nine decentralised regional

organisations across Australia. It provides GP training across over 90% of the large state of Queensland, much of it in rural and remote locations.; Index of Access (IA): A score which delineates level of access to services based on the volume of GP services and population characteristics within floating catchments.; International Medical Graduates (IMG): Doctors completed their basic medical training in another country and now working in Australia.; Modified Monash Model (MMM): A more recent geographical classification system adopted in Australian policy in 2015. This classification defines locations according to their population size and remoteness with 1 being Major City, 2 being >50,000 Population, 3 being 15-50,000 population, 4 being 5-15,000 population, and 6-7 Remote or Very Remote.; Socio-Economic Indexes for Areas (SEIFA): A classification system used nationally as the relative score of socio-economic advantage or disadvantage, based on five-yearly census data.

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Availability of data and materials

The datasets produced and/or analysed during the current study are available from the corresponding author on reasonable request.

Authors' contributions

LY designed the study, participated in shared coding sessions to confirm initial themes, and drafted the manuscript. RP collected the data, conducted all analyses, and drafted the manuscript. BO participated in shared coding sessions to confirm initial themes and drafted the manuscript. CR assisted with study design and interpretation of results. All authors contributed to writing, reading, and approved the final manuscript.

Ethics approval and consent to participate

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional commitments on human experimentation and with Helsinki Declaration of 1975, as revised in 2008. This study was approved by the James Cook University Human Research Ethics Committee (Project H7132) and the Monash University Human Research Ethics Committee (Project 11,026). All participants provided written consent to participate in interviews, which were recorded and transcribed verbatim. Interview transcripts were sent back to each participant for member checking.

Consent for publication

Participants gave consent for using direct quotes in this publication.

Competing interests

LY, RP, and CR were employed by James Cook University and its affiliate Generalist Medical Education in Queensland. BO'S was employed by Monash University School of Rural Health.

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