





## ORIGINAL RESEARCH

# What shapes research and research capacity building in rural health services? Context matters

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## Abstract

**Objective:** To determine the contextual factors influencing research and research capacity building in rural health settings.

**Design:** Qualitative study using semi-structured telephone interviews to collect data regarding health professionals' research education and capacity building. Analysis involved inductive coding using Braun and Clark's thematic analysis; and deductive mapping to the Consolidated Framework for Implementation Research (CFIR).

**Setting:** Victorian rural health services and university campuses.

**Participants:** Twenty senior rural health managers, academics and/or research coordinators. Participants had at least three years' experience in rural public health, health-related research or health education settings.

**Main outcome measures:** Contextual factors influencing the operationalisation and prioritisation of research capacity building in rural health services.

**Results:** Findings reflected the CFIR domains and constructs: intervention characteristics (relative advantage); outer setting (cosmopolitanism, external policies and incentives); inner setting (implementation climate, readiness for implementation); characteristics of individuals (self-efficacy); and process (planning, engaging). Findings illustrated the implementation context and the complex contextual tensions, which either prevent or enhance research capacity building in rural health services.

**Conclusions:** Realising the Australian Government's vision for improved health service provision and health outcomes in rural areas requires a strong culture of research and research capacity building in rural health services. Low levels of rural research funding, chronic workforce shortages and the tension between undertaking research and delivering health care, all significantly impact the operationalisation and prioritisation of research capacity building in rural health

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services. Effective policy and investment addressing these contextual factors is crucial for the success of research capacity building in rural health services.

#### KEYWORDS

contextual factors, evidence-based health care, health service development, implementing evidence, rural workforce development

## 1 | INTRODUCTION

There is general consensus that research capacity and capability should be embedded in health care systems to address the disconnect between health and medical research and health care service delivery.<sup>1</sup> The Australian Government's vision for 'Better Health Through Research,' outlined in the 2013 Strategic Review of Health and Medical Research, calls for strong partnerships between researchers, health professionals, health services and communities.<sup>1,2</sup> The vision recognises health service research as an important driver to increase health service efficiency, and health system sustainability and productivity. This vision for involving the health care workforce in research to drive a continuous improvement mindset and evidence-based practice is yet to be realised for rural health services.<sup>2</sup>

Health care delivery in rural communities is different when compared to metropolitan settings, and so is the conduct of research. Although approximately one third of Australians live in rural areas, Barclay (2018)<sup>2</sup> reported that between 2000 and 2014, only 1.1% of National Health and Medical Research Council funding was allocated to rural health research. In addition, clinician capability and capacity to undertake and translate research is extremely low in rural health services and communities.<sup>3</sup> For research to be relevant and acceptable to people living in rural and remote areas, researchers need to understand the local context. There is a need to build research capacity in people who live and work in rural communities so that they 'can respond to local clinical questions and provide feedback to community on their findings' (p.514).<sup>4</sup>

Engaging health professionals and health care organisations in research is positively associated with improvements in health care performance.<sup>5</sup> Research capacity building (RCB) of health professionals is complex and defined as 'a process of developing sustainable abilities and skills enabling individuals and organisations to perform high quality research' (p.62).<sup>6</sup> Numerous RCB programs and frameworks have been developed<sup>7-12</sup>; however, measuring the mechanisms by which RCB improves health service performance and outcomes has proven difficult. Cooke et al (2018) described potential mechanisms for how RCB activities

#### What is already known on this subject:

- Health service research improves health system performance and service delivery
- Evaluations of research capacity building initiatives have largely focused on their effectiveness
- Clinician research capability and capacity is lower in rural health services

#### What this study adds:

- Multifaceted strategies for rural health services are needed to address research capacity building and workforce retention
- The challenges for health services to undertake research and build research capacity, in addition to delivering clinical care and educating health professionals, are magnified in rural health services
- Rural health service-led research and capacity building creates opportunities to address local health issues and engage with rural communities to develop implementable solutions

achieve their outcomes using a realist logic approach. This approach generates context-mechanism-outcome (CMO) statements, that is 'IF Context A includes... THEN Mechanisms X, Y, Z are activated LEADING TO Outcome O' (p.3).<sup>13</sup> This provides an understanding of mechanisms and outcomes *in* a context (individual, team, organisational, network); however, this does not explore the influence of context *on* the implementation of those mechanisms. Context is not simply the background to the implementation of RCB.<sup>14</sup> There is increasing recognition that 'the boundaries between an intervention, the environment in which it is delivered, and its effectiveness are blurred' (p.2).<sup>15</sup>

For RCB to be successful, the strategies for implementing RCB need to be highly tailored and responsive to local context according to numerous implementation science theories, models and frameworks.<sup>16,17</sup> Damschroder et al's<sup>18</sup> Consolidated Framework for Implementation Research

(CFIR) has been widely used in health research to guide systematic assessment of the implementation context and to identify factors influencing intervention implementation and effectiveness.<sup>18,19</sup> The CFIR is intended to be pragmatic in application, and the framework can be tailored to evaluate the needs of a specific intervention or context.<sup>19</sup>

How the health service context impacts research and RCB, particularly in rural areas, is poorly understood. The aim of this study was to describe the implementation context and the contextual factors influencing RCB in rural health services.

## 2 | METHOD

This qualitative study used semi-structured interviews with key informants with local knowledge of the drivers and challenges for RCB within rural public health services in Victoria, Australia. For this study, the term 'rural' refers to areas that are classified RA2-RA4 (inner regional, outer regional, remote) using the Australian Statistical Geographical Classification,<sup>20</sup> noting that Victoria does not have areas classified as RA5 (very remote).

### 2.1 | Participants

Interview participants were purposively recruited based on their knowledge of local health sector research and research education in rural Victoria. This included knowledge of the existing infrastructure and resources available to support research training development and implementation. Potential participants were required to live or work in rural Victoria or have previously worked there for 3 or more consecutive years. This included working in public health (health services, health department, primary health network, community services), health-related research (academic or professional) or health professional education. Potential participants were identified through Internet searches, grey literature, journal and peak body searches, and snowball sampling methods involving personal communication and networks.

Forty potential participants, holding senior roles in university or health services involving research support, coordination, translation or development roles; or academic roles in health services, were invited to participate in a telephone interview.

### 2.2 | Data collection

The 20 participants consenting to participate included 4 university senior managers/directors, 5 rural health

academics/research coordinators, and 11 regional health managers. Participants were employed by organisations whose catchment populations ranged from 5000 to over 350 000 and included rural health services with hospital beds ranging from 24 to over 1000 beds. A plain language statement was emailed to each participant. Written informed consent was obtained prior to the interview, and reaffirmed verbally at the time of interview.

Semi-structured individual telephone interviews were conducted by an experienced female researcher, DC, who was an independent research consultant with a PhD with research interests in behavioural change and social psychology. The researcher had no prior personal or working relationships with participants. Interviews were conducted in February and March 2020. Interview duration ranged from 30 to 86 minutes, with an average of 49 minutes. The semi-structured interview guide was based on Cooke's 6 principles of RCB—'develop skills and confidence, support linkages and partnerships, ensure the research is "close to practice", develop appropriate dissemination, invest in infrastructure, and build elements of sustainability and continuity.'<sup>21</sup> Participants were asked eight questions (Appendix S1) regarding research education and opportunities for health professionals in rural Victoria. For example, 'What, if anything, enables rural health professionals to engage in research education?' Interviews were audio-recorded and transcribed verbatim. Notes were recorded during the interview by the researcher. Participants were given the opportunity to review their transcripts. To maintain confidentiality, only authors DC and AWS viewed the full transcripts.

### 2.3 | Data analysis

Transcripts were thematically analysed using Braun and Clark's approach.<sup>22</sup> This involved authors DC and AWS: becoming familiar with the data and generating codes inductively; collating codes and data into potential themes; checking themes' appropriateness to the codes and data; and defining and naming the themes. As Cooke's framework focuses on RCB mechanisms and outcomes, the CFIR was selected to understand the influence of context on the implementation of RCB initiatives. The CFIR is a flexible and pragmatic framework that has been widely used in health research to understand the implementation context, process and outcomes.<sup>23</sup> The CFIR has 5 domains (intervention characteristics, outer setting, inner setting, characteristics of individuals and processes) and 39 constructs outlining factors that are likely to influence the implementation of interventions.<sup>18</sup>

A deductive process involving 3 authors (DC, AWS and CQ) was used to map contextual factors to the constructs

of the CFIR. Authors DC, AWS and CQ met throughout the analysis process to review, discuss and resolve coding differences and determine saturation of themes. This mapping process resulted in the identification of 12 constructs and subconstructs, within the 5 CFIR domains, related to contextual factors shaping RCB in rural health services.

## 2.4 | Ethics approval

Ballarat Health Services and St John of God Healthcare Human Research Ethics Committee granted ethics approval for this study [LNR/60139/BHSSJOG-2019-196011(v1)].

## 3 | FINDINGS

Participants drew on their expert knowledge and described their experiences with research and RCB in rural health services. The findings aligned with the following CFIR domains (constructs): intervention characteristics (relative advantage); outer setting (cosmopolitanism, external policies and incentives); inner setting (implementation climate, readiness for implementation); characteristics of individuals (self-efficacy); and the process (planning, engaging; [Table 1](#)).

Illustrative participant quotes are presented in relation to the constructs and subconstructs.

### 3.1 | Intervention characteristics

Participants described the relative advantage of building RCB in rural health services compared with fly-in-fly-out or urban-based researchers. Building research capacity in local health professionals was seen as a means of contributing to the social capital of rural communities. The strong culture of interdisciplinary teamwork between rural health professionals was considered advantageous for conducting rural health research: '[In] rural primary healthcare, you very much have to work as a team because you might be the only physio[therapist] or the only OT working across a big area' (#04). This teamwork approach was evident in rural health service research: 'We [research coordinators] do try to ... link people who are at different levels on the [research] continuum up so that they can benefit from each other's skills and experience' (#09). Similarly, rural health professionals' creative use of local resources was perceived as beneficial:

They [nurses on a dementia ward] found it [research project] was taking a lot of time, so they went to the local historical society,

I think, and got all these volunteers to help these patients map out their lives and engage their families. Apparently, the health outcomes from it were huge.

(#02)

### 3.2 | Outer setting

Cosmopolitanism was characterised as the strength of the linkages and partnerships between rural health services, rural health professionals and other stakeholders, including university-based researchers. Fostering collaboration between rural health professionals and researchers was considered critical for developing a strong foundation for rural health service RCB. Such partnerships were perceived to facilitate mutual benefits for all research partners, by broadening available resources and gaining funding:

They [research partners] bring the research expertise and then opportunities for funding. It starts off with some in kind guidance and support, and maybe a bit of in-kind project, project sorry, research officer help, or post-doc help ... What we're sitting on together as a partnership is a much bigger project that can then attract some funding.

(#14)

However, academics' understanding of the health service context and differing definitions of research impact were identified as challenges to establishing truly collaborative relationships:

The drivers are different. I suppose the language is changing now to impact-based research rather than outcome-based research.... we [academic researchers] are entrenched in that number of publications, number of grants, number of PhD students.

(#18)

Some participants explained how research was conducted with limited interaction between academic researchers and rural health professionals: 'They've had issues where, basically, they're an academic, and pretty much they just did their own stuff and didn't really involve people here [at the health service]' (#11). These missed connections resulted in rural health professionals lacking trust in academic researchers and lost opportunities to build research capacity and collaborations. Participants also identified that academics perceived the partnership with rural health services being, at times, less than optimal:

TABLE 1 CFIR constructs, subconstructs, definitions and exemplar codes

Domain	Construct	Construct/subconstruct definition <sup>a</sup>	Exemplar codes	
Intervention characteristics	Relative advantage	Stakeholders' perception of the advantage of implementing RCB and doing research versus an alternative solution	<ul style="list-style-type: none"> <li>• Health service-led research</li> <li>• Research close to practice</li> <li>• Collaborative approach to research</li> </ul>	
Outer setting	Cosmopolitanism	The degree to which an organisation is networked with other external organisations	<ul style="list-style-type: none"> <li>• Mutual benefits of research networks</li> <li>• Challenges to true collaboration</li> </ul>	
	External policies and incentives	A broad construct that includes external strategies to spread RCB, including policy and regulations, external mandates, recommendations and guidelines	<ul style="list-style-type: none"> <li>• Need for policy mandating rural health service research</li> <li>• Lack of rural research infrastructure and funding</li> </ul>	
Inner setting	Implementation climate	<p><i>Tension for change:</i> The degree to which stakeholders perceive the current situation as needing change</p> <p><i>Relative priority:</i> Individuals' shared perception of the importance of research and RCB within the organisation</p> <p><i>Compatibility:</i> The degree of tangible fit between meaning and values attached to research and RCB by involved individuals, how those align with individuals' own norms, values, and perceived risks and needs, and how research fits with existing workflows and systems</p>	<ul style="list-style-type: none"> <li>• Research is needed for a high-performing workforce and health service</li> <li>• Need for rural health service-led research</li> <li>• Organisational priority</li> <li>• Clinical work prioritised over research</li> </ul>	
		Readiness for Implementation	<p><i>Leadership engagement:</i> Commitment, involvement and accountability of leaders and managers with the implementation of RCB</p>	<ul style="list-style-type: none"> <li>• 'Playing the long game': commitment to developing research</li> <li>• Leadership research literacy and expectations</li> <li>• Inequities in opportunities</li> </ul>
		Self-efficacy	Individual belief in their own capabilities to execute courses of action to achieve implementation goals	<ul style="list-style-type: none"> <li>• Clinicians' lack of confidence in research skills</li> </ul>
Process	Planning	The degree to which RCB and its implementation are developed in advance, and the quality of RCB schemes	<ul style="list-style-type: none"> <li>• Lack of strategic planning</li> <li>• Inconsistent/cyclical nature of research</li> <li>• Lack of research pathways</li> </ul>	
	Engaging	Attracting and involving appropriate individuals in the implementation and use of RCB and research through a combined strategy of social marketing, education, role modelling, training and other similar activities	<ul style="list-style-type: none"> <li>• Funded research positions embedded in health services</li> <li>• Supporting and developing champions</li> <li>• Infrastructure to support research</li> </ul>	

<sup>a</sup>Modified to align with RCB.

They [the health service] get to the point where they still want the research done, they don't have the time to do it, and they try and get you [the academic] to do it for them, but they're not going to pay you for it.

(#12)

External policies and incentives were regarded as key requirements for RCB in rural health services. The lack of ongoing investment in rural RCB and research acted as a disincentive to conduct research over other funded activities: '...They're all [expected to do education], they get paid to have students there, so they're willing to take as many

students as they can and they are a teaching hospital. When it comes to research, that doesn't happen.' (#12). Policy changes were considered important for developing efficient research governance procedures, research benchmarks and performance indicators for health services and enabling a sense of agency:

I doubt it will change unless there's some sort of big mandated policy which says your staff must do research, and by research, we don't mean pretend to do it. We mean ... it's got to be in their professional development- every year you must tell us what research you're working on kind of thing. Unless it's mandated that they do it, it will never change.

(#05)

### 3.3 | Inner setting

Implementation climate varied across rural health services with several subconstructs (tension for change, relative priority and compatibility) identified as relevant to RCB.

Participants described *tension for change* in relation to the varying degrees to which key stakeholders perceived the need to embed research capacity and capability in health services. Drivers for research included enabling innovation, improvement, and creating and retaining a high-performing workforce in rural health services:

It's part of a retention strategy in our catchment... That's an important thing for building someone's career trajectory...In these small centres, there might only be one OT [occupational therapist]. So, if people want to stay [in] regional or rural areas, but are ambitious, and want to keep learning, then opportunities to engage in research ... should be an important offering.

(#10)

The reason we get involved in research is obviously because it's important for a good and high performing organisation to have research as one of their platforms and to get people skilled in identifying, understanding things, translating, all of those sorts of things into practice.

(#08)

Research driven by rural health services was viewed as an important mechanism for generating evidence and interventions that are relevant, acceptable and effective in their local communities. 'It's that context of understanding the community, and what's actually happening in the community, that can tell you a lot about *why* you might be seeing what you're seeing' (#05). Concerns were raised about metropolitan-led research projects as 'just being someone else's petri dish' (#19), particularly regarding the relevance of the research methods used. Social research and qualitative methods were viewed as more appropriate in smaller rural populations. Some participants were dismayed about the potential impact of metro-centric research results informing rural practice: 'evidence-based practice is based on the best available evidence. The problem is that the best available evidence is urban-based' (#19). These comments highlight the pressing need for research that is relevant, feasible and acceptable to rural communities.

Participants emphasised that in rural health services, the *relative priority* of research in comparison with clinical demands was low. The lack of prioritisation given to research and RCB was evident from the limited organisational investment and managerial support in many rural health services. Challenges included aligning research with health service interests and the financial implications of conducting research: 'When it is aligned with the hospital's interests and the hospital's strategic goals, then it becomes a lot better, a lot easier to convince the management to support this kind of [research] work' (#07). Rural health services were described as having a strong focus on meeting key performance indicators: 'the organisations around here are very output driven, so [they focus on the] number of cases, number of people, how quickly you see patients' (#05). Despite sometimes being present in health service strategic plans, 'research, by and large, is not treated as something that is core business for clinicians and therefore it routinely gets placed down the bottom of the priority list.' (#13)

Participants noted a lack of *compatibility* between research and the nature of the rural health service workflows and systems. Rural health workforces are small and fragmented, with many staff working part-time and/or across multiple sites, and high rates of employee turnover: 'Just looking at the staffing capacities [at one service], it already has issues finding staff to just do the work on the wards, let alone supervise and do research at the same time. Everyone's really stretched in rural' (#01). Additionally, the nature of the rural workforce severely hampered clinician capacity to undertake research:

The demands are very different. We see a lot of sole practitioners out there, people working a little bit more flexibly in their roles, leaving less scope or capacity to go out and do something that is considered an extra like research.

(#09)

Nonetheless, participants acknowledged there was a compatibility between research and organisational values, in the pressing need for the translation of evidence into practice to achieve better health outcomes in rural areas:

The most important thing [is] that translation of research into practice. How does this help my practice or how does this relate to practice? How does this help me improve the client/patient's life?

(#4)

For many participants, conducting research and translating evidence into practice to improve patient outcomes was key to garnering organisational and management support for RCB. However, a further incompatibility was apparent, with research being conceptualised differently by health services and academic stakeholders. A mismatch between researchers' interests and organisational needs was often observed, in addition to researchers lacking an understanding of the realities of health system improvement:

I think when health professionals, practitioners, sign up to do the research training or whatever, they have different ideas about what they want to do, what they have the ability to do, and what they have the time to do, than what university partners think.

(#02)

Participants also reported a tension between health professionals and external, non-clinical researchers regarding research and quality improvement (QI). Researchers were often not interested in QI and evaluation: 'I think we're very quick, as researchers, just to say that's just a quality improvement project, and to therefore dismiss it. I think those grey areas - we could explore them a bit more' (#04). Some participants noted that QI and research could be considered on a continuum of evidence-based practice and there was potential for crossover and mutual benefit:

Lots of really good project stuff going on that I look at and think, "oh my goodness, if we just

put in an ethics application and tweaked this, we've got a beautiful research project here".

(#14)

Readiness for implementation of RCB in rural health services was often influenced by the level of *leadership engagement* in research. According to participants, health service leaders generally supported research, despite their understanding of research being at times limited: 'When I go in to negotiate with the health service, I'll say 'so what is it that you want? What do you want to know? ...They've never thought in detail about that. They go, 'we just want research'. Participants acknowledged that the value of research in driving health system improvement needed to be demonstrated to health service leaders:

I think one thing we touched on is getting engagement and support from managers. I think it's really hard to do it without them ... So, helping to improve their research literacy [would be helpful] because I think it's hard for them to support research when they don't understand it, what's involved, and potentially what the benefits [of conducting research] might be.

(#03)

Research opportunities were, at times, dependent on health professionals' position in the health service organisational hierarchy: 'The RN [registered nurse] in charge, the NUM [nurse unit manager] - if they notice something, they might be given the opportunity [to conduct the research] if they make it known to the higher ups. ...They'll be listened to more than another person' (#04).

Traditional academic outputs, such as publications, appeared to have limited value for health service leaders with sensitivities around health service performance:

I think they looked at it more as a quality assurance rather than a research project and went 'well, okay, we've got an answer but we don't want to publish it because it's not what we expected.'

(#12)

### 3.4 | Characteristics of Individuals

Self-efficacy of rural health professionals, including their self-rated skills and confidence to undertake research, was reported as being 'pretty low. If they've had no prior involvement in research, most people don't understand it and therefore don't have much confidence in it' (#13).

Research opportunities were often influenced by professional discipline, intended career path and undergraduate research experience. Despite the challenges of time and resources, much of the local research conducted was driven by individual clinicians with a sense of curiosity to answer particular clinical questions:

I think up until fairly recently it's been very much clinician driven. So, a clinician has an interest or a question they want answered and they essentially drive that process and try and get managers on board and support to do so, but often have to do it within their own time or fit it in amongst their caseloads.

(#03)

However, individual health professionals' expectations were considered to influence the uptake of research. Some participants noted that research was perceived as intimidating, even 'a dirty word' (#06) and as something that not all rural health professionals were interested in or could engage with: 'That it [research] is just too hard and only really top-level people do that' (#04).

### 3.5 | Process

Participants described the planning needed to develop rural health service research. Participants highlighted the need for 'playing the long game' (#19), that is the need to strategically plan research and RCB. They recognised that time is needed to develop a culture that interweaves research and practice: 'We're starting to see some of the benefits. But I mean, we're seven years down the track. It doesn't happen overnight' (#19). However, many participants noted that research sustainability was hampered by the inconsistent and cyclical nature of research and research funding in rural health services: 'There were [research] grants available and then the [health service] spreadsheet went pear shaped and research was one of the first things to go...' (#13). Strategies for sustainable RCB and research also required sustainable research pathways for health professionals:

There needs to be this really big carrot for clinicians to go, 'man, if I spend every week-night for the next three years doing my PhD, then there's going to be a financial reward for me. There's going to be some promotion prospects for me. There's going to be a ... parallel career opens up for me.'... Rather than just doing it for the good of healthcare.

(#13)

Participants expressed the need for rural health services to be forward-thinking and actively select and engage in research projects relevant to their context, recognising the additional effort required for this:

We don't report on, 'does this align with our strategic priorities?', that sort of thing. We're aware that the research that is happening is obviously being deemed worthwhile and ethical because it's gone through those review processes. But I suppose at our organisational level we don't track, 'is this research relevant?'

(#18)

Participants recognised the value of implementing a coherent research agenda, noting that when research 'is aligned with the hospital's interests and the hospital's strategic goals, then it becomes a lot better - a lot easier to convince the management to support this kind of work.' (#07).

Engaging health professionals in research involved a range of strategies, including embedded research positions, support for clinician-researchers, appropriate research infrastructure and training opportunities. Formally appointed and funded research support positions in rural health services have supported research capacity: '[One] uni has been really great at embedding this research position within the hospital to build capacity from within, rather than externally' (#14). Embedded research positions created research opportunities by involving rural health professionals in external projects, as well as developing internally led projects. There was a need for embedded researchers who could 'not just advise but who will do' (#06) and who were interested and able to support emerging clinician-researchers.

Developing emerging clinician-researchers as future research champions was a useful mechanism to sustain RCB: 'I'm trying to engage those [clinicians] that are really focused and interested and look for opportunities for those to begin with and then hopefully, we're able to extend that and have those champion our cause' (#17).

Hard to navigate ethics procedures and lack of access to academic resources, including libraries and research software, were obstacles for rural health professionals undertaking research. Geographical and professional isolation was an issue for rural health professionals:

Things like conferences. Living where we do, you've got to pay to go anywhere. Obviously, not just the rego. But even if it's in Melbourne for a couple of days, you need accommodation. You need your train ticket ... It's very, very costly, I guess, to do research in a regional area.

(#11)



## 4 | DISCUSSION

This study examined the ways in which context influences the implementation of RCB in rural health services. The CFIR was used to frame a detailed analysis of the contextual factors impacting the implementation of RCB initiatives. Several factors related to the CFIR domains of intervention characteristics, outer setting, inner setting, individual staff characteristics and process were identified. Important contextual features were identified at the macro (policies related to workforce and rural research funding), meso (health service expectations and prioritisation of research) and micro (researchers who understand the local context) levels. The influence of these key macro-, meso- and micro-level factors on the implementation of RCB in rural health services and potential mechanisms for addressing these factors are discussed.

The findings of this study suggest rural health services are highly motivated to support RCB as a means for attracting and retaining a health workforce. Yet, rural health services face major workforce challenges including chronic shortages, many part-time and solo practitioners, and high rates of turnover.<sup>24</sup> As a result of a fragmented workforce, the levels of clinician capability and capacity to undertake research in rural health services are critically low.<sup>3</sup> In rural health services, workforce and research capacity issues are 'wicked' problems,<sup>25</sup> hampering the RCB necessary for improvements in health service performance and health outcomes.<sup>26,27</sup> In line with the CFIR construct *external policies and incentives*, there has been a call for a 'cohesive, whole-of-system approach' (p.1) to address the questions of recruiting and retaining health professionals to rural areas and delivering high quality, accessible, sustainable services that meet community needs.<sup>25</sup> For RCB to be successful in rural health services, there is a need for coordination between rural workforce recruitment and retention strategies, RCB initiatives and research funding.

The policy environment is considered important for the effective integration of workforce and RCB initiatives. The Australian Government's considerable investment in initiatives to address rural health workforce and research capacity supports this assertion. One of these initiatives is the National Rural Health Multidisciplinary Training (RHMT) program, a Commonwealth rural health workforce program. The RHMT funds University Departments of Rural Health (UDRHs) to provide rurally based health professional training, with the aim of increasing the number of health professionals working in regional, rural and remote Australia.<sup>28</sup> In addition, UDRHs are required to support rural research and RCB in rural communities.<sup>29</sup> The recent evaluation of the RHMT program found supporting research had a positive impact on rural

health workforce and rural research and emphasised that Commonwealth and state governments need to work together to enhance rural workforce and RCB initiatives.<sup>29</sup>

In addition to policy, organisational investment is required for workforce and RCB initiatives to be successful. The embedded researcher model positions researchers as core members of a health care organisation. The CFIR construct *engaging* highlights the importance of such roles in educating, modelling and promoting research. Embedded researchers supported by health service-academic partnerships have been shown to be successful in rural contexts.<sup>8,27,30,31</sup> While such models might provide research and career opportunities for clinicians and support their retention in rural areas, the adoption has been ad hoc. The findings indicate the importance of these roles in rural health services and the benefits of developing local clinician-researchers.<sup>32</sup> Currently, the proportion of National Health and Medical Research Council (NHMRC)-funded hospital-based researchers is only 0.6%,<sup>1</sup> with few rurally based. There is a need for greater investment in rural health service research roles as both a strategy for recruitment and retention and for progression of the rural health research agenda.<sup>29</sup>

The contextual factors that influence the role of research within the health service system are important with misaligned expectations and priorities identified as critical factors impacting on the success of RCB initiatives. These issues relate to the CFIR constructs *implementation climate* and *readiness for implementation*. Health services are increasingly expected to undertake research and translate evidence into practice,<sup>1</sup> yet this study found that prioritising research was difficult for health services struggling to meet service delivery needs. The difficulties of undertaking research and RCB, in addition to delivering clinical care and training health professionals, are magnified in rural health services, which face unique challenges, including distance, higher costs of health care delivery and workforce shortages.<sup>33</sup> Health services view health care delivery as their core business. Without macro-level support and dedicated additional funding, smaller rural services will struggle to increase research output and capacity, and importantly, existing health inequities for rural communities will persist.

Limited understanding of the role of research is also related to fundamental differences in stakeholders' conceptualisations of research. Often academic researchers did not understand the rural health service context and demands, while health services had limited knowledge of the research process. These differences were indicative of low levels of the CFIR construct *cosmopolitanism*, that is a lack of true collaboration and research networks. As a result, strategic research agenda alignment with rural health service priorities is missing, impacting

on the degree to which RCB and its implementation are developed in advance (CFIR construct *planning*). The need to play the 'long game' where investment in RCB is a commitment to achieve longer-term service delivery and health care gains competed with the health services need for rapid quality improvement. Blurring the lines between research and quality improvement projects might 'bridge the gap' between different stakeholders and potentially enable more accessible and context-specific research.<sup>34</sup> Clarifying research expectations for the organisation is needed for RCB to be prioritised and sustained. A previous study identified the importance of executive-level engagement in the success of an embedded researcher program within a Queensland rural hospital.<sup>30</sup> Shifting from a traditional academic definition of research impact to one that takes into account the real-world context and end-user needs might achieve a shared understanding of research.<sup>35</sup>

Health service rurality influenced the support and sustainability of RCB. Attributes specific to rural areas provided contextual explanation for suboptimal rural research capacity. Rural health professionals' confidence and skills to undertake research were low. Despite issues related to the CFIR construct *self-efficacy*, clinicians were motivated to do research to answer clinical questions. There was a wariness of using 'metro-centric' or potentially 'irrelevant' research to inform rural practice; and smaller rural populations limiting the breadth of possible research. The findings related to the CFIR construct *relative advantage* highlighted overwhelming support for RCB in rural health services, with a clear recognition of the value of locally led research to ensure relevance and acceptability to rural communities. The collaborative team approach, which is innate in the rural workforce, and rural health service researchers' understanding of and influence in their communities were also perceived as facilitators of RCB in rural health services. There is increasing evidence that researchers living and working in rural communities understand their local context and can engage with their communities to develop implementable solutions.<sup>4</sup>

In rural areas, there is a need to move away from the traditional bench-to-bedside research<sup>27</sup> and undertake health service research that is relevant to practice using social and cooperative research methods.<sup>36</sup> Redressing the metropolitan bias and inequitable research funding models, currently used by NHMRC and other research funding sources, would help fund research that is relevant to day-to-day rural health services and practice. There is a need for greater investment and support for rural research and RCB that contributes to the social capital of rural communities in preference to fly-in-fly-out urban researchers.<sup>29</sup>

## 4.1 | Limitations

Our sampling method resulted in recruitment of participants who were highly informed. It did not include clinician-researchers from the private sector, general practitioners, researchers, policy-makers and funding bodies that might have provided further insights into strategies to progress RCB in the rural health service context. The rural informants were Victorian-based and their perspectives might not be reflective of all rural public health organisations. Further research is needed to explore perspectives of those in rural health services across Australia.

## 5 | CONCLUSION

Rural health services provide care to one third of Australians, and a strong culture of research and RCB are crucial to improving the health outcomes of the communities they serve. A broad range of factors impact RCB in rural health settings, including those related to RCB interventions, policies and other factors external to health services, the inner workings of rural health services, individual health professionals and the processes that underpin RCB implementation. The nature of the rural workforce, the health service system and rural settings have strong influences on the operationalisation and prioritisation of RCB in rural health services. Addressing the broad range of contextual factors is paramount for the future implementation and success of RCB in rural health services. For the Australian Government's vision of Better Health Through Research to be realised in rural communities, effective policy and investment that matches community need are required to build research capacity and capability in rural health services.

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## CONFLICTS OF INTEREST

The authors declare they have no conflict of interest.

## AUTHOR CONTRIBUTIONS

AWS: conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; supervision; validation; writing – original draft; writing – review & editing. CQ:

data curation; formal analysis; funding acquisition; investigation; methodology; validation; writing – original draft; writing – review & editing. DC: formal analysis; investigation; methodology; resources; validation; writing – original draft; writing – review & editing. KG: data curation; formal analysis; funding acquisition; investigation; methodology; resources; validation; writing – original draft; writing – review & editing. CM: data curation; formal analysis; funding acquisition; investigation; methodology; project administration; resources; writing – original draft; writing – review & editing. AB: conceptualization; formal analysis; funding acquisition; investigation; methodology; resources; writing – original draft; writing – review & editing. LA: formal analysis; funding acquisition; methodology; writing – original draft; writing – review & editing. DM: formal analysis; funding acquisition; investigation; methodology; resources; writing – original draft; writing – review & editing. DA: conceptualization; funding acquisition; investigation; methodology; resources; writing – review & editing. KMN: conceptualization; formal analysis; funding acquisition; investigation; methodology; resources; writing – original draft; writing – review & editing.

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## SUPPORTING INFORMATION

Additional supporting information may be found in the online version of the article at the publisher's website.

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