A Decade of UDRH-led Health Workforce Research in rural and remote Australia: A Preliminary Report for KBC Australia

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EXECUTIVE SUMMARY

Over the last twenty years, the policy of successive governments in Australia has been to focus on increasing the number of health care professionals in regional, rural and remote Australia. A key policy framework to deliver this has been through the Rural Health Multidisciplinary Training (RHMT) Program.

In April 2019, the Australian Government Department of Health commissioned KBC to undertake an evaluation of the RHMT Program. The purpose was to assess the extent to which the program was meeting its objective to improve the recruitment and retention of health care professionals in regional, rural and remote Australia. In addition, they were asked to assess whether this activity benefits local health delivery.

To inform the RHMT evaluation, the Australian Rural Health Education Network (ARHEN) initiated, and seven UDRHs together conducted, a scoping review of all UDRH research papers over the last ten years. The review examined UDRH research that focused on rural health workforce. This report presents the main findings and implications of the papers, grouped by key health workforce categories generated iteratively by the review process.

In total, 415 papers were identified using predefined criteria: health students undertaking clinical placements including the development and delivery of innovative health student education in rural Australia; recruitment and retention of the rural health workforce; rural health workforce interventions and models; rural health workforce education; and epidemiology of the rural health workforce.

The aggregate body of research in workforce supports the conclusion that UDRHs are well integrated with their communities. It highlights that ***rural academics add value*** through their work with rural communities, increasing ***social capital and intellectual capability.*** They ***are in the region for the region,*** supporting both the future and existing workforce. UDRH ***academic outputs*** link practice with relevant research for contemporary rural Australia and reflect Commonwealth funding and reporting priorities. These workforce outcomes and successes can be strengthened through ***sharing success across the network to increase diffusion of effective innovative approaches, scalability and to demonstrate replicability.*** There are ***opportunities for further analysis of UDRH outputs***. Finally, many publications focused on ***working with Aboriginal and Torres Strait Islander communities***, which has highlighted the pressing need for UDRHs to retain and deepen their activity in this area through partnerships with Aboriginal and Torres Strait Islander communities.

INTRODUCTION AND BACKGROUND

In recognition of the disparities in health and access to health care that exist between rural and metropolitan Australia, University Departments of Rural Health (UDRHs) and Rural Clinical Training Schools (RCTS) were established in 1996 and 2001 respectively. Their purpose is to provide multidisciplinary education and training facilities in rural and remote centres across Australia as well as to conduct relevant rural health research. This includes research regarding health workforce development and the efficacy of rural workforce programs, and research into health issues impacting rural communities. The overall policy objective is to improve the recruitment and retention of health care professionals in rural Australia. The expectation is that exposure to local clinical training will increase the likelihood of university students practicing in rural Australia post-graduation. UDRHs operate as clinical academic units and support student placements across rural and remote Australia. They are key partners in the delivery of health workforce education and development for students, early-career health professionals, and established practitioners. As such, UDRHs have a pivotal role in the planning and development of the health workforce to assist in the design and delivery of health services at a regional level.

In 2016, the Australian Government implemented the RHMT Program to better align existing rural workforce strategies administered through universities including UDRHs and RCTs. The RHMT Program aims (inter alia) to deliver quality health training across rural Australia in order to have a measurable impact on the maldistribution of the health workforce in rural Australia.

The network of UDRHs contributes a significant number of research outputs to the rural health evidence base. Previously, research contributions of the UDRHs have been analysed by examining all published peer-reviewed papers notified in UDRH performance reports to the Commonwealth for the three-year period 2008-10 (Gausia et al., 2015). Of the 182 peer-reviewed articles, 69% of these were reported as original research and 56% addressed rural health issues. Aboriginal health was the main subject of 14% of papers. Further, one in 20 articles included an author from more than one UDRH. Humphreys, Lyle and Barlow (2018), examined rural workforce activity, research outputs, service development and engagement with rural communities of UDRHs between 2009 and 2013. They reported that the UDRH network published 220 papers in 2013, 86% was applied research and 40% addressed rural health issues.

In June 2018, the Government funded an external a review of the RHMT Program to examine how the RHMT Program aligns with the overall policy framework. The aim of this report is to provide a preliminary synthesis of all UDRH workforce related research outputs over the last 10 years to help inform the evaluation.

OBJECTIVES

The objectives of this review are to:

1. Conduct a narrative review of UDRH research papers that focus on rural health workforce
2. Report on the main findings and implications from papers grouped according to key health workforce categories generated iteratively by the review process
3. Make recommendations, informed by this analysis, for future UDRH health workforce research activity

RESEARCH QUESTIONS

1. What are the characteristics of peer-reviewed health workforce related research papers published by UDRHs between January 2010 to September 2019?

2. What are the main findings and implications of these publications as they relate to the key health workforce categories?

Inclusion criteria

All peer-reviewed journal articles with UDRH authorship published between January 2010 and September 2019 that include data from rural, regional, or remote regions in Australia and examine one or more of the following issues:

- Education, training or other experiences of medical, nursing and/or allied health undergraduate and postgraduate students that involve UDRHs, including program delivery, educational innovation, work integrated learning or placements, inter-professional learning/education, student feedback, rural practice intention, education needs/gaps
- Rural workforce distribution including workforce trends, needs, gaps, and shortages
- Rural workforce recruitment and retention
- Innovative rural workforce models
- Education programs aimed at supporting the existing rural health workforce
- Evaluation of rural workforce initiatives including UDRH programs, student tracking studies and rural workforce outcomes

Non-peer reviewed publications such as books, and peer-reviewed letters to the editor, commentaries or editorials were not included.

METHODS

A team of senior academics from seven UDRHs were responsible for conducting the review. Twelve contributing UDRHs were asked to provide an Endnote library of all publications authored by staff members of the UDRH published between January 2010 and September 2019. After preliminary cleaning of the Endnote library, the publications were uploaded into the systematic review software Covidence. Screening of the titles and abstracts was undertaken independently by four investigators (SW, MJ, ST, LB), with each title and abstract reviewed by two investigators. The same four investigators were responsible for full-text screening, again utilising a two-person screening approach for each article. All conflicts for the title and abstract screening and full-text review were resolved by ST, MJ and SW. The research group established *a priori* that disagreements between ST, MJ and SW would be resolved by discussion with a third investigator (SK). MJ and SW developed a data extraction tool in Excel, this was trialed by DL and SP, then refined based on feedback. Data from the papers was extracted for each of the categories using the customized data extraction tool shown in Appendix 1. After the full-text screening was completed, SW transferred the selected publications to the Excel spreadsheet. MJ and SW allocated each paper to one of the identified categories and each member of the research team was then allocated articles within one category to complete data extraction.

The review group used an iterative process to determine the key workforce categories based on the inclusion criteria. These broad categories were developed into Population Concept Context (PCC) statements in line with recommended procedures for scoping reviews (Peters, Godfrey, Khalil, McInerney, Parker & Soares, 2017). This resulted in seven PCC statements:

- Health students undertaking placements in rural Australia

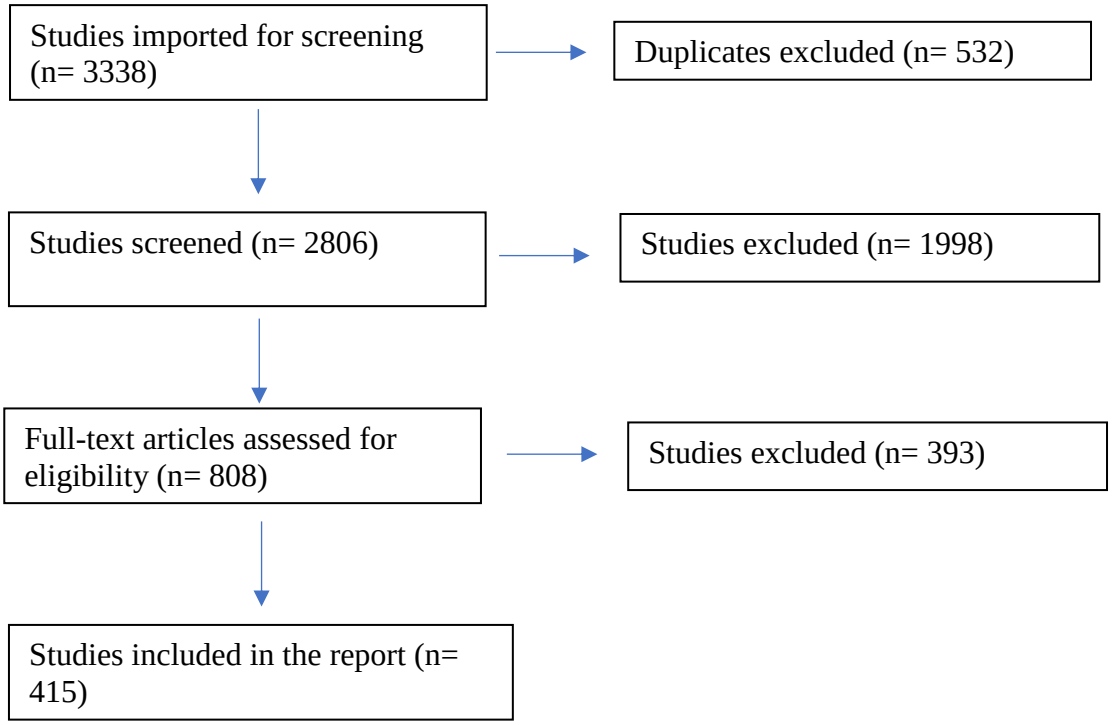
- Health student education in rural Australia
- Epidemiology of rural practitioners engaged in the health workforce in rural areas
- Health workforce interventions in rural Australia
- Health workforce recruitment and retention in rural Australia
- Health workforce models in rural Australia
- Health workforce education in rural Australia

Category allocation for data extraction was: health students undertaking placements (SW); health student education (SW); epidemiology of rural practitioners (MJ); health workforce intervention (DL); health workforce recruitment and retention (ST, VV, LB); health workforce models (SK, SB); and, health workforce education (MJ).

RESULTS

Of a total 2806 individual publications screened, 415 (15%) were included for the workforce study. There were 1998 studies discarded following title and abstract review, and a further 393 after full-text review. (Figure 1). Most excluded after full-text review (n = 297, 77%) did not meet research inclusion criteria related to workforce. Other reasons for exclusion included: not rural-based (n = 27), viewpoint paper or letter (n = 25), not peer-reviewed (n = 14), book chapter (n = 8), wrong study design (n = 13), missed duplicate (n = 3), international study only (n = 3), other (n = 2).

Figure 1. PRISMA Flowchart



Categories of papers

The number of papers in each category is presented in Table 1. The single most common category was workforce retention and recruitment (n = 103, 25%), followed by workforce models (n = 81, 20%) student placements (n = 79, 19%) student education (n = 57, 14%), and workforce education (n = 50, 12%),

Table 1. Number of publications by PCC category allocation

PCC statement	N	%
Health workforce recruitment and retention in rural Australia	103	25
Health workforce models in rural Australia	81	20
Health students undertaking placements in rural Australia	79	19
Health student education in rural Australia	57	14
Health workforce education in rural Australia	50	12
Health workforce intervention in rural Australia	34	8
Epidemiology of rural practitioners engaged in the allied/health workforce in rural Australia	11	3
Total	415	

SYNTHESIS

Health students undertaking placements in rural Australia

The activity reported captured a range of placements from longitudinal integrated clerkships (LICs) to short-term placements (see Appendix 2). Of the 79 papers included in this category, 31 adopted a qualitative approach, 24 were mixed methods, and 23 used quantitative methods. The remaining study was a scoping review protocol investigating allied health student tracking studies. Many of the studies (n = 33, 42%) examined medical placements, one quarter (n = 20, 25%) examined allied health professionals collectively, with the remaining articles examining specific allied health disciplines. Seventeen articles (22%) focused on the relationship between placements, rural background of students, and rural practice intention. A further 18 articles examined the features of placements that contributed to positive or negative placement experiences.

One article considered how to build capacity for clinical placements by examining three hospitals in rural Victoria. The value of teaching and supporting placement students was noted at all three sites, with 40-50% of the current staff at one hospital having been students there at one time. While considering the challenges of increasing student placements, several strategies had been adopted by the sites to enable this, and the paper provided practical strategies that could potentially be adopted by other rural hospitals. Another article also considered opportunities for rural hospitals to increase the quantity and quality of student placements and developed a clinical facilitation model using local clinical facilitators to achieve this aim. The model enabled clinicians to provide higher quality teaching, and for students to develop essential skills, so the approach was continued after the project ended.

Several papers explored the role of community and community partnerships in relation to student placements; these ranged from students feeling a sense of belonging and strategies to enable this, through to the partnerships that can build and sustain placements. A paper that exemplifies the latter reports on a partnership between local primary schools and a UDRH. It identifies six key features that foster transformational and sustainable placements, partnerships and services. These features are: identifying and responding to community need; providing services of value; community leadership and innovation; reputation and trust; consistency; and knowledge sharing and program adaptation.

What becomes evident in the papers that examine student placements is the positioning of UDRHs within the network of their communities and the social capital that is built by the UDRHs through their ongoing presence. Social capital can be defined as "a set of relationships and shared values created and used by multiple individuals to solve collective problems in the present and future" (Ostrom, 2009, p.22). UDRHs are positioned to approach, or be approached by, services/organisations that may ultimately exist for different purposes but, by working in partnership are able to achieve a common goal. In the previous article, schools approached a UDRH to address allied health service inequities experienced by regional children. From this, a service-learning program was established that enabled meaningful student placements and service delivery to children in the community. In this example, the health students who work with the children in turn contribute to the social capital of these communities, sharing values of equity in health service provision and promoting the wellbeing of the children.

Health student education in rural Australia

There were 57 studies included in the health student education in rural Australia category (see Appendix 3). Fourteen (25%) studies adopted quantitative methods, 24 (42%) were qualitative, and 19 (33%) used mixed methods. Most studies (48, 84%) reported on educational activity a UDRH provided to students while undertaking a clinical placement. These activities typically value-added to the placement. Other studies reported on an aspect of community involvement (4, 7%) or educators/clinicians (5, 9%) in educational activities. One of the key educational benefits UDRHs provide to students undertaking rural placements is interprofessional learning and this was the focus of 18 (32%) studies. These articles did not target a specific undergraduate program, instead focusing on a spectrum of disciplines, including occupational therapy, physiotherapy, speech therapy/pathology, and social work. Simulation activities, including objective structured clinical examinations (OSCEs), accounted for 8 (14%) of the published articles. Fourteen (25%) articles focused specifically on medical programs, while 12 (21%) articles had nursing students as the primary focus.

Rather than solely looking at student learning, the articles in this category demonstrated a contextual understanding of students undertaking educational activities in rural communities. Three articles were devoted to Aboriginal health, with one considering how to improve academics to better prepare health science students for work in rural and Indigenous health. Through a three and a half day rurally-based, intercultural and inter-disciplinary program for academics at three universities, the authors reported 'radical' changes in thinking which led to a desire to improve their teaching practices in rural and Indigenous health. Other studies examined organisational preparedness of health services to deliver interprofessional education to students, the role of community members in the selection of medical students, and the perspectives of community members as actors in the delivery of simulation activities. This

highlights the importance of local relationships and rural communities in the educational activities offered through UDRHs. Of note, much of this additional training was not provided in the city, thus providing a richer holistic learning experience for students undertaking rural placements.

Epidemiology of rural practitioners engaged in the health workforce in rural Australia

All 11 papers that focused on the epidemiology of rural health professionals (see Appendix 4) used an analytical approach; topics included workforce characteristics, equity of services, workforce supply and exploring whether workforce characteristics predict practice location. The overarching theme was UDRHs/RCTSs working with communities to better understand how we address workforce maldistribution. One study from 2011 described the nursing workforce in very remote Australia. It showed the workforce was predominantly female (89%), with 40% aged over 50 years. It reported that from 1995 to 2008, there had been a significant decrease in registered nurses with midwifery qualifications (65% in 1995 to 29% in 2008) and child health qualifications (18% in 1995 to 11% in 2008). Very remote nurses worked, on average, 47.6 per week. The study highlighted the vulnerable status of the very remote health workforce and an important role of UDRHs in supporting the existing workforce.

Health workforce interventions in rural Australia

The majority of the 34 published articles on health workforce interventions in rural Australia (see Appendix 5) reported small scale projects, reflecting both local and regional innovation in areas of national significance. There was a strong focus on qualitative methods in 28 (82%) articles, either as the main approach (15 studies) or as part of a mixed-methods design (12 papers). Of the remaining papers, 6 (18%) used quantitative methods only and one (3%) was a secondary review. The primary focus of almost one third of the articles (n = 10, 29%) was Aboriginal health. Two articles were concerned with point of care testing in Aboriginal

communities, including the implementation in remote communities, and the clinical and operational benefits of point of care testing in these communities. Mental health and wellbeing was the concern of 4 of the 10 articles, including the development of best practice pathways, the application of cognitive behavioural therapy (CBT), and the implementation of E-mental health by Aboriginal and Torres Strait Islander health professionals.

Beyond the aforementioned articles, an additional two articles focused on mental health workforce interventions in rural Australia, with one exploring the development of a family focused practice model, and the other considering changes in access to emergency mental health care in emergency departments. Mental health has received increasing attention, and the disparities in mental health between rural and metropolitan areas has been well documented – as have the disparities for Aboriginal peoples in comparison to non-Indigenous people. Hence, the focus of health workforce interventions in the area of mental health is justified.

Over the past ten years, changes to and disparities in birthing services across rural and remote Australia have also received increasing attention in academia (Rolfe et al., 2017) and the media (Australian Broadcasting Commission, 2018). In this category, interventions in maternity and birthing services were reported, including improving Aboriginal maternal and infant health services in the Northern Territory (NT) and the adaptation of a maternity service in rural NSW. Another study explored clinicians' perceptions regarding an intervention to promote normal labour and birth.

Australia's population is ageing, and the proportion of older people is higher in rural areas of Australia (Australia Bureau of Statistics, 2016). Supporting health professionals to deliver quality care to older people was featured in four articles, two on dementia care and two on

palliative care. These articles provided an examination of a dementia care volunteer program in an acute care setting, an electronic dementia pathway tool, a clinical skills matrix to plan and monitor palliative care nurses' skills, and primary health nurses' role in palliative care. Three articles examined health workforce interventions in the area of cancer, concerning the acceptability and feasibility of screening and evidence-based referral processes, a supportive care resource kit, and clinician roles in bowel cancer screening education for Aboriginal peoples. Safety was prominent in five articles, both in terms of patient medication safety and safety of workers in remote areas. Six articles reported program-wide evaluations of the Primary Health Care Research, Evaluation and Development Strategy, UDRHs, and RCTs.

Only one article incorporated an international comparison of a workforce intervention. This study examined the implementation of diabetes prevention programs in rural Australia and the United States. Further, there was limited formal reporting on the extension of local initiatives to a wider area or to other settings or on sustainability of successful interventions.

Health workforce recruitment and retention in rural Australia

There was a total of 103 articles in the health workforce recruitment and retention category. Of these, 52 (50%) employed quantitative methods, 25 (24%) qualitative, and 13 (13%) mixed methods (see Appendix 6). The remaining 13 (13%) articles were systematic reviews, literature reviews or critical appraisals. Eleven (11%) papers focused on health care professionals or allied health professionals generally, while other articles targeted particular disciplines, including dietetics, dental, pharmacy, rehabilitation, and Aboriginal mental health workers. The recruitment and retention of nursing staff accounted for 10 (10%) articles, with 6 of those paying attention to remote nursing. There was a noticeable interest in retention and recruitment of staff to mental health services, with 11 (11%) papers focusing on this specifically. Half of the papers (n = 51, 50%) focused on the medical profession, which ranged across topics

including International Medical Graduates (IMGs, n = 7, 7%), and those utilising Medicine in Australia: Balancing Employment and Life Study (MABEL) data (n = 15, 15%). The predominance of papers on medical workforce likely reflects the maturity of this topic, with research related to nursing and allied health disciplines likely to develop over time, corresponding to the increase in funding in 2016.

Broadly speaking, papers focused on tracking studies, or explored internal and external factors that may be important for recruitment and retention. Internal factors included personality and resilience, while external factors included workplace stress, community factors, and rural background. One paper that captures this category was the study 'Getting doctors into the bush: general practitioners' preferences for rural location'. Using discrete choice experiments, the study reported that doctors would move to a small inland town (<5000 population) for additional incentives the equivalent of 64% of their current average annual personal earnings ($116,000). For doctors to move to a town with a population of 5000-20000, they would need incentives of at least 37% of their current annual earnings ($68,000).

A wide variety of activities were aimed at recruiting and retaining health care professionals in rural Australia. A study in the Northern Territory examined opportunities to support senior health care nurses to continue to work once they retired, many expressing interest and a preference for taking on a different role in the organisation. Other studies examined the professional satisfaction of GPs in rural practice and identified that they did not differ by community size for most aspects of the job. Overall satisfaction was high (85%) and the authors' commented that too often the challenges of working in the bush (such as isolation, long hours, workload) are highlighted, whereas the sources of satisfaction are not given

sufficient emphasis. They reflected that working in rural Australia as a health care professional brings real benefits and opportunities that warrant greater prominence in discussion of workforce issues.

Health workforce models in rural Australia

Of the 81 articles included in the category of health workforce models in rural Australia (see Appendix 7), 36 (44%) used qualitative methods (focus groups or interviews), 23 (28%) mixed methods, and 20 (25%) adopted quantitative methods. The remaining papers were systematic or literature reviews. The studies in this category examined models that extended the scope of practice for rural clinicians, described innovative multidisciplinary models of care to improve service access, evaluated new models, and examined barriers and enablers for implementing existing models. Seven papers described activity to improve Aboriginal and Torres Strait Islander peoples' health, including maternity care, cardiac rehabilitation, eye care, oral health, and mental health. With regard to the latter, one study considered access, effectiveness and sustainability of a social and emotional wellbeing service, while another investigated eMental health practice in Aboriginal and Torres Strait Islander service providers.

Many papers described new and innovative models of service delivery with the aim to support the rural workforce to increase their scope of practice and role change, particularly for nurses, pharmacists, radiographers, and paramedics. The extended scope of practice for pharmacists focused on an adherence program for antihypertensive medication, and behavior change interventions for cardiovascular disease risk. Whereas the studies exploring extended scope of practice for nurses were concerned with nurse practitioners and community nurses. Two papers explored the role of rural radiographers and radiation therapists. These focused on radiation therapists' participation in treatment reviews, and radiographers' disclosure of their

radiographic opinion to patients. Barriers regarding extended scoped of practice for rural health professions included accessing funding, changing health systems, professional silos, sustainability, and medicolegal issues. The acceptability of generalists in rural communities and the strength of an extended scope of practice provided professional opportunities for rural practitioners. New roles explored in this category included physician's assistants and speech language pathology assistant.

Eight studies focused on health service delivery models, rather than professional models. One study examined the role of remote communities in service design, challenging deficit ideas. Similarly, another study considered what core services should be offered by primary health care services to help ensure equitability of services, while another considered the sustainability of smaller rural primary health care services. A fourth study observed how an increase in the provision of primary healthcare services was associated with more acute medical evacuations and more remote telephone consultations. Some studies reported positive aspects of health care in rural Australia, such as adherence to practice guidelines, noting positive adherence to diabetes and acute myocardial infarction guidelines. This category incorporated three evaluations of telehealth models which noted telehealth had increased allied health service provisions, such as speech therapy and community rehabilitation. Overall there was little consideration of workforce models in rural aged care settings.

Health workforce education in rural Australia

Of the 50 papers included in health workforce education in rural Australia (see Appendix 8), 17 (34%) adopted a qualitative approach, 20 (40%) used quantitative methods and 13 (26%) a mixed-methods approach. Educational activities included traditional face-to-face delivery, web-based, simulation, or a combination of these. Some educational activities were for specific

disciplines, including nursing, general practice/medicine, Aboriginal health workers, physiotherapy, and dietetics. However, over one quarter (14, 28%) of the articles reported multidisciplinary participants. Ten (20%) studies reported on educational activities aimed at improving the health and wellbeing of Aboriginal communities. Other educational activities, while not exclusively focused on Aboriginal health services, incorporated Aboriginal peoples health, cultural appropriateness and working in Aboriginal Community Controlled Health Organisations as a part of the program. For example, in one of the larger studies, an educational activity was delivered to 246 health care professionals at 15 rural and remote sites in the Midwest and Pilbara regions of Western Australia, 5 of which were delivered in ACCHOs. Diabetes and foot-related issues are significant for Aboriginal communities. This study highlighted the need for clinical decision support tools for health professionals working in these regions.

Thirteen studies explored the professional development needs of the rural workforce. The overarching theme underpinning the reported activity was support to and of local rural partners. A study that exemplifies this was conducted in Mount Isa in which the UDRH worked with primary health services to explore how primary health services can better engage with Aboriginal communities. Twenty-four health care professionals and 54 people from Aboriginal communities participated. The study used open-ended questions exploring participants' views of factors affecting culturally appropriate service provision. An attitudinal scale on the perceived culturally appropriateness of the service was used. Through working with the Aboriginal community and local Primary Health Services, it was identified that primary health services require a strategy to support Aboriginal Health Workers. Several recommendations were made as to how this could be achieved, including involving local community leaders in cultural awareness training, displaying Aboriginal artwork, and culturally appropriate spaces

in the service setting. They also recommended regular cultural awareness training for primary health teams.

DISCUSSION

Since 2010, the UDRH network has contributed 415 research publications to help build a credible evidence base on the rural health workforce in Australia. These papers have reported on the work of UDRHs supporting health students undertaking clinical placements including the development and delivery of innovative health student education in rural Australia; recruitment and retention of the rural health workforce; rural health workforce interventions and models; health workforce education; and epidemiology of the rural health workforce. The aggregate is a substantial body of work describing UDRH research activity examining the rural health workforce. The research highlights the role of rural academics within UDRHs in developing relevant evidence related to the rural workforce in Australia and contributing to the recruitment and retention of the rural health workforce.

The research examined key issues for rural Australia, such as interventions to increase the access to evidence-based mental health care, improving the health and wellbeing of Aboriginal communities, the impact of extending existing workforce roles, the added value of education for students undertaking rural placements, and the impact of placement students on the social capital of rural communities.

In the region, for the region

UDRHs are strategically positioned, both geographically and academically, to provide research expertise that responds to rural community needs. This is evidenced by the number of articles reporting locally driven, grassroots or bespoke approaches to workforce issues. In addition, it

highlights activities that occur due to established relationships with rural partners and an ability to engage meaningfully with them. Many articles highlighted the ability of UDRHs to develop successful and novel ways to respond to community need/s. With reference to undergraduate placements, several studies noted that although students had a positive attitude towards practice in rural Australia and a clear rural practice intention, they also reported that jobs were not always available in those communities. There is a need to identify alternate models of allied health service delivery for isolated rural and remote populations where market failure restricts access to limited publicly funded services only. Alternative avenues to explore sustainable rural allied health workforce models need to be developed and evaluated.

The review has reported on activities that may help us understand how to attract a sustainable rural workforce and how it is distributed; an activity that supports rural partners to innovate and collaborate at a regional level and potentially across the UDRH network. However, it also highlights the need to investigate workforce data quantitatively, particularly for nursing and allied health disciplines. If UDRHs are to strengthen the evidence base regarding health workforce recruitment and retention, there is a need to consider how best to measure this. Consistency of data and measures would enable Australia-wide considerations of recruitment and retention. The use of large surveys, such as the MABEL study, reflects the benefit from investment in major longitudinal studies researching the medical profession. There is a need to consider an equivalent approach for allied health and nursing.

The common themes across different professional groups settings (medical, allied health and nursing, mental health) confirms the importance of social support for the family, education for children, professional networks, spousal employment and other supports. UDRHs are well positioned to assist in developing strategies with health service partners to better support health

professionals recruited to their region and to investigate and respond to what may be specific for their region to optimize outcomes. It would be beneficial to explore opportunities to strengthen and formalise regional partnerships to engage in aspects of recruitment and retention decision making.

Sharing success to increase replicability

While acknowledging the heterogeneity of rural communities, UDRHs learn from each other and can adapt programs that demonstrate efficacy in one location to other geographic locations with similar needs. An emphasis on transferability and shared learning seems important for maximising efficiencies from the UDRH research program and needs further development. Much of the identified literature was based on smaller studies conducted in a local context. The UDRH network could take advantage of funding, such as the Medical Research Future Fund, to foster collaboration between UDRH academics, host university academics, other universities in Australia, and international partners, to promote more effective system wide investigations into health workforce development, the efficacy of rural workforce programs, and evaluation of workforce programs targeting health issues impacting rural communities.

The review demonstrates the regional responsiveness of UDRHs. To enable different insights to be shared, a UDRH/RCTS research network could identify and foster opportunities for further collaboration across rural Australia. This should recognise the diversity of each UDRH and its research activities, enabling them to continue to respond to local need, but also leverage the many advantages of collaborative research on small populations that experience common issues, including health service access. The establishment of the UDRH research bibliographic database has been one vehicle to enable this. It has allowed the development of a rich repository of publications on rural health. As such, it is recommended that a modest investment

be made to regularly update and maintain the UDRH publication database, with corresponding discussion regarding governance and resourcing.

Rural academics balancing building social capital and research portfolios

Many of the included studies show that research activities have had an impact on the rural communities in which they occurred, for example, increasing understanding of how to prepare mental health nurses to safely prescribe mental health medicines. An enabling factor that has facilitated the activity to occur has been the integration of UDRHs in the local communities. However, some of this activity may not receive broad academic recognition within the current university metric system which in turn impacts potential funding opportunities. Although impactful for rural communities, rural academic outputs often differ from the outputs valued by universities such as publication in high impact factor journals and citation counts. Much of the reported UDRH activity was applied research undertaken to answer a question or solve a local issue. This may not have occurred if UDRHs were not embedded in their communities.

Working with Aboriginal and Torres Strait Islander communities

Many papers included in this review reported on work with Aboriginal and Torres Strait Islander communities, however there were many which focused on health, wellbeing and care delivery that did not meet the criteria for inclusion in this review of workforce. The level of engagement with Aboriginal and Torres Strait Islander communities highlights the importance of this UDRH role and the need to continue to build on the existing work with Aboriginal and Torres Strait Islander communities, as well as to extend collaboration with Aboriginal and Torres Strait Islander academics and health care professionals.

Opportunities for further analysis of UDRH outputs

The current analysis included only a proportion (approximately 15%) of the total number of publications of the UDRHs over nearly a decade. Our focus was on the health workforce, but two other major categories of research output were identified, both highly relevant to the issue of improving the health and wellbeing of rural and remote populations. The first area of activity relates to working with Aboriginal communities and the second relates to innovations in health service delivery and service improvement. These could be subject to further scoping reviews to highlight important contributions of UDRHs to rural health.

KEY RECOMMENDATIONS

1. Establish a UDRH/RCTS research network to identify and foster opportunities for further collaboration across rural Australia including opportunities for rural academics to collaborate in larger-scale trials and studies and translate evidence into practice.

a. Encourage collaboration between UDRH academics, host university academics, other universities in Australia and international partners with the aim of improving rural health in Australia. This should include more opportunities to share and translate knowledge across rural Australia.

b. Critically examine emerging approaches to building a long-term health workforce qualified to address rural health issues and appropriate career support and pathways. This could include examination of the rural generalist pathway, what does and does not work, the suitability of curricula, continuing professional development to support practitioners, and development and evaluation of health care innovations for people living in rural Australia.

c. Explore and report on how UDRH activity contributes to the social capital of rural communities in which they operate and their impact in those communities.

d. Develop the skills of rural academics and health practitioners to undertake relevant research and evaluation within their communities and workplaces.

2. Continue to maintain and update the UDRH publication database and utilise it for further scoping reviews of UDRH research contributions. Two key areas with many papers relate to research in the areas of:

a. working with Aboriginal and Torres Strait Islander communities

b. exploring models of health service delivery and improvement appropriate for rural, regional, and remote contexts.

3. Build on the existing work with Aboriginal and Torres Strait Islander communities and workers in rural Australia through a UDRH program of research and educational activity developed in collaboration with Aboriginal and Torres Strait Islander academics, peak health professional bodies, health care professionals, and communities.

a. UDRHs are well placed to develop and trial interventions to improve the uptake of health careers by Aboriginal and Torres Strait Islander peoples and their retention in the health workforce, both areas of importance to Australia, rural areas, and to Aboriginal and Torres Strait Islander peoples.

4. Promote the strength of the UDRH network in research and awareness that current competitive research grant funding generally does not enable funding for the type of research to address the challenging needs of health care delivery in rural Australia. Advocate for dedicated research funding to support both committed rural researchers and research that addresses the needs of rural communities and health services.

5. Conduct research and evaluation regarding other rural workforce development programs with key partners.

LIMITATIONS

This review of the research output of UDRHs since 2010 captured publications up to September 2019, so slightly less than a decade of research regarding the rural health workforce. No quality criteria were adopted to limit inclusion of articles that explored any of the health workforce categories. Many of the studies had small sizes and the absence of large comprehensive trials limits conclusions about the effectiveness of some programs. Qualitative research, while providing rich and meaningful information for the context and those participating, may produce findings not generalisable to practice or circumstances elsewhere.

CONCLUSION

UDRHs have contributed to a significant body of work in the area of rural health workforce development over the last decade. This has been enabled by UDRHs strong connections with their rural communities, and much of the research appears to have been developed in response to the needs of the community, health service, and workforce partners. A range of methodological approaches have been used in the research. We conclude that UDRHs are a powerful network for research, with established activity in their communities, and significant potential for sharing successes across the network to increase replicability and explore opportunities for further analysis of UDRH outputs. They have an important role in working with Aboriginal and Torres Strait Islander communities. Rural academics build social capital, adding value through their relationships, continuity in the community, intellectual capacity and contribution to the social fabric of rural communities.

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APPENDICIES

Appendix 1. Data Extraction tool

REVIEWER	Covidence #	Title	Theme A	Theme B	STUDY DESIGN/METHODOLOGY	METHOD	AIM/RESEARCH QUESTION/S	POPULATION	N=	FOCUS	INTERVENTION/TRAINING	OUTCOME/FINDINGS	RECOMMENDATIONS	IMPLICATIONS	NOTES - including Sub-Themes etc

Appendix 2. Health students undertaking placements in rural Australia

Author/s	Year	Study design	Aim/objectives	Population	Key results
May, J., Brown, L., Burrows, J.	2018	Quantitative - retrospective cross-sectional study. Demographics - UON/UNE datasets. Rural and Remote Admissions Scheme - RB indicator. Current principal place of practice (PPP) - AHPRA. Practice locations – by MMM.	To determine what influence extended RCS placements had on postgraduate-practice location. Hypothesis was that extended RCS placements are positively associated with rural workforce location in the early postgraduate years.	N = 426. first 3 graduate cohorts (2012–2014) from a Joint Medical Program offered by two universities based in northern New South Wales	Participation in an extended RCS placement, rural background (RB) and being 25 years or older at completion of a medical degree were all independently associated with rural PPP. Being bonded into a program to practice rurally not associated with rural PPP. Participation in an extended RCS placement is strongly associated with rural practice in the first 3 to 5 years of practice for graduates from both rural and metro backgrounds.
Kleinitz, A., Campbell, D., Walters, L.	2014	Qualitative - organisational development theory - semi-structured interviews.	To determine registrars and supervisors in the Northern Territory (NT) perceptions of supervising students in general practice.	N = 11 Registrars (n = 9) and supervisors (n = 2)	Registrars described themselves as more thorough when they had a student, altering consultations to set a good example and ensure professional credibility. Saw advantages for patients and their learning. Thoroughness slowed them down and was main barrier for teaching, particularly if it resulted in seeing fewer patients and reducing income. Lack of physical space constrained teaching opportunities. Although ability to teach not identified as major barrier, registrars reported desire for teacher training. Leading to more confidence in supervision.
Kirby, S., Held, F.P., Jones, D., Lyle, D.	2018	Mixed methods - qualitative analysis of data from interviews/ focus group with the partners in the university and education sectors, and quantitative social network analysis of data	To explore the partnership between universities and local primary schools to deliver a classroom-based paediatric communication impairment service provided by undergraduate speech pathology students;	Survey (n = 39); interview/focus group (n =49). Service-learning program stakeholders identified by local host university in 3 sites: Broken Hill;	Factors supporting partnerships were long-term, work and social relationships, commitment to community, trust and an appetite for risk-taking. Postulated these characteristics are more likely to exist in rural communities. Community–campus partnerships supporting service-learning programs across the three sites were triggered and maintained by a commitment to providing

		from an electronic survey of the partners.	and how partnerships work to facilitate program replication.	Geraldton; Katherine. Focus on speech pathologists	services in areas of unmet need and a high level of trust between partners engendered by a history of working together on other programs.
Davis, K., Doole, E., Cheek, C., Shires, L.	2018	Qualitative - focus group - transcripts analysed thematically and incorporated into an overarching conceptual framework	To explore RCS student perceptions of positive general practice placements and identify features students found most helpful and relate these to facilitate sharing and adoption.	21 medical students (5-year undergrad degree) - UTAS	Students positively viewed placements where they felt part of team, had opportunity to practice procedural skills, learned at level congruent to their stage and gained experience practicing independently. Students not motivated when did not feel valued, or where learning opportunities inconsistent with personal learning objectives.
Brown, L., Smith, T., Wakely, L., Little, A., Wolfgang, R., Burrows, J.	2017	Mixed-methods longitudinal workforce outcomes study - (i) an end of placement survey, (ii) a semi-structured interview and/or (iii) a follow-up survey at one, three and five years after graduation. UON students who participated in a 2 to 8-week rural placement or 1-year immersion attachment.	To describe and analyse the short-term workforce outcomes from this immersive student placement program located in rural NSW, Australia.	404 eligible students (2011-2014; OT, radiography, nuclear science, nutrition and dietetics, radiation therapy and speech pathology). 2012–2015, 269 invited to participate, 233 consented to follow-up surveys. End 2015, 129 graduates completed 1-year follow-up survey (55.4% resp. rate).	Outcomes, to date, show 52% of graduates working in rural or remote area (RA2–RA5) after 1 year and 37.5% at 3 years post-graduation. Students from a rural/remote background were 2.35 times more likely to be in a rural or remote workplace after one year than graduates from a metropolitan background. Graduates provided reasons for their plans to move from or stay in their current position. Four themes: seeking new and different opportunities; better income and job security; personal change and lifestyle improvement; level of job satisfaction. Ongoing monitoring of workforce outcomes is required to determine long-term outcomes for rural and remote communities.
Thackrah, R.D., Thompson, S.C., Durey, A.	2014	Qualitative - Interviews - conducted over 15 months. Detailed journal kept by one participant during the placement. Interviews conducted with midwifery staff at the university and practice setting, although focus of	To describe midwifery students' reflections on a remote Aboriginal clinical placement that has been offered at a Western Australian university since 2010.	n = 7 - participants who completed the program. At the time of interview, four participants were in the final year of their undergraduate degree and three were practicing midwives	Initial themes: motivations and preparation; getting there and responding to the setting; encounters: giving and receiving; highlights and challenges; and application to midwifery practice. Remote clinical placement highly valued by all students and recommended to others as profound learning experience. Highlights: connections made with community members and cultural knowledge learned

		this paper is on student experience.			experientially. Challenges: geographic and professional isolation, complexities of remote health care delivery, especially to pregnant and birthing Aboriginal women. All students recognised transferability of knowledge and skills acquired to urban settings, and some had already incorporated learnings into clinical practice. Cultural immersion can provide students with rich learning experiences not acquired in classroom. In Aboriginal communities on Ngaanyatjarra Lands students gained valuable insights into impact of isolation on health service delivery, extent and strength of cultural traditions, and heightened awareness of difficulties encountered by pregnant and birthing Aboriginal women in remote locations.
Roberts, C., Daly, M., Kumar, K., Perkins, D., Richards, D., Garne, D	2012	Quantitative - Socio-cognitive career theory - Framework analysis used to develop thematic framework illustrating the key findings.	To explore the impact of an integrated placement on medical students' attitudes towards rural practice	n = 28 10 medical students, 15 clinical supervisors and teachers, three community health staff, and focus groups made up of medical students.	Longitudinal placement enabled students to achieve personal goals and enhanced self-efficacy beliefs and orientation towards he complex personal and professional demands of rural practice. Informal curriculum (multifaceted interactions with patients and families, clinical teachers and other health care staff) vital experiential component. Some students had little intention of practicing rurally, partly as a result of contextual barriers such as geographic isolation, family and relationship needs, restricted postgraduate training opportunities and limited opportunities for specialist practice. Richness of informal curriculum in a longitudinal rural placement powerfully influenced students' intentions to practice rurally. Provided an important context for learning and evolving notions of professionalism and rural professional identity. This richness

					could be reinforced by developing formal curricula using educational activities based around service-led and interprofessional learning. To overcome contextual barriers, rural workforce development model needs to focus on socialising medical students into rural and remote medicine. More generic issues - student selection, further expansion of structured vocational training pathways that vertically integrate with longitudinal rural placements and maintenance of rurally focused support throughout postgraduate training.
Amorin-Woods, L.G., Losco, B.E., Leach, M.J.	2019	Mixed-method Students enrolled in an Australian undergraduate chiropractic program were invited to complete a service experience questionnaire and an open-ended reflective feedback form following a nonmetropolitan CIP (Part A). Online searches were performed to gather data on graduate practice location (Part B).	To explore the influence of nonmetropolitan clinical immersion placements (CIPs) on undergraduate chiropractic student experience, professional attributes, and practice destination.	64 students participated in Part A - Australian undergraduate chiropractic program	All participants agreed that placement was educational and should be retained in program. Students agreed placement enhanced respect for individuals and awareness of others in need, highlighted importance of respect for all people, improved empathy for disadvantaged, and provided opportunity to improve communication skills. Most indicated they were more likely to practice in a country setting as a result of placement, with those participating in a country placement more likely to practice in nonmetropolitan regions after graduation. Study first to investigate possible influence of nonmetropolitan CIPs on development of desirable attributes in Australian chiropractic students. Supports utility of CIPs to help meet educational objectives of chiropractic programs and possibly address maldistribution of chiropractic workforce.
McLean, R.G., Pallant, J., Cunningham, C., DeWitt, D.E.	2010	Mixed-method Questionnaires - students asked to rate level of agreement on 29 items	To evaluate the experiences of medical students who attended rural clinical schools during 2006, using	125 (of 166 students - 75.3%) -RCS medical students who had completed 1 year	86% stated they would go to RCS again if they had their time over and 64% stated they would spend longer at RCS if they could. All items evaluating the educational experience recorded

		concerning their overall RCS experience, skills development and clinical supervision experience.	the rural-specific questionnaire. This is the second part of a broader study conducted to explore medical students' views of rural clinical schools.	at the RCS at 6 participating universities (UNSW, UniMelb, UTAS UoAdel, USyd, ANU).	greater than 80% agreement (indicating very positive perceptions of the RCS experience). For items concerning skills development, highest level of agreement related to developing procedural skills (97%). For clinical supervision items, agreement rate exceeded 80%. 97% found supervisors approachable, enthusiastic (96%) and respectful (95%). Students' experiences in the RCSs unequivocally positive. Most importantly, RCS environment was conducive to learning and development of clinical skills, students were able to see adequate number of patients and were well-prepared for exam, and their supervisors were very good and acted as positive role models. Augers well for success of RCS program and for its role in attracting future doctors to work in rural environments.
O'Sullivan, B.G., McGrail, M.R., Russell, D., Chambers, H., Major, L.	2018	Qualitative - scoping review - published peer-reviewed studies via Ovid MEDLINE and Informit (2000–2016) and direct journal searching included studies that focused on outcomes of undergrad rural immersion in Australian medical schools from 2000 to 2016.	To describe the characteristics and outcomes of the rural immersion programs that were implemented in Australian medical schools.	Overall 392 studies were identified: 45 from Ovid MEDLINE and 347 from Informit. An additional 12 were from direct searching and one that was known to authors. After screening, 26 eligible studies were included	Programs varied widely by selection criteria and program design, offering between 1- and 6-year immersion. Based on 26 studies from 10 medical schools, rural immersion was positively associated with rural practice in first postgrad year (internship) and early career (first 10 years post-qualifying). RB increased effects of rural immersion. Evidence suggested longer duration of immersion increases uptake of rural work, including by metro-background students, though limited evidence about the influence of different program designs. Most evidence based on relatively weak, predominantly cross-sectional research designs and single-institution studies. Flaws - small sample sizes, studying internship outcomes only, inadequately controlling for confounding variables, not using metropolitan-trained controls and providing limited

					justification as to the postgrad stage at which rural practice outcomes were measured. More research - influence of student interest in rural practice and duration and setting of immersion on rural work uptake and working more remotely. Research needs to be more nationally balanced and scaled-up to inform national policy development. Quality of research could be strengthened through longer-term follow-up studies, adjusting for known confounders, accounting for postgrad stages and using appropriate controls to test relative effects of student characteristics and program designs. Australia's immersion programs are moderately associated with an increased rural supply of early career doctors although metropolitan-trained students contribute equal numbers to overall rural workforce capacity.
Wright, J.R., Bourke, L., Waite, C.J., Holden, T.A., Goodwin, J.M., Marmo, A.L., Wilson, M.L., Malcolm, H.E., Pierce, D.	2014	Mixed methods - focus groups and questionnaires pre- and post-. transcripts thematically analysed and questionnaire data statistically analysed. Main outcome measures: questionnaire item responses pre and post RHM, scored on a 7-point Likert scale.	To determine whether a short-term placement of metropolitan medical students in a rural environment can improve their knowledge of, and change their attitudes to, rural health issues.	69 medical students taking part in the March and May 2013 3-week Rural Health Modules (RHMs)	5 themes: access; teamwork, models of care and generalist practice; overlapping relationships; indigenous health; working in a rural career. In all five areas, change was seen in depth of knowledge students had about these issues and in students' attitudes towards rural health care. Questionnaires showed significant shift in students' appreciation of, and positivity towards, rural health issues. Undertaking a 3-week RHM changed students' perceptions of rural health and improved their knowledge of issues facing rural health practitioners and patients.
Khalil, H., Sutton, K., Waller, S.	2018	Scoping review protocol only - search strategy detailed.	To examine the study designs and outcomes of allied health and nursing student and graduate tracking studies. Review	Participants - students undertaking their studies in a tertiary setting and graduates. Health	n/a

			questions: i) What are the study designs of placement tracking studies for allied health and nursing students and graduates, as described in the literature? ii) What are the outcomes reported in studies addressing allied health and nursing student and graduate tracking studies?	professions: nursing and midwifery, pharmacy, audiology, dietetics, exercise physiology, occupational therapy, physiotherapy, podiatry, social work, psychology, medical imaging and speech pathology.	
Jones, M.P., Bushnell, J.A., Humphreys, J.S.	2014	Quantitative - data from Medical Schools Outcomes Database and Longitudinal Tracking Project, a longitudinal study with a high response rate that prospectively collects data, including practice location intention, from all Australian medical schools.	To determine whether rural clinical placements are associated with a higher proportion of graduating students planning rural careers and to explore associations with timing, duration and location of placements.	3268 students from all Australian medical schools who completed medical studies between 2008 and 2011 inclusive	Association between rural/ remote placements later in program and rural practice intention (RPI) was strongly positive whether viewed as simple occurrence or as duration, in contrast to later urban placements, which were strongly negative. Longer placement duration enhanced associations reported. Non-metro medical schools were associated with higher odds of intention to take up rural practice. However, association with rural placements was overshadowed by strong positive associations with student RB and their stated intention to be a rural doctor at start of studies. A better understanding of effect of rural exposure on practice intention and take-up enables stakeholders to plan the nature, duration and location of medical education placements to maximise their benefit in terms of workforce outcomes. Exposure to rural practice during basic medical training, and location and curriculum focus of a medical school are confirmed as factors positively associated with students' intention to become rural doctors after

					graduation. Rural origin and early intentions at start of medical training are better predictors of expressed intention to take up rural practice than rural clinical placements.
Isaac, V., Walters, L., McLachlan, C.S.	2015	Quantitative - cross-sectional study - Data from 2013 FRAME evaluation survey. Primary and secondary outcome measures: Rural self-efficacy: Six questions to measure self-efficacy beliefs in rural medical practice, based on the sources of self-efficacy described by Bandura. Rural career intention: Students were asked to identify their preferred location for future practice. The options were, Capital or Major City; Inner regional city or large town; Smaller town and very remote area.	To investigate medical student's self-efficacy at the time of finishing their rural clinical school (RCS) placement and factors associated with self-efficacy. Secondary aims are to explore whether interest levels or self-efficacy are associated with rural or remote career intentions.	653 (response rate 89.2%) medical students who had completed their RCS term in 17 Australian universities - responses were analysed from 653 medical students from regional Australia. All 732 students who completed their RCS term in 2013 were invited to participate.	83.8% of students recalled an increase in their interest levels for rural medicine as a result of their RCS experience. Actual career intention to work in a regional area or rural area was 60.2%. Female gender, RB, an RCS preference for clinical training and general practice intentions were factors associated with higher levels of self-efficacy. Self-efficacy was independently associated with increased interest in rural medicine and rural career intent. (Model included gender, rural background, preference for RCS, generalist intent, rural practice interest and self-efficacy). Early identification of low self-efficacy in potential RCS - unlikely to benefit from RCS experience in terms of enhancing interest in rural medical careers. Students with low self-efficacy on exit from an RCS - less likely to develop rural career pathway intentions. Concept for developing learning opportunities in more remote areas to increase remote clinical self-efficacy is suggested - may translate to additional remote rural clinical practice intentions. Self-efficacy - increased interest levels for rural medicine and rural medical career intent.
Maloney, P., Stagnitti, K., Schoo, A.	2013	Mixed - explorative, nonexperimental - postal survey questionnaire - comprised 26 closed-answer questions and four open-ended questions.	(1) to examine the experiences of rural AHPs with clinical fieldwork education, (2) to determine whether AHPs in public and private practice	113 AHPs Inclusion criteria: (1) university trained - OT, physio, speech pathology, dietetics, podiatry or	75 had previously supervised students; most only provided fieldwork education in public sector. AHPs working in public and private sectors had positive experiences with clinical fieldwork education and often had increased job satisfaction while supervising students. They

		The questions elicited information on AHPs' experiences with supervising students and the barriers and enablers they encountered.	experience different barriers and enablers to clinical fieldwork education and (3) to explore what would encourage more AHPs in public as well as private practice to provide clinical fieldwork education in the future.	psychology (2) involved in direct patient care or services to the community (3) working in rural south west Victoria. 63.8% private sector, 15.0% public sector 21.2% working part-time in both public and private sectors. 71.7% female. Over half were aged 40 and above. Physios (26.5%), psychologists (25.7%).	experienced similar enablers to involvement in clinical fieldwork education programs, however barriers they encountered were different. Students' clinical skills and their own clinical skills were enabling factors for positive clinical placements. Barrier to clinical fieldwork education in private practice: time (72.2%), clients' willingness to be treated by a student was a barrier to taking on students (51.5%), practice productivity (43.1%). Findings highlight differing issues between rural public and private settings that need to be addressed for successful clinical fieldwork education and WIL. Strategies to address identified barriers need to be specific to work conditions of each setting. Private practice factors: fluctuating client-contact time, business and marketing duties, client satisfaction and confidentiality and practice profitability. Offering incentives (financial remuneration, professional recognition and accreditation points) may encourage more private AHPs to supervise. Policy support needs to include private sector to enhance fieldwork education capacity. Research needed: qualitative study exploring barriers and enablers to clinical fieldwork education in rural public and private practice; exploring barriers and enablers to rural clinical fieldwork education from a student perspective.
Witney, M., Isaac, V., Playford, D., Walker, L., Garne, D., Walters, L.	2018	Quantitative De-identified data from 2015 version of the Australian national rural clinical schools (RCSs) exit survey used to compare students in	To compare rural LIC and rural block rotation students' reported experiences of clinical supervision.	447 respondents from 13 medical schools, 279 - LICs 168 - block-based programs.	No association between placement type (LIC versus Block) and reported clinical supervision. Single independent predictor of positive perception of clinical supervisors was choosing an RCS as first preference. No association between placement type (LIC versus Block) and

		LICs with those in block rotations in relation to how they evaluate their clinical supervisors and how they rate their own clinical competence.		Of the LIC survey participants, the UoWollongong made up 31%, with the 15.1% University of Adelaide, 13.3% University of Western Australia and 11.5% Flinders University. Block rotations - UNSW made up 42.3%, UoNewcastle 22.6%, UoNotre Dame 12.5% and UNE 11.9%.	self-rated clinical competence. Clinical supervision score and male gender predicted more positive self-ratings of clinical competence. Quality of clinical supervision in block placements and LIC programs in rural Australian settings was reported by students as equivalent. Both rural LIC and rural block rotation students rate the behaviours of their clinical supervisors very positively. Both groups similarly rate their clinical competence positively. Suggests that for clinical supervision, LIC programs and block rotation programs are not distinguishable in rural settings. Biggest predictor of students rating their preceptors positively is whether it was their first choice to attend their RCS clinical school rather than type of rural medical education they are exposed to.
Kirschbaum, M., Khalil, H., Page, A.T.	2016	Mixed methods - phone survey - all identified course coordinators or placement officers to obtain the required data from the nominated school of pharmacy representative. Descriptive statistics used to analyse participants and courses demographics, qualitative data thematically analysed.	To describe characteristics of rural clinical placements programs currently being in Australian university schools of pharmacy including the objectives of the rural placements, assessment requirements, preceptors' support, barriers, and influence of rural support programs employed by 18 Australian university schools of pharmacy.	17 representatives from 18 pharmacy schools - course coordinators or the placement officers at each of the 18 Australian university schools of pharmacy that offer an entry-level pharmacy degree.	Australian schools of pharmacy have substantial similarities in the assessment of placements; though vary considerably in their approach to placement duration and innovations. The participants noted three main barriers to rural placements, which were consistent across the universities. These identified barriers to rural placements included; staff workload in coordinating placements, the administrative burden, and recent changes to the methods used by pharmacy organizations to calculate rurality for funding.
Weston, K.M., Hudson, J.N.	2014	Qualitative - interviews - thematic analysis - GP preceptors interviewed after the first student	To investigate the influence of the LIC model of medical education on scholarship among	26 preceptors who supervised LIC medical students in rural and regional	Thematic analysis revealed evidence of clinical scholarship in regional/ rural clinical medicine. The 'practice' was validated as a place where scholarship occurs, an 'academy of learning'

		cohort had completed their 38-week placements.	preceptors in these practice communities. Main outcome measure: The study looked for evidence of clinical scholarship among preceptors supervising students in the longitudinal medical student clerkship.	New South Wales participated. None had previously been involved in this model of medical education.	and part of the university. About half of the preceptors believed LICs gave students a deeper link with the community. Two thirds perceived an improved quality of care in their practice. Four themes: Scholastic partnership with the university; mutual teaching and learning partnership; Integration into the wider community; Better practice, better systems and better care. LICs in teaching communities of practice provide opportunity for emergence of clinical scholarship among preceptors supporting learning needs of medical students.
Jones, D., Lyle, D., McAllister, L.	2016	Qualitative - pragmatic - focus groups with students and individual interviews with academics. Data analysed using a constant comparative analysis method. Broad codes were developed and then collapsed into two themes	To better understand the impacts and outcomes of participation in the community-campus partnership and service-learning program, which was informed by community and campus participants. To contribute a rural perspective to the growing service-learning discourse in Australian higher education.	students (n = 10 – 4 OT, 6 speech pathology), from 2 universities, and academics (n = 2 – 1 metro, 1 rural). students represented one cohort undertaking placement in one school term in 2014,	2 themes: catalysts for program participation and civic impacts of participation Need to ensure development of community literate (CL) health students, academics, and practicing professionals if unis are to create a rural-ready and responsive health workforce. CL approach must inform how Australian higher education institutions engage with rural communities in community-based service-learning innovation. Health students, academics, and professionals need to access rural community knowledge to enhance capacity to effectively engage with communities. Development of CL health professionals just as important as development of health-literate consumers, and reciprocal investment at policy, funding, education, and practice levels is required.
Caygill, R., Peardon, M., Waite, C., Wright, J.	2017	Qualitative - data collected from two groups of rural students (LIC; traditional hospital-based) over 2 academic years at 4 time-points (February,	To examine and compare learning experience of third-year rural medical students studying specialties (women's health, aged care, child and	number of participants not clearly stated - A total of 38 focus groups were conducted over the	No perceived academic disadvantage to studying medicine rurally. Studying medicine in a rural area provides increased access to patients, more hands-on experience, and close relationships with patients and colleagues. LIC students reported increased confidence in clinical skills,

		May, August, and November), to investigate general experiences of living and learning rurally, within the different educational models. Thematic analysis used.	adolescent heath, mental health, general practice) by either a traditional hospital-based rotation or a LIC in a rural general practice setting.	research period. Rural students in third year of UoM's MD course invited to participate focus groups. Focus groups numbers ranged from three to nine, with an average of six per group. Not all students attended, but most attended multiple focus groups throughout the year.	felt better prepared for internship, however experienced more social isolation than students in hospital-based rotations. 13 major themes, 3 consistently and voluntarily discussed, in most groups, across both cohorts throughout the year, over 2 years: Access to patients and exposure to cases; Confidence in clinical skills; Rural living/social isolation. Rural LIC students feel more confident in their clinical skills and preparedness for practice than other rural students. Supports use of LICs as a powerful educational tool. Reaffirms rural effect, studying rurally has positive impact on learning. Rural students, both those who followed traditional hospital-based learning and undertook a LIC, benefitted from greater access to patients and exposure to cases, giving them more hands on experience than metro-based counterparts. This research isolated LIC effect, independent from rural effect: LIC students feel more confident about their clinical skills and better prepared to enter the workforce than other rural students.
D'Amore, A., Mitchell, E.K., Robinson, C.A., Chesters, J.E.	2011	Mixed methods - cross-sectional - questionnaire - closed-ended questions statistically analysed. Open-ended responses thematically analysed. Questionnaire administered to year 3–5 medical students at their clinical school.	To determine senior medical student (year 3–5) opinions of their early-year (year 1–2) rural placement.	n = 97 (49% response rate). 29% male, 71% female; 44% RB, 56% metro background; 48% year 3, 32% year 4, 20% year 5; 59% were, at the time, situated at a RCS and 41% were at a metro clinical school.	69% considered the year 1 placement length as 'about right'. Overall, most students found year 1 rural placements positive and grasped placement aims and objectives. Most students were pleased with year 2 rural placements, mainly due to clinical aspects. Medical students appear to prefer shorter early-year rural placements and understand benefits and importance of such placements. They have a desire for greater clinical exposure during these early year placements.
Nancarrow, S., Wade, R., Moran,	2014	Qualitative - review and thematic analysis of	To analyse existing clinical supervision frameworks to	17 supervision frameworks	13 domains of supervision: definitions; purpose and function; supervision models; contexts;

A., Coyle, J., Young, J., Boxall, D.		literature/existing supervision frameworks - three-tiered sampling approach - thematic analysis was undertaken by Framework analysis methodology using Mindmapping software. Results organised into a new conceptual model which places the practitioner at the centre of supervision.	develop a supervision meta-model.		content; modes of engagement; Supervisor attributes; supervisory relationships; supervisor responsibilities; supervisee responsibilities; structures/process for supervision and support; facilitators and barriers; outcomes. Developed a reflective, supervision and support framework "Connecting Practice" that is practitioner centred, recognises the tacit and explicit knowledge staff bring to relationship and enables them to identify their own goals and support networks within work context. Framework organises domains of supervision in a temporal way, separating domains that can be modified to improve supervision framework, from those less easily modifiable. Important to help embed the implementation of supervision and support into organisational practice. Adds to body of work around supervision by helping understand domains or components of supervisory experience. Core domains provide an evidence-based foundation for development of clinical supervision models which can be adapted to many contexts.
Rae, K., Bohringer, E. Ashman, A. Brown, L., Collins, C.	2016	Qualitative - interviews - generic inductive approach used to summarise data and identify key themes relating to outcome of interest, the cultural awareness experiences of the participants.	To evaluate the cultural experiences of student and new-graduate dietitians visiting an Aboriginal ArtsHealth centre through a quality assurance project.	6 student and new-graduate dietitians	Key qualitative themes 'building rapport' and 'developing cultural understanding' identified. 4 participants felt they gained a deeper understanding of context around health disparity for Indigenous Australians through their experiences. Key ways to build rapport with community members identified. Suggest first-hand experiences working in Aboriginal ArtsHealth centre are effective in building cultural competency skills for student and new-graduate dietitians. Experiences could be better supported through improved preparation for

					cultural setting, and ongoing monitoring of participant experiences.
Walters, L., Prideaux, D., Worley, P., Greenhill, J.	2011	Qualitative - semi-structured interviews - thematic analysis	To consider why general practitioners (GPs) teach, in particular by defining the longitudinal supervisory relationships between rural clinician-preceptors and students.	n = 41 GPs, practice managers and students	Preceptors identified many ways that precepting added value to their roles. However, themes relating to doctor–student relationship were central to GP preceptors' experiences. Motivators for precepting - a group of constantly changing interconnected factors that contribute to defining of preceptors as central members of professional community of practice. Challenges the simplistic organisational concept that universities can recruit and retain GPs by offering increased rewards. Introduces 4 clinical preceptor models, which involve the roles of, respectively: the student observer; the teacher-healer; the doctor orchestrator, and the doctor-advisor. Symbiosis between student learning and patient care found to occur in the doctor-orchestrator model. Evolution of doctor– student relationships in long-term placements explains how students become more useful over the academic year and sheds light on how GPs are changed through precepting as part of the complex process by which they come to recognise themselves as central members of the rural generalist community.
Kirby, S., Brunero, C., Lyle, D., Dettwiller, P., Purcell,A.	2018	Quantitative - outcome data of children attending the program - supervised speech pathology students on rural clinical placement provided speech, language and communication screening, assessment and therapy to	Research question: does the provision of a service-learning model of care improve communication outcomes in children? There is no firm evidence for the hypothesised improvements in communication skills and	122 children - in 2014, who began primary school in Broken Hill were referred for screening – 55% of the estimated primary school intake of 220 children that year.	At screening, most children had delay in one area (speech 34%, language 17% and phonological awareness 5%) and 44% had delay in multiple areas. After 1 year's therapy, 17% had reached an age-appropriate standard in speech, language and communication skills and required no further action; 48% had mild delay/disorder; 25% had moderate delay/disorder; 10% had severe delay/disorder.

		children starting kindergarten. The students collected service outcome data for children in the program.	educational outcomes for school pupils as a result of the service-learning program. This paper describes the design and delivery processes of the Broken Hill speech pathology student-led clinics and reports the service impact of the program.	Children screened individually in a room at the school outside the classroom.	Of the 101 children needing further action, 71 had deficits in speech, 59 in language and 29 in phonological awareness. 82% with delay in one area had a mild problem compared with only 25% of children with multiple problems. Outcome data demonstrated improvements in communication impairments for approximately 25%. Clinical-based service-learning programs can address gaps in service availability under specific circumstances and deliver acceptable and accessible care while working effectively in collaboration with established services. This program is a comprehensive evidence-based service designed to meet the dual goals of addressing primary school pupil communication deficits and providing speech pathology students with a fruitful learning experience. Could be implemented in other locations and revolutionise undergraduate student learning placements, as well as address the chronic health professional shortage in rural Australia.
Woodward, G.	2014	Mixed methods - after 6-month implementation phase, an evaluation survey containing 20 questions (quantitative and qualitative) was mailed to 445 (64%) of the NSW addresses who had received the book.	An evaluation was conducted by BN&D students to: 1. Assess the usage of the book. 2. Determine the level of client involvement. 3. Identify any improvements to be made.	N = 61 (low response rate of 14%) mainly group home carers, provided feedback on the cookbook	Rated very positively - with 87% using the recipes regularly. Simple instructions and visual aids were appreciated, enabling 85% of responding carers to involve clients in mealtime activities on a weekly basis. Carers reported that clients' nutrition, independence, ability to make their own meal choices, cooking participation and quality of life, all improved since using the cookbook. Practical improvement suggestions: dividing book up into separate sections to reduce bulk/weight and providing texture modification instructions for suitable recipes.
Playford, D.E., Lines, A.	2013	Mixed methods - impact of "Country Week" on	To assess health sciences students' understanding of	26 final year undergrad students in	Students' perceptions of community care and PHC principles qualitatively changed following

		students' understanding was assessed through discussions during workshops and pre-post surveys from the 2003 "Country Week" cohort.	primary health care principles and to examine the impact of immersion in rural community practice on their grasp of the practical significance of these principles.	from nursing, physio, pharmacy, OT, speech therapy, dietetics, health promotion, social work and medicine, representing UWA, Curtin Uni and Edith Cowan Uni.	immersion: their definition of 'health' broadened; they grasped the practical meaning of 'access', recognising that not all people are equally served in a community; and their views of 'community' as a target of programs shifted so they understood the necessary role of community in effecting its own sustainable health care programs. A single week of community care immersion, towards the end of students' degrees, in which students related to individuals and organisations in the country, made an unexpectedly significant educational contribution towards bridging the gap between populations most needing and benefitting from PHC and students preparedness to care for them as new graduates in the healthcare workforce. It illumined the essentially collaborative nature of community-based primary health care and encouraged students to consider one another as well as the community as essential partners. This development of understanding was consistent with new graduates' being better equipped to understand and address the impacts of difference and disadvantage in their clients' lives.
O'Sullivan, B., McGrail, M., Russell, D., Walker, J., Chambers, H., Major, L., Langham, R.	2018	Quantitative - cross-sectional and longitudinal - outcome of interest - graduate's main work location, from APHRA website. Associations between duration and setting of any rural immersion they did during the medical degree and (i) working in a rural	To explore associations between various durations and settings of rural immersion during the medical degree and whether doctors work in rural areas after graduation.	Overall, 2412 (2126 domestic and 286 international student) graduates registered and working in 2017 and included in the study. Eligible participants were medical graduates of Monash University 2008 - 2016 in	The adjusted odds of working in a rural area were significantly increased if students were immersed for one full year, for between 1 and 2 years and for 2 or more years relative to no rural immersion. Strongest association was for immersion in a mix of both regional hospitals and rural general practice, followed by immersion in regional hospitals only and rural general practice only. More than 1 year's immersion in a mix of regional hospitals and rural general practices was associated with

		area and (ii) working in large or smaller rural towns, in 2017.		postgraduate years 1-9, whose characteristics, rural immersion information and work location had been prospectively collected.	working in smaller regional or rural towns (<50 000 population). Rural medical schools may improve outcomes by considering longer duration and a mixed range of settings of immersion as part of program planning - longer rural immersion and immersion in both regional hospitals and rural general practices are likely to increase rural work and rural distribution of early career doctors.
Walters, L., Seal, A., McGirr, J., Stewart, R., Dewitt, D., Playford, D.	2016	Quantitative - questionnaire - Medical students completing an RCS placement in 2012 and 2013 Data analysed to compare medical students for whom the RCS was their first choice with students who described the RCS as other than their first preference. Using Federation of Rural Australian Medical Educators (FRAME) data	To describe the association between a medical student's selection preference and their RCS experience and rural career intent.	440 and 652 responses to the 2012 and 2013 FRAME questionnaires respectively (1092 participants)	Students for whom RCS was their first choice (724/1092) were significantly more likely to be female, from a RB and be from an undergrad program. These students reported more positive experiences of all aspects of the RCS program (costs, access, support and networks, safety) and were 2.36 times more likely to report intentions to practice in a nonmetropolitan area - true for students of rural and metro backgrounds. 68.8% in first-choice group intended to practice in a regional area (not a capital or major city), significantly higher than 48.4% in other group. Preference for RCS is significant factor in predicting students reported positive experience during RCS training. Extent to which reported positive experience is related to objective differences in support requirements or confirmational bias yet to be explored. Entrance preference could be a significant factor in students' subsequent workforce choices. RCS can cement interest in rural practice in students who did not initially preference RCS attendance. First-choice students significantly more positive than other-preference students in expressing a rural career intention - for pre-vocational as well as vocational training. Highlights priority to

					ensure first-preference students are provided with opportunity to participate in RCS training. Value to identify other-preference students and their specific social support needs, to proactively facilitate more positive perception of rural career. Decision to choose RCS placement is marker of RPI and positive rural training experience for students of both rural and metro backgrounds.
Craig, P.L., Barnard, A., Glasgow, N., May, E.	2014	Quantitative - questionnaires - debriefing questionnaire, Interprofessional Education Perception (IEPS) and Team Performance (TPS) scales.	To report on the initial stages of an evaluation of a rural-based IPL intervention using the modified Freeth/Kirkpatrick's 4-level evaluation model.	69 student participants of 33 IPL teams during the evaluation period included	IEPS scores increased with participation. TPS showed a statistically significant difference between teams and a trend toward agreement with audience perceptions of team performance. The evaluation demonstrated positive short-term outcomes suggesting benefits of this applied approach in preparing students to work interprofessionally.
Khalil, H., Leversha, A., Walker, J.	2015	Quantitative - cross sectional design - questionnaire - developed for undergraduate pharmacy students, adapted from various validated questionnaires used in the medical literature and by other health professionals. Participation was voluntary and anonymous.	To evaluate an innovative rural pharmacy placement program targeted at influencing students to work and live in rural areas after graduation. A secondary aim of the study was to explore the students' intentions to come back and practice in rural areas as a result of their involvement in the rural pharmacy program.	57 responses were returned (response rate = 98%) third and fourth (final) year pharmacy students undertaking their rural placement in the Gippsland region, in rural Victoria in 2011 and 2012	Understanding pharmacy practice from a rural perspective, visits to rural health professionals and sites and the attitude of their preceptors were essential to their satisfaction with their rural placements. 72% intend to seek employment in rural areas if opportunities arise as a result of their increased rural awareness. Key components for a successful rural placement program: social awareness, recognising job opportunities and interprofessional learning. Future research - a tracking study of all pharmacy students who undertook rural placement and their long-term job locations after graduation – to determine the true benefit of rural placement programs and students' past experiences in rural areas.
Barnett, T., Walker, L.E., Jacob, E.,	2012	Mixed methods - cross-sectional, design - clinical	To map and describe how student placements were	N = 51	Teaching and supporting students was regarded as an important part of the service each hospital

Missen, K., Cross, M.D., Shahwan-Akl, L.		placement data from 2009 - comparative analysis - numeric data on student placements mapped on a spread sheet. Information about managing placements, constraints to and opportunities for expanding capacity obtained from each informant through a structured 20–45-minute interview. Focus group convened with informants at each hospital, where the major findings from placement mapping exercise and interviews were presented - involved 9 to 11 participants	organised and managed at three rural hospitals and to identify opportunities that could build capacity for clinical placements and interprofessional learning (IPL).	3 hospitals in rural Victoria - each site, persons responsible for organisation of student placements within each discipline were identified by CEO or delegate and invited to contribute to the study. At some sites, a discipline group was represented by more than one person.	provided and a useful staff recruitment strategy. Peaks and troughs in student load over the year, this was less marked for medicine and dentistry than for nursing and allied health disciplines. Placements managed largely on a discipline basis, each hospital had taken steps to communicate information about student placements across disciplines and identify opportunities for interprofessional education (IPE). Genuine collaboration between professions and universities is essential if more students are to be safely and effectively accommodated for placement in hospitals – if not, universities and other stakeholders will compete for finite and limited placements displacing Peta to place Paul. Placement capacity could be increased by sharing placement data within hospitals, smoothing utilisation patterns across the year, capitalising on opportunities for IPE when there is concurrent placement of students from different disciplines, and through better employment of underutilised clinical areas.
Bonney, A., Albert, G., Hudson, J.N., Knight-Billington, P.	2014	Qualitative - semi-structured interviews - thematic analysis - A template approach was used for analysis of transcripts	To investigate the experience of students undertaking a LIC from the perspective of ‘belonging’, in order to identify areas for improvement.	13 Students from a regional medical school undertaking a LIC	3 themes: academic leadership, external (general practice) environment and intrinsic (student) factors. Optimally, a synergistic relationship between factors resulted in a sense of belonging, which created a rich learning environment for students and motivation to return to a non-metro community for clinical practice. Perspective of general practice placement, there is a complex interaction of factors resulting in a positive or negative LIC experience. No single factor/player stood alone; rather quality of interactions between the GSM, practice, community, GP

					preceptor and student were involved in the individual response. Academic leadership role in facilitating geographically distributed medical curricula warrants research. Supports concept of highly dynamic interaction between factors determining student LIC experience. Individual nature of learners and learning contexts require multi-level academic leadership.
Leversha, A., Stewart, K.	2016	Quantitative - survey - Two questionnaires relating to the practical experience placements (PEPs) were completed by students during their final year of undergrad study. First questionnaire conducted prior to hospital pharmacy selection and second one after that selection process. Questionnaire was specifically developed, piloted with an earlier cohort.	To identify factors that influence Monash pharmacy students' choice of site for their intern training.	107 4th-year students in 2012 - Monash University Studies Online (MUSO) site for the PEP unit. 208 students enrolled to undertake PEPs. Response rates to questionnaire 51.9% (April) and 50.0% (October), 33.5% reporting they had responded both times	Almost two-thirds stated that the expectation of a good internship experience was their reason for choosing their site. Previous or ongoing employment at chosen site was influential. About three-quarters listed being close to home or university (the site of the training seminars) as a reason for choosing site location. Most respondents identified PEPs influenced choice of placement site (April 91.9%; October 86.1%), and most felt they were a major or moderate influence (April 83.7%; October 76.0%). Of those nominating the most influential site, 69.2% (April) and 76.8% (October) agreed on metro hospitals. When asked if they had gained information or experience from PEPs that influenced their choice, both cohorts nominated clinical experience (84.0% April; 84.1% October), information about intern training program offered by the site (62.7%; 56.5%) and pharmacy team perspectives (49.3%; 59.4%) as most influential factors. Influences not necessarily positive; however, questionnaire did not address this. Future research - clarify extent and nature of negative influences. In addition to their primary purpose as an educational tool, PEPs have an overall strong influence on students' internship site preferences, with metro

					hospital placements being the major influence. This assurance should encourage placement sites and preceptors to continue and improve their involvement with the PEPs.
Bentley, M., O'Sullivan, B., Russell, D., McGrail, M., Sampson, M., Warrington, A., Wallace, G., Couch, D.	2019	Quantitative - multivariate analysis of the 2016 MABEL survey	To explore the factors related to rural general practitioners (GPs) supervising general practice registrars.	941 rural GPs - median age 49 years, 62.8% male, 93.2% in accredited practices. Of these, 528 were currently supervising registrars.	57.8% of rural GPs were supervising registrars. Supervising strongly related to being Australian trained, working in a larger practice, and supervising medical students and interns. First multivariate model, included GP characteristics, showed relationship between practice location and supervising registrars was similar to univariate results. Second model included practice factors, the practice factors, rather than location, had strongest associations with supervision. Final model, also included practice teaching activity, strongest associations with supervision were working in a practice with a greater number of GPs and supervising medical students and interns/prevocational doctors. Additionally, GPs in later career, those who were Australian-trained or Fellowed IMGs, and those working moderate extra hours in other community settings were significantly more likely to supervise registrars. Rural supervising capacity could be increased through supporting GPs in smaller practices to engage in supervision and maintaining the strong involvement of GPs in larger practices. Other factors - greater number of Australian-trained graduates working in rural general practice and increased support for IMGs to Fellow and feel confident to supervise.
Page, A.T., Hamilton, S.J., Hall, M.,	2016	Mixed methods - pre and post questionnaires (including Likert and	To report on the evaluation of an Academic Bush Camp, which sought to	N = 10 completed post-camp questionnaire. Six	12 academics from 5 WA universities and seven health disciplines attended. 9 had previously lived or worked rurally. Camp met participants'

Fitzgerald, K., Warner, W., Nattabi, B., Thompson, S.C.		open-ended questions), and semi-structured interviews six months later - situated learning theory - multiphase evaluation - collection of demographic details at. Main outcome measure: whether the camp met participants' expectations, and their knowledge about and interest in WACRH's programs	build relationships and showcase innovative rural learning opportunities. The camp started and finished in Geraldton, WA and was centered in Mt Magnet, WA a remote town 600 kilometres northeast of Perth	months after the camp, 10 of the 12 (83%) participants were interviewed. WACRH invited allied health and nursing academics and clinical placement coordinators from WA universities. 12 participants attended representing all 5 WA universities and 7 health disciplines (physiotherapy, speech pathology, pharmacy, social work, nursing, public health, and teaching and learning). 11 were female.	expectations, and all would recommend opportunity to a colleague. Many valued the interaction with community and clinical placement partners and would have preferred more of this. Camp increased awareness of WACRH's programs and benefits of longer rural placements and a service-learning environment. 6 months later, participants' familiarity with WACRH's placement model, supports and staff had led to an enhanced willingness to place students. High-quality rural student placements encourage consideration of working rurally after graduation. To encourage student participation in rural clinical placements, important that metropolitan academic staff are aware what exists in rural areas, including logistical and pastoral support and clinical supervision that UDRHs provide during rural-based programs. Camps - effective to increase awareness of rural clinical placements opportunities; form an additional strategy to increase teaching academics' awareness of rural health issues and to encourage students to undertake rural placements. Findings highlight previous work on importance of embedding rural health learning in campus-based coursework delivery and linking this with rural placement opportunities. Rural academics can influence RPI by demonstrating the infrastructure, learning and academic support available. Camp experience increases metropolitan academics' awareness of rural placement programs and willingness to encourage student participation. RB participants appeared more receptive to rural learning possibilities.

Smith, T., Sutton, K., Pit, S., Muyambi, K., Terry, D., Farthing, A., Courtney, C., Cross, M.	2018	Quantitative - cross-sectional survey - 21 core questions used by all UDRHs. 11 UDRHs across Australia support students' placements in regional, rural and remote locations. Key dependent variables were placement satisfaction and rural practice intention. Descriptive variables were age, gender, Aboriginal or Torres Strait Islander background, location of placement, healthcare discipline, year of study and type and length of placement.	To profile students undertaking placements at UDRHs and investigate factors affecting students' satisfaction and intention to enter rural practice.	3328 Medical, nursing and allied health students who participated in UDRH placements between July 2014 and November 2015 and completed the questionnaire. The sample was predominantly female (79%), the mean age was 26.0 years and 1.8% identified as ATSI.	69% placements were >2 but ≤12 weeks, 80% in MMM 3, 4, 5. Public hospitals and community health made up 63% of placements. Students satisfied with their placement had 2.33 higher odds of rural practice intention. Those satisfied with Indigenous cultural training, workplace supervision, access to education resources and accommodation had higher odds of overall satisfaction and post-placement rural practice intention. Further investigation - the effect of duration and frequency of rural exposure and cumulative effect of multiple rural placements, not only on RPI but on actual employment in rural health. 'Threshold level' of rural exposure is undefined and may vary between individuals and disciplines, some disciplines having shorter placements than others. Will be targeted in future, longitudinal studies undertaken across the UDRH network, in collaboration with other stakeholder organisations. Most students highly satisfied with placement and support provided by rural clinicians and UDRHs. UDRHs well placed to provide health students with highly satisfactory placements fostering RPI.
Gum, L.F., Richards, J.N., Walters, L., Forgan, J., Lopriore, M., Nobes, C.	2013	Qualitative - focus groups and reflective writing exercises - data was analysed in relation to the students' thoughts and reflections around professionalism, teamwork and collegial relationships.	To explore the experiences of health professional students involved in an IPL program during a longitudinal rural placement.	5 students from 2010 IMMERSe program - 2 final-year students Nutrition and Dietetics (N&D), 1 final year student Speech Pathology and 2 students Paramedic Program (PP) (1st year level) took part in the pilot	Three themes: (1) interprofessional interactions with other students; (2) interprofessional interactions with other health professionals; and (3) interprofessional interactions with the community. Students demonstrated a new level of respect for health professionals outside of their discipline and gained a sense of how their own independent roles can blend or partner with others' roles, to draw on each other's expertise. Sustaining a program like this requires IPE to be embedded into each of the course's curricula as

				of IMMERSe program. Partnership with CHSA and South Australian Ambulance Service, FU students placed in Mt Gambier's regional services under clinical supervision.	opposed to being just an 'opportunity'. Student learning experiences can be enhanced through engagement and integration in a rural community context. Interprofessional learning in a rural community placement can increase students' understanding of professionalism, teamwork and collegiality, which are all important components of collaborative practice. Reflective journaling is a useful method for evaluating the student experience.
Smith, M., Lloyd, G., Lobzin, S., Bartel, C., Medlicott, K.	2015	Mixed methods - developmental evaluation Feedback from students - weekly debriefs via questionnaire at end of placement and during placement activities. Clinical facilitators - team meetings - reflect on project aims and progress. Clinical staff - feedback sought during staff development sessions, ward meetings and senior staff meetings. Survey circulated every 6 months to clinical venues. Steering committee views were sought at bimonthly meetings and more frequently if necessary.	To report on a quality improvement project aimed at increasing the number of placements for students and the development of a quality clinical facilitation model that could continue when project funding ceased	not reported - students, the clinical facilitation team, nurses and midwives and the project-steering committee.	Placement targets were met, and all health services involved chose to continue the model of clinical facilitation developed after project funding ceased. Clinical education skills developed by staff under project remain in region to support future students. In 2014, post-project opportunities for staff to act in part-time clinical facilitation roles with funds from education providers have continued. Inability of higher education system to guarantee consistent supply of students to some venues has impacted on staffing clinical facilitation. Staff can only be released to undertake clinical facilitation if enough students are allocated - created some rostering issues in a small venue. Clinical facilitation model could be rolled out more widely. It is possible to create a sustainable, high-quality, rural placement experience for larger numbers of nursing and midwifery students. Funding sources are available to continue clinical facilitation model, but for it to work optimally, a steady supply of students across the year is required.

Moore, M., Bennett, P., Bolte, K.	2012	Mixed methods - survey with free comments and focus group. Survey post workshop - all attendees not compulsory. Qualitative evaluation of the program at end of semester 1. Thematic analysis.	To provide an overview of the ENRICH program and report evaluation results.	not reported - students in the ENRICH program	For semester 1 - 2011, all sessions 90% or more of students felt their learning objectives were met, workshop was appropriate and enjoyable, and would recommend the workshop to others. ENRICH program puts issues of life and practice in a rural community firmly on agenda of BHUDRH students. Gives them an experience of the depth of a rural community they might otherwise not be aware of and promotes teamwork through interprofessional education. Another strategy for encouraging students to return to rural work.
Le, Q., Yue, Y.	2013	Mixed methods - questionnaires and semi-structured interviews	To identify a variety of barriers obstructing international tertiary students' positive social contacts in an Australian regional area; to investigate the relationships between the international students' demographics and social contacts; and to examine the relationship between the international students' social contacts and their psychological wellbeing.	341 questionnaire, 20 interview international students recruited through the University International Offices	Cultural differences, inadequate language competency, intercultural understanding, religion, psychological worries, and racial discrimination are 6 salient barriers obstructing international students' positive and effective social interaction. Limited contact with local community significantly associated with international students' negative emotions (homesickness, loneliness, anxiety and depression); and demographic factors (age, gender) not significantly related to their social engagement - length of stay and English proficiency in host country have significant impact. Current/prospective international students should pay attention to increasing cultural sensitivity and developing cross-cultural awareness. Cultural differences and resulting cultural misunderstandings/conflicts occur within cross-cultural communication and contact. Should concentrate on improving cultural competence through professional education and training, improving target language proficiency and extending experiences

					in target culture. Host country/institute recruiting students should pay more attention to international students and provide more effective support to assist them in adapting to new environment.
Jones, D., McAllister, L., Lyle, D.	2015	Qualitative - pragmatic - Data analysed using a constant comparative method - students participated in interprofessional focus groups. Academics participated in semi-structured individual interviews.	To gain a holistic understanding of program impact and outcomes from multi-dimensional perspectives.	4 OT and 6 SP students – representing all potential participants. 1 rural academic with direct supervision of students, and 1 metropolitan academic with a strategic role in the program	Students had experienced either no previous interprofessional practice exposure, or exposure that effectively enhanced student understanding of teamwork practice; 2) student participation in the program enhanced continuity of care through the 'team continuum' and capacity to practice interprofessionally. Lessons learnt from this rural program have influenced the practice of a metropolitan university.
Daly, M., Kumar, K., Perkins, D., Roberts, C.	2013	Qualitative - semi-structured interviews were analysed using framework analysis - data interpretation was informed by the theory of social learning systems (SLS)	To theoretically illustrate the pedagogical and socio-cultural underpinnings of student learning within a longitudinal, integrated, community-engaged rural placement.	total n=34, GPs = 8, health clinicians = 10, medical students = 16 participating in a longitudinal rural placement program	Students participate in an SLS with distinct yet interrelated learning spaces that contain embedded communities of practice (CoPs). Spaces characterised by varying degrees of formality, membership and interaction, and different learning opportunities and experiences. Situated within and shaped by a unique geography of place comprising the physical and social features of placement setting. Within learning spaces, students acquire clinical knowledge, skills and competencies, professional attitudes, behaviours and professional values. Process of connectivity helps explain how students access and cross boundaries between learning spaces and develop a more complex sense of professional identity. LIC placement models can be understood as SLSs comprising synergistic and complementary

					learning spaces, in which students engage and participate in multiple CoPs. Occurs in a context shaped by unique influences of geography of place. Engagement provides range of student learning experiences, which contribute to clinical learning and development more sophisticated professional identity. Range of pedagogical and practical strategies embedded within this SLS to enhance student learning.
Brown, L., Smith, T., Wakley, L., Wolfgang, R., Little, A., Burrows, J.	2017	Mixed methods - series of surveys and an individual in-depth semi-structured interview (results not reported in this study).	To evaluate allied health students' experiences of their short-term, medium term, or long-term rural placement and to follow their career outcomes.	198 students completed 257 end-of-placement surveys as of June 2014 Students from 6 allied health degree programs undertaking placements in Tamworth and Taree.	72.7% reported intention to work rurally after placement. 55% of the 92 students who had never lived in a rural area had a more favourable attitude towards working rurally following placement. After 1 year, 50% of graduates were working in rural or remote location, compared to 23.7% of all graduates from these disciplines. Preliminary findings indicated a positive perception of rural placement experience and impact on intention to work rurally/rural location, particularly those who had not previously spent time in a rural area. Future research - investigate longer-term workforce outcomes and impact on rural health workforce.
Jones, D., Grant-Thomas, D., Bourne, E., Clark, P., Beck, H., Lyle, D.	2011	Quantitative – data from student led clinics	To report on a novel clinical education model structured around student-run clinics in the primary schools.	231 primary school aged children, including 167 from kindergarten (93% of enrolments) were assessed in 2010.	58% of kindergarten children had a speech pathology intervention. The number of new referrals on the speech pathology service waiting list decreased from 250 clients in September 2009 to eight in September 2010. Both formal and informal feedback from speech pathology students, teachers, parents and health staff about the program has been positive and three students have already returned for an 'adult' placement in Broken Hill. A formal evaluation of the program is planned.

Somers, G.T., Spencer, R.J.	2012	Quantitative – prospective controlled quasi-experiment using self-paired scores on the SOMERS Index of rural career choice likelihood, before and after 3 years of clinical rotations in either mainly rural or mainly urban locations.	Do undergraduate rural clinical rotations increase the likelihood of medical students to choose a rural career once pre-existent likelihood is accounted for?	58 undergraduate-entry medical students (35% of the 2002 entry class). Monash University medical school	Overall decline in SOMERS Index score (22%) and in each of its components (12–41%). Graduating students who attended rural rotations more likely to choose a rural career on graduation; however, at entry, students choosing rural rotations had an even greater SOMERS score. Self-paired pre–post reductions in likelihood were not affected by attending mainly rural or urban rotations, nor were there differences based on rural background alone or sex. Rural rotations are an important component of undergraduate medical training, however nature of students choosing to study in rural locations rather than experiences during course is greater influence on rural career choice. To improve rural medical workforce, medical schools should attract more students with pre-existent likelihood to choose a rural career. SOMERS Index was found to be useful tool for this quantitative analysis.
Campbell, D.G., McGrail, M.R., O'Sullivan, B., Russell, D.J.	2019	Quantitative - information about training location(s), and duration, type and timing of training was prospectively collected from university admin systems. Outcome of interest was main work location in 2017, obtained from the AHPRA public website.	To explore the workforce outcomes of LIC model of placements delivered in year 4, the penultimate year of the medical course, as part of the rural programs delivered by a medical school in Victoria. To compare the work locations (regional or more rural), following registration as a medical practitioner, of medical students who had completed 1 year of the LIC, with, first, students	Study participants commenced their medical degree after 2004 and had graduated between 2008 and 2016 and were in postgraduate year 1–9 in 2017 when evaluated.	Students who had undertaken year 4 LIC along with additional rural training in years 3 and/or 5 were more likely than all other groups to be working in smaller regional or rural towns, where workforce need is greatest. Non-LIC training of similar duration in rural areas was significantly associated, but more weakly, with smaller regional work location. Students whose only rural training was the year 4 LIC were not significantly associated with smaller regional work location. Overall, after accounting for both LIC and non-LIC rural training exposure, rural work after graduation was consistently positively associated with rural background, being an international student and having a

			who had other types of rural training of comparable duration elsewhere, and second, students who had no rural training.		return of service obligation under a bonded program as a student. Demonstrates value of rural LICs, coupled with additional rural training, in contributing to improving Australia's medical workforce distribution. Provides evidence that expanding this model of rural undergraduate education may lead to a better geographically distributed medical workforce.
Morrison, J., Clement, T., Nestel, D., Brown, J.	2015	Qualitative - semi-structured interviews with purposively sampled supervisors, registrars and practice managers from regional general practice settings. Data analysed using template analysis.	To examine supervisors', registrars' and practice managers' perceptions of ad hoc supervisory encounters.	n = 15	Perceptions of ad hoc encounters were reported under the categories of immediacy, safety, education, professional identity and supervisor stress. Ad hoc encounters in general practice registrar training are highly valued for supporting patient safety and registrar education. The encounters serve a range of practical purposes for supervisors, registrars and practices, and warrant further exploration on how to optimise their benefits within general practice.
Page, A., Hamilton, S.	2015	Qualitative - students' daily reflections and detailed postplacement reflection analysed using thematic/content analysis	To explore the students' perception and reported experiences of the pilot non-traditional rural placement.	5 pharmacy students (2 male, 3 female) had a two-week non-traditional rural placement, and experienced a variety of rural health activities and professionals	4 themes: learning about and from other health professionals, discipline-specific learning, consumer-specific learning, and rurality. Students developed an increased appreciation and understanding of roles of allied health professionals and nursing staff. Understanding of pharmacists' role in health care team improved. Common theme - consumer-specific factors and importance of clear communication. Appreciated need for clear communication, particularly regarding Aboriginal peoples and those with increased care needs. Students reflected on flexibility and diversity of rural health workforce, reduced rural health services and workforce compared to metro regions. Students' knowledge of other health

					professionals, pharmacists, and consumers as a result of placement. Students connected interprofessional and consumer observations to their discipline-specific learning.
Kirschbaum, M., Khalil, H., Talyor, S., Page, A.T.	2016	Mixed methods – survey	To describe the effect of rural placements and rural background on pharmacy students' intention to practice rurally.	156 (250 pharmacy students)	68% female, 74% aged 20–24. 32% had RB, and 53% had undertaken a clinical placement. RB students more likely to work in rural areas than urban after graduation. When both rural and urban background students undertook a rural placement - no difference in rural career intentions. 93% considered rural placements as beneficial to their training. Major barriers to rural practice: standards of healthcare and social isolation features. Facilitators: increased patient interaction and community engagement. Rural exposure (RB or rural placement) can positively affect students' intentions to participate in rural workforce regardless of their background. Students have a desire to understand rural health and are likely to consider a rural career.
Leys, J., Wakely, L., Thurlow, K., Page, R.H.	2017	Quantitative - patient demographic, diagnostic and treatment data were recorded for each occasion of service from January 2013 to May 2015. Diagnostic data were classified into either hard tissue (fracture), soft tissue (sprains or strains) or other (such as a mobility assessment). Further classified into the body part affected for example the	To explore physiotherapy students in a rural emergency department (ED) exposure to a range of conditions and their impact on patient flow.	Since 2009, 123 3rd and 4th year physiotherapy students have completed a placement in the rural EDs. Students from the University of Newcastle who undertook an ED placement at Tamworth Rural Referral Hospital or Manning Rural Referral Hospital	Physiotherapy students' case-mix involved a variety of musculoskeletal and orthopaedic conditions including 36% hard tissue injuries, 60% soft tissue injuries and 4% other injuries. Patients aged from 1 year to over 100 years. Physio students in rural ED managed range of mainly acute musculoskeletal issues in ED yet did not impact on the time it took to care for patients. Rural ED provides an appropriate case-mix where students gain experience managing a range of conditions common in physiotherapy practice. ED is a suitable physiotherapy placement setting that is possibly underutilised, particularly in rural areas due to the broader case load often seen in these departments. Further

		shoulder or ankle.		were included in the study.	research - to investigate student and staff experiences of these placements and cost and quality of the care provided.
Fatima, Y., Kazmi, S., King, S., Solomon, S., Knight, S.	2018	Mixed method – survey - repeated cross-sectional study conducted January 2014 to December 2017 - students' sociodemographic factors, discipline, placement experience, placement satisfaction, and rural/remote practice intentions collected. Qualitative data - thematic analysis	To identify the constituents of positive placement experience and explore the association between positive placement experiences and rural and remote practice intentions.	N = 873 Medical, nursing, dentistry, and allied health students who completed a rural/remote placement	70.06% female, median age of 22 years, and 44.46% were medical students. Students satisfied with placement were 2.10 times more likely to RPI than their counterparts. Of all components of rural/remote placement experience, satisfaction with placement supervision had highest impact on changing students' rural/remote practice intentions from negative to positive. Major themes: wide variety of experience and hands-on learning opportunities; multidisciplinary exposure at home and workplace; support from the local UDRH; learning of indigenous culture; experiencing challenges of rural health care services. Strong association between positive placement experience and future rural/remote practice intentions. Facilitation of positive placement experiences in remote and rural locations could be key strategy in addressing rural health workforce maldistribution.
Cross, M., Sculthorpe, J., Barnett, T., Dennis, S.	2017	Qualitative - participatory action project undertaken in 2014-15 in Tasmania. Data for the informational content, actioning of images and video-clips were gathered during face-to-face discussions at each Aboriginal Health Service (AHS).	To report on the co-construction of a virtual web-based platform to enhance the preparation of health care students for placement in Aboriginal health settings	N = not specified Participants were an Aboriginal community controlled organisation, its Aboriginal Health Services and rural health academics at an Australian university.	Virtual orientation tours of 3 Aboriginal Health Services were viewed 1,500 times within 12 months of being uploaded online in 2015. Collaboration was central to producing a mutually-useful, culturally-informed online resource that met the needs of placement and education providers for preparing students for placements in Aboriginal health. Partners and faculty that manage undergraduate placements valued the consistency, reach and flexibility the tours afforded. Co-constructed virtual orientation tours provide a resource effective

					way for placement and education providers to augment the practical, cultural and ethical preparation of students for placement in Aboriginal health. Providing all health care students from any education provider, timely and flexible access to virtual tours of Aboriginal health services can demystify these services, attract interest in-context and begin orientation prior to arrival.
O'Sullivan, B., Russell, D., McGrail, M., Sampson, M., Warrington, A., Wallace, G., Bentley, M., Couch, D.	2019	Quantitative – 2016 MABEL study	To explore the factors related to rural general practitioners (GPs) supervising general practice registrars.	1241 (14%) clinically active GPs working in rural Australia in 2016.	57.8% of rural GPs were supervising registrars. Supervising was strongly related to being Australian trained, working in a larger practice, and supervising medical students and interns. Rural supervising capacity could be increased through supporting GPs in smaller practices to engage in supervision and maintaining strong involvement of GPs in larger practices. Other important factors may include a greater number of Australian-trained graduates working in rural general practice and increased support for IMGs to Fellow and feel confident to supervise.
Taylor, S.M., Lindsay, D., Glass, B.D.	2019	Mixed methods - sequential approach - questionnaire and semi-structured in-depth interviews. Main outcome measures: university curriculum and clinical placements during the degree and their influence on the current rural workforce.	To explore the influence of a university rural curriculum and clinical placements on pharmacists' choice to practise in a rural or remote area.	92 pharmacists from varied areas of practice, working in rural and remote locations across Australia, participated in the study. 42% were working in a remote location, 43% of whom had been working in a rural area for longer than 10 years. Participants	Two thirds of current rural pharmacy workforce's choice of practice location were significantly influenced by positive rural placement experiences. Rural practice was, however, not included in the curriculum for 50% of sample rural workforce, although graduates from regional universities experienced up to 80% more exposure to rural curricula. Rural origin was not found to be significant determinant of rural practice. Rural lifestyle, family commitments, remuneration, career opportunities and other contractual agreements have had a greater influence than university education. Although the positive influence of

				(65%) were women and approximately half were working in community pharmacy.	rural placements has been identified, still require development of a meaningful rural curriculum. Highlights that universities have a role in addressing this issue to produce graduates who are better prepared for opportunities and challenges of rural pharmacy practice.
Birden, H.H., Wilson, I.	2012	Mixed methods - survey, modified from a validated instrument, and focus group. Class ranking of students, and changes over the time of their placement, were also examined.	To examine the experience of the first-year cohort of the University of Western Sydney (UWS) Medical School long-term rural placement students.	21 students undertaking a rural placement in their final year of the UWS medical program	Students very pleased with their rural experience, both clinically and socially. Rural experience more comprehensive than they had expected. Stronger learning experience in most aspects than they expect they would have received in a metropolitan area. Smaller realm of medical world in a rural area considered an advantage in providing more hands-on experience and interprofessional team approaches to healthcare provision. Drawback: more advanced cases of all kinds were sent to metro hospitals. Between their ranking end of Year 3 exam and exam in middle of Year 5, during which students undertook year-long placement, 14 of 22 students increased class rank, 2 no change and 6 decreased class rank. Rural cohort advanced 4.2 places compared to urban-placed peers. Curriculum content regarding Aboriginal health should emphasise complexity of culture and range of living conditions that makes up Aboriginal Australia avoiding 'deficit-based perspective'. Rural long-term placements are at least as effective, and may be more effective, than metro hospital placements as a means of providing clinical education to medical students in senior years.
McGrail, M.R., O'Sullivan, B.G., Russell, D.J.	2018	Quantitative – longitudinal tracking study - outcome was rural	To investigate the rate at which medical students who have trained for 12	2800 graduates in the study period, 2451 were observed	15% graduates working rurally, 25% working in same region where they did rural training. 24% were working in same region where they

		region of work, based on 2017 work location postcode for graduates spanning 1–9 years post-graduation, for Monash medical program in Victoria. Region of rural training combined with region of secondary schooling and duration of rural training was explored for its association with region of practice.	months or more in a rural region return to practice in that same region in their early medical career. Secondary aim: to investigate whether there is an independent or additional association with the effect of longer duration of rural exposure in a region (18–24 months) and for those completing both schooling and training in the same rural region.	working in 2017 with those missing mostly being international students. The number of observations reduced from 2451 to 1388 (43% attrition) with the addition of school location.	completed schooling. Longer duration (18–24 vs 12 months) of rural training and completing both schooling and training in same rural region were associated with returning to practice in same rural region after training. Medical graduates practising rurally in their early career (1–9 years post-graduation) are likely to have previous connections to the region, through either their basic medical training, their secondary schooling, or both. Social accountability of medical schools and rural medical workforce outcomes could be improved by policies that enable preferential selection and training of prospective medical students from rural regions that need more doctors, and further enhanced by longer duration of within-region training.
O'Sullivan, B., McGrail, M., Major, L., Woodfield, M., Holmes, C.	2019	Quantitative – longitudinal tracking study	To examine rural work location outcomes of an Extended Rural Cohort (ERC) program in medical school. Students nominate a preference and are contracted to the program at entry to the medical course, involving 2–3 years continuous rural training.	2412 graduates from Monash University medical school cohort study	Students who entered medicine with ERC as first preference commonly had RB (95.5%) compared with second/lower preferences (61.5% and 40.4%, respectively). ERC participants more likely to work rurally, though higher odds were associated with lower preference for ERC. Non-ERC students undertaking a similar duration rural training by opting for this "year by year" after course entry, had strongest odds of rural work and work in smaller rural towns. ERC attracts RB students and increases rural work outcomes. However, students choosing a rural training path of equivalent duration after course entry may be more effective and improve rural workforce distribution.
Smith, T., Cross, M., Waller, S., Chambers, H., Farthing, A.,	2018	Qualitative - open-ended survey questions analysed using two independent methods applied	To provide an understanding of the lived experiences of students undertaking placements in	3,204 students from multiple health professions and universities	Core concept: "ruralization of students' horizons," a construct representing the importance of preparing health professional students for practice in nonmetropolitan

Barraclough, F., Pit, S.W., Sutton, K., Muyambi, K., King, S., Anderson, J.		concurrently: manual thematic analysis and computerized content analysis using Leximancer software.	various nonmetro locations across Australia. Provides insight into factors contributing to positive and negative experiences that influence students' future RPI, and suggestions to improve rural placements,		locations. Ruralization has 3 interrelated themes: preparation and support, rural or remote health experience, and rural lifestyle and socialization. Each has multiple subthemes. Factors that promoted students' RPI: a "positive" practice experience, interactions with "supportive staff," and interactions with the "community" in general. Difficulties (accommodation, internet access, transport, and financial support) negatively impacted students' placement experience and rural practice intentions. Policy and practice implications for supporting students undertaking regional, rural, and remote placements and preparing them for future practice in nonmetro locations. Informs ongoing strategies for improving rural placement experiences and enhancing rural health workforce recruitment, retention, and capacity building.
Isaac, V., McLachlan, C.S., Walters, L., Greenhill, J.	2019	Quantitative - 2016 Federation of Rural Australian Medical Educators evaluation survey - is a cross-sectional study of medical students from 17 Australian universities.	To investigate Australian medical student burnout during rural clinical placement. Second, to examine the association between perceived burn-out and rural career intent at the time of finishing their rural placement.	638 medical students from regional Australia were analysed in the study of all eligible 756 medical students (response rate 84.3%). Medical students had completed a full academic year or more at an RCS.	26.5% experienced burn-out during a rural placement. Factors associated with burn-out were female gender, rural origin, low preference for RCS, stress in year prior to rural clinical placement, perceived social isolation during placement and lower rural practice self-efficacy. Burn-out not associated with rural career intentions. Social isolation and low rural self-efficacy independently associated with burn-out during placement and together explained 10% of variance in burn-out. Burn-out during rural placement may be a consequence of stress prior to a medical school placement. Social isolation and rural self-efficacy are amendable factors to mitigate medical student burn-out during rural placements.

Jones, D., McAllister, L., Dyson, R., Lyle, D.	2018	Qualitative - focus groups and individual semi-structured interviews. Data analysed using four stages of data comparison.	To describe features that promote transformational and sustainable community engaged health partnerships and services in rural and remote Australian locations.	Community - school principals (n = 7) senior managers (n = 2) from local facilitating agencies. Campus - allied health students (n = 10) and academics (n = 2), 1 rural 1 metropolitan	Six features: (i) identifying and responding to community need, (ii) providing services of value, (iii) community leadership and innovation, (iv) reputation and trust, (v) consistency, and (vi) knowledge sharing and program adaptation. These features contributed to transformational engagement of community and university participants. Features can inform health sector approaches to community engagement, enhancing rural and remote service accessibility, acceptability, and sustainability outcomes.
Roberts, C., Daly, M., Held, F., Lyle, D.	2017	Qualitative - sequential - employing thematic, comparative and relational analysis of data from student interviews to understand possible processes and mechanisms of student learning in the LIC. Broken Hill Extended Clinical Placement Program	To explore the relationship between student learning, student perceptions of preparedness for practice and student engagement, in the context of a rural LIC.	n = 18 medical students from 3 consecutive cohorts who completed Broken Hill Extended Clinical Placement Program during 2010 (n = 6), 2011 (n = 5), and 2012 (n = 7).	Two major themes: connectivity and preparedness for practice. Connectivity = engagement and relationship building by students, across formal and informal learning experiences, interprofessional interactions, social interactions with colleagues, interaction with patients outside of the clinical setting, and the extent of integration in the wider community. Preparedness for practice = having enough depth in clinical skills, personal and professional development, cultural awareness and understanding of the health system, to work in that system. Comparative analysis = compared the nature and variation of learning across students. Relational analysis = positive association between connectivity and preparedness for practice. Connectivity is powerful enabler of students' agentic engagement, collaboration, and learning within an LIC; related to student perceptions of preparedness for practice. Provides insight for developing similar programs, encouraging health professional educators to consider all

					potential elements of placements, which most promote connectivity.
Jones, D., McAllister, L., Lyle, D.	2015	Qualitative - inter-professional focus groups and individual interviews.	To describe the impact of participation in a rural Australian service-learning program on student and academic perceptions of work-readiness and future employability.	N = 12 allied health students (OT 4 and SP 6) and 2 allied health academics (1 rural 1 metro)	Students were challenged in transitioning from being observational or highly directed learners, described as [being in the] 'shadows' or 'shadowing', to semi-autonomous healthcare providers. Participants reported enhanced perceptions of future employability through 'real work' experiences and identified broader program implications for universities and students. Service-learning, a relatively new educational pedagogy in rural health education in Australia, may provide universities, health services, and students with an alternative to acute hospital placements in the development of work-ready attributes for new graduate allied health practitioners.
Poncelet, A.N., Hudson, J.N.	2015	Qualitative - Lit review. Inclusion: medical students, placements longer than 24 weeks, students access to and continuity of patient population in same location and/or continuity of preceptor/supervisor and meets definition for LIC, evaluation data relating to effectiveness of placements.	To explore the LIC as a delivery system innovation to improve patient care and the patient experience of care	n = unknown	When continuity between students and patients is built into the structure of clinical training, the result is a powerful positive impact on student learning and benefits patient perceptions of care with the promise of benefits to patient care. Evidence continues to grow on the positive impact of this symbiotic model of medical education, which enables the student to create a positive synergy between the patient and the physician through longitudinal relationships. This model has the potential to improve direct patient care as well as the quality of physicians trained in this model.
Wolfgang, R., Wakely, L., Smith, T., Burrows, J., Little, A., Brown, L.	2019	Mixed methods - part of larger longitudinal study of students' placement experiences and subsequent career	To explore the rural placement experiences and future work intentions of students who attended a	440 end of placement surveys were completed by 275 students (response rate 69.8%)	Positive shift in intention to work rurally for students of both rural and urban background post-placement, only statistically significant in the group from an urban background. Three themes: immersed rural supported placement

		choices. Qualitative data - short answer questions - analyzed thematically guided by qualitative content analysis.	placement with the UoNDRH.		experience, immersed interaction in rural life with other students, and immersed interaction in the rural community. Students from both rural and urban backgrounds indicated similar benefits and challenges. While positive impact of rural placement experiences and rural background on future rural practice is well known, this highlights importance of positive supported placement experience for students from both rural and urban backgrounds.
Bennett, P., Jones, D., Brown, J., Barlow, V.	2013	Mixed methods - Pre/post questionnaires, focus groups and three-month post-placement phone interviews provided data on levels of participant confidence in the areas of primary health care delivery and culturally knowledgeable practice.	To report on the analysis of data from undergraduate nursing students who participated in the Primary Health Care Intensive Programme (PHCIP) in far west NSW between 2006 and 2008.	n=31 undergrad nurses, 84% female, 30 years average age. All lived on the mid-north to north coast of NSW. 1 lost to medium term follow-up.	Structured preparation for practice, underpinned by authentic learning experiences and aligned with comprehensive education programs can have a positive impact in the areas of skills, knowledge and attitudes and enhance confidence of undergrad nurses undertaking clinical placements in these settings. Findings relevant to contemporary nursing education and evolving models of health care delivery for rural/remote communities.
King, K.R., Purcell, R.A., Quinn, S.J., Schoo, A.M., Walters, L.K., King, K.R.	2016	Quantitative - annual Federation of Australian Medical Educators survey - September 2012 to January 2013	To analyse RCS students' perceptions of these supports and impact on intentions to work rurally.	454 of a potential 701 medical students who completed a RCS placement, participated in the survey, (response rate 64.8%). 41.5% male.	79.1% felt well supported by their RCS. RB students, or who indicated that their placement had a positive impact on their wellbeing, were more likely to intend to complete a rural internship. Those who felt socially isolated were less likely to elect this. Outcomes were similar for those indicating a preference for rural or remote practice after completing training. Perceptions of (RCS) financial support were not predictive of rural career intent. Although this does not negate the importance of providing appropriate financial supports, it does demonstrate student wellbeing is a more important recruitment factor for rural practice.

Wittick, T.A., Wittick, P.K., O'Neill, E.J., Davis, W.J., Mitchell, E.K.L., Campbell, D.G., Connolly, M.A., Fry, D., D'Amore, A.	2018	Qualitative - 2 focus groups – thematic analysis. Program was a community engagement activity with a special school. Six health education sessions were delivered to eight adolescent special school students.	To describe the perceptions of medical students and special school teachers in relation to the effect of the program on medical student personal and professional development, its acceptability by special school teachers, and factors which contributed to the program outcomes.	n = 9 8 medical students undertaking LIC at a rural clinical school, 2 special school teachers	Theme 1: Symbiotic nature of program. Perceived improvement in medical students' communication, leadership and teaching skills, and their understanding of working with people with disabilities. Special school teachers noted benefits to their students from the health expertise and role modelling provided. The university experienced enhanced links with the community. Theme 2: Factors that contributed to success of community engagement activity. All parties wanted to engage in the program. Valuable time was spent developing relationships and preparing with all stakeholders. Constructive teamwork was paramount. Involvement in program gave students a unique opportunity to develop skills in professionalism essential to working as health practitioners but difficult for universities to teach. Voluntary nature of initiative was novel, promoting skill development and enhancing effectiveness of the program. Program is potentially applicable and replicable to other settings.
Misan, G., Ellis, B., Hutchings, O., Beech, A., Moyle, C., Thiele, N.	2018	Qualitative - observation	To describe two intergenerational learning programs with a health promotion focus conducted by Occupational Therapy students in a men's shed in Whyalla, South Australia (SA).	unknown	Students reported changes in the men's knowledge, attitude, and behaviours and activities that demonstrated active engagement with concepts promoted. Student experience was enhanced by working on small projects allowing them to develop basic woodworking and construction skills. Shed members reported enjoying opportunity to share life stories, skills, and experience while 'learning by doing'. Intergenerational engagements will continue to provide enrichment for both younger and older

					learners, building mutual respect and enhancing the self-esteem of all concerned.
Johnston, C., Newstead, C., Sanderson, M., Wakely, L., Osmotherly, P.	2017	Quantitative - retrospective cohort design - Main outcome measure(s) - Data from all clinical placements in the Physiotherapy program between 2003 and 2014 were included. For all clinical placements, student assessment mark, year of study, type of placement and placement location were collected. Placement location classified using the Modified Monash Model (MMM).	To describe the geographical distribution of physiotherapy clinical placements and investigate the relationship between geographical setting and clinical placement marks in physiotherapy students.	3964 Bachelor of Physiotherapy student clinical placements	Over the 12-year study period 3964 placements completed. 2003 – 2005 average proportion of clinical placements occurred in MMM1 was 78% and MMM3–6 was 22%. In 2014, this changed to 59% MMM1 and 40% MMM3-6. Significant differences in clinical placement grades between MMM1 and all other categories except MMM2, with lower assessment marks in MMM1 than other categories. Changing distribution of physio clinical placements may be reflective of increasing student numbers and greater efforts to support students completing rural and remote placements. This may lead to positive effect on rural and remote physio workforce. Further research required to determine the specific training and support needs of students and clinical educators in rural and remote settings.
Le, Q., Auckland, S., Nguyen, H.B., Terry, D.R.	2013	Qualitative - semi-structured interviews and 1 focus group (one student and four representatives from the International Student Services, Campus Security, and Accommodation Services) – thematic analysis	To investigate the safety of international students at a regional campus and surrounding environment.	25 international students- interviews (various cultural background including China, India, Malaysia, Korea, Japan, Vietnam, Singapore and Saudi Arabia) and 5 stakeholders – FG	Majority of students felt safe on and off campus. Negative feelings about safety among the minority were associated with their own bad experience or with stories they heard. Combination of personal, environmental and social-economic factors have a propensity for international students to be perceived as soft targets. Concerns about safety of international students in the current context are legitimate and safety issues should be taken seriously. 4 main themes: safety concerns, safety risks, preventative safety strategies, and safety needs. One of the most frequent suggestions was to increase reach of surveillance, greater support from the responsible authorities, particularly as

					related to environments beyond the confines of the university campus.
Greenhill, J., Fielke, K.R., Richards, J.N., Walker, L.J., Walters, L.K.	2015	Qualitative - in-depth interviews - purposive sample of - interpretive approach - used to analyse the data with emerging concepts compared to define evolving theoretical constructs and develop a conceptual framework.	To understand student resilience during the first year of clinical training in a rural LIC where there were consistent anecdotal reports of high student resilience.	19 medical students, professional staff and clinician teachers.	LIC students experienced adversity during first clinical year of medical course due to challenges encountered in the learning environment. Distress was moderated by: a secure, supportive learning environment; their profound learning journey; and utilisation of organisational structures to stay on course. Triad of inter-related themes forms a conceptual model that challenges simplistic notions that medical courses should focus solely on providing tangible and emotional supports for students. How LIC programs may contribute to student wellbeing is discussed through the lenses of agentic, reflective and transformative learning.
Greenhill, J., Richards, J.N., Mahoney, S., Campbell, N., Walters, L.	2018	Qualitative - longitudinal study interviewed - end of final preclinical year, early and late in first clinical year, early and late in final clinical year, and in early internship.	To determine the transformations students experienced within the sociocultural context of clinical practice.	20 medical students - over 4 years, from beginning of clinical immersion, through 1 of 3 different clinical placement models: block rotation, LIC, or community- and hospital-integrated learning, to intern year postgrad.	Identified 6 well-defined changes to their ways of seeing the world which participants described as insights shaped by their clinical training. Themes: self-awareness, patient centeredness, systems thinking, self-care, clinical scepticism, and understanding diversity. Further analysis explored how changes in worldview can be instrumental, communicative, and emancipatory. Demonstrates that context matters and that longitudinal models of clinical education may facilitate emancipatory learning.
Webster, S., Lopez, V., Allnutt, J., Clague, L., Jones, D., Bennett, P.	2010	Mixed methods - A pre-test/post-test questionnaire – with comments	To demonstrate the aspects of rural placements that were effective in engaging students in the learning process.	8 second-year nursing students from ACU, in partnership with BHUDRH, who participated in a	Clinical experience in rural areas can positively influence attitudes, preparedness for practice and engage students on many levels, deepening their understanding of rural communities and issues related to rural health. Students indicated they all had a positive learning experience in their rural clinical placement. The value of rural placements as a method for increasing nursing

				4-week rural placement in far western NSW.	student's practical experience should be promoted.
Fisher, K., Smith, A., Brown, L., Little, A., Wakely, L., Hudson, J.N., Squires, K.	2018	Mixed methods - student survey, both closed and open-ended questions, and semi-structured interviews with staff members involved in delivery of community engagement program.	To investigate whether the multidisciplinary community engagement program added to students' rural health placement experiences based on perceptions of both students and UONDRH staff.	student survey (n = 96), staff members (n = 15).	Overarching theme: Enhancing work readiness and employability. Student and staff perceived that students' participation in community engagement improved their employment prospects. 3 themes: Expanding professional practice capabilities; Building confidence and showing motivation; and 'Better understanding the nature of rural practice'. There was value for students in short-term, community engagement activities, many of which could be readily integrated into existing health professional education programs with considerable benefits. Would lend itself to other non-health professional programs, such as law, journalism or business studies, as a means of broadening the students' perspectives beyond the limits of their own professional horizons.
Little, F.H., Croker, A., Carey, T.	2019	Qualitative – structured individual interviews - thematic analysis used to explore experiences.	To explore postgraduate clinical psychology placements in rural and remote locations as part of a larger study known as the Mental Health Tertiary Curriculum project.	n = 10 8 postgrad psychology students, 1 service provider and 1 representative of an educational institution.	2 key themes: 'Beyond expectations, but …', recognised the value of clinical placements from students' perspectives, but cautioned against the challenges faced by supervisors supporting these placements; 'Immersed in connectedness with …', makes explicit the growing sense of belonging and professional identity that accompanied students' engagement with their rural communities, other health professions and their own profession. Highlights the complexity of developing workplace readiness for psychology students and provides areas for future consideration including role of practice-based education and where this fits within undergrad psychology degrees.

Connolly, M., Sweet, L., Campbell, D.	2014	Qualitative - individual and group-structured interviews - thematic analysed.	To explore the educational impacts and benefits gained from supervisory responsibilities in a rural hospital context.	15 senior medical and nursing staff at two rural hospitals who supervised year four medical students in a longitudinal clinical program.	Three themes: changes to the supervisor, change in the hospital learning culture, and student usefulness. Doctors and nurses who undertook student supervisory responsibilities reported a sense of personal change - increased reflective practice, improved value of professional identity and increased enthusiasm for interprofessional learning. Supervisors updated their clinical skills and became proactive in seeking out learning opportunities for students. Hospitals became more vibrant learning environments and interprofessional education enhanced teamwork. Patient care increased, knowledge gaps filled, and hospital governance, policy and procedures challenged. The benefits of LIC in rural hospital setting provided symbiotic relationships between hospitals, students, patients and educations provider. The interprofessional approach towards clinical supervision enhanced supervisor learning and generated an understanding among professional groups of each other's clinical skills, roles and values, and raised an awareness of the importance of working collaboratively for better patient outcomes and addressing future workforce shortages.
Hudson, J.N., Thomson, B., Weston, K.M., Knight-Billington, P.J.	2015	Qualitative - Semi-structured, face-to-face interviews - themes identified using inductive content analysis methodology.	What is the impact of the LIC medical education initiative on the healthcare community(s) of practice in two rural towns in NSW?	n = 23 Roles associated with rural medical practices or local hospital: 4 reception, 3 business, 5 doctors (four GPs, one vocational trainee (GP registrar)), 2	4 themes: transforming a community of practice; realising the potential of the health service; investment in rural return; and sustainability. There was significant clinical exposure, skill and teaching capacity in these previously unrecognised rural placements but realising the potential of the health service needs careful management to sustain this resource. Early engagement and initial enthusiasm have

				immediate-past LIC medical students, 8 in practice or hospital nursing or midwifery (including one ED specialist) and 1 in allied health.	produced many positive outcomes for the healthcare community, but this alone is not enough to sustain an increasing role for rural primary care in medical education. Issues need addressing for sustainability, namely validation, time and costs. Strategies to address these are key to continuation of LICs in small rural communities.
Zournazis, H.E., Marlow, A., Mather, C.,	2018	Mixed methods - evaluation included needs analysis; literature review and online surveys from preceptors, facilitators and nursing students (this study only includes preceptors). Survey consisted of twenty-eight open and closed-ended questions – open ended were thematically analysed.	To evaluate a whole of community facilitator model of support for nursing students and their preceptors in rural practice settings.	29 preceptors, 69% over 45 years. 83% female, 52% completed tertiary quals, including 3 preceptors who had undertaken more than one degree or diploma. 41% had been supervising students for more than 10 years, 14% had precepted students for 6-10 years. 26 were RNs and 3 were AHPs	The needs analysis and surveys identified how the whole of community facilitator model contributed to supporting preceptors to build placement capability and promote workforce development. Results revealed benefits to students and preceptors. Emerging themes centred on the interrelationship between learning, teaching and healthcare environments. Preceptors recognised the value of the whole of community facilitator model through their contribution of clinical and educational information, resources, modelling professional development, and provision of support. Multiple placement opportunities within a single community, enriched student experiences. Model has potential to contribute to workforce development in other rural placement environments.

Appendix 3. Health student education in rural Australia

Authors	Year	Study design	Aim/objectives	Population	Key findings
Spencer, J., Woodroffe, J., Cross, M., Allen, P.	2015	Mixed methods - two focus groups and a 13-item organisational IPP/IPL readiness survey developed by Barnett et al.	To examine organisational readiness for IPP and IPL	14 health professionals from six disciplinary fields	Rural placements offer students valuable clinically relevant exposure to IPP/IPL which occurs ‘‘naturally’’ in rural practice settings. To optimise the potential of similar health services to provide IPP/IPL, there is a need for clinical educators and staff to have training in IPP and IPL
Durey, A., Lin, I., Thompson, D.	2013	Mixed methods - pre-program questionnaire (demographic info and open-ended questions about previous rural/ remote/ Indigenous health experience and program expectations); post-program questionnaire; Semi-structured phone interviews four months later	To evaluate a 3 ½ day, rurally-based, intercultural and inter-disciplinary program for academics from three universities aimed to improve how academics prepared health science students for work in this rural and Indigenous health.	21 teaching academics	This approach had radically changed thinking and led to a desire to improve rural and Indigenous health and teaching practice. Targeting academics to learn about rural and Indigenous health in situ is one promising strategy for improving undergraduate health science education in this priority area.
Birden, H., Usherwood, T.	2013	Qualitative study - five focus groups between 2 June 2010 and 30 September 2010	To discover what Australian medical students think about the way professionalism is taught in their medical curriculum	n=40 16 women and 24 men; mean age, 26 years [range 23–32 years], undergraduate and postgraduate entry medical students in the last 1–2 years of the medical program and had undertaken rural LIC placements	Participants expressed a low regard for the ways in which professionalism had been taught and assessed in their learning programs. They “gamed the system”, giving assessors the results on reflective writing assignments that they believed would gain them a pass. A less didactic approach in early years, with more evaluation and feedback from students to assure relevance; an emphasis on true reflection, as opposed to guided reflections linked to overformalised requirements; and more attention to role-modelling and mentoring in the clinical training.

Krahe, L.M., McColl, A.R., Pallant, J.F., Cunningham, C.E., DeWitt, D.E.	2010	Quantitative study - survey - level of agreement on 29 items concerning overall RCS experience, skills development and clinical supervision experience	To evaluate the experiences of medical students who attended rural clinical schools during 2006, using the rural-specific questionnaire. This is the second part of a broader study conducted to explore medical students' views of rural clinical schools.	166 (n = 125) medical students who had completed one year at the RCS with UNSW, UniMelb, UTAS, UoA, UniSydney and ANU	86% would go again and 64% would spend more time at the RCS if they could. All items evaluating educational experience recorded greater than 80% agreement (indicating very positive RCS experience). For the skills development, the highest level of agreement related to developing procedural skills (97%). For clinical supervision the agreement rate exceeded 80%. Students found supervisors approachable (97%), enthusiastic (96%) and respectful (95%). Highlights success of the RCS program and for its role in attracting future doctors to work in rural environments
Moore, M., Roberts, C., Newbury, J., Crossley, J.	2017	Mixed methods, cross-sectional; assessment tool applied 'live' by receiving clinicians and from recorded handovers by academic assessors. Performance analysed using generalisability theory. Clinicians and assessors provided feedback. Assessor training for use of tool provided to 5 research group academics using RFDS recorded handovers. RFDS doctors participated tool development and trained in its use.	To determine what factors impact on the reliability and validity of the assessment of telephone handovers from medical students and remote nurses to primary care doctors.	Sample of remote telephone clinical handover (RTCH) recordings over 1 year for assessment by academic group: 40 recordings of medical students (2 per student from 20 students); and 48 recordings of remote nurses (4 per nurse from 12 nurses). All students and nurses in the study sites were invited to participate prior to recording.	Reliability for assessing a call was good (G = 0.73 with 4 assessments). The scale had a single factor structure with good internal consistency (Cronbach's alpha = 0.8). Group mean for global score for nurses and students was 2.30 (SD 0.85) out of a maximum 3.0, no difference between sub-groups. Tool shows promise in the formative and progressive summative assessment of students and clinicians making individual handover calls - could be considered for further use and evaluation in that context; and for use in other rural and remote sites where students and junior doctors are playing an active role in healthcare teams and demonstrating safe practice is important.
Jacob, E., Barnett, T., Missen, K.,	2012	Qualitative - exploratory study - semi-structured questionnaire (open-ended	To explore the perceptions of and opportunities for	57 clinical staff from three regional/rural	IPE perceived by most clinicians as valuable for students in enhancing teamwork, improving the understanding of roles and functions of team

Cross, M., Walker, L.		questions), interviews, and focus group discussions were used	interprofessional education (IPE)	health services across Victoria	members, and facilitating common goals for patient care. Student engagement with IPE in clinical areas appeared limited, largely ad hoc, and opportunistic. Barriers: timing of students' placements, planning and coordination of activities, resource availability, and current regulatory and education provider requirements. Participants were confident that appointing a central figure to coordinate and plan for IPE would enable implementation in the rural clinical setting.
Nestel, D., Ivkovic, A., Hill, R.A., Warrens, A.N., Paraskevas, P.A., McDonnell, J.A., Mudarikwa, R.S., Browne, C.	2012	Mixed methods –study concentrates more on focus groups - evaluation in the first year	(1) To assess the extent to which the broad curriculum goals are met; (2) to measure the degree to which the program is being implemented as intended; (3) to gain insight into the experiences of medical students, faculty and community partners.	Individual interviews (n = 8) with students, faculty (academic, clinical, admin and technical) and community representatives (simulated patients and community agencies).	Focus groups proved invaluable in yielding rich information assuring enhanced program quality and the potential to improve patient care. Based on all evaluation data, the curriculum goals in the first year have been met and the curriculum is being implemented as intended.
Morrison, T., Brown, J., Bryant, M., Nestel, D.	2014	Qualitative study - 3 case studies of rural general practices with multiple levels of learners - interviews analysed using open and axial coding and thematic analysis.	To investigate the educational benefits and challenges associated with 'multi-level learner' practices.	N = 29 Learners (n = 12), staff (n = 12), patients (n = 5)	Learner benefits: sharing knowledge and experience, vertical peer learning, a positive learning environment and a supportive network. Benefits to practice sub-themes: knowledge exchange with others, sense of community, increase in patient services and supervisor satisfaction. Learner challenges: perceived decreased learner access to the supervisor, increased anxiety among some learners, reduced exposure to patients with the caseload distributed between several learners and patient reluctance to see junior learners. Practice challenges: administration, learner turnover, infrastructure and disparate learner needs.

Cheek, C., Hays, R., Allen, P., Walker, G., Shires, L.	2019	Quantitative - descriptive analysis of student demographic characteristics. Data from several different sources combined eliciting a comprehensive database of successful applicant characteristics from 2010 to 2016.	To identify under-represented groups in a medical school intake.	N = 819 Students enrolled in a UTAS medical school 2010 to 2016	57.6% from Tasmania, 1.1% identified as Aboriginal or Torres Strait Islander, 71.0% completed secondary education at independent schools and 29.0% at government schools. The overall median Modified Monash Model was 2 and median AGSRA was 2 reflecting majority came from one of the two main cities. 69.5% had a parent with Bachelor degree or higher. 47.7% of all Tasmanian students attended a secondary school with a parental contribution of ≥$5000 per annum.
Shahi, R., Walters, L., Ward, H., Woodman, R.J., Prideaux, D.	2015	Mixed methods - logbooks and semi-structured student interviews. Quantitative analysis of 88 logbook weeks, data from which were triangulated through the analysis of 101 individual interviews using grounded theory	To explore and compare the clinical experiences of students in hospital-based and community-based training programs	N = 35. Year 3 medical students	Significant differences among the three models in students' clinical participation and suggest that community settings provide more opportunities to students for meaningful engagement in patient care activities
Nestel, D., Gray, K., Simmons, M., Pritchard, S.A., Islam, R., Eng, W.Q., Ng, A., Dornan, T.	2014	Qualitative study - phenomenological approach - constructivist/interpretivist paradigm - individual telephone interviews - thematic analysis of transcripts.	In what ways can Gippsland Medical School (GMS) engage with its local community and what are the community's expectations of GMS students while completing their medical degree and upon graduation?	N = 12. Individuals living in the Latrobe Valley community (mean age 33). 7 females 5 males aged 25–82 (mean 45) years. 5 retired, others employed - health information officer, disability service officer, homemaker, town planner, fireman, cleaner.	Main themes: knowledge and involvement with GMS; GMS engagement and serving local communities; students interacting with patients and doctors; and measuring the success of GMS. Provides a platform for enhanced community input to the school

Wenham, J., Bennett, P., Gleeson, W.	2017	Mixed methods - semi-structured focus-group and short-answer questionnaires immediately after the event.	To evaluate the impact of annual crash simulation exercise on the health students' learning.	17 health students	Themes: value of good teamwork and communication; increased understanding of the impact of stressful work; and willingness to engage in reflection of the value of interprofessional learning environments on performance. 94% felt all learning outcomes were met. Domain scores (preparation for day-to-day practice; effective teaching strategies; adequate resources; and should we run it again?) were 75% or above. Comments affirmed communication, realism of simulation and the involvement of other agencies were important.
Isaacs, A.N., Raymond, A., Jacob, E., Jones, J., McGrail, M., Drysdale, M.	2016	Quantitative - cross-sectional - 7 item self-reporting questionnaire. Main outcome cultural desire, measured using 2 items: level of agreement with Aboriginal health being an integral component of the nursing curriculum and an expressed interest in Aboriginal health	To explore cultural desire among student nurses towards Aboriginal peoples and its association with participation in Aboriginal Health and Wellbeing (mandatory unit one semester part of 2nd year Nursing degree rural campus).	220 nursing students	Completing the Aboriginal Health unit did not influence students' opinions on inclusion of the unit as part of the nursing curriculum (odds ratio 0.73, 95% CI 0.43e1.29) or their overall cultural desire (mean difference ¼ 0.69, 95% CI 1.29 to 0.08, p ¼ 0.026). Students who completed the unit reported higher understanding of Aboriginal health (OR ¼ 2.35, 95% CI ¼ 1.35e4.08) but lower interest levels in the subject (OR ¼ 0.45, 95% CI: 0.24e0.84).
Croker, A., Brown, L., Little, A., Squires, K., Crowley, E.	2019	Qualitative - collaborative dialogical inquiry	The aim was to support rich collaborative practice between two professions who frequently work together across both ordered and organic modes of collaboration. 'From the perspective of dietitians and speech pathologists, "what works well" for developing and	10 academics and clinicians from dietetics and speech pathology	Beyond shared purpose, knowledge of roles and good communication, the notions of curiosity, willingness and momentum were at the core of 'what works well' for collaborative practice between dietitians and speech pathologists. Participant perspectives related to collaborative practice between these professions and beyond to other professions and involved collaborative practice within and across healthcare organisations and a university setting.

			maintaining collaborative practice?'		
Playford, D., Wheatland, B., Larson, A.	2010	Quantitative - longitudinal cohort study - brief survey (either email or phone survey)	To compare the relative workforce impacts of rural campus versus short-term rural placements out of urban campus	149 nursing students - rural campus and urban campus who did a rural placement	Single outcome measure – rural or urban location after graduation – showed the rural school graduated a significantly higher proportion of rural-working graduates. No difference in rural workforce choices of students from rural backgrounds, irrespective of university location.
Whetton, S., Hazlitt, C.	2015	Mixed methods - anonymous on-line survey and interviews with thematic analysis	To: map location of UTAS health informatics graduates and current students in health services across Australia; map professional location of graduates, differentiating between health professionals and health informatics professionals; explore impact of UTAS program on graduates' approaches to the practice of health informatics	N = 24. All graduates and current students of health informatics program invited to participate	Qualitative data indicated that course graduates reside in every state and territory, the majority employed by state health services. Most respondents had moved into health informatics professions or senior positions in health informatics. 80% directly attributed this to participation in course. Respondents indicated strong socio-technical orientation in their approach to health informatics.
Croker, A., Smith, T., Fisher, K., Littlejohns, S.	2016	Qualitative methods - collaborative dialogical inquiry - interprofessional focus groups and semi-structured interviews interpreted to identify themes that transcended participants' professional affiliations	What is the nature of educators' interprofessional collaborative relationships in a co-located setting, as they help students learn to work with other professions?	N = 21. UONDRH educators, 17 academic and healthcare roles, 4 had only academic roles. 19 females, 2 males. Disciplines: diagn radiography (n=2), medicine (n=4), nursing (n=4), nutrition dietetics (n=3), OT (n=2),	Educators' interprofessional collaborative relationships involved development and interweaving of five interpersonal behaviours: being inclusive of other professions; developing interpersonal connections with colleagues from other professions; bringing a sense of own profession in relation to other professions; giving and receiving respect to other professions; and being learner-centred for students' collaborative practice. Pharmacy educators need to ensure that interprofessional relationships are founded on positive

				pharmacy (n=2), physio (n=3) speech path (n =1).	experiences rather than vested in professional interests.
Croker, A., Wakely, L., Leys, J.	2016	Qualitative study - collaborative dialogical inquiry - semi-structured interviews and 9 focus groups	To explore how IPE educators develop shared purpose to help students learn to work with other health professions.	N = 21. Research group and study participants comprised educators from eight different professions.	The ease with which educators of different professions in interprofessional collaborative relationships developed shared purpose for IPE was not necessarily uniform. Some educators found it a seamless process, others began in a fragmented interprofessional space where different ways of working or negative past experiences influenced their willingness and openness to work with some professions. Reframing these experiences in a socially aware interprofessional space they transitioned to collaborate in an intentional interprofessional space. Transitioning through these spaces required successful, ongoing, negotiated interactions with educators from other professions and reflection on one's "own perceptions" of other professions and how to work with them.
Wakely, L., Brown, L., Burrows, J.	2013	Quantitative study - survey students' attitudes towards interprofessional learning were assessed pre- and post-ILM, using the Readiness for Interprofessional Learning scale (RIPLS) - scored on a 5-point Likert-type scale and with four domains: teamwork and collaboration, negative professional identity, positive professional	To evaluate University of Newcastle's Department of Rural Health monthly interprofessional learning modules (ILMs) delivered to students on a range of health topics. Anticipated that by deepening students' understanding of the value and roles of other health professions, their attitude to interprofessional care would improve.	N = 38. 80% of students were in final years of undergrad program. Student professions: nursing (44.7%), physio (18.4%), OT (15.8%), nutrition and dietetics (10.5%), medicine (7.9%) and medical radiation science (2.6%).	Significantly improved readiness for interprofessional learning in the domains of teamwork and collaboration and negative professional identity - statistically significant improvement in students' attitudes to interprofessional learning in three of four domains.

		identity, and roles and responsibilities.			
Jacob, E., Raymond, A., Jones, J., Jacob, A., Drysdale, M., Isaacs, A.N.	2016	Mixed methods. Quantitative cross-sectional design – survey. Qualitative content analysis of an open-ended survey question was used to interrogate the data.	To explore content expectations of nursing students required to undertake Aboriginal and Torres Strait Islander health studies as part of a Bachelor of Nursing Degree at a rural university campus.	N = 246. Nursing students across all three year levels	Four themes emerged: cultural competence, disease implications and management, nursing care, and other issues. Content expectations were consistent for students who were yet to undertake (pre) or had completed (post) the unit. Content expectations included Aboriginal and Torres Strait Islander culture (pre 30.4%—post 29.8%), Aboriginal and Torres Strait Islander health issues (pre 20.0%—post 23.7%) and understanding nursing care related issues (pre 15.7%—post 17.1%).
Snow, P.C., Harvey, P.J., Cocking, K.L.	2014	Qualitative - purposive and snowballing sampling - interview transcripts independently coded into themes and emergent data categories were refined through comparative analysis between the authors.	To gain a better understanding of how fitness-to-practice (FTP) concerns are viewed by rural medical school stakeholders.	N = 13. Australian rural medical school staff (n = 7; clinical educators, program coordinators and academic faculty); final year medical students (n = 6).	Students and staff responded similarly in their recognition of FTP concerns, they varied in their assessment of their frequency, with students indicating that concerns were rare. Students and staff expressed reluctance to formally report students/colleagues with FTP concerns due to the complexity and uncertainty of medical practice. Both groups considered early recognition of problems and implementation of supportive mechanisms as important, but students generally did not want to contact the university about concerns for fear of stigmatisation.
Prout, S., Lin, I., Nattabi, B., Green, C.	2014	Qualitative - primary data derived from student journal entries, collected at the conclusion of Country Week. Journals were analysed thematically using a deductive approach with regard to the learning	To examine students' underlying assumptions in view of the new experiences and to explore individual possibilities for enhanced rural health practice. Country Week is an intensive, interprofessional,	N = 27. Students from allied health and nursing schools from five WA universities. Age range 18 - 54 years (mainly female), and represented nursing, physiotherapy, health	Learning in context and interactions with communities and 'communities of practice' can generate transformative learning moments that are not possible within conventional tertiary lecturing frameworks. This experiential, interprofessional educational experience provides students with grounded opportunities to develop into effective and reflective

		objectives, and an inductive approach with regard to learning process: findings that were later explained within a transformational education framework.	experiential learning program for tertiary health science students in WA. It is coordinated by the Combined Universities Centre for Rural Health	promotion, health science, pharmacy, social work, medical imaging.	practitioners. These skills are critical in the 'messy swamps' of rural health practice.
Malau-Aduli, B.S., Teague, P.A., Turner, R., Holman, B., D'Souza, K., Garne, D., Heal, C., Heggarty, P., Hudson, J.N., Wilson, I.G., Van Der Vleuten, C.	2016	Quantitative - Partial Credit Rasch Model used to evaluate psychometric properties of shared OSCE data. Evaluation of quality assurance reports used to determine beneficial impact of collaborative benchmarking exercise on learning and teaching outcomes.	To what extent do the OSCE performance data form a unidimensional and locally independent construct according to the Rasch measurement model? What are the benefits of the exercise for the participating schools?	4470 student records. 4 regionally dispersed (different states) medical schools participated sharing OSCE stations co-developed by expert committee. 2 schools run 4-year grad-entry programs, 2 schools run undergrad-entry medical programs. 11 OSCE stations co-developed by medical schools and used in summative 2011 and 2012 examinations for assessment of clinical performance in early clinical and exit OSCEs in each school's medical course	Data for each examination demonstrated sufficient fit to the Rasch model with infit mean square values from 0.88 to 0.99. Person separation (1.25–1.63) indices indicated good reliability. Evaluation of perceived benefits showed the benchmarking process was successful as it highlighted common curriculum areas requiring specific focus and provided comparable data on quality of teaching at participating medical schools. Educational impact - supports the use of shared OSCEs to benchmark clinical competence, providing a robust and flexible assessment system. Demonstrates sharing assessment materials can provide common, defensible, reliable, valid, robust and standardised assessments which enhance transparency and accountability. Economic benefits and collective wisdom gained by such collaboration provide justification for ongoing application.
Sutton, K.P., Patrick, K.,	2015	Mixed methods. Sequential confirmatory design - online pre- and	Examine impact of the Gippsland Mental Health Vacation School on	N = 25. majority female. Median age 23.0, mean age 38.74	Comparison of pre- and post-program surveys indicated a significant increase in participants' interest in rural work/career and rural mental

Maybery, D., Eaton, K.		post-program surveys and semi-structured individual interviews. Statistical analyses compared pre- and post-program survey interest in rural work/career, mental health work/career and rural mental health work/career. Content analysis was undertaken to explore interview transcripts for data that confirmed, contradicted or added depth to the quantitative findings	students' pre and post-program levels of interest in working and having a career in a rural setting, the mental health field and the rural mental health sector. Hypothesis - the vacation school will increase students' interest in working in and a career in a rural setting and working in and a career in the rural mental health sector. Hypothesis - the program will not change students' interest in working in and a career in the mental health sector.	years. Over half studying psychology, a third social work students, others nursing or OT. Majority third/fourth year. Half were urban background. 12 students had undertaken a mental health clinical placement, 7 undertaken a rural placement and 1 student undertaken rural mental health placement prior to attending vacation school.	health work/career. The qualitative findings provided depth to and supported the change in interest toward working in a rural environment. Despite qualitative evidence that the program has increased participants' knowledge and understanding of the mental health sector as a whole, overt support for the changes in interest toward mental health work was not evident.
Taylor, J., Burley, M., Nestel, D.	2015	Mixed methods evaluation - written questionnaires and interviews (Thematic analysis)	To evaluate a simulated student clinic where students from different disciplines collaborated in pairs to assess Simulated Clients (SCs) within the practice setting in a community health service, which emphasises holistic care in a psychosocial model of health. To explore to what extent has participation in a student clinic with SCs enhanced the students' learning of interprofessional	N = 34. group 1 students, group 2 simulated clients (SCs). The first group of students on placement at LCHS, invited to participate. 26 students volunteered to participate from 11 health disciplines. Second group, volunteer SCs, invited to participate through the LCHS volunteer newsletter.	Three major themes for student and SC evaluations with some overlap between the two groups. Both groups saw the experience as highly realistic and positive. Students made comments such as 'the experience was great', the SCs reported it 'was fun'. Student themes: Theme 1: Client focus. Centrality of client was dominant theme combined with need to look at client holistically. Theme 2: Interactions between disciplines. Many students emphasised the importance of an interdisciplinary team, and of the collaborative process and rapport necessary for communicating with the other discipline. Theme 3: Realism and authenticity. All students emphasised realistic nature of the experience. Group 2 SCs. Consistently positive

			communication skills and attitudes	Of the 8 volunteer SCs in the second group, 2 were members of staff with tertiary education, 2 were tertiary level students and 4 were existing LCHS clients	about their experience with no perceived negative impact on their enthusiasm from their differences in background and education level. Theme 1: Supporting students' learning for real world. All SCs supported their purpose in the clinic as providing relevant learning for relating to real people in the real world. Theme 2: Realism and authenticity. SCs' commented it was important they portrayed a realistic character. Theme 3: Importance of support for SCs. Irrespective of backgrounds, SCs reported it was important for them to have support from faculty, for training and character development, and in providing control and safety.
Missen, K., Jacob, E.R., Barnett, T., Walker, L., Cross, M.	2012	Mixed methods - exploratory descriptive methodology - semi-structured questionnaire, interviews and focus group discussions	To investigate the potential for interprofessional education to increase undergraduate clinical placement capacity in clinical settings. To obtain the views of health care professionals about the use of interprofessional education in clinical education at three rural health facilities in Victoria.	57 questionnaire; 51 interviews - field/placement coordinators, representing 15 different health disciplines (Speech therapy, Occupational therapy, social work, Dietetics, Physiotherapy, Psychologist, Mental health nursing, Radiology, Pharmacy, Dentistry, Podiatry, Medical Imaging, Pathology)	Although there was clear recognition of the importance of collaboration and interprofessional practice to achieving good outcomes for patients, many clinicians identified challenges associated with incorporating IPE within clinical placements. Across all settings, it was emphasized that for IPE to be fully embraced in undergraduate curricula and the clinical experience (or fieldwork) undertaken by students, leadership needs to be demonstrated across three ''spheres of influence'': the health care organisation, the education provider (university), and the relevant regulatory authorities. Considered key to the successful implementation of IPE were having ''champions'' in IPE, collaboration across each of these sectors and for sufficient resources to support and engage with IPE in the clinical setting.
Croker, A., Hudson, J.N.	2015	Qualitative - literature interpretation informed by	A literature interpretation to answer: what is the	24 articles suitable for inclusion	The nature of the collaborative relationships involved in planning and implementing

		philosophical hermeneutics	nature of educators' collaborative relationships in the planning and implementation of IPE initiatives, as portrayed by authors of articles on rural IPE?	identified through searches of databases and relevant journals. Those involved in planning and implementing interprofessional learning in rural areas	educational strategies was rarely explicit. However, within an implied sense of interpersonal relationships, three themes were interpreted: grounded beginnings; untold stories, and anthropomorphised collectives.
Croker, A., Brown, L., Little, A., Crowley, E.	2016	Qualitative - transcripts of 5 focus groups compiled into a text set and interpreted using tools of philosophical hermeneutics	As part of a larger collaborative inquiry, educators involved in the initiative explored the nature of interprofessional relationships involved in developing, delivering and participating in the initiative. The aim was to develop a deeper understanding of such interprofessional relationships in order to provide guidance for ongoing development of students' and educators' collaborative practice.	N = 13. students (n = 5), academic educators (n = 4) and clinical educators (n = 4)	Findings of this study were iteratively dialogued with earlier findings of the collaborative dialogical inquiry to ensure "fusion of horizons" between studies. The three interpreted themes transcended professional affiliations: facilitating interprofessional mutuality, appreciating the multifaceted nature of "respect" and considering the visibility of interprofessional relationships.
James, S., D'Amore, A., Thomas, T.	2011	Quantitative - cross sectional survey set at the beginning of semester 2, 2008	To profile first year nursing/midwifery students at two campuses of Australian Catholic University, to investigate their learning preferences and the effect demographic background has on these preferences	334 nursing and midwifery students enrolled in first year Science units (Applied Science for Practice 1, BIOL117 or 2, BIOL118) at one metropolitan (Melbourne) and one	Demographic factors such as gender and age group did not influence mean scores of each sensory modality. The predominant preference was quadmodal utilising all four learning styles. The distribution of students preferring to learn by unimodal, bimodal, trimodal and quadmodal styles varied between demographic groupings. The rural students had significantly higher visual and kinaesthetic scores compared to their

				rural (Ballarat) campus of Australian Catholic University.	metropolitan counterparts. Students attending the rural campus had higher visual and read–write scores. Visual and aural scores were significantly lower for students from non-English speaking backgrounds.
Held, F.P., Roberts, C., Daly, M., Brunero, C.	2019	Quantitative - social network survey in 4 learning domains (clinical knowledge, procedural skills, professional development, and complex determinants of health) to explore learning relationships (ties) with other people (alters) that students (egos) formed during their placement. Quantified how different roles (supervisors, health professionals, administrators, peers, schoolteachers, and clients) contributed to students' learning. Exponential random graph models (ERGMs) to test which relational processes contributed to the structure of observed learning networks.	To analyse students' learning relationships to quantify what, and from whom students learnt. To describe, using a social network approach, the entire network of learning relations that AHP students recalled at the end of a six-week community-based service-learning program.	Data was available from a complete cohort of 10 students (in an allied health service-learning program) on placement in a network of 69 members, providing information on 680 potential learning relations.	Students engaged in similar ways in the domains of clinical knowledge, procedural skills, and professional development. Learning relations with academic supervisors were significantly more likely. Students reported reciprocal learning relations with peers – they formed learning pairs. This effect was absent in learning networks about complex determinants of health (including socio-economic and cultural factors). Instead, local administrative staff were significantly more often the source of learning about the local contextual factors.
Walker, L., Cross, M., Barnett, T.	2018	Qualitative - integrative review. Search of databases: CINAHL, Cochrane Library, EMBASE, MEDLINE,	To identify, analyse and synthesise the research available about the nature of and potential for IPE provided to undergraduate	27 primary research studies undertaken in seven countries: Australia, Canada, USA, New Zealand,	Studies demonstrate rural clinical learning environments provide rich and varied IPE opportunities for students that increase their interprofessional understanding, professional respect for other roles, and awareness of the

		ProQuest, PubMed, SCOPUS, Web of Science and Google Scholar. Search terms adapted to suit different disciplines and databases. Key words related to IPE, rurality, undergraduate students and clinical placement. Inclusion criteria: primary research and reports of IPE in rural settings, peer reviewed, published in English between 2000 and mid-2016.	students undertaking rural placements, the settings and disciplines involved, and the outcomes achieved.	the Philippines, South Africa and Tanzania	collaborative and interprofessional nature of rural practice. All studies were concerned with developing collaborative, interprofessional practice-ready graduates and adopted a similar mix of research methods. The studies involved more than 3800 students (range 3–1360) from 36 disciplinary areas. Interprofessional education was provided in a combination of university and rural placement settings (hospitals, community health services and other venues). Education activities most frequently utilised were seminars, tutorial discussion groups, case presentations and community projects augmented by preliminary orientation and ongoing interaction with clinicians during placement.
Hlushak, A., MacQuarrie, A., Sutton, C., Pickering, G., Logan, P., Robertson, C.,	2018	Mixed-methods crossover study - completion of self-reflection questionnaires (SRQ) and pre-post simulation questionnaires: Readiness for Interprofessional Learning Scale (RIPLS) and Attitudes Towards Health Care Teams Scale (ATHCT).	To measure the effectiveness of student handovers in simulation and examine perceptions of handover effectiveness.	15 students - 18 handovers were observed. Interprofessional teams of nursing (n=3 1st year), paramedic (n=8 3rd year) from Charles Sturt University and medical (n=4) students (4th year) from Western Sydney University. Students participated in two medical clinical simulations, which involved handovers	Data most likely to be handed over: patient demographics, clinical impression and treatment. Least likely: additional background and response to treatment. RIPLS questionnaire: significant differences between student groups and a change in score between pre-post questionnaires. No differences noted between the pre- and post-ATHCT questionnaire. Comparison of actual and perceived data transferred showed percentage of non-clinical data actually transferred to be higher than students' perceived. Students require increased opportunities for handover practice and clarification on what constitutes an accurate handover.
Pit, S.W., Bailey, J.	2018	Qualitative - 2 focus groups conducted upon	To explore medical students' knowledge of,	31 final year medical students who had	Exposure to telehealth consults varied and appeared ad hoc. Overall interest in telehealth

		completion of a 12-month rural placement. Questions focused on students' exposure to and experiences with telehealth, their perspectives on those experiences, their desire to learn more about telehealth, and their perspectives on who should drive the implementation of telehealth services. Thematic analysis was conducted to identify key themes.	exposure to and attitudes towards telehealth.	completed a 12-month clinical placement in 2 rural clinical schools in NSW	appeared to be low, but students recognised its value in specific circumstances, such as for scripts, complicated/rare cases and to reduce social isolation for patients and doctors. Identified barriers to telehealth: legal/liability issues, technology, organisational issues, patient rapport, potential lower quality of care, lack of confidence in clinical ability, and a preference for 'face-to-face' medicine. Students felt that rural, rather than urban-based, clinicians need to drive the telehealth agenda and further telehealth skills training and guidelines are required.
Nestel, D., Gray, K., Ng, A., McGrail, M., Kotsanas, G., Villanueva, E.	2014	Mixed methods evaluation involved questionnaires, focus groups and document analysis. Descriptive statistics were computed. Focus groups were audio-recorded, transcribed, and analysed thematically	To explore the feasibility and educational benefits of mobile learning for two cohorts of students learning in two settings—university campus (first-year students) and rural clinical placements (second-year students). Students in a new medical school were provided with laptops.	44 students participated in 6 focus groups. 6 faculty participated in 1 focus group. Questionnaires n= 112. University campus (first-year students) and rural clinical placements (second-year students).	More first-year students (than 2nd year) took their laptops to campus daily and used them for more hours each day. All students used laptops most frequently to access the internet (85% and 97%) and applications (Word and PowerPoint. Students showed appreciation for the laptops but frustrated with initial software image. Faculty identified enthusiasm for mobile learning but acknowledged its limitations. If adequately resourced, mobile learning through university-issued laptops would be feasible and have educational benefits, including equitable access to learning resources, when and where they are needed. However, barriers remain for full implementation
Little, F., Brown, L., Grotowski, M., Harris, D.	2012	Qualitative - case study/descriptive	To describe a model of interprofessional learning developed to address some	137 rural health professionals	Interprofessional learning can be delivered effectively in a rural setting by utilising technology to help bridge the

			of barriers to delivery of interprofessional education in the rural health setting in Australia. A model for interprofessional learning has been developed to attempt to address the barriers related to the delivery of interprofessional education in the rural health setting in Australia. This model demonstrates a flexible approach to interprofessional learning which meets different educational needs across several health disciplines and is tailored to varying levels of expertise.		isolation experienced in rural practice. Challenges in delivering the program included: engaging rural general practitioners, utilising technology and maintaining participant engagement. The use of technology is essential to access a broad group of rural clinicians however, there are limitations in its use that must be acknowledged.
Moore, L., Campbell, N.	2019	Mixed methods - observation of participants before, during and after the room; participant evaluation questionnaires; free-flow discussion after participation; and through written and verbal feedback received.	To evaluate the 'escape room' as a way to engage participants in interprofessional learning. Room was run as a pilot in three stages – briefing, solving the room and debriefing. Escape room is an immersive team-based activity with puzzles and problem solving, developed specifically for this program. The room has an interprofessional	34 participants from a wide range of professions and experience (students, new graduates, experienced professionals)	The escape room activity was very enjoyable, encouraged participant engagement, suited many professions, was transportable and showed promise as an interprofessional learning platform. Additionally, it provided unexpected benefits, including networking opportunities, staff engagement and peer support possibilities. A strength of the escape room is its engaging way of promoting learning and applying a wide range of skills that students often undervalue yet are critical to ensuring quality healthcare outcomes for patients.

			healthcare theme and can be transported in a suitcase to enable use in almost any placement site.		
Buykx, P., Cooper, S., Kinsman, L., Endacott, R., Scholes, J., McConnell-Henry, T., Cant, R.	2012	Quantitative - Time series analysis was conducted for five fortnightly blocks before and after the delivery of the FIRST2ACT training to assess change in key outcome variables, including frequency of vital signs recording and charting of pain scores. assessing patient notes before and after the intervention for time series analysis	The FIRST2ACT model was implemented in a rural hospital to investigate whether there were measurable improvements in actual clinical practice. Simulation-based educational model, 'FIRST2ACT' (Feedback Incorporating Review and Simulation Techniques to Act on Clinical Trends), to provide nurses with a high-fidelity learning experience.	35 Registered nurses in a rural hospital	The model has been tested in three different settings: it is highly acceptable to learners, adaptable to different training needs, and shows promise in improving actual clinical performance. Knowledge levels averaged 67% (27—91%) which was significantly lower for this qualified cohort compared to third year students. Situation awareness was low (50%) with many important actions and observations missed with, as in previous studies, a significant decline in performance as the patient deteriorated and the participant became more anxious. 258 patient records were audited for the ten weeks before the intervention and 242 records for the ten weeks after. Staff were significantly more likely to record observations at applicable intervals after the intervention and much more likely to record pain scores and to deliver/ apply oxygen therapy correctly.
Harvey, P., Radomski, N.	2011	Mixed methods - written survey, focus groups, and a retrospective postal survey. Main outcome measures: Challenges of the OSCE roleplay experience and the reported effects on simulated patients (SPs).	To investigate the effects and challenges of being a SP in a high-stakes clinical examination context in a regional setting.	19 SP volunteers (from an existing database of 55 people) who had been involved in midyear, summative Objective Structured Clinical Examination (OSCE) role-play performances - A university clinical	Physical and emotional effects (exhaustion) were reported, as well as empathy and concern for medical students. Retrospective postal survey indicated that SPs had no long-term negative effects from their high-stakes examination experiences. Participants reported a level of decision-making and improvisation was needed in the OSCE performance. SP roles involve more than the transfer of scripted information. SPs should be considered members of the examination team when preparing and implementing high-stakes examinations to assist

				school in a Victorian regional city.	in maintaining standardised performance during and across OSCE role plays. Relationships between SPs and educational institutes need to be nurtured to ensure that the ability to continue high-stakes OSCEs in a regional setting is maintained.
Thackrah, R.D., Thompson, S.C., Durey, A.	2015	Qualitative - In-depth, semi-structured interviews Thematic analysis Main outcome measures: Student learning related to culturally respectful health care delivery and promotion of health.	To describe midwifery students' insights on promoting health to Aboriginal women in remote Australia following a supervised clinical placement.	7 female mature-aged undergrad and postgrad midwifery students from a Western Australian university. Students who Remote cultural immersion clinical placement - Aboriginal communities on the Ngaanyatjarra Lands, Western Australia between 2010 and 2013.	Although short in duration, the placement provided midwifery students with a rare opportunity to observe the importance of local contexts and cultural protocols in Aboriginal communities, and to adapt health promotion strategies to meet local needs and ways of doing things. These strategies embraced the strengths, assets and capacities of communities, yet students also witnessed challenges associated with access, delivery and acceptance of health care in remote settings. Students observed that, despite vast distances, high rates of participation in a breast screening program were achieved due to the informal provision of culturally relevant information and support. Opportunistic encounters in communities enabled sexual health messages to be delivered more widely and in less formal settings. The role played by Aboriginal Health Workers and female family members was vital. The importance of culturally respectful approaches to sensitive women's business, including discretion, the use of local language and pictorial representations of information, was recognised as was the socio-cultural context and its impact on the health and well-being of the community.
Beattie, J., D'Souza, K., Mc	2019	Qualitative – semi-structured interviews on two occasions;	(1) to explore the extent to which the simulation and debriefing process reflects	A total of 20 health professionals from four rural hospitals in	Three themes were constructed by the researchers: (1) self-reflexivity, (2) connectedness, and (3) social context. The

Leod, J., Versace, V.		immediately following the CSiM workshops and again 3–6 months later	transformative learning, as described by Mezirow; and (2) to introduce a reflective conceptual framework for post-simulation debriefing.	South Australia out of a possible 21 participants volunteered to be part of the CSiM study. This article focuses on the data collected from 16 of the 20 participants (a mix of nurses, midwives, and doctors).	findings in our study prompted the authors to develop a reflective conceptual model of debriefing—Sim TRACT.
Gum, L., Greenhill, J., Dix, K.	2011	Quantitative - tracking academic progress and selection criteria entry data	To examine participants' medical school selection data and academic performance in the Deakin University (DU), Bachelor of Medicine Bachelor of Surgery (BMBS) course. The comparison is between rural and metropolitan background students.	To date, 147 graduates have participated in this study (response rate 20%). At least 25% of each cohort originates from a rural background (RB), which was classified as five consecutive or 10 cumulative years in a rural location after birth.	RB applicants had a significantly lower GPA compared to metropolitan background students and were more likely to suffer from financial disadvantage. To mitigate such inequities, rural or regional residency (4%-8%—increasing scale with level of rurality) and financial disadvantage (2% for students receiving government support for at least 12 months of their undergraduate degree) bonuses are applied. Once admitted to the BMBS course, RB students' mean academic performance was comparable to metropolitan students' (68% and 70% respectively)—demonstrating that both groups had similar academic results when exposed to the same learning environment.
Taylor, S., Fatima, Y., Lakshman, N., Roberts, H.	2017	Qualitative - 3 focus groups - thematic analysis was undertaken on the qualitative data obtained from the focus groups	To explore health care students' perception of the relevance of simulated IPL for rural health care services.	22 - purposive sample of health care students on remote placement at MICCRH - pre-registration medical, pharmacy, and allied health students	Participants embraced both interprofessional and simulation components enthusiastically and perceived these to be useful as rural health care practitioners. 4 themes emerged: appreciation of the role of other health disciplines, collaborative approach to patient care, competency and skills for future health care practice, and relevance for future rural and remote health care practice. IPL

					sessions improved students understanding of rural multidisciplinary practice and facilitated appreciation for collaborative practice and expertise.
Newby, J.P., Keast, J., Adam, W.R.	2010	Quantitative - post-participation questionnaire utilizing a 5-point Likert scale (1 = strongly disagree, 5 = strongly agree) assessed student attitudes.	To develop a simulation training programme in the management of medical emergencies for final year undergraduate dental students, and then assess their attitudes toward the programme. Its purpose was to provide additional training to that currently undertaken by undergraduate dental students from UoM	52 final year UoM dental students from were required to complete simulation training incorporating an interactive tutorial and realistic, simulated emergency scenarios conducted in the students' real clinical environment.	Realistic simulation training in management of medical emergencies is an effective adjunct to traditional lecture style teaching. Given the importance of this subject, this mode of training would benefit students if incorporated into undergraduate dental courses. Student responses supported simulation training, evidenced by the following selected questionnaire responses: achieved greater confidence in managing emergencies 4.65 ± 0.48 ($n = 52$); prefer lecture to simulation 1.46 ± 0.74 ($n = 52$); simulation training is important in undergraduate teaching 4.86 ± 0.35 ($n = 43$).
Somporn, P., Ash, J., Walters, L.	2018	Qualitative - narrative literature review - articles published between 1970 and 2016 in order to adequately capture contemporary RCBME programs. The PubMed and MEDLINE databases were searched using the terms 'community-based medical education' and 'rural health' and 'undergraduate'.	To examine stakeholder experiences of rural community-based medical education (RCBME) programs internationally	30 RCBME programs are described in 52 articles, representing a wide range of rural clinical placements. Local stakeholders involved in rural community-based medical education programs	One-year LICs for penultimate-year students in Anglosphere countries were most common. Such RCBME enables students to engage in work-integrated learning in a feasible manner that is acceptable to many rural clinicians and patients. Academic results are not compromised, and a few papers demonstrate quality improvement for rural health services engaged in RCBME. These programs have delivered some rural medical workforce outcomes to communities and governments. Medical students provide social capital to rural communities. However, these programs have significant financial cost and risk student social and educational isolation.
van de Mortel, T.F., Silberberg,	2016	Quantitative - cross sectional design - national anonymous online survey	To examine the perceptions of key stakeholders on near-peer teaching in	N = 1122. 269 GP supervisors, 221 GP registrars,	Near-peer teaching was supported by majority stakeholders but is underutilised and has poor structural support. Guidelines may be required to

P.L., Ahern, C.M., Pit, S.W.		- closed and open-ended questions	general practice, their current near-peer teaching activities, and methods of recruitment and support.	319 prevocational trainees, and 313 medical students	help supervisors better support learners in this role and manage quality issues related to teaching. Stakeholder groups agreed registrars should teach learners in general practice, 72% of registrars, 68% of prevocational trainees, and 3 % of medical students reported having done some teaching in this setting. Three-quarters of supervisors allowed learners to teach. Having another learner observe their consultations was the most common form of teaching for registrars and prevocational trainees. 80% of registrars received some remuneration for teaching. The approach used to determine teaching readiness and quality varied greatly between supervisors.
Paliadelis, P.S., Stupans, L., Parker, V., Piper, D., Gillan, P., Lea, J., Jarrott, H.M., Wilson, R.L., Hudson, J.N., Fagan, A.	2014	Mixed methods - program evaluated post participation - 5 open-text evaluative questions asked learners whether: they enjoyed the program, it generated insights or new ideas, what they learned might improve their practice, highlights and ideas for improvements, other comments. Project team members and clinically based contributors provided comments regarding their participation.	To report on the development and evaluation of an innovative interprofessional online learning program based on a story-telling framework for students and those who supervise their placement experiences, aimed at enhancing student and clinical supervisors' preparedness for effective workplace-based learning.	170 postings, input of 284 learners in relation to their depth of learning and the relevance of that learning to their clinical education and supervision experiences. Students and health professionals for workplace-based learning, across a large rural area of northern NSW.	Evaluation of this program by the learners and stakeholders clearly indicated that they felt authentically 'connected' with the characters in the stories and developed insights that suggested effective learning had occurred. learners found the activities enjoyable (73%), agreed that they gained insights into practice (80%) and thought that the activities would improve their practice (74%)
Willsher, K.A.	2013	Qualitative - scenario presented as a case study to two classes, one comprised undergrad	To explore the ethical perspectives of students in relation to a complex case scenario. In 2008 and	12 students University of Third Age cohort; the number of nursing	Nurses are in a key position to identify potential ethical conflicts but need adequate supports in place in order to become empowered and advocate for patients. The differing attitudes

		nursing students, the other, mature-aged retirees. The International Council of Nurses Code of Ethics (2006) used to critically analyze the concepts of quality of life and empowerment. Qualitative data was collected from both groups and compared.	2009, the author introduced Joanna as a case study to two different instructional groups - 2nd year nursing students on a regional campus and University of the third age cohort	students is not reported. 2nd year nursing students on a regional campus and University of the third age cohort	towards Joanna and the care she received reflected the diversity, different quantities and types of life experiences available in the two class groups
Worley, P., Lowe, M., Notaras, L., Strasser, S., Kidd, M., Slee, M., Williams, R., Noutsos, T., Wakerman, J.	2019	Quantitative - descriptive with some data supplied - such as entry data and completion data	To describe the development, implementation and outcomes of the Northern Territory Medical Program (NTMP), a major development of the Flinders University distributed program, which aimed to develop the medical workforce for the NT environment.	144 students enrolled in the NTMP from 2011 to 2016	The mean age of the first cohort was relatively high, and time since first degree was longer than the Adelaide cohort. The majority did not have science backgrounds. With BCS students entering the MD from 2013, the mean age has fallen, and science literacy has increased. Examination scores post-2011 are statistically indistinguishable between Darwin and Adelaide cohorts. Paper provides a list of lessons learned for programs being developed and implemented in geographically dispersed areas
Woodroffe, J., Spencer, J., Rooney, Kim; Le, Q., Allen, P.	2012	Mixed method - 3 years of results from the program's evaluation- pre- and post-survey mixed method evaluative approach was used to evaluate students' understandings and experiences of the program and to assist in detecting any changes to students' attitudes and perspectives resulting	To explore students' understandings and experiences of the program and to assist in detecting any changes to students' attitudes and perspectives resulting from their exposure to the program	90 final year Tasmanian nursing, medical, and pharmacy students. Rural Interprofessional Program Educational Retreat (RIPPER)	A significant and positive shift in students' attitudes and understanding of interprofessional learning and practice following their participation in RIPPER. The evaluation findings suggest the need for sustainable interprofessional rural health education that is embedded in undergraduate curricula. Exposure of healthcare students to interprofessional education can positively affect their perceptions of collaboration, patient care, and teamwork. The rural context is an ideal place to showcase elements of effective interprofessional practice.

		from their exposure to the program. Thematic analysis.			
Jeffrey, C.A., Mitchell, M.L., Henderson, A., Lenthall, S., Knight, S., Glover, P., Kelly, M., Nulty, D., Groves, M.	2014	Mixed methods – survey, focus groups, and staff interviews provided an in-depth analysis of perceptions of revised OSCE. Descriptive statistics used to describe the student sample. Narrative data transcribed verbatim and analysed using content analysis. Triangulation through convergence of separate data sources focusing on themes and patterns within and between students and tutors.	To evaluate the effectiveness of the BPGs in providing quality OSCEs for student learning in a remote area postgraduate nursing program. OSCE = Objective structured clinical examinations. BPG = best practice guidelines	N = 33 (total). student surveys (n=15) and focus groups (n=13) and staff interviews (n=5)	OSCEs developed, taught and assessed using BPGs were highly valued. The BPGs provided an integrated approach with real-life scenarios with a strong cultural perspective – all important features to the RANs' future success in providing individualised care to clients in remote areas of Australia. Most student participants had limited experience in working in remote area nursing prior to participation and therefore the opportunities that availed themselves were critical in adequately equipping them with the requisite knowledge, skills and abilities. Three themes emerged from the data: (1) value of common and significant events in OSCE; (2) power of deliberate actions; and (3) learning cultural sensitivity.
Masters, S.C.; Elliott, S., Boyd, S., Dunbar, J.A.	2017	Mixed methods - descriptive study - clinical educators from the GGT UDRH project reported on number, location and duration of SBE workshops, number of attendees, student or other status, and discipline. Activity details (topic and simulation modality) were recorded. Questionnaire completed at end of workshops. Regular telephone and face-to-face	A key aim was to increase access to SBE for professional entry students (PES) in rural and remote locations through distributed simulation; defined as the ability to deliver a simulation learning experience in any location. A distributed model to deliver SBE in rural and remote locations in collaboration with local health and community services, education	Total number of participants 1437; however, 2 questions administered to 1187 participants. Professional entry students and clinicians in health and education facilities in regional SA and south-west Victoria	The distributed collaborative model substantially increased access to clinical skills training for PES and health professionals in rural and remote locations. The number of SBE participants and training hours delivered exceeded targets. The distributed model enabled access to regular, localised training for PES and health professionals, minimising travel and staff backfill costs incurred when attending regional centres. The skills acquired by local educators remain in rural areas to support future training.

		meetings with clinical educators to share challenges and lessons learnt.	providers and the general public.		
Campbell, D., Walters, L., Couper, I., Greacen, J.	2017	Qualitative - Delphi process - constructivist approach - delegates asked to prepare a 55-word vignette related to their experience of teaching clinical reasoning, and these case studies formed the basis of identification of key issues, further refined via a modified Delphi process	To explore the lived experience of rural primary care clinicians engaged in community-based and/or LIC programs, and to capture how clinical reasoning develops in students and junior doctors exposed to repeated undifferentiated patient presentations in the community context	19 participants in an international research workshop - clinician teachers and medical educators who work in rural primary care.	Four key themes were identified: the patient's story, the learner's reasoning, the role of the supervisor, and the context of the clinical encounter.
Bennett, P., Hooker, C.	2018	Qualitative – semi-structured one-to-one interviews with artists who provided art-based workshops to undergrad clinical students within the Enhanced Rural Interprofessional Cultural Health (ENRICH) program in Broken Hill. Artists and students engage and interact in art-based activities as part of the unique structure within the clinically focused ENRICH program.	To investigate artists' perspectives in participating as non-traditional (not medically trained) teachers in a clinical training program. To explore how a group of professional artists articulate the value they place on their engagement with undergraduate medical students. ENRICH has approx 40 clinical and non-clinical half-day (some full day) education sessions a year, spread over two semesters.	5 artists who provided art-based workshops to undergraduate clinical students within the ENRICH program.	5 interconnected conceptual themes. Artists' constructed value in terms of an ethic of reciprocal respect for developing professional identity − their own and of the students. This was constructed in a concept of reciprocal contribution to, and validating support from, local community. Artists' perspectives should not be regarded as extrinsic to evaluations of clinical training programmes. Artists valued participation that went beyond the usual features of developing student capacities for empathy and insight into patient experiences.
Croker, A., Fisher, K., Smith, T.	2015	Qualitative - philosophical hermeneutics - Photo-	To explore participants' experiences with, and	N = 29 (total). students, academic	Students' interpersonal capabilities influenced their openness/willingness to engage with other

		elicitation interviews were used as a tool. Participants were asked to bring to the interview 10 photographs of places, spaces or things they believe represented factors that influence how students learn to work with other health professions.	perspectives of, students learning to work with other health professions, co-location and its effects on how students learn to work with other professions. Research question – in a setting where professions are co-located, how do students learn to work with other professions?	educators and clinical supervisors in diagnostic radiography, medicine, nursing, nutrition and dietetics, pharmacy, physiotherapy, occupational therapy, and speech pathology	professions. Key interpersonal qualities: being interested in other professions; being inclusive of other professions; developing interpersonal bonds to facilitate interprofessional interactions; giving and receiving respect to other professions; bringing a sense of own profession to interprofessional interactions; being patient-centred when working with other professions. Core contextual conditions: balance of professions; shared spaces; adequate time.
Stagg, P., Rosenthal, D.	2012	Qualitative - interview consisted of seven open-ended questions. Using a qualitative methodology two rounds of coding of the data were undertaken independently by each of the authors. Interviews with each participant were audiotaped to assist in gaining an accurate transcription.	To understand what motivates community members to participate in the selection of medical students, how they feel about their participation, and their perceptions of who are the beneficiaries of their involvement.	N = 8. Flinders University - community involvement in medical school student selection can be by participation in mainstream Graduate Entry Medical Program (GEMP) selection process at the Adelaide campus, or through membership of rural based Community Liaison Committee (CLC).	5 themes described why community members are motivated to be involved in 5 selection of medical students: opportunity for professional growth; personal growth; responsibility to represent broader community; protecting student-, public- and self-interest in shaping future workforce. Community members experienced feelings: associated with energising; emotive feelings; associated with self-worth, positivity and feelings of obligation. By bringing their own views/values to selection process they believed students will meet needs of their communities. They believe the university gains financially and politically by their involvement. Members of the rural based CLC considered this a service to their community, to which they have a strong sense of accountability.
Taylor, S., Hays, C., Glass, B.	2018	Qualitative - focus groups using thematic analysis. Provided workshops on compounding medication	To determine health students understanding of the role of pharmacists role in compounding medication to optimise health outcomes for rural and remote Australians	n=15 Allied Health and Aboriginal Public Health Students	Liked opportunity to participate in compound exercises and being part of a interprofessional team, particular beneficial for people in rural and remote practice and increased understanding about the role of the pharmacist. Understanding if reported benefits transfer to the patient

Barnett, T., Huang, W., Mather, C.	2017	Quantitative - observational study data collected via a questionnaire administered to all participants. Helping Hands Technology	To understand the impact of a collaborative system that allowed students to undertake a clinical procedure with real time audio/visual guidance	n=5 students	Instructors could use technology to guide students to undertake procedural learning

Appendix 4. Epidemiology of rural practitioners engaged in the health workforce in rural Australia

Authors	Year	Study design	Aim/objectives	Population	Key findings
Bradbury, J., Nancarrow, S., Avila, C., Pit, S., Potts, R., Doran, F., & Freed, G.	2017	Observational, cross sectional study of 184 general practices across 12 local government areas in Northern New South wales	To determine the appointment availability and out pocket costs for patients presenting with non-urgent general practices in a regional setting.	162 general practices	Rate of same day availability was 47.5% and bulk billing was 21%. Implications: Limited access to affordable, same day GP appointments, especially female GP. Improving availability of primary healthcare services may reduce non-urgent use of emergency department services.
Smith, T., Fisher, K., Keane, S., Lincoln, M.	2011	Observational study, comparative analysis of two cross sectional surveys	To compare the results of the 2005-2008 surveys of rural allied health workforce in Northern NSW.	225 in 2005 and 205 2008	1/3 of respondents were rural origin, 1/2 had a rural placement during training, 1/2 supervised students, though only 1/3 received training. Large number will retire in the next 5 to 10 years
McGrail, M.R., Russell, D.J., O'Sullivan, B.G., Reeve, C., Gasser, L., Campbell, D.	2018	Observational study. An assessment of the location of GP registrars in a large catchment area of rural North West Queensland	To describes an approach for planning and monitoring the distribution of general practice GP training posts to meet health needs across dispersed geographical	378 registrars and 582 supervisors	Registrars and supervisors well distributed. Implications: The approach describes distributed workforce planning and monitoring applicable in a range of contexts, with increased sensitivity for registrar distribution planning.
McGrail, M.R., Humphreys, J.S., Joyce, C.M., Scott, A., Kalb, G.	2012	Observational study. National longitudinal survey of Australian doctors	To investigate patterns of geographical variation in the workload and work activities of GP by community size.	3636 GPs	GP total hours increase as population decreases. Implications: Understanding patterns of geographical variation in GP work hours and activities has important implications for remuneration and providing necessarily support for GP. Current activities to attract graduates to rural practice will fail unless the nature of practice activity accords with graduates' aspirations for professional work life balance.
Zhao, Y., Russell, D.J., Guthridge, S., Ramjan, M., Jones, M.P., Humphreys,	2017	Observational study. Descriptive and Markov-switching dynamic regression analysis of NT	To describe temporal changes in workforce supply in government operated clinics in remote	54 remote clinics	Overall increases in workforce supply occurred. Implications: Despite substantial increases associated with greater funding, imperative remains to implement robust health service

J.S., Carey, T.A., Wakerman, J.		Government Department of Health Payroll	NT communities through a period in which there has been a substantial increase in health funding.		models which better support supply and retention of resident staff.
McGrail, M. R., Humphreys, J. S., Joyce, C. M.	2011	Observational study. Data for 3156 GP and 2425 specialists were obtained from the MABEL study.	To investigate the association between rural background and practice location of Australian general practitioners and specialists.	3156 GPs, 2425 Specialists	GP with at least 6 years of their childhood spent in a rural area were significantly more likely than those with 0-5 years in rural areas to be practicing in a rural location. Implications: Increase take up of rural practice by new graduates requires an increase selection of students with strong rural backgrounds.
Lenthall, S., Wakerman, J., Opie, T., Dunn, S., Macleod, M., Dollard, M., Rickard, G., Knight, S.	2011	Observational study. Data was collected from 1. CRAN database of remote facilities 2. 2006 census which provided population of Aboriginal people in communities in remote Australia 3. national survey on occupational stress	To describe the nursing workforce in very remote Australia, characteristics and key issues.	349 remote area nurses	Workforce 89% female, 40% aged over 50 43% live in remote Aboriginal communities, last 1o years decrease in registered nurses with midwifery qualifications 55% and child health nurses 39% only 5% have postgraduate qualifications. Implications: Study highlights the vulnerable status of the current remote health workforce.
Merritt, J., Perkins, D., Boreland, F.	2013	Observational study. Survey of private providers of Occupational Therapy (OT).	To understand private providers of rural OT regarding type of services provided, practice models and demographics.	37 occupational therapists	OT services in remote communities minimal and in very remote communities there are no OT services provided. Implications: Potential for market failure in private Occupational Therapy in rural and remote. Low incomes and low levels of health insurance in regional/remote areas. Address reimbursement for travel, provide student placements and recognise rural practice as a specialist field.
Rolfe, M.I., Donoghue, Deborah Anne; Longman, Jo M; Pilcher, Jennifer;	2017	Observational study. Mapping of maternity services	To examine the current state of equity of access to birthing services for women living in small communities	259 health facilities	Population more likely to have a birthing service if they have more births. Implications: Study identified disparities in birth services distribution, very remote communities less likely to have any service.

Kildea, S., Kruske, S., Kornelsen, J., Grzybowski, Stefan; Barclay, Lesley; Morgan, Geoffrey Gerard			in rural and remote Australia		
Whitford, D., Smith, T., Newbury, J.	2012	Observational study. Survey of South Australian Allied Health Workforce	To present data regarding demographics characteristics, employment, education, recruitment and retention of allied health professionals.	1539 responses	75% worked in the city, work life balance was the most common attraction to respondents' current jobs and better career prospects the most common reason for intending to leave. Generation Y respondents more likely to leave.
Mendis, K., Greenhill, J., Walker, J., Bailey, J., Croft, A., Doyle, Z., McCrossin, T., Stevens, W.	2015	Quantitative study - survey with closed and open questions - conducted from March to June 2014	To obtain data on the current Rural Clinical Training and Support workforce	413 responses were received and 316 (40.9%) complete responses analysed. All professional, academic and clinical academic staff employed through the RCTS program	Current RCTS workforce: majority were female (71%), 40–60-years predominant (28%), professional staff constituted the majority (62%). 62% of academics were aged above 50 years, no academics aged less than 30 years. percentage of professional staff with a rural background was higher (62%) than academics with a rural background (42%). Provides a benchmark to monitor trends in turnover or predict shortages due to cohort ageing

Appendix 5. Health workforce interventions in rural Australia

Author/s	Year	Study design	Aim/objectives	Population	Key results
McIntyre E., Brun L., Cameron, H.	2011	Mixed methods descriptive - on-line survey	To evaluate experiential novice researcher development program effect on participants research knowledge attitudes and practice.	105 of 249 recipients of researcher development program	Program was a valuable experience and had a positive effect on participants research knowledge, attitudes and way the use research in their work, 89% expressed interest in undertaking further research. Further research to focus on what worked and what did not to inform future programs. Program can be tailored to accommodate a broad range of PHC professionals.
Young, L., Peel, R., O'Sullivan, B., Reeve, C.	2019	Qualitative - semi-structured interviews thematic analysis	To explore the factors influencing GPs, PC doctors, GP registrars to work and train in underserved towns.	39 registrars, GP supervisors and practice managers	Four themes that suggest remote GP training provides extensive and safer registrar learning opportunities and supervision is usually of high quality. Evidence for the development of high-quality GP training in remote contexts. Potential to improve access to GP services in underserved populations
Bennett-Levy, J., Wilson, S., Nelson, J., Stirling, J., Ryan, K., Rotumah, D., Budden, D., Beale, D.	2014	Qualitative - participatory action research	To investigate whether high and low intensity CBT effective in enhancing the mental health of Aboriginal Australians.	5 university qualified Aboriginal or Torres Strait Islander mental health professional	Overall CBT perceived to be useful for clients and themselves, reporting improved patient outcomes wellbeing as well as their own skills and reduced burnout. CBT effective, safe and adaptable for different social and cultural contexts. Effective treatment delivered by Aboriginal health professionals for Aboriginal Australians.
Ristevski, E., Regan, M., Jones, R., Breen, S., Batson, A., McGrail, M. R.	2015	Mixed methods descriptive - structured questionnaire	To examine patient and clinician acceptability and feasibility of using supportive care screening and referral process in routine care for cancer patients in rural Australia.	154 cancer patients and 36 cancer clinicians	Approach highly acceptable, screening worked well, enhanced clinician patient rapport and patient awareness of services feasibility issues noted including timing of screening setting for screening and clinician availability. Further testing required before implementation more widely. Potential to improve care of cancer patients in rural Australia.

Spaeth, B.A., Shephard, M.D.S.	2016	Quantitative and case studies - clinical audit of POCT program	To examine the clinical and operational effectiveness of POCT to measure INR in remote Indigenous communities.	32 remote health services in NT - staff/patients/tests	Testing adopted and sustained over 6 years, good quality control achieved, patients appear to have benefited. Expansion of program across NT, resolve reimbursement issues. Feasible, accessible mechanism to monitor INR in remote populations.
Shephard, M.D.S., Spaeth, B., Mazzachi, B.C., Auld, M., Schatz, S., Loudon, J., Rigby, J., Daniel, V.	2012	Quantitative descriptive - analysis of administrative data and stakeholder satisfaction survey -	To examine the implementation of POCT testing program and stakeholder satisfaction.	32 remote health services in NT - 39 of 127 operators for satisfaction survey	Successful introduction, health staff operators satisfaction high, training challenges resolved. Potential to improve access to INR testing in remote settings.
Hinton, R., Kavanagh, D.J., Barclay, L., Chenhall, R., Nagel, T.	2015	Qualitative - participatory action research semi-structured interviews - best practice pathway developed as part of the project	To explore Indigenous community and service provider perspectives of well-being and improved access to care for Indigenous people at risk of depressive illness.	27 service providers and community members in 2 remote NT communities	Clear impediments to the early diagnosis and treatment of well-being concerns noted, addressing these challenges will require systematic change in service delivery that promotes the importance of culture and traditional leadership in care pathway. Targeted investment and resources are needed to improve access to services including strong leadership at policy level and accountability for provision of culturally appropriate care. Continued need to address the challenges to making services culturally appropriate and sustainable.
Reupert, A., Ward, B., McCormick, F., Ward, C., Waller, S., Kidd, S.	2018	Qualitative - community participatory research semi-structured interviews and workshops - designing new health service model	To inform the development of a family focused practice model for mental health services.	interviews 32, workshops 46 consumers family members, mental health practitioners and managers	Framework for family focused practice incl collaborative planning. Model needs further development with community. Potential for a more effective model of care.
Wakely, L., Wakely, K., Little, A., Crowley, E.	2017	Quantitative post implementation - questionnaire	To develop a multimedia child development resource that was easily accessible to rural clinicians.	112 rural clinicians	DVD acceptable and useful tool for rural clinicians. Online version in development.

Cumming, M., Boreland, F., Perkins, D.	2012	Mixed methods descriptive - questionnaire and interviews	To explore experiences of PHC nurses in rural and remote NSW who are required to provide palliative care as part of their generalist role.	40 rural and remote PHC nurses	Palliative care a small but important role, need to equip generalist nurses to provide high quality palliative care, including accessible education and PD. Health services need to provide increased support and accessible education for PHC nurses in palliative care will enhance palliative and EOL in rural and remote communities.
Breen, S., Ristevski, E., Regan, M.	2012	Mixed methods descriptive - questionnaire and document analysis	To assess acceptability and effectiveness of supportive care resource kit.	40 cancer patients and 7 cancer clinicians	Supportive care resource kit acceptable to patients - helped meet support needs, successfully used by clinicians. Use of kit should improve patient care.
Kuipers, P., Lindeman, M.A., Grant, L., Dingwall, K.	2016	Qualitative – in-depth interviews	To discuss the development of more effective ways for front line workers to deal with Indigenous youth in responding to suicidal behaviour.	22 practitioners in central Australia	Inadequacy of current services noted, definitional issues and refinement of local assessment and referral protocols that are sensitive to social and contextual realities - need for more coordinated client centred approach to care and communication pathways. Need to revise current clinical practices in Central Australia. May have broader application in other jurisdictions.
Khalil, H., Cullen, M., Chambers, H., Steers, N., Walker, J.	2014	Qualitative - not explicitly stated - informal interviews and document review	To describe the steps needed for successful implementation of the - e-health mobile wound management project and make recommendations for future e-health initiatives.	N = not stated. Clinicians and managers	Successful implementation, key features of program outlined. Need provision of reliable computer equipment, formal staff training, staff motivation, guidelines, monitoring and review (audit) of data key elements. Potential service model to improve wound management.
Reddy, P., Hernan, A.L., Vanderwood, K.K., Arave, D., Niebylski, M.L., Harwell, T.S., Dunbar, J.A.	2011	Qualitative - focus groups in two countries	To identify the key elements that enabled successful implementation of diabetes prevention control programs in rural areas in USA and Australia.	10 program facilitators	Four main themes success in establishing and implementing the program, strategies for recruitment and retention of participants, what works in these programs, rural-centred issues. Improved success related to securing funding early, support from community leaders and positive relationships with service providers,

					program team, celebrating successes for participants, procedures of post-intervention support. Guide for successful implementation in rural areas.
Tall, J., Brew, B., Saurman, E., Jones, T.	2015	Qualitative - phenomenology - interviews and focus groups	To explore challenges and strategies for implementing an anti-smoking program by PHC staff in RR communities.	15 interviews, 65 in focus groups. Staff involved in implementing the program	Challenges: limited healthcare resources, limited collaboration between health services, difficulty accessing staff training, high level of community distress and disadvantage, normalisation of smoking, low morale in staff. Strategies to overcome challenges include appointing dedicated staff, improving collaboration, access and flexibility, subsidies for medications, and increasing staff morale. Findings may assist in implementation of other programs. Program challenges can be substantial in rural and remote settings.
Wong Shee, A., Nagle, C., Corboy, D., Versace, V.L., Robertson, C., Frawley, N., McKenzie, A., Lodge, J.	2019	Mixed methods - questionnaire and focus groups	To understand clinician factors that may influence the uptake, acceptance and use of the normal labour and birth bundle.	76 survey, 16 clinicians focus group. Health staff delivering the service	Obstetricians and midwives in favour on the bundle, perceived to align with expectations of colleagues and patients. Understanding staff perceptions important to implementation.
Barclay, L., Kruske, S., Bar-Zeev, S., Steenkamp, M., Josif, C., Narjic, C.W., Wardaguga, M., Belton, S., Gao, Y., Dunbar, T., Kildea, S.	2014	Mixed methods - participatory research - routinely collected data, interviews and focus groups	To summarise the program that led to sustainable improvements in maternity services for remote dwelling Aboriginal women in the top end of Australia.	N = not stated. Two large remote Aboriginal communities in the top end	Cost effective improvements achieved, but system wide problems still account for substandard quality services, including lack of Aboriginal leadership and inadequate coordination between remote and tertiary services. Use of evidence-based practice improved clinical effectiveness but more needed to deal with substandard care.
Durst, M., Rolfe, M., Longman, J., Robin, S.,	2016	Quantitative before-after study - service data	To describe the outcomes of a public hospital maternity unit in rural	1172 births -hospital patients	Rural maternity service maintained quality care outcomes following adaption of midwifery service. Option to consider low risk midwifery

Dhnaram, B., Mullany, K., Wright, I., Barclay, L.			NSW following adaption from specialist and GP led service to low risk midwifery group practice.		service to maintain birthing services in rural communities.
Christou, A., Thompson, S.C.	2013	Mixed methods - descriptive - questionnaire, closed and open-ended questions	To evaluation of an Aboriginal specific bowel cancer education flipchart.	N = 37. Health staff sent flipchart	Few respondents used the flipchart, including view Aboriginal education responsibility of AHWs. Greater recognition of health staff role in education Aboriginal people. Successful use of health promotion or patient education materials for Aboriginal people requires awareness of the problem among health professionals and adequate time for and specific training in implementation of the tool.
Cameron, H., Boreland, F., Morris, J., Lyle, D. Perkins, D.	2013	Mixed methods descriptive - questionnaire and follow up interviews	To evaluate the NSW researcher development program.	37 survey - 23 interviews. Researcher development program participants	Evidence of skills development through modest programs - strong supervisory support, realistic time frames and synergy between research and day to day work of participants components of successful program. Provides a pathway for PHC practitioners to develop research skills. One approach to overcoming lack of research capacity in PHC.
Saurman, E., Kirby, S., Lyle, D.	2015	Qualitative - interviews and focus groups	To understand experience of managing emergency mental health patients and their use of MHEC-RAP.	12 ED staff	Increased confidence of ED staff managing mental health emergencies locally, provided access to specialist assessment. Program accessible - offers insights to those considering how to establish a telehealth service in other settings. Viable model for providing emergency mental health care remotely.
Greenhill, J.A., Walker, J., Playford, D., Greenhill, J.A.	2015	Mixed methods – descriptive - interviews closed and open questions	To explore the achievements and challenges of the Rural Clinical School (RCS) and Regional Medical School (RMS) Program.	18 RCS and RMS	Increased opportunity for medical students to undertake long stay rural placements, extensive positive impacts on rural and regional communities, medical education innovation and curriculum, community engagement, rural academic workforce, rural research, and

					infrastructure. Program sets the stage for sustainable rural medical workforce.
Terry, D.R., Le, Q., Hoang, H., Barrett, A.	2015	Qualitative - phenomenology - interviews	To examine the benefits and challenges community nurses experience when working in rural or remote Tasmania.	15 rural community nurses in Tasmania	Increasing expectations and challenges of maintaining skills, need to maintain services with workforce shortages, difficulty collaborating communicating with other services esp acute - community sector - lack of appreciation of community nurse role - need for relief staff, WHS issues, improved access to training was identified. Role has evolved there is need for greater recognition and development to meet contemporary PHC needs of rural and remote communities.
Ervin, K., Moore, S.	2014	Qualitative - interviews	To explore the opinions of nursing staff of volunteers delivering patient centred care for patients with dementia and delirium.	15 nurses in a small rural hospital	Volunteers provided increased cognitive stimulation and increased patient safety through constant presence of volunteers - nurses also indicated they were freed up for other tasks - supported by nurses. Valuable service worthwhile to be implemented in other settings. Mechanism to help deal with predicted increasing demand for care for dementia patients.
Rix, E.F., Barclay, L., Wilson, S.	2013	Qualitative - semi-structured interviews thematic analysis	To describe service providers perspectives on health service delivery for Aboriginal people receiving haemodialysis for end-stage renal disease in rural Australia.	29 service providers in a health district in rural NSW	Five themes: rigidity of service design, responding to social complexities, promoting empowerment, trust and rapport, contending with discrimination and racism - services not designed to meet Aboriginal people's cultural needs. Need for an Aboriginal-specific pre-dialysis pathway and cultural awareness of staff, cultural safety of institutions, increased patient support for home dialysis.
Khalil, H.	2019	Quantitative - pre- post intervention - questionnaires to evaluate educational program	To describe the steps in successful implementation of medication safety program in an Aboriginal	8 - interviews, 17 post implementation questionnaires.	Successful implementation: improved knowledge, confidence behaviour, use and satisfaction. Programs need to include training for culturally appropriate medication response.

			Community Controlled Health Service.	Aboriginal health practitioners	
Ingham, G., Plastow, K., Kippen, R., White, N.	2019	Qualitative - semi-structured interviews	To understand how patient safety in early GP training is managed.	9 medical educators	Seven themes, main finding - supervision delegated to training practice, supervisory practices vary, safety risk of quota driven recruitment, high risk management lacks consistency. Suggestion reconsideration of rural training requirements and reintroduction of a targeted short GP placement with level 1 supervision for hospital residents who are intending to apply for GP training. Potential changes to medical training to enhance safety in early GP training.
Khalil, H., Byrne, A., Ristevski, E.	2019	Developmental evaluation - overview of process	To develop and implement a region-wide clinical skills matrix to guide palliative care and district nurses.	palliative care and district nurses	Successful implementation - process described. Matrix allowed managers of services access to skills and knowledge needed by staff in an individualised and timely way.
Khalil, H., Lee, S.	2018	Mixed methods - pre-post implementation	To describe the steps involved for the successful implementation of a medication safety program in rural primary care and report on its evaluation.	large non for provide health care organisation working in community	Successful implementation: improved knowledge, confidence behaviour, use and satisfaction. Importance of the three main stages: connect and communicate, collaborate and consolidate. Potential for use in other organisations.
Ollerenshaw, A., Wong Shee, A., Yates, M.	2018	Quantitative - descriptive - questionnaire	To explore the awareness and usage of an online dementia pathways tool.	263 rural Victorian General Practice Staff (GPs and Practice Nurses)	Tool provided access to regional specific referral and management resources for all stages of dementia. Further research needed to determine the tool's contribution to learning in the practice setting. Such tools have broad transferability in other health areas.
Bennett-Levy, J., Singer, J., DuBois, S., Hyde, K.	2017	Qualitative - interviews	To explore the barriers and enablers of e-Mental Health uptake (supported by training program) in predominately Aboriginal	26 community-based Aboriginal and Torres Strait Islander health professionals with case management roles	Uptake of e-MH relatively low due to organisational impediments, issues of fit for work environment and impact of high staff turnover. important to match e-Health to work roles (fit for purpose). Criteria needed evaluating e-health that is relevant to context.

			and Torres Strait Islander health professional.		
Lyle, D., Greenhill, J.	2018	Secondary review of published resources - review article	To review contribution of UDRHs and RCS to the development of rural health and rural health workforce over 2 decades.	33 UDRHs/RCS/RMS	UDRHs and RCS have established a substantial footprint across rural and remote Australia, increased number of students on rural clinical placements, substantial research output, early evidence of workforce outcomes for medicine. Community engagement and accountability to region hallmark of program important not to be lost in the realignment to RHMT program. Current investments should provide new opportunities for UDRHs and RCS to address training needs of medicine and other health disciplines after graduation as well.
Humphreys, J., Lyle, D., Barlow, V.	2018	Mixed methods - descriptive - review of administrative data and interviews	UDRH program	11 UDRHs	Evidence for engagement with regional communities covering 40% of rural and remote Australia - increasing student access to clinical placements, innovation student placements, strong research performance. UDRHs provide strong academic presence in rural and remote Australia. UDRHs are contributing to workforce training in rural and remote Australia - further work required to achieve workforce outcomes.
Terry, D., Le, Q., Nguyen, U., Hoang, H.	2015	Qualitative - narrative enquiry (phenomenological approach) – in-depth interviews	To investigate the types of workplace health and safety issues rural community nurses encounter and impact these issues have on providing care.	15 rural community nurses	Specific WHS issues included geographical environment issues, working in isolation; physical environmental issues, client behaviour, consumer's home condition and smoking and organisational issue include workload, workplace culture, nonetheless community nurses have developed strategies to deal with these and other issues. Issues impact on sustainability and quality and safety of health practice in rural and remote community

					nursing. Improved policy and capacity building regarding WHS required.
Lenthall, S., Wakerman, J., Dollard, M.F., Dunn, S., Knight, S., Opie, T., Rickard, G., MacLeod, M.	2018	Mixed methods - participatory action research/organisational development model; Workshops, interviews; pre-post surveys	To explore the effectiveness of an intervention to reduce occupational stress	Number of participants not clear - RANs in the NT	Few measurable changes. Need for sustained effort - implementation of recommendations from reports and other studies. No improvements shown but other recommendations to improve safety and working life of RANs still need to be implemented. Study undertaken during the NT intervention.

Appendix 6. Health workforce recruitment and retention in rural Australia

Author/s	Year	Study design	Aim/objectives	Population	Key results
McGrail, M.R., Humphreys, J.S., Joyce, C.M., Scott, A.	2012	Quantitative - Wave 2 of MABEL longitudinal study. Main outcome measures - level of professional and non-professional satisfaction expressed by GPs with respect to various job and social aspects.	To analyse the satisfaction of IMGs in their current work location, particularly in relation to the effect of mandating IMGs to small rural communities.	3502 IMGs mandated to practice in rural Australia	non-professional satisfaction of mandated IMGs was significantly lower across all social aspects, whilst professional satisfaction was also significantly lower for most job aspects relating to their professional autonomy. In contrast, non-mandated IMGs were similarly satisfied compared to Australian trained GPs.
Strasser, R., Hogenbirk, J.C., Lewenberg, M., Story, M., Kevat, A.	2010	Mixed methods - retrospective cohort mail survey	To determine if selecting rural background students into the Monash Bachelor of Medicine and Bachelor of Surgery affects vocational training location and intended practice location after training.	n = 223 MBBS students at Monash 1992-1994	Rural background medical students significantly more likely to work rural. Consideration of strategies, such as rural based vocational training programs, may enhance entry into rural practice.
O'Sullivan, B.G., McGrail, M.R., Stoelwinder, J.U.	2017	Quantitative - wave 7 MABEL survey, national subsidy data	To determine whether subsidies have the potential to support the provision of specialist outreach services into more remote locations	n = 264, medical specialist outreach providers	Rural Health Outreach Fund (RHOF) subsidies, while only provided to 1 in 5 outreach specialists, have helped to provide targeted outreach services in remote areas and provides stable services in areas of highest relative need. Non-RHOF subsidies may need to be better structured to promote regular and sustained practice
Moran, A.M., Coyle, J., Pope, R., Boxall, D., Nancarrow, S.A., Young, J.	2014	Qualitative - integrative review thematic analysis	To identify the mechanisms for the successful implementation of support strategies for health-care practitioners in rural and remote contexts.	n = 43 papers from empirical literature	Strategies focused on training and education programs, rather than supervision or mentoring programs. Mechanisms associated with success: access to appropriate and adequate training, skills and knowledge for the support intervention; accessible and adequate resources; active involvement of stakeholders in program

					design, implementation and evaluation; a needs analysis prior to the intervention; external support, organisation, facilitation and/or coordination of the program; marketing of the program; organisational commitment; appropriate mode of delivery; leadership; and regular feedback and evaluation of the program. Key mechanisms may assist decision makers in development and implementation of support strategies for staff.
Wright, A., Regan, M., Haigh, C., Sunderji, I., Vijayakumar, P., Smith, C., Nestel, D.	2012	Mixed methods - (i) workshop and end of session evaluations (including pre and post Multisource Feedback (MSF)) and (ii) telephone interviews	(i) To what extent is it possible to support professional development of IMGs in a regional setting? (ii) What aspects of the GIPSIE program were effective? (iii) What aspects need improvement	n = 15 participants completed GIPSIE. 17 IMGs were recruited from hospitals and general practices across the Gippsland region.	Program highly, especially simulation-based activities with feedback and audio-visual review on iPods and GIPSIE website. Increased knowledge, skills and professionalism after the program. No statistically significant changes in overall MSF scores. Positive directional changes for 'technical skills appropriate to current practice', 'willingness and effectiveness when teaching/training colleagues' and 'communication with carers and family'. Learning sustained 3-months after program. Sustainability of these programs requires significant commitment. Relationship between regional clinicians and medical school pivotal to success.
Keane, S., Smith, T., Lincoln, M., Fischer, K.	2011	Mixed methods - descriptive cross sectional	To investigate the demographics, employment, education and factors affecting recruitment and retention of New South Wales (NSW) rural allied health professionals	n =1879 allied health professionals from regional, rural and remote areas of NSW	70% female, mean age 42, 21 different AH professions. 60% rural origin. 84% worked in centres of 10 000 or more people. 46% public sector, 40% private sector, and 18% self-employed. Two-thirds worked 35 hours or more/week, only 49% employed full-time. Job satisfaction high, but 56% intended leaving within 10 years, 28% to retire. Almost half dissatisfied with access to continuing education. Recruitment should target rural high school

					students and promote positive aspects of rural practice, such as diversity and autonomy. Retention strategies should include flexible employment options and career development opportunities.
Buykx, P., Humphreys, J., Wakerman, J., Pashen, D.	2010	Systematic review	To synthesise the available evidence regarding the effectiveness of retention strategies for health workers in rural and remote areas, with a focus on those studies relevant to Australia	6 program evaluation articles, 8 review articles and 1 grey literature report identified that met study inclusion criteria	Wide range of retention strategies have been introduced in various settings, few have been rigorously evaluated. Little evidence demonstrating effectiveness of any specific strategy is currently available, except for health worker obligation. Multiple factors influence length of employment. Flexible, multifaceted response to improving workforce retention required. Need for rigorous evaluations of rural and remote health workforce retention strategies using pre- and post- comparisons. Workforce retention framework to address factors known to contribute to avoidable turnover, six components: staffing, infrastructure, remuneration, workplace organisation, professional environment, and social, family and community support.
Terry, D., La, Q,	2015	Qualitative - Critical discourse analysis was used to determine if social power, dominance, and inequality are enacted and reproduced through the text and talk of stakeholders	To examine IMGs and their acculturation in rural Tasmania.	n =23 IMG stakeholders - medical educators, directors of clinical training and recruitment staff, who work with IMGs and understand main issues faced by IMGs	Dominant views and practices were intentionally and unintentionally produced within Tasmanian health care setting. Issues were reported to contribute to marginalisation of IMGs, impacting on retention. Participants were positive and respectful in their vocalisation of IMGs and their contribution to the health system and community. Majority were extremely optimistic about changes which they had observed within health care system to accommodate, assist and respect IMGs. Addressing unintentional elements of racism (making assumptions, lack of respect or

					devaluation of IMGs) is necessary to unsettle dominant views and practices which intentionally or unintentionally continue to marginalise, discriminate and impact on IMGs which contributes negatively to the long-term retention.
McGirr, J., Seal, A., Barnard, A., Cheek, C., Garne, D., Greenhill, J., Kondalsamy-Chennakesavan, S., Luscombe, G.M., May, J., McLeod, J., O'Sullivan, B., Playford, D., Wright, J.	2019	Quantitative - data analysis from AHPRA and university records	To combine data from all RCSs' 2011 graduating classes to determine the association between rural location of practice (principal practice postcode - PPP) in 2017 and (i) extended rural clinical placement during medical school (at least 12 months training in a rural area) and (ii) having a rural background.	n =1695 graduates from 12 Australian RCSs	Proportion of students with a rural background range of 12.3–76.6% and proportion who participated in extended RCS placement ranged of 13.7–74.6%. Almost 17% had a rural PPP (based on ASGC), range 5.8–55.6%, and 8.3% had a PPP in rural areas (based on MMM3–7), range 4.5–29.9%. After controlling for rural background: students who attended RCS were 1.5 times more likely to be in rural practice using ASGC criteria and using the MMM3–7 criteria, students who participated in extended RCS placement were 2.6 times as likely to be practising in a rural location. Development of a vocationally qualified rural workforce is expected to take a further 5–10 years. Ongoing funding important to fulfil Commonwealth mandate to produce a locally trained graduate workforce. National evidence to indicate RCSs are associated with a statistically significant improvement in rural workforce relative to urban trained peers. Results are additional to the known positive effect of rural background in recruiting a rural workforce, which article also demonstrates.
Sutton, K., Patrick, K., Maybery, D., Eaton, K.	2016	Mixed methods confirmatory study - pre-post program online surveys and individual semi-structured	To examine the immediate impact of a 5-day intervention designed to attract urban trained allied health and nursing students	n =81 participated, 76 (93.8%) student completed pre-program questionnaire, 65	Significant post-program change in participants attitudes to working in a rural setting but less pronounced changes in attitude towards rural life. Interviews validated and augmented these results. Students frequently remarked about

		interviews (content analysis).	to rural mental health work.	(80.2%) completed post-program survey and 60 (74.1%) completed both pre- and post-surveys. 25 - semi-structured interviews. Students undertaking pre-registration undergrad and postgrad psychology, social work, OT and nursing at Melbourne-based universities invited to participate.	range of employment and career opportunities available in rural areas; however, far fewer interview responses related to non-work aspects of rural life. Need for research into longer term impact of brief recruitment interventions to understand: (1) whether immediate positive changes in attitude are maintained over time; (2) whether such programs result in increased recruitment of mental health practitioners to rural areas and (3) need to strengthen health workforce choice of practice location research through adoption of a theoretical underpinning. Study demonstrates that a brief rural workforce recruitment intervention has a differential impact upon participants 'attitudes to living and working in a rural area
Hays, R., Bowles, S., Brown, T., Lawler, A., Vickers, J.	2017	Quantitative - database of all medical graduates from UTAS, registration records and local workforce survey databases.	To report on the workforce outcomes of the first 42 graduating cohorts from the UTAS medical program.	n=2012 All UTAS medical graduates from 1970 to 2011.	1707 (85%) registered, most commonly in general practice (45.8%), medicine (13%), anaesthetics (7.9%), surgery (7.5%), psychiatry (4.3%), emergency medicine (35, 3.5%), paediatrics (3.4%) and pathology (3.3%). 41.9% worked in Tasmania, they comprised 35.6% of the local workforce and clustered around the two larger cities. Establishment of clinical schools in rural communities, promotion of admission of rural applicants and increased rural clinical placement opportunities, to improve workforce recruitment and retention. Need to consider lifestyle choices and availability of training opportunities and career positions as contributing factors to workforce outcomes. UTAS medical school has established clinical schools in rural communities, promoted admission of rural applicants and increased rural clinical

					placement opportunities, with some early signs of success. Contribution of UTAS medical program substantial but may be less than other regional medical schools.
Law, I.R., Walters, L.	2015	Quantitative - analysis of questionnaire data collected by the Medical School Outcomes Database (MSOD).	To examine, i) the association between elective experience and preferred training program at EQ (Exit Questionnaire) taking into account Commencing Medical Student Questionnaire (CMSQ) preference and, ii) the association between elective experience and preferred region of practice	n =3596 MSOD survey participants answering CMSQ and EQ (2006-2011), excluding international students	Nil significant findings. Need for further research and critical examination of elective programs at Australian medical schools. Study did not demonstrate an association between elective experience in resource poor settings and a preference for primary care or rural practice. Suggests that previously observed correlation between low- and middle-income countries international electives and interest in primary care in disadvantaged communities is likely dependent on student and elective program characteristics.
Sutton, K.P., Maybery, D., Patrick, K.J.	2015	Quantitative - quasi-experimental Online questionnaires prior to, immediately post, and 6 months following the program	To examine the longer-term impact of the vacation school upon student participants' interest in and attitudes toward: (i) living and working in a rural area; (ii) mental health work; and (iii) working in the rural mental health sector. Pre, post, and 6-month follow-up questionnaires from surveys of five vacation school cohorts sought to determine any significant changes in interest and attitudes toward living, working, and having a mental health career in a rural environment.	n =36 student participants from vacation schools held from July 2010 to August 2013	Large and significant positive increase in pre to post scores for student interest and attitudes to working in a career in rural mental health sector. Gains in interest and attitudes fell away by approx 50% in the 6 months after the program. Changes in attitudes toward rural work remained significant 6 months post-program. Attitudes to rural life at 6 months post-program were not-significantly different to pre-program scores. A short-term program designed to attract students to rural mental health work can positively change participants' interest in and attitudes toward rural work and life, however the change diminishes over time. Interest in rural work and career and rural work attitudes generally maintain significant improvement in longer term. Need for follow-up reminder or booster to reinvigorate interest in working and a career in a rural setting back

					to post-program levels: a follow-up program, ongoing contact, and/or regular information bulletins for past participants about regional job opportunities as they arise. Highlights the importance in recognizing the optimal point in a pre-registration student's studies for them to be exposed to possibilities and attractions of rural practice and rural life. Findings support brief interventions like the vacation school might ideally be in the 6 months prior to completion of studies
Terry, D., Le, Q., Woodroffe, J.J., Ogden, K.	2011	Literature review	To identify the experiences, challenges and acculturation of IMGs living and working throughout rural and remote Australia.	n = N/A IMGs in Australia	IMGs acculturation in Australian rural settings occurs rapidly. IMGs with Australian spouses or who have practiced in rural settings prior to migration experience a new phase of acculturation. However, maintaining cultural and religious connectivity continues to be challenging in these settings. Community awareness and an ability to embrace IMGs and cultural differences remain crucial for identity and cultural retention. Few studies recognised quality of life and social needs of IMGs and their family's impact on rural acculturation and settlement success. Previous research has focused primarily on employment integration, satisfaction and practice support. Gap - quality of life and social needs of IMGs and their families. Crucial factors impacting rural acculturation, retention and IMGs health and wellbeing. Literature highlights insights into IMGs acculturation as they migrate and reside in Tasmania, a less culturally diverse population, remains absent with very little comparable research conducted

Eley, D.S., Cloninger, C.R., Walters, L., Laurence, C., Synnott, R., Wilkinson, D.	2013	Quantitative - cross sectional cohort study - completion of personality and resilience scales	To examine the relationship of resilience to personality traits and resilience in doctors in order to identify the key traits that promote or impair resilience.	n = 479 family practitioners in practice across Australia	Strong to medium positive correlations found between resilience and self-directedness, persistence, and cooperativeness; and negative with harm avoidance. Individual differences in personality explained 39% of variance in resilience. Three traits which contributed significantly to variance: self-directedness, persistence and harm avoidance. Supports inclusion of resilience as a component of optimal functioning and wellbeing in doctors. Strategies for enhancing resilience should consider key traits that drive or impair it. Resilience associated with a personality trait pattern that is mature, responsible, optimistic, persevering, and cooperative.
Somers, G.T., Jolly, B., Strasser, R.P.	2011	Quantitative - cross sectional cohort study, literature review - development and validity assessment of index to predict rural career choice	To examine the development, validity, structure and reliability of the easily-administered SOMERS Index.	n = 345 Australian undergraduate-entry medical students in years 1 to 4 of the 5-year course	International literature strongly supported the validity of index components. Factor analysis revealed a single, strong factor (eigenvalue: 2.78) explaining 56% of the variance. Each of the other variables contributed independently and strongly to Stated Rural Intent (semi-partial correlation coefficients range:0.20–0.25). Cronbach's alpha was high at 0.78. A scale comprising all five factors that can individually predict rural outcome (intention, rural background, rural training, generalists role and self-efficacy) is valid, reliable and more methodologically sound than previous measures. Index might be a timely, more rigorous tool to aid in in student selection, the allocation of rural undergraduate and postgraduate resources and the evaluation of programs designed to increase rural career choice. This measure can help to predict which students are more likely to benefit from, and

					evaluation of, programs designed to increase rural likelihood, hence enabling the better targeting of limited resources.
Tyrrell, M.S., Carey, T.A., Wakerman, J.	2018	Quantitative (i) Cross-sectional survey, (ii) Development of motivation subscale,	To establish the nature of health practitioner (HP) motivations that are associated with the practitioner who chooses and stays in work in a very remote Indigenous (VRI) community for more than 3 years.	n = 547 HPs from four levels of remoteness in Australia	8 of 14 subscales developed were sensitive to VRI work experience. These formed the Very Remote Health Practitioner Motivation subscale set. Four motivation subscale scores together provided a significant estimate of likelihood of a practitioner having more than 3 years' VRI community work experience, compared with no such experience. Important new knowledge that can be applied through utilisation of 8 subscales, which relates specifically to VRI workplace and retention prospect. Could assist in personnel selection, new appointee orientation, professional development, and staff counselling, to foster better recruitment and retention of very remote health workforce.
Eley, D.S., Leung, J.K., Campbell, N., Cloninger, C.R.	2017	Quantitative cross-sectional study - surveys (i) The Temperament and Character Inventory (TCIR-140), (ii) The Multiple Stimulus Types Ambiguity Tolerance Scale-II (MSTAT-II), (iii) The Resilience Scale, and (iv) the Frost Multidimensional Perfectionism Scale (FMPS)	(1) Do rural background students have a different profile of personality than non-rural background students; (2) Does the degree of interest in rural practice have any association with a distinct personality profile; (3) How are rural background or interest in rural practice associated with coping constructs, and (4) Are the associations between levels of coping constructs and degree of interest in rural practice	n=797 medical students - 4th year	More (72%) rural background students had Profile 1 which was associated with higher levels of Tolerance of Ambiguity, High standards, and Resilience, but lower Concern over mistakes. Non-rural background students reporting a strong rural interest also had Profile 1 (64%) and similar levels of coping constructs. Rural background students, no significant association between interest and profile - likely to have Profile 1, regardless of interest in rural practice. Non-rural background students, interest was significantly associated with Profile 1. Rural immersion programs, and workforce initiatives through education, should continue to nurture students with a genuine interest in rural practice regardless of background. Rural background or strong rural

			mediated by their personality profile regardless of background?		interest are associated with a personality profile that indicates better capacity for coping. Personality may play a part in individual's interest in rural practice.
Opie, T., Lenthall, S., Dollard, M., Wakerman, J., MacLeod, M., Knight, S., Dunn, S., Rickard, G.	2010	Quantitative, cross-sectional - structured survey	To determine whether the incidence of violence against remote area nurses has changed over time. The frequency of various forms of workplace violence and their relationships to PTSD symptoms in this population were assessed.	n=349 nurses working in very remote regions across Australia	Increases in all incidents of reported workplace violence between 1995 and 2008. Verbal aggression, property damage and physical violence most frequently experienced forms of violence perpetrated directly towards remote area nurses - statistically significant positive correlations between all types of workplace violence and PTSD symptoms. Verbal aggression, physical violence and property damage most commonly witnessed forms of violence occurring between other people - statistically significant positive correlations found between each type of witnessed violence and PTSD symptoms, excluding sexual abuse/assault. Nurses working in very remote regions in Australia are fearful for their personal safety. Recommendations: (i) establish zero tolerance assessment teams (ii) systems for mandatory reporting of violence and aggressive incidents and mandatory debriefing for those affected (iii) education programs and improved psychosocial care (iv) workplace interventions targeting the physical work environment itself. Need to assess effectiveness of these strategies. Implications for the implementation of workplace policies that target the identification, management and prevention of violence in remote area nursing workforce. Increasing need to actively implement policies in administration and practice - will require participation/collaboration of all stakeholders

Hogenbirk, J.C., McGrail, M.R., Strasser, R., Lacarte, S.A., Kevat, A., Lewenberg, M.	2015	Quantitative - cohort survey	To test predictors of practice location of fully qualified Monash University Bachelor of Medicine, Bachelor of Surgery (MBBS) graduates	n=67 rural and 86 urban background doctors starting at Monash University 1992–1999.	Rural versus urban background significant predictor of rural (outside major city) first practice location and rural current practice location for fully qualified doctors. GP versus other medical specialists significantly predicted first or current rural practice location. Preference for a rural practice location in 5–10 years was predicted by rural background and positive intention towards rural practice upon completing MBBS. Surveyed in 2011, 28% of those who also responded to the 2006 survey shifted their preferred future practice location from rural to urban communities versus 13% shifting from urban to rural. RBE diminished over time and may need continued support during training and practice.
Willems, J., Sutton, K., Maybery, D.	2015	Qualitative - three-phase Delphi Study, utlising focus groups	To engage with expert knowledge of the programs key stakeholder groups in order to inform the initial steps of shifting the Gippsland Mental Health Vacation School (GMHVS) program toward a blended model, distributed across space and time.	n=27 student participants and service provider staff of the GMHVS	Participants suggested improving by adopting blended delivery - face to face and both asynchronous and synchronous e-learning methods and approaches. Could optimize engagement with students and service providers. Highest priorities were outlining information about how the disciplines, agencies and service systems work daily and scheduling information at optimal times. On-line environment offers opportunity to overcome barriers which currently limit capacity of the existing structure of the vacation school program to benefit the region. Future research - continue to evaluate the program transition to blended model and monitor its success in providing a key need to promote rural health and ability to engage participants in virtual space. Provides important information about how student interest in a rural career choice

					might be maintained following a brief intervention such as the vacation school. Second, the results highlighted the desired ways in which participants conceptualized the blended delivery alternative to GMHVS without it having to be provided solely in a face-to-face context
Godwin, D., Hoang, H., Crocombe, L.	2016	Qualitative - descriptive study utilising telephone, semi-structured interviews	To investigate the attitudes of Australian dental practitioners towards what may attract them to rural areas and why they may remain in them.	n=50 dentists, oral health therapists and dental prosthetists working in rural and urban areas of Australia	Four main themes: business case (concerns related to income and employment security), differences in clinical practices (differences in clinical treatments and professional work), community (fitting in and belonging in the area in which you live and work), and Individual Factors (local area provision for lifestyle choices and circumstances). Most influential themes were business case and individual factors. Smaller rural areas, due to low populations and being unable to provide individuals with their lifestyle needs, considered unappealing for dental practitioners to live. Previous experience of rural areas was highly influential. Factors (employment security, quality lifestyle and previous experience in rural areas) should be considered to develop effective strategies to address unequal distribution of dental practitioners. Most important of the lifestyle/family concerns were: quality schooling opportunities for children, and employment opportunities for partners. Facilitation of employment opportunities for the spouses of relocating dental practitioners, developing a sense of belonging in rural communities and social engagement with local populations may assist with retention. Assurance of long-term financial

					security from a rural location is a complex issue which requires flexible, practical and different models tailored for rural oral health care delivery for individual communities, mobile clinics and tele-dental services.
McCullough, K. M.; Williams, A. M.; Lenthall, S.	2012	Qualitative - descriptive study using Delphi method and a risk management approach	To identify and describe hazards within the RAN workplace from the perspective of experienced RANs and to facilitate consensus among expert RANs about the identification and priority of hazards.	n=10 remote area nurses in Australia	RANs encounter a wide variety of hazards from a variety of sources. Environmental hazards are complicated by living in remote areas and practicing in different locations. Relationships between nurse and community can be complex, lack of experience and organisational support may contribute to an increased risk of violence. Hazards prioritised as 'major' or 'extreme' risks included: clinic maintenance and security features, attending to patients at staff residences, RAN inexperience and lack of knowledge about the community, intoxicated clients with mental health issues. A work culture that accepts verbal abuse as 'part of the job' identified as a significant organisational risk. Lack of action from management when hazards are identified by clinic staff and insufficient recognition of risk of violence by employers were significant hazards. Implementation of strategies to reduce stress and improve retention of RANs may deliver reductions in level of violence experienced. Assessments of employers' policies, responses and occupational health and safety legislation compliance may provide evidence to encourage urgent action required to halt unacceptable burden of violence. Research needed to (i) identify measures that may reduce risk of violence towards RANs. (ii) consider impact of violence on victims and costs incurred by

					organisations. Further consideration of hazards following risk management process, may provide opportunities to reduce risk of violence towards RANs. Proposed control measures should be developed in consultation with RANs and remote communities they work in.
Penman, J., Martinez, L., Papoulis, D., Cronin, K.	2018	Qualitative, descriptive - semi-structured interviews	To (i) determine the factors that motivate nurses to pursue mental health nursing; (ii) identify the strategies that might attract nursing students and practising nurses to pursue mental health nursing as a professional career; (iii) and identify the difficulties of nurses in achieving their preferred clinical specialty	n=15 mental health nurses from rural and regional South Australia	Motivated factors to pursue MH nursing categorised as intrinsic and extrinsic. Strategies to attract nursing students and nurses to field: provision of high quality meaningful clinical placements; convey personal satisfaction derived from being a MH nurse; promote MH nursing aggressively; provide employment incentives. Study highlighted importance of addressing stigma, and greater education and support for nurses to pursue a MH career. Increase profile of MH, through professional education for clinical staff, by developing specific strategies for recruitment, as well as strategies for a sustainable workforce. Clinical practice implications - valuing MH nursing at workplaces, providing supportive environments, mentoring new staff, nurturing potential recruits during clinical placements.
Bennett, P., Barlow, V., Brown, J., Jones, D.	2012	Qualitative - literature review	To explore and describe the needs of new graduate registered nurses in a rural and remote (R&R) setting within Australia	New graduate nurses in rural and remote communities	Three main themes reflected enablers and disablers of retention of nurses as they transition from student role to new graduate practice: expectations, support and workloads. Provide a supportive learning environment for graduate nurses to acquire skills (clinical and non-clinical) necessary to be proficient, safe, valuable employees. Development, implementation and evaluation of structured program could reduce losses and improve retention rates should be considered for trial

					within Australian, especially in R&R context. Should address needs of new graduate registered nurses and workforce deficiencies in R&R settings. Unexplored research: social inclusion, particularly within the community setting; the relocation for employment of new graduate registered nurses to towns/ communities away from family/friends; expectations of new graduate registered nurses, nurse unit managers, nurse educators and employers; and multi-site longitudinal design. What is currently provided in Australia is ad hoc approach to new graduate programs, some new graduate nurses receiving limited guidance and supervision.
Russell, D.J., McGrail, M.R., Humphreys, J.S., Wakerman, J.	2012	Quantitative - data obtained from (i) the Australian State and Territory Rural Workforce Agencies National Minimum Data Set (NMDS) and (ii) baseline cohort of Australian RRMA 3–7 GPs undertaking clinical work during 2008, who responded to MABEL survey.	To measure the relative strength, significance and contribution of factors associated with rural and remote medical workforce retention.	n = 4223 (NMDS dataset); n = 1189 (MABEL survey) Rural and remote GPs in Australia	Most important factors associated with retention of rural and remote GPs, after adjusting for GP age: primary income source, registrar status, hospital work and restrictions on practice location (which are linked to geographic location). Practice ownership associated with ~70% higher retention than average. Undertaking hospital work in addition to routine general practice was associated with at least 18% higher retention compared with if no hospital work was undertaken. Less important factors: geographic location, procedural skills, annual leave, workload and practice size. Implications for future medical workforce policy, providing an empirical evidence base to support targeting and 'bundling 'of retention initiatives in order to optimise the retention of rural GPs.
Daly, M., Perkins, D., Kumar, K.,	2013	Qualitative - semi-structured interviews	To identify the factors in an integrated, community-	n=42 - medical students in final 1–2	Opportunities for clinical learning, personal and professional development and cultural

Roberts, C., Moore, M.			engaged rural placement that may contribute to preparedness for practice (P4P) from the perspective of students and clinicians	years of medical school, on rural placement at Broken Hill UDRH, supervisors and clinicians	awareness were reported by students and clinicians as key factors that contribute to P4P. Potential barriers in rural and remote settings: geographical and academic isolation, perceived educational risk, differing degrees of program engagement. Students need to be well oriented and given strategies to maximise learning opportunities and supported to be self-motivated and pro-active during their placement. Important to identify skilled supervisors willing to teach and support them to develop their teaching and mentorship skills. A longitudinal clinical placement in a rural setting may enable development of enhanced competencies leading to P4P. Rural setting can provide unique experience through hands-on learning, enhanced personal and professional development opportunities and observation of cultural and contextual impact on health.
Russell, D.J., Wakerman, J., Humphreys, J.S.	2013	Mixed methods - (i) literature review, (ii) secondary analysis of existing Australian PHC workforce datasets; and (iii) a postal survey of 108 rural and remote PHC services	What is a reasonable length of employment for health workers in Australian rural and remote primary healthcare services?	n=108 Survey - stratified random sample of health services located in Rural, Remote and Metropolitan Areas 5, 6 or 7	Differences in retention by geographic location and profession took time to emerge and were not sustained indefinitely. Provisional benchmarks for reasonable length of employment were developed for health professional groups in rural and remote settings. This research has potential to assist managers to better understand baseline retention patterns, and how they compare with other similar services. Benchmarking workforce retention in comparable health services can enable identification of best practice and underpinning retention strategies. Workforce planners can use this, knowledge of baseline retention patterns and high cost of staff replacement, to guide

					design, timing and implementation of cost-neutral retention strategies.
Durey, A., Haigh, M., Katzenellenbogen, J.M.	2015	literature review	To identify barriers to AHP recruitment and retention and identify strategies to encourage and support AHPs from educational, financial, organisational, professional and social perspectives with a view to improving recruitment and retention at different stages along the pipeline.	Rural AHPs	Discrete themes within and between AHPs about factors influencing rural recruitment and retention choices and include career stage at entry to rural practice, age, gender, social context, professional support, organisational environment and public–private practice mix in service delivery. Findings underscored development of an extended rural pipeline adapted to specifically target AHPs. Flexible framework of rural practice entry can be applied at any career stage and includes retention strategies suggestions. An integrated, collaborative, inter-sectoral, sustained approach to develop and implement creative ways to improve AHP recruitment and retention offers opportunity to share disciplinary and industry knowledge, skills and expertise and build capacity across sectors in this context. Flexible approach needed to acknowledge issue complexity, address diversity within and between professions, and meet AHPs' professional and social needs. By avoiding a one-size-fits-all approach, the extended rural pipeline allows developing recruitment and retention strategies that reflect various stages AHPs enter rural practice along with differences in age, gender, professional needs, social context, cultural background, career stage.
Eley, D.S., Laurence, C., Cloninger, C.R., Walters, L.	2015	Quantitative - survey and Temperament and Character Inventory	To describe the predominant personalities of existing trainees. At its foundation, this	n=451 registrars from (i) the Australian College of Rural and Remote	Registrars training in Aust College of Rural and Remote Medicine pathway more likely to be male, older, have a definite interest in or already practising in a rural area and were

			study strives to obtain more information about those individuals choosing rural practice, which may in form ways to enhance future recruitment and training into rural medicine.	Medicine, (ii) Australian general practice training rural only, and (iii) two Australian general practice training rural and general pathway regional training providers	significantly (with moderate effect sizes) lower in levels of harm avoidance and higher in persistence, self-directedness and resilience compared to the other training pathways. Investigation needed: determine if individuals with a certain pattern of personal traits are attracted to rural practice training or whether the training itself, in part by exposure to rural life and rural medical practice, selects for those most suited to and will eventually choose to practice in a rural location. Along with certain demographic characteristics, combination and levels of temperament (stable) and character (developmental) traits support the notion of a mixture of personal traits that may be indicative of those best suited to rural and remote medicine
Humphreys, J.S., McGrail, M.R., Joyce, C.M., Scott, A., Kalb, G.	2012	Quantitative - Geo-coded data from national MABEL study (Wave 1) used to examine statistical variation in 4 professional indicators (total hours worked, public hospital work, on call after-hours and difficulty taking time off) and 2 non-professional indicators (partner employment and schooling opportunities).	To define an improved classification for allocating incentives to support the recruitment and retention of doctors in rural Australia.	n=3636 GPs completing MABEL survey	Classification based predominantly on town size rather than location (remoteness) is significantly more sensitive to small-area geographical differences relevant to workforce supply. Six-level geographical classification provides more equitable basis for allocation of recruitment/retention incentives targeting rural and remote doctors. Key professional and non-professional aspects of rural practice correlate with locality-based characteristics including town size and remoteness. Useful in grouping doctors according to those who do/do not warrant incentives, and delimiting geographically defined groups, which maximise 'within-group' and minimise 'between-group 'similarity. In this way, GPs sharing similar characteristics and needs for support are grouped together and differentiated from other

					GP groups who may need more/less support through incentives.
O'Toole, K., Schoo, A.M.M., Hernan, A.	2010	Qualitative - structured telephone interview	To explore the lack of retention of allied health professionals in rural areas in Victoria, Australia	n=32 Allied health professionals from south-west, central-west and north-east Victoria	Work experiences in rural areas summarised within 3 domains: organisational, professional and personal/community. Organisational domain: participants focussed on the way their work arrangements require them to be both more generalist in their approach to day-to-day work, and more expansive in shouldering management style functions in the workplace. Professional domain - three major issues: clinical, career and education/training. Personal/community domain: affinity for workplace and location in a rural place. Need improvements to public sector retention programs and to create broader policies for rural health that include private AHPs. Could make system more efficient, better use of resources, increasing local resource allocation and service provision, and increasing the sustainability of AHP practice. Factors that influence whether allied health professionals stay or leave rural areas is concern for health policy makers. Need to rethink models that help integrate private sector into policy mix.
Jones, M., Humphreys, J.S., McGrail, M.R.	2012	Quantitative - secondary analysis of linked data-bases from the Medical Schools Outcomes Database (MSOD), Australian Bureau of Statistics and other government sources	To identify the role of social, environmental and economic factors in addition to isolation characterising rural environments that either explain or modify the association between rural background and becoming	n=7422 Commencing medical students completing the Medical Schools Outcomes Database (MSOD) survey with linked external data	No social, environmental or economic factor or isolation significantly contributed to explaining the Rural Background Effect (RBE), although some evidence areas of more attractive climate strengthen RBE. Even when RBE is weakest, it remains a strong, positive predictor of attraction to rural practice. RBE remains a strong predictor for rural practice, even when all amenity variables are considered. RBE is not uniform across all rural areas, even in the worst

			a rural doctor rural practice intention.		case observed, the RBE remains a strong, positive predictor of interest in becoming a rural doctor. Findings suggest that RBE is stronger if individuals come from an 'attractive' rural area compared with those from less desirable rural areas (low SES and hot/dry climates). Unable to determine causal mechanisms, possibilities include socialisation and acculturation to urban environment, urban social networks or romantic during early adulthood, establishing relationship/family in urban areas.
Cosgrave, C., Maple, M., Hussain, R.	2018	Qualitative - in-depth semi-structured interviews	To identify work factors negatively affecting the job satisfaction of early career health professionals working in rural Australia's public sector Community Mental Health (CMH) services	n=25 Health professionals working in rural and remote CMH services in New South Wales (NSW), Australia	Factors negatively affecting the job satisfaction of early career rural-based CMH professionals affects all professionals working in rural CMH, and these negative effects increase with service remoteness. For early career, having to simultaneously deal with significant rural health and sector-specific constraints and professional challenges has a negative multiplier effect on job satisfaction. This phenomenon likely explains the high levels of job dissatisfaction and turnover found among Australia's rural-based early career CMH professionals. Proposed strategies may have relevance beyond rural CMH workforce to broader early career nursing and allied health rural workforce, and other countries with similar geography and health system. Testing findings generalisability and effectiveness of strategies for improving job satisfaction are important areas for future research. Findings highlight need to provide time-critical supports to address challenges facing rural-based CMH professionals in early career years to maximise job satisfaction and

					reduce avoidable turnover. By understanding multiple and simultaneous pressures on rural-based early career CMH professionals, public health services and governments involved in addressing rural mental health workforce issues will be better able to identify and implement time-critical supports.
Opie, T., Dollard, M., Lenthall, S., Wakerman, J., Dunn, S., Knight, S., Macleod, M.	2010	Quantitative - survey	To identify key workplace demands and resources for nurses working in very remote Australia and measure levels of occupational stress in this population	n=349 (34.6% RR) Nurses working in very remote regions of Australia	Compared with other professional populations, RANS had higher levels of psychological distress and emotional exhaustion, higher than average levels of work engagement and moderate levels of job satisfaction. Significant job demands: emotional demands, staffing issues, workload, responsibilities and expectations, and social issues. Key job resources: supervision, opportunities for professional development, skill development and application. To reduce work turnover in RANS, need to reduce job demands, increase job resources to foster long-term work engagement and to reduce emotional exhaustion. High work turnover even when high levels of work engagement and moderate levels of work satisfaction.
Chisholm, M., Russell, D., Humphreys, J.	2011	Quantitative - survey - stratified sampling	To measure variations in turnover and retention, determinants of turnover, and costs of recruitment of allied health professionals in rural areas	n=11 Health services (/16)	Differences in crude patterns of workforce turnover and retention of allied health professionals by location; profession, employee age and grade at commencement were significant determinants of turn-over risk. Costs of replacing allied health workers are high. Implementing comprehensive retention strategies in first year of employment in rural and remote settings; should be targeted to professions and location. Linking knowledge of the costs associated with avoidable turnover can

					open the way for the development of cost-neutral retention incentive.
McGrail, M.R., Wingrove, P.M., Petterson, S.M., Humphreys, J.S., Russell, D.J., Bazemore, A.W.	2017	Quantitative - Census and primary care supply data	To investigate the association of community amenity indicators with spatial variations in the supply of rural primary care doctor	Population level administrative data	Increased population size, having a hospital in the county, increased house prices and affluence, and a more educated and older population were all significantly associated with increased workforce supply. Remote areas were strongly linked with poorer supply. Future primary care workforce policies need to place a greater focus on rural communities that may be less attractive to doctors.
Bourke, L., Waite, C., Wright, J.	2014	Literature review -review of mentoring papers	to assess aspects of mentoring to ascertain their suitability for rural and remote health professionals	n=39 papers	Four mentoring models identified: cloning, nurturing, friendship and apprenticeship models. Apprenticeship model suitable for students. Nurturing model suited to new health professionals in rural and remote settings. Friendship model for senior practitioners/academics. Factors to enable mentoring in rural and remote settings: feelings of obligation by senior practitioners, strong relationships between staff, blurred work/social boundaries, lack of hierarchy, interprofessional practice and technology. Barriers: workloads, access to mentors, fee-for-service system for some practitioners, conflicts, and feelings of being judged. Mentoring rural and remote health professionals may allow them to grow, focus on personal goals and provide practitioners support during difficult times. Should trial mentoring program for RR HPs
Opie, T., Lenthall, S., Wakerman, J., Dollard, M., MacLeod, M.,	2011	Quantitative - survey	To examine the experiences of occupational violence in GP and non-GP staff. Further objectives were to compare prevalence of	n=125 GPs and non-GP staff (receptionist, practice-management, nursing	59.3% of GPs and 74.6% of non-GPs had experienced work-related violence during the previous 12 months. Rural practices had more experienced violence than urban practices. Personal experience of violence and a

Knight, S., Rickard, G., Dunn, S.			violence in GP and non-GP staff and to examine levels of apprehension and perceptions of control over violence.	and allied health staff)	perception that violence is increasing were associated with apprehension regarding violence at work. Apprehension and fear among GP staff strongly associated with experiences of violence and must be addressed at a whole-of-practice level with measures to reduce violence and improve safety. Measures that reduce violence in general practice are needed.
Magin, P.J., May, J., McElduff, P., Goode, S.M., Adams, J., Cotter, G. L.	2011	Quantitative - survey	To compare workplace conditions and levels of occupational stress in two samples of Australian nurses	n=349 remote 277 major hospitals - nurses working in very remote Australia in three major hospitals in SA/NT	Nurses working in major Australian hospitals reported higher levels of psychological distress and emotional exhaustion than nurses working very remotely - both reported relatively high levels of stress. Nurses working very remotely demonstrated higher levels of work engagement and job satisfaction. Workload was significantly positively correlated to emotional exhaustion, while conflict with other nurses and supervisors significantly positively correlated with psychological distress. Future research: consider workplace interventions that address job demands and increase job resources.
Rickard, G., Lenthall, S., Dollard, M., Opie, T., Knight, S., Dunn, S., Wakerman, J., MacLeod, M., Seller, J., Brewster-Webb, D.	2012	Quantitative - survey	To evaluate the impact of an organisational intervention aimed to reduce occupational stress and turnover rates of 55% in hospital nurses	n=484 nurses from two NT hospitals	Significant reduction in psychological distress and emotional exhaustion and a significant improvement in job satisfaction, across both hospitals, and a reduction in turnover in one hospital. Significant improvement in system capacity (adaptability, communication), reduction in job demands in both hospitals, increase in resources (supervisor and co-worker support, and job control) particularly in one hospital. need for further organisational-level interventions and address the causes of unhealthy working environments and the associated negative impacts on quality of care. Improvements for nurses and midwives could

					be attributed to the organisational intervention by the NT Department of Health.
Russell, D.J., Zhao, Y., Guthridge, S., Ramjan, M., Jones, M.P., Humphreys, J.S., Wakerman, J.	2017	Quantitative Payroll and financial datasets for primary HC clinics	To quantify turnover and retention in remote NT communities and explore correlations between turnover and retention metrics and health service/community characteristics	n=Remote clinic workers - 53 remote clinics	Mean annual turnover rates for nurses and AHPs combined were extremely high, however defined (no longer working in any remote clinic (66%) or no longer working at a specific remote clinic (128%).) Staffing turnover incurs higher direct costs for service provision—and compromises long-term sustainability and contributes to sub-optimal continuity of care, compromised health outcomes and poorer levels of staff safety. Stability rates were low, and only 20% of nurses and AHPs remain working at a specific remote clinic 12 months after commencing. Half left within 4 months. Little correlation between most workforce metrics and health service characteristics. Investments in implementing, resourcing and evaluating staffing models to stabilise the remote primary care workforce are needed as a matter of priority. Turnover is high, inefficient and results in poorer care.
Laurence, C.O., Eley, D.S., Walters, L., Elliott, T., Cloninger, C.R.	2016	Quantitative - Personality tests TCI, Resilience scale	To describe the personality profiles of IMGs undertaking training through either the AGPT or IP, and compare their profile with Australian Medical Graduates (AMGs) in the same programs	n=452 Participants in AGPT or IP training program - comparison of AMG (350) and IMG (102)	Compared to the general population both groups have moderately high resilience, and well-organised characters with high Self-directedness, high Cooperativeness and low Self-transcendence, supported by temperaments which were high in Persistence and Reward Dependence. IMGs were different than AMGs in two temperament traits, Novelty Seeking and Persistence and two character traits, Self-directedness and Cooperativeness. Understanding personalities may impact on targeted training and support and then on retention.

Voit, K., Carson, D.B.	2014	Quantitative - survey (online)	To examine retirement intentions of nurses, and investigate the types and facilitators significant for post-retirement engagement	n=207 Nurses and midwives working for the dept of Health in the NT	Strong interest among nurses and midwives in engaging in post-retirement work. Facilitators were financial incentives (90.0% identified it as a facilitator for post-retirement engagement), followed by support from line management. Many respondents intended to leave NT for the time of their retirement (33.7%). Current retirement policies need - more flexible opportunities for post-retirement employment. Individualised work arrangements such as mentoring roles, job-sharing opportunities or seasonally cycling in and out of the workforce could be implemented. Creative ways to engage workers at point of retirement could reduce workplace loss and keep them in the workplace
McGrail, M.R., Humphreys, J.S., Scott, A., Joyce, C.M., Kalb, G.	2010	Quantitative MABEL Survey	To investigate whether the level of professional satisfaction of Australian GPs varies according to community size and location	n=3906 GPs (36% rural)	Professional satisfaction of GPs did not differ by community size for most aspects of the job. Overall satisfaction was high (85%). Professional satisfaction with freedom of choosing work method, variety of work, working conditions, opportunities to use abilities, amount of responsibility, and colleagues was very high across all community sizes. Satisfaction with remuneration higher in smaller rural towns but hours were less predictable. It is important to disseminate positive information to counterbalance negative stereotypes that exist re rural practice.
Hansen, V., Pit, S., Honeyman, P., Barclay, L.	2013	Qualitative Interviews	To explore the most important retention factors in a sample of older rural GPs	n=16 GPs over 45 years working in northern NSW	GPs used a range of strategies - personal, practice based, and professional strategies as well as systemic factors beyond the practice. Key issues: achieve a sensible workload, working in a supportive team environment, and being able to fulfil one's individual need for clinical variety or specialised professional

					interests. Multifaceted solution proposed with GPs, local networks and govt working together.
O'Sullivan, B.G., McGrail, M.R., Stoelwinder, J.U.	2017	Quantitative - MABEL study Survey	To explore reasons why specialist doctors provide regular rural outreach services and whether reasons related to salaried or fee-for-service arrangements or servicing more remote locations.	n=567 Specialists providing rural outreach	Reasons for participating: grow practice (54%), maintain regional connection (26%), provide complex healthcare (18%), healthcare for disadvantaged people (12%), and support rural staff (6%). Salaried specialists more commonly participated to grow the practice compared with specialists in fee-for-service practice (68 vs 49%). Private specialists undertook more outreach services to provide complex healthcare (22 vs 14%). Reasons for outreach vary. Structuring rural outreach around the specialist's main practice is likely to support participation and improve service distribution.
McCullough, K.M., Lenthall, S., Williams, A.M., Andrew, L.	2012	Qualitative - Delphi - open ended questions and online survey	To gain expert opinion on methods to reduce violence against RANs	n=10 Expert RANs	Toolbox of measures needed: job-specific education (de-escalation techniques, risk assessment' cultural training); professional support (access to counselling and debriefing); 0rganisational responsibilities: adequate staffing to provide back up; policies and procedures and action from management when hazards are identified; community collaboration. Good figure showing approaches to violence reduction (primary, secondary and tertiary prevention). Violence management needs multifactored approaches
Li, J., Scott, A., McGrail, M., Humphreys, J., Witt, J.	2014	Quantitative - MABEL longitudinal survey Discrete - choice experiment	What retention incentives are preferred by rural GPs	n=1720 MABEL participants	Preferences were 1. locum relief 2. retention payments; 3 rural skills loading. Need to tailor retention policies to those incentives which are most effective. Unclear to what extent incentive schemes impact on recruitment and retention.
Cosgrave, C., Hussain, R., Maple, M.	2015	Qualitative Interviews	To investigate factors impacting on retention of	n=5 community mental health managers	Staff problems are persistent, small remote towns pose the biggest challenges; decisions to stay or leave are complex, multifactorial;

			community mental health professionals		workloads, lack of career structure and opportunities. Highlights the importance of experienced staff working in rural positions.
Keane, S., Lincoln, M., Smith, T.	2012	Qualitative – 5 focus groups	To identify factors affecting recruitment and retention of allied health professionals	n=30 AHPs working in rural NSW	Five themes: personal factors; workload and type of work; continuing professional development (CPD); the impact of management; and career progression. Rural practice pull factors: attraction to rural lifestyle; married or having family in the area; low cost of living; rural origin; personal engagement in the community; advanced work roles; a broad variety of challenging clinical work; and making a difference. Push factors: lack of employment opportunities for spouses; perceived inadequate quality of secondary schools; age related issues (retirement, desire for younger peer social interaction, and intention to travel); limited opportunity for career advancement; unmanageable workloads; and inadequate access to CPD. Competent clinical managers mitigated general frustration with health service management related to inappropriate service models and insufficient or inequitably distributed resources. Failure to fill vacant positions and frustration with lack of CPD access strongly represented by informants.
Bond, A., Barnett, T., Lowe, S., Allen, P.	2013	Quantitative - survey	To provide a detailed profile of the rural and remote allied health professional workforce	n=1182 (44.8%) AHPs in Tasmania	Respondents who were older (44.4 years versus 41.3 years) and had more years' experience (19.0 years versus 16.3 years) were more likely to report intention to stay in current job. Multivariate analysis - job satisfaction the only independent predictor of retention (odds ratio 6.2, 95% CI 2.3–16.6). Organisations must create working environments conducive to promoting job satisfaction. Recognise the

					importance of family and local community factors. Enable collaborative employment opportunities across public - private health sectors.
Keane, S., Lincoln, M., Rolfe, M.	2013	Quantitative - survey	To explore differences in AHPs working in public and private settings on demographics, job satisfaction and intention to leave	n=1589 Rural allied health professionals working in NSW	Different profiles between private and public cohorts, and health discipline. 6 factors: professional isolation, participation in community, clinical demand, taking time away from work, resources and 'specialist generalist' work influenced intention to leave. Factors differed slightly between groups. Seventh factor (management) present in public cohort. Gender not significant predictor of intention to leave. Age group - strongest predictor of intention to leave - younger and older groups being significantly more likely to leave than middle aged. Policy initiatives effectiveness may be improved with better targeting. Orientation and mentoring are appropriate to both cohorts. Early career opportunities and CPD access may be best utilised in public sector with younger demographic. Locum support and recognition of "specialist generalist" expertise in more experienced rural practitioners may be more important for the older private sector. Targeting of initiatives may need to be different for AHPs by age and type of practice.
O'Toole, K., Schoo, A.M.	2010	Quantitative Survey	To explore the thoughts and perceptions of private rehabilitation therapists in rural areas concerning their incorporation into broader rural health policies and concomitant programs	n=72 (40% response rate) private rural rehabilitation therapists (Physio, OT or SP)	After adjusting for age group, the ability to get away from work did not predict intention to leave in either group. High clinical demand predicted intention to leave in both the public and private cohorts. Professional isolation and Participation in community also contributed to the model in the public cohort. Strong interest in partnerships between private and public

					practice in RRR - multiple benefits nominated; Keen on government and professional assistance for small business training when practitioners were seeking to establish their businesses.
Eley, D.S., Laurence, C., David, M., Cloninger, C.R., Walters, L.	2017	Quantitative Survey	To identify GP registrar attributes describing a cohort choosing to work in rural GP	n=452 GP registrars in general or rural training in 3 states	Increased interest in rural practice was to found to exist among registrars who were male, identified themselves as being rural, had a partner who identified as being rural, were enrolled in a rural training pathway and had high levels of Cooperativeness. Considering oneself as rural was a significant predictor of a rural medical career outcome - should continue to weight its importance in medical school selection and ongoing engagement with and support for rural immersion throughout the medical training pipeline
O'Sullivan, B., Russell, D.J., McGrail, M.R., Scott, A.	2019	Quantitative MABEL survey	To identify patterns of work by overseas- and locally trained doctors in Australia, to inform planning of self-sufficiency of the rural medical workforce in Australia.	n= MABEL - longitudinal study of medical workforce	The proportion of OTDs among rural GPs and other medical specialists increases for each cohort of doctors entering the medical workforce since the 1970, peaking for entrants in 2005–2009.
Jones, M P., Eley, D., Lampe, L., Coulston, C.M., Malhli, G.S., Wilson, I., Kelly, B., Talley, N.J., Owen, C., Corrigan, G., Griffin, B., Humphreys, J., Alba, B., Stagg, P.	2013	Quantitative MSOD including personality instruments (NEO-FFI and ACL)	To assess factors influencing rural preference, including personality characteristics.	n=914 medical students	Preference for a rural practice location was associated with a combination of six domains of personality. The probability of rural preference was greater with higher scores on openness to experience, agreeableness and self-confidence but lower with higher scores on extraversion, autonomy and intraception. Some aspects of personality may be an important factor in rural attraction. Some individuals may be better suited to a rural medical career than others - may influence 'marketing' of rural practice

McGrail, M.R., Humphreys, J.S., Joyce, C., Scott, A., Kalb, G.	2011	Quantitative Measures of District Workforce Shortage and a measure of rural amenity	To investigate the association between rural medical workforce shortage and various place characteristics descriptive of their isolation, climate, and overall rural amenity.	n=?	Only a weak association between District of Workforce Shortage (DWS) and rural amenity. Rural amenity makes only a small contribution to explaining DWS designation - may reflect limitations of the DWS measure or lower significance of rural amenity compared with other professional aspects. Further research using comprehensive indicators that relate to the professional, geographical, economic, and social aspects underpinning doctors' locational preferences and work-place decisions relating to where doctors take up practice.
Kumar, K., Jones, D., Naden, K., Roberts, C.	2015	Qualitative – focus groups, interviews	To explore factors impacting on rural and remote youths' health career decision-making within the context of a health workforce development program	n=12 interviews; 6 focus groups. Secondary school students participating in student health academy and stakeholders (teachers, career advisors, school principals, parents, and pre-graduate health students)	Career decision-making in the context of a local health workforce development program was influenced by a range of personal, contextual and experiential factor
Fisher, K.A., Fraser, J.D.	2010	Literature review - describes stages in recruitment and retention	To describe stages in recruitment and retention of health professionals to rural health careers	N/A – focus on western countries	4 stages of rural career pathways - making career choices, taking up rural practice; being attached to place; and remaining in practice. Need to: work across the health workforce pipeline; develop a coordinated structured continuing professional development program for other health professionals; use a multidisciplinary approach needed. Further research could explore relationship between place and identity for career choices.

Moore, T., Sutton, K., Maybery, D.	2010	Qualitative - interviews	To explore managers perspectives of factors that could contribute to a more sustainable and effective mental health workforce	n=24 - Managers of health/mental health services; senior administrators and clinicians	Issues associated with rurality (personal and professional isolation, distances to deliver service and small organisations) and a general shortage of trained personnel). Other issues: unattractive nature of mental health work, fragmented administration of mental health system, short-term and tied funding, and shortcomings in training; issues internal to the organisation. Need for highly creative leadership to negotiate the numerous policy changes, diverse sources of funding, training regimens, worker cohorts and models of care. Managers must nurture capacity of their own organisation to respond flexibly to demands, by establishing a responsive culture and structure. Must encourage the collaboration of their other organisations in their sub-regional grouping
Walker, J.H., DeWitt, D.E., Pallant, J.F., Cunningham, C.E.	2012	Quantitative - survey	To identify and assess factors affecting preferences for future rural practice in RCS students	n=125 (75% response rate) medical students participating in RCS	Students from rural background 10x more likely to prefer work in rural areas; 85% reported RCS experience increased their interest in rural practice; Support and incentives were key factors influencing rural intent; partner and family opportunities important. Program supports rural medical recruitment and retention through education and training. Rural medical recruitment and retention needs education and training plus post-graduate rural training including specialty placements.
Khalil, H., Leversha, A.	2010	Qualitative – Focus groups and interviews	To explore challenges facing rural community and hospital pharmacists	Not clear; 15 invited; 7 in focus groups - pharmacists in a central Gippsland town	5 themes identified: 1) family/social ties 2) career opportunities; 3) misconception about rural life; 4) gender and ethnicity affects; 5) proximity to a large city. Multiple challenges identified - locums, small town issues, need to do multiple things; financial model. Increase rural origin students into pharmacy course

					(promote to schools etc); rural placement opportunities for pharmacy students late in their course; rural incentives; promote rural pharmacy opportunities. Findings consistent with finding from other professional groups.
Terry, D.R., Le, Q., Hoang, H.	2014	Mixed methods - questionnaire and semi-structured interviews	To investigate experiences, challenges and barriers faced by IMGs living and working in rural Tasmania	n=105 questionnaires returned; 23 interviews IMGs in Tas	Most satisfied in current employment; factors would influence their ongoing employment in Tas; communication and navigating a new medical system were the biggest challenges; support provided by colleagues was important. Formal and informal support helps retention. Need to facilitate increased peer and pastoral support within the workplace and the community.
Isaac, V., Pit, S.W., McLachlan, C.S.	2018	Quantitative - FRAME cross sectional survey	To explore social isolation and self-efficacy influences on rural workforce intentions	n=619 medical students attending RCS	31.3% of surveyed students self-reported feeling socially isolated during their rural placement. Social isolation associated with reduced rural career intent after controlling for gender, rural background, RCS preference, RCS support and wellbeing. In step-wise logistic regression association between social isolation and rural intent disappeared with inclusion of rural self-efficacy. Relationship between social isolation, rural self-efficacy and future rural career intent among medical students
Cosgrave, C., Malatzky, C., Gillespie, J.	2019	Literature review - Scoping review	To examine the influence of place-based social processes on turnover or retention of rural health professionals, to identify current gaps in the literature, and to formulate a guide for future rural	n=21 articles	Place-based social processes affect and influence retention of rural health workforces. Themes identified (1) rural familiarity and/or interest, (2) social connection and place integration, (3) community participation and satisfaction, and (4) fulfillment of life aspirations. more research to build understanding of the social determinants of rural workforce retention. Multiple social

			health workforce retention research		factors influence rural retention - rural familiarity; social connections; community participation and fulfilment of life aspirations
Cosgrave, C., Maple, M., Hussain, R.	2018	Qualitative - constructivist grounded theory methodological approach	To investigate how employment and rural-living factors impacted the turnover intention of early-career, rural-based CMH professionals in their first few years of working.	n=26 Rural NSW	Development of turnover intention theory: provides a whole-of-person explanation of turnover intention. Based on identified core category of professional and personal expectations being met and an identified basic social process of adjusting to change. Posits an individual's decision to stay or leave their job is determined by meeting of life aspirations, and this relates to the extent of the gap between individuals' professional and personal expectations and the reality of current employment and rural-living experience. The extent of individuals' professional and personal expectations can be measured by their satisfaction levels. Major finding from the identification of the basic social process was, in the adjustment stages (initial and continuing), turnover intention was most strongly affected by professional experiences, particularly those relating to job role, workplace relationships and level of access to continuing professional development. In this stage, personal satisfaction mostly concerned those with limited social connections in the town. Having reached the 'having adapted' stage, major influence on turnover intention shifted to personal satisfaction, and was strongly impacted by individuals' life stage. Drawing on turnover intention theory and basic social process, it is possible to make a risk assessment of individuals' turnover intention. 3 levels of risk identified: highly vulnerable, moderately

					vulnerable and not very vulnerable. Offers a holistic explanation of life factors influencing turnover intention of early-career health professionals working in public health services in rural NSW. Findings and turnover intention risk matrix may be suitable for use by Australian public health services and governments, to assist in development of policies and strategies tailored for individual health professionals' work-experience level and life stage. Adopting a whole-of-person approach, health services and governments will be better positioned to address life aspirations of rural-based, early-career health professionals and is likely to assist in reduction of avoidable turnover.
Wakerman, J., Humphreys, J., Bourke, L., Dunbar, T., Jones, M., Carey, T. A., Guthridge, S., Russell, D., Lyle, D., Zhao, Y., Murakami-Gold, L.	2016	Mixed Methods (PROTOCOL) - administrative that relates to all 54 remote clinics managed by the Northern Territory Department of Health, covering a population of 35,800	To provide rigorous empirical data by addressing the following objectives: (1) to identify the impact of short-term health staff on the workload, professional satisfaction, and retention of resident health teams in remote areas; (2) to identify the impact of short-term health staff on the quality, safety, and continuity of patient care; and (3) to identify the impact of short-term health staff on service cost and effectiveness	n=54 remote clinics managed by the Northern Territory Department of Health, covering a population of 35,800	Study has commenced, but too early to provide results or conclusions. Study aims to build the currently deficient evidence base relating the impact of short-term staffing on the quality and costs of remote primary health care services. Study involves working in an equally complex remote, cross-cultural setting, involving multiple primary health care providers. Challenging real-world problem that requires a comprehensive, mixed methods approach to understand both the "what" and "why". Direct involvement of health services, local researchers, a high-level key stakeholder group, and a comprehensive knowledge exchange strategy will help generate solutions and maximize the impact of the results on policy and practice.

Sutton, K., Maybery, D., Moore, T.	2012	Mixed methods: Questionnaire, paper included quotations but no formal qualitative analysis - A longitudinal study is underway to evaluate the effect and outcomes of the program and includes surveying participants' interest in rural mental health work through an online questionnaire immediately prior to and following the program	To address rural mental health workforce shortages.	n=20 students participated (17 F, 3 M), aged 20-59 years, in pilot programs. Group included 6 Social Work, 4 OT and 10 Psychology (3 studying Bachelor of Behavioural Neuroscience). 18 in third or fourth year of undergrad study. 2 students were in first year of Masters level entry courses (Psychology and Social Work).	Significant increase from pre- to post-event, supported by strong effect sizes, suggesting the program had a significant effect on participant interest in rural mental health work. Longer-term evaluation will determine whether program influences participant career decisions and thereby addressing mental health workforce shortages in Gippsland. Study provides a potentially successful recruiting tool for mental health sector policy-makers and managers which will be evaluated over the long-term.
Cheek, C., Hays, R., Allen, P., Walker, G., Shires, L.	2017	Mixed methods, 2 studies in the paper (Quantitative & qualitative) - cohort study of International feepaying (IFP) students who graduated from the UTAS School of Medicine. AHPRA data used to examine outcomes (2000-2015, with 2016 work locations), semi-structured interviews used to establish intention (2015 final year students).	Better understanding of the career intentions and work locations of IFP graduates from the medical program in Tasmania	n = 276; 261 AHPRA follow up, 15 semi-structured interviews. 261 IFP graduates, 54.4% male. Most common origin country was Malaysia (55.2%). In 2016, 189 (72.4 %) working in Australia, 42 (16.1%) in Tas and 126 (66.7%) in Modified Monash 1 areas.	Recent graduates in postgraduate year 1/2 (71.3%) more likely to be working in Tas but most left for specialty training. All 15 interview participants intended to remain in Australia for at least their intern year, although at enrolment only 6 had planned to remain. Factors influencing workplace location decisions: (1) 'professional': greater appeal of Aust medical workplaces, intention to pursue speciality, and to complete at an Australian metropolitan hospital; (2) 'social': proximity to family/partner or opportunity to meet prospective partner, family obligations, positive rural experiences; (3) 'location': direct travel access to family. Most IFPs do not choose to work rurally. Rurally focused medical programs

					need to consider how they place IFP students to meet both learning and career needs of students and the goal of rural medical programs in developing a rural workforce. IFP graduates from program make an important contribution to Australian mainland metropolitan medical workforce but play only a small role in workforce development for both Tas and the broader Australian rural and remote context.
Orda, U., Orda, S., Sen Gupta, T., Knight, S.	2017	Mixed - Quality improvement report - descriptive	To explore ways to improve service provision, recruitment and retention of appropriately trained medical workforce staff to care for rural and remote Australians	Medically trained from internship to fellowship	Accreditation was achieved through collaboration with training providers, accreditation agencies, ACRRM and a local general practice. The whole pathway from Internship to Fellowship is offered with the RG Intern intake as a primary allocation site beginning in 2016. Comprehensive supervision and clinical exposure provide an interesting and rewarding experience – for staff at all levels. Since 2013 RMO locum rates have been <1%. Registrars on ACRRM pathway and Interns increased from 0 to 7 positions each in 2015, with similar achievements in SMO staffing. 3 RMOs expressed interest in a Registrar position. No set answers to problem of attraction and retention. Maintaining dialogue with key stakeholders – colleges, universities, providers of postgraduate education, jurisdictions, and other accreditation and training institutions necessary. Must match local needs with numbers and qualification of potential applicants – in Australia and overseas. Should provide local coordination and leadership, seeking synergies with all service providers to facilitate excellent training opportunities. Appropriate governance is

					needed to develop and advertise the program. This includes the NWHHS, the RG Pathway and JCU.
Smyth, J., Pit, S.W., Hansen, V.	2018	Qualitative - thematic analysis of 19 in-depth interviews with GPs in the Northern Rivers region of NSW, Australia, was conducted and formed the basis for a qualitative validation of the work ability model	To ascertain whether the work ability (WA) model can provide a useful explanatory framework to understand some elements of sustainable employability (SE) amongst GPs	n=19 GPs in the Northern Rivers of Australia	To provide a comprehensive reflection on factors and dynamics found to underpin work ability among ageing GPs required creation of specific subcategories within WA model. Additionally, new themes relevant to general practice emerged from the data. Analysis revealed a set of important, new factors and relationships that required additions and refinements to original model, to fully explain sustainable employability in this GP sample. New emerging themes: 'Work-life balance and lifestyle', 'Extended social community' and 'Impact of gender'. WA model can be utilised to understand elements of sustainable employability among GPs. Work-life balance, lifestyle, extended social community and gender were aspects of work ability pertinent to GPs did not form part of the original model and required inclusion to more accurately reflect components contributing to sustainable employability amongst GPs. While the WA model provides a basic explanatory framework for understanding some elements of sustainable employability amongst GPs, a revision of the current model has been proposed to sufficiently describe the factors impinging on sustainable employability in this group. The extended model can potentially be used for addressing workforce planning issues and to assist in program design to promote sustainable employability amongst GPs and could

					potentially be translated to other health professional groups.
Campbell, N.A., Franzi, S., Thomas, P.	2013	Quantitative - retrospective review of surgical procedures carried out by two surgeons over 5 years working from a base in Wangaratta, Victoria, with outreach services to Benalla, Bright and Mansfield was undertaken. Data were extracted from surgeon records using Medicare Benefits Schedule item numbers	To describe the workload of surgeons working in a rural centre with outreach practices in order to determine the required skills mix for prospective surgeons	18 029 procedures performed over 5 years, with 15% performed in peripheral hospitals as part of an outreach service. 90000 in catchment, 2 surgeons' data analysed	Full range of general surgical procedures were undertaken, endoscopies accounting for 32% of procedures. Vascular procedures and emergency craniotomies were performed. Most procedures undertaken at peripheral centres were minor procedures, only two laparotomies performed at these centres over 5 years. Trainees should be encouraged to consider rural practice, and those with an interest should consider needs of community in which they intend to practice ensuring they undertake adequate training in a range of procedures likely to be undertaken. Surgeons in rural towns should consider outreach to smaller towns to increase service provision, and in return receive extra theatre time and professional association with local doctors in these areas. Future studies should examine caseloads of surgeons working in rural and remote areas of other states, to allow planning for future healthcare of rural Australia. General surgeons working rurally need broad skills and ability to undertake many procedures.
Terry, D.R.; Le, Q.	2015	Quantitative - questionnaire - findings from the Tasmanian IMG questionnaire, administered in hardcopy and online format to all known IMGs within the state. A total of	To highlight the experiences and challenges of IMGs living and working in rural and remote Tasmania, and how this informs their acculturation and retention in the state.	n =105 questionnaires were returned, representing a response rate of 30.0%. IMGs from 30 countries and majority under 49 years of age, migrated in past 10	Many IMGs were satisfied with current employment, medical facilities, friendliness of patients and friendliness of community where they lived and would like to stay much longer in Tas. Also reported on migration profile, reg and employment profile, current time and intention in location, employment satisfaction, lifestyle, and future intentions. Findings indicate many IMGs reasonably satisfied with current employment and lifestyle in Tas that

				years, with over half having worked in the state for less than 2 years.	they and their families are experiencing. Nevertheless, beyond employment satisfaction, employment itself, coupled with career pathway and training opportunities, were highlighted as contributory factors for leaving rural Tas. Strategic recruitment of IMGs needs to benefit all parties, while IMG integration and retention is a process of marrying IMGs desires, their training requirements with current and long-term local needs of the community. Many IMGs have previously lived and worked in rural areas. The following factors play an important part in their views and attitudes: employment satisfaction, access to schools, employment for spouse or partner and access to cultural or religious foods and goods.
Spiers, M.C., Harris, M., Spiers, M.C.	2015	REVIEW Literature analysis. A search of empirical literature was conducted together with review of theoretical publications, including public health strategies and policy documents.	To identify drivers to recruitment and retention of an allied health workforce in rural and remote communities.	28 publications met selection criteria and 22 grey literature texts identified with relevance to research objective. Patterns of barriers and enablers for rural and remote student transition in the allied health professions were identified in the literature.	Recruitment pathways to AH studies in rural/remote communities vague and often interrupted, and return of graduates is haphazard. Students from rural/remote communities face array of barriers, and often experience secondary education disadvantage with inadequate subject choices, pathways and opportunities. Programs to facilitate transition to study often limited in capacity to address cumulative concerns. Students face financial imposts, are confronted by daunting social isolation, and separation from families and support systems. Clinical placements: disincentives weigh heavily; financial burdens of a rural placement offer little inducement; social isolation of a placement far from home more acutely felt by students when inadequate administrative support and consequent disillusionment. Students lack a frame of

					reference to pursue a rural placement option, and often discouraged by cumulative commitments. Policy directions should include: standardised national allied health definition and classification of rurality for clarity and equity for professional and student support, and to strengthen workforce data collection methods; continued emphasis on regional development in support of viable communities and health services in rural and remote areas; policy support for inter-sectoral collaboration through identification of common goals and non-competitive resource allocation for mutually beneficial outcomes in health and higher education sectors. Paper suggests number of strategies to improve recruitment and retention.
Terry, D.R., Baker, E., Schmitz, D.F.	2016	Mixed method - questionnaire with structured face to face interviews with hospital chief executive officers (CEOs) and directors of clinical services (DCSs) from 14 of the 21 (76%) health services that agreed to participate in rural north-eastern Victoria, Australia. The interviews were undertaken to complete the CAQ, which contains 50 questions centred on factors that influence physician recruitment and retention.	The objective of this study was to use the Community Apgar Questionnaire (CAQ) in rural Australia to examine its utility and develop a greater understanding of the community factors that impact GP recruitment and retention.	n = 28 - 14 CEOs and 14 DCSs	14 rural communities exhibited cumulative CAQ scores ranging from a high of 387 to a low score of 61. Suggests tool sensitive enough to differentiate between communities high and low performers in terms of physician recruitment. Groups of factors with greatest impact on recruitment and retention were ranked highest to lowest: medical support, hospital/community support, economic, scope of practice and geographic factors. Highest individual factors: perception of quality, hospital leadership, nursing workforce and transfer arrangements. Lowest factors and challenges to recruitment and retention were family related, specifically spousal satisfaction and access to schools. Strong and open communication between GPs and leadership was paramount and ensured GPs working in

					private practices felt valued and empowered. Adequacy of nursing workforce (quantity and quality) was as essential as the relationship between GPs and nurses. Also need to have procedures in place when critically ill patients require greater care. CAQ provided each community with a tailored gap analysis, while confidentially sharing best practices of other health facilities. Possible solutions for GP recruitment and retention must consider social, employment and educational opportunities that are available for spouses and children. Participation in the program was useful as it helped health facilities ascertain how they were performing while highlighting areas for improvement.
Zhao, Y., Russell, D.J., Guthridge, S., Ramjan, M.; Jones, M.P., Humphreys, J S., Wakerman, J.	2018	Quantitative - economic analysis - cost impact assessment used administrative data from NT Department of Health datasets, including the government accounting system and personnel information and payroll systems between 2004 and 2015, and the primary care information system from 2007 to 2015. Data related to 54 government-managed clinics providing primary care for approximately 27 200 Aboriginal and non-Aboriginal people. Main	To estimate the costs of providing primary care and quantify the cost impact of high staff turnover in Northern Territory (NT) remote communities	n = 54 clinics servicing >27000 people in NT	On average, in constant prices, there was a nearly 10% annual increase in remote clinic expenditure between 2004 and 2015 and an almost 15% annual increase in consultation numbers since 2007. In real terms, the average costs per consultation decreased markedly from A$273 in 2007 to A$197 in 2015, a figure still well above the Medicare bulkbilling rate. The cost differentials between clinics were proportional to staff turnover and remoteness (both $P < 0.001$). A 10% higher annual turnover rate pertains to an A$6.12 increase in costs per consultation. Findings suggest strategies that mitigate the extraordinarily high turnover in remote areas could result in significant cost savings for government over time. A sustained, equitable investment in a systematic approach to training a remote health workforce and the provision of better professional and personal

		outcome measures: average costs per consultation and per capita, cost differentials by clinic, year and levels of staff turnover			support for nurses and AHPs working in remote communities may, in the longer term, produce such cost savings. Adjusting policy away from high use of short-term staff to investment in appropriate training 'pipelines' for remote primary workforce may, in the medium and longer term, result in reduced turnover of resident staff and associated cost savings. Targeted recruitment and retention strategies that ensure individual primary care workers are an optimal fit with communities, with improved professional and personal support for staff residing in remote communities, may help reduce turnover, improve workforce stability and lead to stronger therapeutic relationships and better health outcomes
Zhao, Y., Russell, D.J., Guthridge, S., Ramjan, M., Jones, M.P., Humphreys, J.S., Wakerman, J.	2019	Quantitative - economic analysis - observational cohort study, using hospital admission, financial and payroll data	To compare the costs and effects of higher turnover of resident nurses and Aboriginal health practitioners and higher use of agency-employed nurses in remote primary care (PC) services and quantify associations between staffing patterns and health outcomes in remote PC clinics in the Northern Territory (NT) of Australia.	n = 53 clinics in NT	Higher turnover was associated with significantly higher hospitalisation rates and higher average health costs than lower turnover. Lower turnover was always more cost-effective. Average costs were significantly higher when higher proportions of agency-employed nurses were employed. The probability that lower use of agency-employed nurses was more cost-effective was 0.84. Halving turnover and reducing use of a short-term workforce have the potential to save $32 million annually in the NT. Great potential for more cost-effective PC to be attained. Will require PC workforce turnover, retention and use of short-term agency-employed nurses to be addressed as a priority. Higher turnover of government-employed nurses and AHPs is costly and associated with poorer health outcomes for Aboriginal people.

Bell, E.	2011	Review of available scholarly and applied literature relevant to not only these two programs, but also rural medical education and, more generally, rural health education	To describe what is now RHMT as the intervention: to describe an Australian intervention—University Departments of Rural Health and Rural Clinical Schools—in ways that are helpful for lesson-drawing by rural medical educators and health workforce policy-makers in this and other countries	n = 11 UDRHs & 14 RCSs	Importance of creating a rural pathway or integrated sequence of interventions made over time with the aim of supporting a particular individual to develop as a motivated and well trained rural medical practitioner. UDRHs and RCSs successful in creating a 'chronological sequence of interventions' targeting particular groups at each of the different levels of school, undergraduate education, as well as postgraduate and continuing professional development. One future direction for the UDRHs and RCS could be developing existing interventions into integrated rural pathways - tailoring packages of interventions to suit individuals as part of a long-term 'school to rural practice' mentoring approach. Reconceptualises key challenge of addressing rural health workforce shortages - creating willing and able practitioners - and the place of rural medical education in meeting that challenge.
Sutton, K.P., Maybery, D., Moore, T.	2011	Qualitative - Interviews Investigators conducted semi-structured individual interviews with 26 administrators, managers and senior clinicians from public and private sector mental health organisations throughout Gippsland. Thematic content analysis of the transcribed interviews identified current approaches and potential	To inform a strategic regional approach to the development of a more sustainable and effective mental health workforce.	n = 26 administrators, managers and senior clinicians	Categorised solutions as focusing on factors external or internal to organisations. External: efforts to enhance the pool of available workers, improve intra-sectoral collaboration and cross-sectoral linkages, make funding more flexible, and to institute a contemporary curriculum and take innovative pedagogical approaches to training. Internal: need for strong leadership and quality organisational culture, flexible and adaptable approaches to meeting individual worker and community needs, promoting the organisation and local area and adopting models of care. Individual organisations limited in their capacity to

		solutions to the recruiting, retaining and training problems in the region.			address recruitment, retention and training issues and highlighted potential benefits of a regional mental health workforce recruitment, retention and training strategy. Present study findings and previous literature illustrate the importance of considering the individual applicant and their family in recruitment strategies, thereby ensuring that the location is attractive to the prospective employee. It is important further consideration given to implementing and evaluating evidence-informed mental health workforce development strategies and linking local regional strategies.
Muecke, A., Lenthall, S., Lindeman, M.	2011	REVIEW comprehensive literature review was conducted utilising the meta-databases CINAHL and Ovid Medline	This article is presented in two parts. The first part provides a thorough background in the theory of culture shock and cultural adaptation, and a comprehensive analysis of the consequences, causes, and current issues around the phenomenon in the remote Australian healthcare context. Second, the article presents the results of a comprehensive literature review undertaken to determine if existing studies provide tools which may measure the cultural adaptation of remote health professionals.	no empirical evidence was found relating to the cultural adaptation of non-Indigenous health professionals working in Indigenous communities in Australia. 15 international articles found that provided empirical evidence to support the concept of culture shock.	Only 2 articles contained tools that met the pre-determined selection criteria to measure the stages of culture shock: Culture methods Shock Profile (CSP) by Zapf and the Culture Shock Adaptation Inventory (CSAI) by Juffer. There is evidence to determine that culture shock is a significant issue for non-Indigenous health professionals working in Indigenous communities in Australia. However, further research is needed. Available empirical evidence indicates a measurement tool is possible but needs further development to be suitable for use in remote Indigenous communities in Australia. Expert opinion and descriptive literature suggest there is a significant relationship between culture shock experienced by healthcare professionals and high level of turnover in remote areas. Validating this claim with empirical evidence by first measuring the stages of culture shock is important step towards reducing turnover. Short term medical contracts and fly-in fly-out health

					care in remote communities adds to complexity of healthcare provision in these environments and adds weight to the need to understand the phenomenon of cultural adaptation more fully. Filling the gaps in current knowledge will enable policy makers to implement interventions which can give the greatest benefit to remote healthcare workers and to remote health care in general.
Godwin, D.M., Hoang, H., Crocombe, L.A., Bell, E.	2014	REVIEW Literature Review The study had primary focus on Australia and included relevant international literature. Databases used were PubMed, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Informit, Web of Science, Scopus and Summon. Search terms included dental practitioner, rural, remote, retention, recruitment and strategies.	To increase understanding of dental practitioner workforce regional maldistribution, with focus on Australia. This review synthesised the available evidence on the recruitment and retention of the dental practitioner workforce in rural and remote areas	See lit review methods	Positive factors: clinical work being a 'challenge', close social and professional support networks, enjoyment of rural lifestyle and successful integration into the rural community. Negative factors: social and professional isolation, workload and type of clinical work, access to further education opportunities, access to facilities, education for children, job opportunities for a partner, and inability to integrate into the rural community. Recruitment incentives described 3 strategies currently used to influence recruitment, all were financial or contractual in nature. Retention factors described 7 long-term retention motivators; of these, six were personal reasons. Most commonly mentioned motivational factor for recruitment and retention of rural dental practitioner workforce was effect of prior rural exposure. Most important influences on rural dental practitioner workforce recruitment and retention: combination of financial reimbursement and personal reasons. Large influence of rural medical workforce research on untested assumptions and drivers of rural dental practitioner workforce. High recruitment rate compared with low retention rate indicates

					current strategies not effective in addressing rural dental practitioner workforce shortages long term. One important question remained in the international dental practitioner workforce literature: How relevant were assumptions made from rural medical workforce studies in explaining patterns seen in the rural dental practitioner workforce? Prior rural exposure considered by many medical workforce studies to be most influential predictor of long-term rural workforce retention, particularly rural upbringing. Dental practitioner workforce literature was contested on the subject - requires further testing. Better understanding of the determinants of workforce choice will enhance service delivery through the provision of a more stable and accessible workforce. The nature of health workforce sustainability is complex; strategies should not address one singular aspect of the issue - should be adaptable in order to be able to address the changing needs of dental practitioners. Research into such strategies does not yet exist to provide a useful tool for such a comprehensive solution.
Russell, D.J., McGrail, M.R., Humphreys, J.S.	2017	Synthesis and quant - comprehensive search of Medline, PsychINFO, CINAHL plus, Scopus and EMBASE revealed eight peer-reviewed empirical studies published since 2000 quantifying factors associated with actual retention. HR leaving	To synthesise key Australian empirical rural retention evidence and outline implications and potential applications for policymaking.	See lit review methods	Broad range of geographical, professional, financial, educational, regulatory and personal factors are strongly and significantly associated with the rural retention of Australian primary health care workers. Important factors: geographical remoteness and population size, profession, providing hospital services, practising procedural skills, taking annual leave, employment grade, employment and payment structures, restricted access to provider numbers, country of training, vocational

		rural, LOS, OR leaving rural			training, practitioner age group and cognitive behavioural coaching. Retention strategies should be multifaceted and 'bundled', addressing combination of modifiable factors most important for specific groups of Australian rural and remote primary health care workers, and compensating health professionals for hardships they face that are linked to less modifiable factors. Many questions unanswered – particularly effectiveness of specific retention interventions. Essential aspects of supporting rural and remote PHC workforce retention and supply, therefore, are for policymakers to improve rural and remote PHC workforce data collection and accessibility to build evaluation into workforce program as an integral component, and to facilitate ongoing research so that progressively more is known about what works well, where and why with regards to Australian rural and remote PHC workforce retention
Yong, J., Scott, A., Gravelle, H., Sivey, P., McGrail, M.	2018	Difference-in-differences methodology - economic analysis. The analysis uses panel data (2008–2014) on all Australian GPs aggregated to small areas	To examine the effectiveness of a policy reform in Australia that made some locations newly eligible for financial incentives and increased incentives for locations already eligible.	n = 3791 locations	The policy change increased the entry of newly-qualified GPs to newly eligible locations but had no effect on the entry and exit of other GPs. Our results suggest that location incentives should be targeted at newly qualified GPs. Policy implications: location decisions by newly qualified GPs can be influenced by financial incentives. Instead of providing financial incentives to all GPs, it will be more cost effective for policies to specifically target newly qualified GPs.
Bentley, M., Dummond, N.,	2019	Quantitative - cross-sectional study – survey. Rural self-efficacy	To consider rural practice self-efficacy and its	252 invited, n = 102 participated (response rate	28.5% currently working in communities of <25 000 people. Levels of intent for future small town rural practice were consistent across

Isaac, V., Hodge, H., Walters, L.		survey; current and intended location of practice in small rural communities (<25 000 people).	influence on rural career choice by doctors.	40.5%) -alumni of the rural, community-engaged LIC with known email addresses invited by email to participate in an online survey.	career stages after internship. Higher rural practice self-efficacy scores in doctors working in smaller towns (<25 000) and small communities (<10 000). Higher self-efficacy was associated with rural background, more senior career status, earlier speciality decision time and smaller expectation-experience gap. Rural practise self-efficacy is associated with current rural practise and future intention to practise rurally. Rural practise self-efficacy increases with career progression and increases with smaller, more isolated locations of practice. Rural practise self-efficacy explains how nature and nurture contribute to rural medical practise intent. Study proposes that fostering the development of an individual's rural practice self-efficacy beliefs might contribute to recruitment and retention of rural GPs within small rural communities. Article offers RCSs opportunity to consider how they can influence future rural career outcomes.
Godwin, D., Blizzard, L., Hoang, H., Crocombe, L.	2017	Quantitative - self-administered questionnaire was sent to a sample of dental practitioners via their professional dental associations.	To investigate whether dental practitioners who have a rural background are more likely to work in a rural area than those who do not have a rural background; and whether the gender of dental practitioners plays a role.	n = 631 - 11300 dentists	rural background participants more than twice as likely to practise in a rural area than urban background. Evidence of RBE in female Australian dental practitioners - more than twice as likely than urban backgrounds to work in a rural practice. Structure of rural dental health care provision needs to meet the needs of women. Findings indicate that policy makers and universities attempting to increase rural recruitment and retention in the future, could do so by selecting more women with a rural background. First study from Australia to find rural background was positively associated with practising in a rural area for women, but not

					men. Adds to small amount of research into influences on rural work movements of Aust dental practitioners. Gives information to policy makers when designing strategies to increase rural dental workforce
Walters, L., Laurence, C.O., Dollard, J., Elliott, T., Eley, D.S.	2015	Qualitative - interpretive research, semi-structured interviews were recorded, transcribed and analysed using an inductive approach. Initial coding resulted in a coding framework which was refined using constant comparison and negative case analysis.	To explore GP registrars' perceptions of their resilience and strategies they used to maintain resilience in rural general practice.	n = 18 GP registrars	6 themes. Rural GP registrars described four dichotomous tensions they faced: clinical caution versus clinical courage; flexibility versus persistence; reflective practice versus task-focused practice; and personal connections versus professional commitment. Further themes: personal skills for balance which facilitated resilience including optimistic attitude, self-reflection and metacognition; and GP registrars recognised the role of their supervisors in supporting and stretching them to enhance their clinical resilience. Resilience maintained on a wobble board by balancing professional tensions within acceptable limits. Limits are individual and may be expanded through personal growth and professional development as part of rural general practice training. Building and maintaining resilience requires balance between: clinical caution and courage, personal flexibility and persistence; reflective practice and task focused practice and work life balance. Educators should formally assist GP registrars to recognise and reflect on tensions with an optimistic attitude and enhance their metacognition skills to face these challenges and extend resilience as a core competency for rural GP training. GP training organisations have role in mentoring registrars to engender a strong sense of professional identity and intellectual engagement in rural

					practice, while developing work boundaries to invest in mutually supporting personal relationships outside medicine
Cosgrave, C., Maple, M., Hussain, R.	2017	Qualitative - in-depth, semi-structured interviews - understand how employment and rural living factors affected workers' decisions to stay or leave their CMH positions. Constructivist grounded theory analysis	To identify factors affecting the job satisfaction and subsequent retention of Aboriginal mental health workers (AMHWs).	n = 5 Aboriginal mental health workers working in New South Wales (NSW) for NSW Health in rural and remote community mental health (CMH) services participated	3 aspects negatively impacting job satisfaction of AMHWs identified: (1) difficulties being accepted into the team and organisation; (2) culturally specific work challenges; and (3) professional differences and inequality. Policy and procedural changes to AMHW training program may address lower remuneration and limited career opportunities identified regarding the Bachelor Health Sciences (Mental Health). Current structure of AMHW training program creates workplace conditions that contribute to job dissatisfaction among rural and remote-based AMHWs. Delivering training to increase levels of understanding about the AMHW training program, and cultural awareness generally, to CMH staff and NSW Health management may assist in addressing negative team, organisational and cultural issues identified.
Cosgrave, C., Hussain, R., Maple, M.	2015	REVIEW - Literature Review - undertaking a comprehensive literature review of Australian peer-reviewed studies	To identify the impacting factors on retention among community mental health (CMH) clinicians working in rural Australia	See lit review methods	Identifies CMH workers have demanding and stressful roles and heavy workloads. Clinicians working in rural positions experience additional challenges arising from extra work demands and workplace stresses. Impacts of interdisciplinary generic casework approach and rurality within CMH have not been well investigated. The studies exploring impacting factors on retention have, so far, mostly focused on work and professional considerations with less research conducted exploring personal and community factors. To ensure future policy responses concerned with improving retention

					of Australia's rural community mental health services are effective, must be a strong evidence base to draw on. 3 key recommendations: (1) Need for more retention-focused studies that are geographically focused, either specifically on rural or remote services, or including both; (2) Need for future retention studies to be taken from a multidisciplinary approach. Should include full range and type of CMH workers who currently work in these generic casework positions. Could help to better understand impact on retention of workplace culture, team dynamics, health care approaches (models in use) and staffing mix (age, training, professions). (3) Need to adopt a multifactor approach and investigate full range of factors across life-domains including work, career, professional, personal and community factors. Can lead to better understanding of similarities and differences between rural CMH professionals and their metropolitan counterparts and other groups of health clinicians working rurally. Effective policy interventions need to be developed, to do this requires better understanding of factors contributing to avoidable turnover.
Pit, S.W., Hansen, V.	2014	Quantitative - cross-sectional study of GPs practising in rural Australia. Odds ratios of early retirement intentions across work, occupational and individual health factors were calculated.	To assess the various work, occupational and individual health factors associated with early retirement intentions among Australian rural GPs that may be amenable to intervention.	n = 92 GPs - Northern Rivers General Practice Network (NRGPN) is the local body representing GPs in the Northern Rivers region of New South Wales, Australia.	47% intended to retire before 65. GPs with medium to high burnout levels had higher odds of intending to retire. Increased job satisfaction and work ability scores associated with decreased retirement intentions, increased physical and mental work ability demands associated with an increase in retirement intentions. Absenteeism not related to retirement intentions but presenteeism was. GPs

					reporting any work-related sleep problems had a 3-fold increase in the odds of early retirement intentions. Odds of early retirement intentions increased with higher psychological distress, worsening general health and longer working hours. Opportunities for improving retention of experienced GPs might focus on improving life–work interface through strategies to diminish the impact of work-related stressors on personal life. From a health policy reform perspective, greatest impact on reducing early retirement intentions among ageing GPs could be made by intervening in areas of working hours, burnout and work-related sleep issues, followed by job satisfaction, psychological distress, health, general workability and mental and physical work ability.
McGrail, M.R., Russell, D.J., O'Sullivan, B.G.	2017	Quantitative - Survey, panel study MABEL. Participants included 4377 GPs responding to at least two consecutive annual surveys of the MABEL national longitudinal study between 2008 and 2014.	To measure longitudinal associations between the rurality of GP work location and having (i) school-aged children and (ii) a spouse/partner in the workforce.	n = 4377 GPs responding to MABEL survey	Male GPs with children in secondary school were significantly less likely to work rurally (inclusive of > 50 000 regional centres through to the smallest rural towns of < 5000) compared to male GPs with children in primary school. Female GPs' locations not significantly associated with educational stage of children. Having a partner in the workforce was not associated with work location for male GPs, whereas female GPs with a partner in the workforce were significantly less likely to work in smaller rural/remote communities (< 15 000 population). The first systematic, national-level longitudinal study showing GP work location is related to key family needs which differ according to GP gender and educational stages of children. Non-professional factors are dynamic across the GP's lifespan and should be

					regularly reviewed as part of GP retention planning. Supports investment in regional development for strong local secondary school and partner employment opportunities.
McGrail, M.R., Humphreys, J.S.	2015	Quantitative - MABEL survey - Annual panel survey of GPs between 2008 and 2012.	To describe the geographical mobility of GPs in Australia, both within rural areas and between rural and metropolitan areas.	n = 1810 GPs – MABEL survey - 3906 participants in 2008 (representative cohort, 19% of Australia's GP workforce) and 3502, 3514, 3287 and 3361 in subsequent years. 1810 GPs participated in all 5 years	10 900 origin–destination pairs were observed after removing GP registrars from the dataset. 133 GPs moved from rural to metropolitan locations, 103 moved from metropolitan to rural locations, and 271 location changes were within rural areas. Annual location retention rates were 95% in regional centres, 90% in small rural towns and 82% in very remote areas. GPs in small towns of < 5000 residents had highest risk of leaving rural practice. Mobility rates significantly higher for GPs who had worked in a location for under 3 years and those working as contracted or salaried employees, somewhat higher for IMGs. Younger age small predictor of increased mobility, sex and family status had no association with mobility. Support the need for policies to better target GPs in small rural communities and differentiate them from GPs in large regional centres. Further investigation of strength of association between mobility and changed restriction (overseas trained) or bonding (Australian trained) status is planned. GPs working in small communities and those in a rural location for less than 3 years are most at risk of leaving rural practice. This helps to understand who is most likely to move each year, how often moves occur and where they might move to and from. These results highlight and quantify the strong association between mobility propensity and increasing rurality and remoteness of practice locations.

					Such evidence is useful in guiding more effective targeting of rural health policies and workforce planning and incentives.
Scott, A., Witt, J., Humphreys, J., Joyce, C., Kalb, G., Jeon, S. H., McGrail, M.	2013	Quantitative - MABEL survey - GPs were asked to choose between two job options or to stay at their current job as part of the MABEL longitudinal survey of doctors.	To examine the preferences of GPs for rural location using a discrete choice experiment	n = 3727 GPs – MABEL study	65% of GPs chose to stay where they were in all choices presented to them. Moving to an inland town (less than 5000 population) and reasonable levels of other job characteristics would require incentives equivalent to 64% of current average annual personal earnings ($116,000). Moving to a town with a population between 5000 - 20,000 people would require incentives of at least 37% of current annual earnings, around $68,000. Size of incentives depends not only on area but on job characteristics. Policies should perhaps be targeted more to GPs who are more mobile, such as those in training, and to retaining GPs who are already in nonmetropolitan areas. In terms of the predicted probabilities, no revealed preference data available on actual proportions of GPs moving into rural areas and it is not possible to calibrate results using actual market shares. When interpreting results, perhaps more useful to focus on percentage of annual earnings, rather than absolute dollar figures. Percentage figures would seem more useful as they can be applied to estimates of total revenue, though there are no reliable national estimates in Australia. Least attractive rural job package would require incentives of at least 130% of annual earnings, around $237,000. Important to tailor incentive packages to characteristics of jobs and rural areas.

Brown, L., Williams, L., Capra, S.	2010	Mixed methods - sequential explanatory approach used to examine six case study sites of dietetic practice, in a geographical area covering 30 000 km2 in rural New South Wales, Australia	To determine the recruitment and retention issues for rural based dietetic services.	n = 40 key informants at six rural sites	90 dietitians (94% female) employed across the 6 sites over 15 years. Majority were new graduates with less than 1 year of experience. Approx one-third remained in position for less than 6 months, 32% remained for 2 years or longer. Key themes: characteristics of a rural role, line management of dietitians in a rural site and establishing and maintaining rural staff. Improved career pathways, professional networks and support from management are key factors for improving recruitment and retention of dietitians in rural areas. Part-time positions difficult to fill, unless site is within close proximity to metropolitan centre where commuting to work may be an option. May be solved by: combining unfilled part-time FTE to provide a 1.0 FTE across an area to provide an area-based service; lobbying for part-time positions to be increased to full-time positions or providing alternative sources of funding to make up the hours to full time (private practice work, other models). To improve retention of dietitians in rural areas a broad-based approach needed. Management efforts: improved career options (including graded and specialist positions); formal supervision of new graduates. Lack of support provided by direct line managers may be difficult to resolve; however, establishment of senior dietetic or AH positions in rural areas would assist with management at a local level. Recruitment and retention strategies to reduce perceived professional isolation, improve management support, access to continuing education and the development of career pathways.

Robinson, M., Slaney, G.M., Jones, G.I., Robinson, J.B.	2010	Qualitative - case study methodology - structured interviews, and electronic surveys	To explore the factors that influence the nature of GP procedural medicine. (1) What procedures are being performed by GP proceduralists in the Bogong region? (2) What procedures are no longer performed and why? (3) What is the likely future of GP procedural practice in the next 5 to 10 years?	n = 38 - 70	GP proceduralists attracted by diversity, challenge and passion for procedural work. Gradual but sustained decline in volume and complexity of procedural work due, in part, to shifts in community demography, changing medical practices, the rise of specialisation, the centralisation of services, infrastructure and other costs, and fear of litigation. Ageing workforce and a shift in demographic profile of GPs and pressures of procedural life have contributed to a decline in GP proceduralist numbers. Nevertheless, there remains a substantial demand for GP procedural medicine in rural communities. Needs to be critical mass of GPs with procedural skills being trained and maintained in the wider system of rural general practice to have a labour force capable of working in more remote locations. If downward demographic trends continue, and the demand for GP proceduralist services remains static or increases, it will take a substantial recruitment drive and training effort in each procedural discipline to maintain current supply levels. Rural towns dependent on GP proceduralists to ensure continuing health and sustainability of local communities. However, existence of a viable and robust workforce of GP proceduralists is at 'breaking point'. Until GP proceduralists are recognised and counted as a distinct cohort of valued and highly trained medical practitioners they will remain the 'hidden heart' of primary care in rural and regional Australia. Holistic approach must be adopted to attract, train, maintain and recognise GP proceduralists' unique place in rural health.

					Opportunities to revitalise GP procedural practice as a long term, viable and challenging career choice and ensure ongoing support for rural in-patient and emergency department services
Russell, D.J., Humphreys, J.S., Wakerman, J.	2012	Critical appraisal of workforce measurement metrics - five key workforce turnover and retention metrics	To identify and critically appraise the strengths and weaknesses of five sentinel measures of health workforce turnover and retention, and to make recommendations for their use based on organisational size and capacity for data collection and analysis	N/A	In recognition of the shortcomings of using single measures in isolation, this article identifies, critically appraises and illustrates use of five key workforce turnover and retention metrics well suited for use by Australian rural health workforce planners: crude turnover (separation) rates, stability rates, survival probabilities, median survival and Cox proportional hazard ratios. Recommends their use as a 'package'. Small number of metrics as a 'workforce measurement package' helps overcome many limitations evident when a single measure is reported in isolation, by providing a more comprehensive picture of turnover and retention patterns. Health services can calculate the simplest measures, whereas regional and centralised health authorities with higher levels of expertise undertake survival analysis and comparisons of compiled data. Key metrics can be used routinely to measure baseline levels of health worker turnover and retention, to quantify important determinants of turnover and retention, and importantly, to make valid comparisons. This enables areas for improvement to be better targeted using appropriate retention strategies, and changes resulting from retention interventions to be evaluated effectively.
Russell, D.J., McGrail, M.R.	2017	Quantitative - MABEL survey - Self-reported	To investigate patterns of Australian GP procedural	n = 4638 GPs responding to	Significantly increased odds of GP procedural activity in anaesthetics, obstetrics or emergency

		geographical work location, hours worked in different settings, and on-call availability per usual week, were analysed against GP procedural activity in anaesthetics, obstetrics, surgery or emergency medicine	activity and associations with: 1. geographical remoteness and population size; 2. hours worked in hospitals and in total; and 3. availability for on-call	MABEL Analysis of 9301 survey responses from 4638 individual GPs	medicine as geographical remoteness increased and community population size decreased, albeit with plateauing of the effect-size from medium sized (population 5000–15 000) rural communities. After adjusting for confounders, procedural GPs work more hospital and more total hours each week than non-procedural GPs. In 2011 this equated to GPs practising anaesthetics, obstetrics, surgery, and emergency medicine providing 8%, 13%, 8% and 18% more total hours each week, respectively. Extra hours attributable to longer hours worked in hospital settings, with no reduction in private consultation hours. Procedural GPs carry a significantly higher burden of on-call. Addressing these deterrents to procedural general practice is likely to increase the attractiveness of procedural careers to current and aspiring rural GPs. Robust procedural GP workforce supply may, in turn, strengthen rural primary care workforce in locations that may otherwise face intractable workforce supply issues. Longer working hours and higher on-call demands experienced by rural and remote procedural GPs demand improved solutions, such as changes to service delivery models, so that long-term procedural GP careers are attractive to current and aspiring rural GPs.
Nestel, D., Regan, M., Vijayakumar, P., Sunderji, I., Haigh, C., Smith, C., Wright, A.	2011	Mixed methods - The Gippsland Inspiring Professional Standards for International Experts program comprised a weekend workshop and four subsequent evening	To evaluate the Gippsland Inspiring Professional Standards for International Experts program	n = 15 - 17	Intermediate evaluations facilitated insight on transfer of learning. Principal challenge related to resource intensive nature of evaluation strategy. A dedicated program administrator was required to manage data collection. Although resource-intensive, we recommend baseline, immediate, and intermediate data

		sessions over three months.			collection points, with multi-source feedback being especially illuminating. Encourage broad stakeholder involvement in the development of the strategy. Allocate adequate resourcing of administrative support, especially for MSF and booking telephone interviews. Incorporate evaluation data into educational content and process - schedule evaluation activities as part of curriculum. Use data collected to engage participants in a personalized program while ensuring relevance. If using MSF, provide clear instructions to participants and assessors to minimize the encroachment on their time. Indicate that free text comments are highly valued if contextualized. Offer reassurance about confidentiality to assessors. Offer reassurance to participants that the results will not be used in any way to influence their employment with their health service. Incorporate participant feedback into ongoing program refinement and delivery to allow for personalization of education strategies as well as clarification of program objectives. Ensure externally commissioned contractual work is clearly articulated and include progress reports.
McGrail, M.R., O'Sullivan, B.G., Bendotti, H.R., Kondalsamy-Chennakesavan, S.	2019	Quantitative - MABEL survey - Annual national survey of Australian doctors 2008 - 2016	To investigate whether publishing research is an important aspect of medical careers, and how it varies by specialty and rural or metropolitan location.	n = Pre-reg 11263, Registrar 9745, Consultants 35983 - Hard to decipher as the time was 2008-2016 and participants moved between groups. MABEL study	Main outcome 'research publications are important to progress my training' (junior doctors) or 'research publications are important to my career' (consultants). Highest proportion agreeing were registrars (65%) and pre-registrars (60%), compared with consultants (36%). After accounting for key covariates, rural location was significantly associated with lower importance of publishing research for pre-registrars and consultants, but not for

					registrars. Compared with anaesthetics, research importance was significantly higher for pre-registrars pursuing surgery and obstetrics/gynaecology careers, for registrars enrolled in surgery and internal medicine training, and consultants of internal medicine, pathology, radiology and paediatrics. Importance of publishing research strongly relates to early career doctors, pursuing targeted specialties and is lower for doctors in rural locations. Embedding research requirements more evenly into specialty college selection criteria may stimulate uptake and achieve more equitable opportunities to conduct research. Attracting early career doctors to rural pathways depends on strengthening opportunities for rural-based research specialties.
Jones, M.P., Humphreys, J. S., Nicholson, T.	2012	Quantitative - questionnaire - Neuroticism, Extraversion, Openness – Five Factor Inventory (NEO-FFI), Adjective Checklist personality instruments and answered questions about demographics and rural upbringing. Retrospective case-control design - 'cases' are rural practitioners and 'controls' are urban practitioners.	To gain insight into whether personality plays a role in GPs' decisions to work in rural areas and the length of time that they intend to remain as a rural practitioner.	n = 472 rural and urban GPs. Samples of rural (n = 372) and urban (n = 100) GPs from New South Wales (Australia)	Rural GPs scored, on average, more highly than urban GPs with respect to conscientiousness and agreeableness but lower on openness, which can also be taken to mean a more 'down-to-earth' personality. Personality together with age, gender, experience as a GP, time in current location and rural childhood yield an area under the receiver operating characteristic curve of 0.81 in discriminating rural from urban GPs. Among rural GPs, openness was positively correlated with intended longevity as a rural doctor as was nurturing. Personality plays a small but important role in doctors' decision to move into rural practice and in how long they remain in rural practice. Understanding how a professional and social environment 'fits' an individual might lead to better rural recruitment

					and retention policies and more satisfied rural doctors. Personality appears to play some role both in discriminating rural from urban GPs and in how long existing rural GPs intend to remain as rural GPs. Consideration of personality might assist in selection of individuals who will better fit the professional and social environment of rural life.
McGrail, M.R., Humphreys, J.S., Joyce, C.M., Scott, A.	2012	Quantitative - Wave 2 of MABEL longitudinal study of Australian doctors. The main outcome measures were the level of professional and non-professional satisfaction expressed by GPs with respect to various job and social aspects.	To analyse the satisfaction of IMGs in their current work location, particularly in relation to the effect of mandating IMGs to small rural communities.	n = 3502 IMGs mandated to practice in rural Australia	Non-professional satisfaction of mandated IMGs was significantly lower across all social aspects, whilst professional satisfaction was also significantly lower for most job aspects relating to their professional autonomy. In contrast, non-mandated IMGs were similarly satisfied compared to Australian trained GPs. Mandated IMGs are currently filling a critical shortage in rural areas of Australia. However, long-term success of this policy is problematic unless outstanding issues affecting their significantly reduced professional and non-professional satisfaction can be addressed.
Terry, D., Le, Q.	2013	Qualitative study - semi-structured interviews - purposive snowball sampling	To explore the perspective of IMG informants, the experiences and challenges of IMGs living and working in rural and remote Tasmania and how it informs the acculturation process.	23 individuals who recruit, support and act as educators and advisors to IMGs in the Tas public and private health workforce. Include clinical/non-clinical backgrounds who worked full or part time - medical educators, directors of clinical training, program officers,	Tas based IMGs encounter professional and social challenges, including vulnerability due to fear of job security, loss of status, discrimination and communication challenges within the workplace, spouse employment, obtaining high quality academic access for children, and cultural & religious connectivity. Challenges influence IMGs and their families to stay/ relocate. Several identified needs identified to improve retention of IMGs within Tas. Recommended that retaining IMGs within Tas requires greater focus on promoting and improving attractiveness and accessibility of those career pathways which are available and

				organisational heads and recruitment management and staff.	needed in Tas, and greater support to meet identified professional and social needs of IMGs living throughout Tasmania, could extend to AMGs in more rural and remote regions.

Appendix 7. Health workforce models in rural Australia

Author/s	Year	Study design	Aim/objectives	Population	Key results
Barnett, T., Hoang, H., Stuart, J., Crocombe, L.	2016	Qualitative - Semi-structured interviews	To examine the provision of oral health and oral health service in rural areas from the perspective of GPs working in communities without resident dentists.	30 GPs	Four themes: rural oral health, managing oral health presentations, barriers to patients seeing a dentist, and improving oral health. Recommendations: Building GP capacity to better care for patients with oral health problems, establishing more effective communication and referral pathways between GPs and dentists, focusing on preventive dental care, and delivering dental services in more flexible and consistent ways that better meet the needs of the communities.
Jones, D., Ballard, J., Dyson, R., Macbeth, P., Lyle, D., Sunny, P., Thomas, A., Sharma, I.	2019	Qualitative – describes strategy evaluation. Strategy designed to enhance nursing service and practice responsiveness to the rural context, primary healthcare principles, and community experiences and expectations of healthcare. Strategy underpinned by cross-sector collaboration between local health district, school education and UDRH.	To describe the design and implementation of a community engaged primary healthcare strategy in rural Australia, the Primary Healthcare Registered Nurse: Schools-Based strategy.	School students, primary health care nursing.	Challenges experienced in attracting suitably qualified registered nurses to positions. Additional investments required to support appointed PHCRNs in transitioning from hospital-centric and acute care practice to schools-based and primary healthcare practice. Substantial resource, time and education investments directed towards nurse preparation for primary healthcare practice, including enrolment of all nurses in post-graduate primary healthcare coursework. Title 'school nurse' not sufficient in describing role and scope of nursing practice. Significant differences identified (life-phases approach to student health, engagement of community in codesigning strategy and service, explicit focus on FCC, trauma-informed care, integrated care and primary healthcare provision). Significant time investments to establish consensus-orientated interpretation of strategy intent. Sustainable funding is needed.

Brown, J.B., Morrison, T., Bryant, M., Kassell, L., Nestel, D.	2015	Qualitative - case study research- interviews	To develop a rural academic general practice framework to assist rural practices in developing both comprehensive educational activity and a strong research focus.	44 (12 learners, 22 staff, 10 patients) - staff (supervisors, practice managers, nurses), learners (medical students, interns and registrars) and patients	Themes: 1) organisational (values, vision and culture/patient population and clinical services/staffing/ Physical infrastructure/ Funding streams/governance structure. 2) educational (Educational processes/clinical supervision/Educational networks/ learner presence) 3) research (Attitude to research/ little research activity). The pathway to becoming an academic rural GP is a complex process, requires many years of deliberate development. Pathway stages conceptualised as: beginning, emerging, consolidating and established.
Carey, T.A.	2013	Qualitative - semi-structured interviews with a range of people involved in the SEWBS (social and emotional wellbeing service).	To analyse the impact of the SEWBS, including issues of effectiveness and sustainability among service delivery stakeholders.	21 people with different involvement in the service: providers, participants, referrers, significant others, stakeholders	Providing a localised response to significant social and emotional wellbeing issues: appropriate staffing, involve community residents, identify priorities, priorities for future research and development, localise decision making, cost/benefit analyses and staff/community ratios, relevant training models recognising connectedness and culture, position descriptions and qualifications.
Smith, T., McNeil, K., Mitchell, R., Boyle, B., Ries, N.	2019	Qualitative - semi-structured, in-depth interviews	To explore the experiences and perceptions of nurse practitioners (NPs) and their colleagues about barriers to and enablers of extended scope of practice and consider the relevance of the findings to other health professions. To use an established socio-institutional theoretical model of macro-, meso and micro-perspectives to	20 primary NPs and colleagues	Key barriers/ enablers: macro-level - legal, regulatory, and economic barriers and enablers, job availability. Meso-level- local health service, work load and community factors (attitudes and support from managers and patients). Micro-level: day-today practice: role clarity, embedded professional hierarchy, traditional role expectations, lack of understanding by others on NP role, leading to increased effort to promote their role. Implications: 1) Define and standardise scope of practice ideally with regulatory framework 2) continue development of educational and

			reflect on how such barriers and enablers may be generalised to extended scope of practice roles in other health professions, especially in the context of rural and remote practice		support networks 3) promote role 4) HR implications in developing new competencies to attract staff 5) Mx to take active role
Nelson, J., Bennett-Levy, J., Wilson, S., Ryan, K., Rotumah, D., Budden, W., Beale, D., Stirling, J.	2015	Qualitative - participatory action research (PAR) - reflections	To identify issues affecting the clinical supervision of the Aboriginal and Torres Strait Islander mental healthcare workforce and propose alternative supervision models.	5 Aboriginal counsellors	High levels of stress/burnout. Current supervisor models inadequate, current non-Indigenous supervisors do not understand the context, underqualified workforce, need for self-care, working beyond competency, high sense of duty blurring between community, family as co-workers and clients, confidentiality risk and 24/7 vigilance. Recommendations: implementation of alternative supervision models including use of cultural supervisors and dual supervisors, accessibility to consultation, supervisor training, consultation for skill development, development of communities of practice for remote workers through modern technologies, supervisor training models, recognising the blur for Aboriginal Torres Strait Island mental health practitioners.
Amsters, D., Kendall, M., Schuurs, S., Lindeman, M., Kuipers, P.	2013	Qualitative - Six focus groups	To determine how is consultancy practiced and how effective is AHP consultancy as a knowledge translation medium.	39 AHP and key informants (specialist educators, nurses)	Framework consisting of: 1) actors =consultant, consultee and client 2) Process: formal/ informal engagement processes, information exchange (consultee should be proactive), collaborative process. Advocacy and case Mx not seen as consultancy 3) Context: consultee background, client setting, location, broader health systems 4) Outcomes: change Mx, process outcomes between actors, consultant job satisfaction, implementation, attainment of

					agreed goals between actors and knowledge translation. Currently less formalised among AHP in Australia. Relationships key among actors. Need: to align policy/practice/ training and research; formalise documentation processes and outcomes for medico-legal reasons; can be discipline specific. Training should focus on: defining consultancy in AH, understanding contextual barriers and facilitators, understanding goal setting, setting up processes and outcomes for consultancy, developing consultancy relationships and roles. Stronger evidence base required to do training. Understanding consultancy for AHP will contribute to further developing the workforce
Monk, C.M., Wrightson, S.J., Smith, A.	2013	Quantitative - an audit of 200 treatment reviews to determine medical intervention (MI) levels required and a survey of 80 clinical staff to explore attitudes towards radiation therapists (RT) participation in clinics	To investigate the feasibility of RT participation in review clinics treatment as an area of RO practice into which radiation therapist (RT) practice could extend	200 treatment reviews and 60 staff - radiation therapists/ oncologists	All but one respondent agreed RTs would be willing to participate in treatment review clinics, all consultant ROs indicated they would not be willing to delegate reviews to RTs. Medical intervention required in 59% (n = 118) of observed reviews, lowest for breast (33%) and prostate (28%) cancers. RTs see themselves as more accessible and closer to patients, facilitating better communication, and enabling participation in review clinics than ROs. Neither feasibility measure reached acceptable levels to recommend RT participation in treatment review clinics. Medicolegal issues need to be considered for extended scope of practice, Medicare funding. RTs considered well placed to: use common toxicity criteria, explain treatment techniques to patients but less so in area of nutrition advice, side effects, complementary medicines, more training needed in that area. Medical advice or treatment

					break should remain responsibility of RO. Implications: extended scope of practices cannot take place without planning and re-education of workforce to overcome current barriers to new models of care and to meet future needs. Planning should be taking place now, rather than waiting and allowing the workloads to increase to more unsustainable levels in rural areas.
Anderson, R.	2015	Quantitative - survey describing 10 scenarios (ethical dilemmas) and reactions by HPs	To investigate rural, regional and metropolitan psychologists' and medical practitioners' beliefs of ethical appropriateness of overlapping relationships, especially when they are concerned with mental health issues.	439 psychologists and 478 medical practitioners	For each of scenario psychologists more likely than medical practitioners to express ethical concern about clinician behaviour. Experiencing previous overlapping relationships significantly influenced attributions of ethical concern for psychologists and medical practitioners. Psychologists living in rural areas less concerned about colleague's acceptance of social event invitation than counterparts in regional or large urban centre. Overlapping relationships inevitable for rural, regional and, at times, urban psychologists and may lead to atypical treatment and is difficult for the HPs. Previous experience led to higher acceptance rates, as does being a medical practitioner and working in rural area. May be a typical rural response to ethical situations in terms of relationships, requires additional awareness of HPs working in rural practice.
Nestel, D., Hill, R., Bullock, S.	2011	Mixed methods - satisfaction survey, focus groups, and summative assessments students	To describe the recruitment and training of late-career clinicians, already located in Gippsland, to teach anatomy. To what extent can a late-career medical workforce provide effective	survey: 37 students, (65% response rate), focus group five tutors. Late-career medical clinicians	Some tutors requested further professional development, especially in the use of technology to support learning. Both students and tutors found training intense, Lectures valued but tutorials varied depending on tutor. Recommendations: facilitate 'shared' teaching between tutors to enable them to observe

			support to medical students in anatomy tutorials in a graduate entry program? To what extent are students satisfied with anatomy program content and methods?		different approaches and students' responses; improve access to technology-based resources and consider ways to recruit additional late-career clinicians; evaluate long-term impact of focused clinical anatomy teaching early in medical program.
Passey, M., Fanaian, M., Lyle, D., Harris, M.F.	2010	Quantitative - survey	To compare baseline CVD preventive practices among high risk individuals in rural and urban general practices	27 nurses and 36 GPs	Rural practitioners had lower scores for frequency of advice, management of obesity/overweight, pre-diabetes and high lipids. No significant differences between urban and rural practitioners in relation to assessment of risk, assessment of stage of change, referral or barriers to referral or the management of high blood pressure. No difference in confidence and attitude on CVD preventative activities. Barriers: lack of time, funding, systems and referral services. Room for improvement in CVD preventative care despite high levels of positive attitudes and confidence. Gaps in provision of care reflect lack of capacity and systems to support delivery rather than lack of interest or knowledge. While clinicians report frequently advising high risk patients to exercise more, significant gaps remain in provision of dietary advice and referral. Greater attention to addressing these issues required to maximise potential benefits for CVD prevention in GP setting.
Squibb, K., Bull, R.M., Smith, A., Dalton, L.	2015	Qualitative - interviews	To explore the findings in relation to disclosure of results to patients using a research framework that draws upon ethical theories.	23 radiographers	Main theme 'Disclosure of Radiographic Opinion to Patients'. Three interrelated sub-themes: Acting Ethically, Selective Disclosure and Filtered Truth. Without clear picture of where they stand medico-legally, rural radiographers draw on experience and strong

					ethical framework as the basis for complex decisions. May be relevant to improving patient management pathways, particularly as Code of Conduct for Registered Health Practitioners states radiographers may discuss 'with patients or clients their condition and…respond…to questions … about their clinical progress …' within relevant legislative boundaries. Medicolegal implications need to be addressed. Need for clarification of radiographers' legal position about disclosure of their radiographic opinion to patients and this should be promoted throughout the profession.
Hamilton, S., Mills, B., McRae, S., Thompson, S.	2016	Mixed methods - semi-structured interviews + survey	To investigate the provision of cardiac rehabilitation (CR) and secondary prevention services in Western Australia (WA) among rural, remote and Indigenous populations	34 cardiac rehab and Aboriginal medical services coordinators	65% Indigenous identification systems present, least in rural areas, most in remote areas, referral and attendance rates and meeting cultural needs varied: case management (32%), specific educational materials (35%), use of a buddy or mentoring system (27%), and access to an AHW (71%). Cultural awareness training in place in 97% of cases. 77% of coordinators reported program based on CR guidelines: 60% rural, 67% remote, 100% metropolitan. Recommendations: Improve access to culturally appropriate CR and secondary prevention given high rates of premature CVD affecting Indigenous people; improve systematic data collection to enable regular monitoring and staff upskilling; create new health pathways to ensure continuity of care; promote cultural awareness professional development; resources needed.
Jones, D., McAllister, L., Lyle, D.	2016	Qualitative - Focus groups and semi-structured interviews	To document and describe the formation of the community-campus	7 school principals, 10 allied health students, 2 senior	1) Initiating the partnership 2) Catalysts for community participation: remote context (lower SES, isolation, AH workforce shortage, low

			partnership, the development and adaptation of the service-learning program from the perspectives of community and campus participants, and to develop a greater understanding of the impacts of participation in the partnership and program for community and campus participants	managers and 2 academics	services accessibility), health sector failures (services not responding, waiting lists), communities of participation (constantly improving service and learning components, community led adaption increased service acceptability and sustainability, partnership commitment and service consistency, service acceptability and accessibility , community investment in health workforce development). Enhancing community literacy to improve patient access to AH services; community perspectives on partnership initiation and ongoing engagement contribute to substantive and long-term solutions for children in remote regions; remote communities can lead health partnerships and support development of programs that provide viable and sustainable alternatives to addressing health inequities and workforce shortages. Model may address health inequities and workforce shortages.
Brown, L. J., Williams, L.T., Capra, S.	2012	Mixed methods - six case study sites of dietetic service delivery. Data sources included workforce documents (quantitative) and in-depth individual interviews	To describe dietetic services in rural areas and to determine the drivers for and barriers to the development of dietetic positions in rural areas.	40 dieticians, dietetic managers, health service managers	Dietetic workforce had a 5.6-fold increase across the six sites between 1991 and 2006. New positions established through: ad hoc and opportunistic funding, a gradual increase in funding or due to concerted efforts by champions advocating for increased funding. Factors that inhibited development of positions: general lack of funds and competing priorities. This led to deliberately denying a service due to a lack of staffing to alert management. A consistent systematic approach to development of dietetic positions in rural areas is needed. Champions needed for development of positions as they are effective in increasing positions. Developing a high profile with

					local management is a key factor that assisted in additional funding negotiations.
Bird, J., Rotumah, D., Bennett-Levy, J., Singer, J.	2017	Qualitative - semi-structured interviews	To investigate how Aboriginal and Torres Strait Islander service providers in one regional area of Australia used eMH resources in their practice following an eMH training program and to determine what types of eMH resources they used	16 Aboriginal and Torres Strait Islander service providers who had undergone a 2/3 eMH training program with 6 monthly skills-based follow consultation sessions	9/16 service providers implementing eMH resources into routine practice. eMH resources used for supporting social inclusion, informing and educating, assessment, case planning and management, referral, responding to crises, and self and family care. Combination of culturally specific and mainstream sources used: information websites, online tele crisis and support services, online symptom-based treatment programs, online health prevention programs, YouTube, self-help mobile apps. While they referred clients to online treatment programs, they used only eMH resources designed for mobile devices in face-to-face contact with clients. The contexts within which they work, the way they use eMH resources, and the types of eMH resources they use with their Aboriginal and Torres Strait Islander clients all deserve separate and distinct investigation and reporting. Field needs to foster production of culturally relevant resources, services, and treatment modalities that support social and emotional wellbeing and treat mental health disorders.
Kinsman, L.D., Rotter, T., Willis, J., Snow, P.C., Buykx, P., Humphreys, J.S.	2012	Quantitative – experimental - cluster RCT- - 3 control 3 intervention	To measure the impact of a five-step implementation process for an acute myocardial infarction (AMI) clinical pathway (CPW) on thrombolytic administration in rural emergency departments.	6 rural EDs, 915 medical records - patients with primary diagnosis of acute myocardial infarction who were eligible for thrombolysis	915 records audited, 108 patients eligible for thrombolysis. No significant difference between intervention and control groups for median door-to-needle time, proportion of those eligible receiving a thrombolytic (78% versus 84%), median time to electrocardiogram and other outcome measures. Due to ceiling effect or small sample no improvement in outcome measures. Results suggests quality of AMI

					treatment in rural emergency departments (EDs) is high and does not contribute to the worse mortality rate reported for AMIs in rural areas. Clinical pathway had no measurable impact.
Skinner, T., Allen, P., Peach, E., Browne, J.L., Pouwer, F., Speight, J., Dunbar, J.A.	2013	Quantitative - cross-sectional national postal/online survey of persons registered with the National Diabetes Services Scheme	To investigate differences in access to services and health outcomes between people living with Type 1 (T1DM) and Type 2 (T2DM) diabetes in rural/regional and metropolitan areas.	3338	Rural people with T1DM and T2DM less likely to report consulting an endocrinologist during the past 12 months and reporting trouble with costs. Rural people with T1DM were more than twice as likely to have accessed a community/practice nurse for diabetes care. Those with T2DM were more likely to have accessed a diabetes educator and/or dietician and reporting trouble with distance being an obstacle to care. T1DM rural respondents more than twice as likely to have accessed a community or practice nurse for diabetes care and approximately half as likely to have accessed a diabetes support group during the past 12 months. No rural-urban difference in self-reported hypoglycaemic events during past week and most self-care indicators, except BMI and foot self-assessments. Multidisciplinary primary services in rural areas may be providing additional care for people with diabetes, compensating for poor access to specialists. Need to increase proportion of people with diabetes meeting recommended reviews with GPs and maximise coordinated, multidisciplinary model of care that emphasises self-management support in both rural and metropolitan Australia. Inequalities in access to specialist level care, particularly people with Type 1 diabetes, must be prioritised.

Thomas, S.L., Wakerman, J., Humphreys, J.S.	2015	Qualitative - Delphi method comprising panelists with expertise in rural, remote and/or Indigenous PHC, two surveys to identify threshold, follow up focus group	To define the population thresholds governing which PHC services would be best provided by a resident health worker, and to outline attendant implementation issues.	28 rural and remote experts	Population thresholds for core PHC services provided by resident worker were less in remote communities compared with rural communities. Principles underpinning implementation included: fundamental importance of equity; consideration of social determinants of health; flexibility, effective expenditure of resources, tailoring services to ensure consumer acceptability, prioritising services according to need, and providing services as close to home as possible. For rural communities with populations over 100, experts agreed most 'care of the sick and injured' and 'aged care and disability' services should be provided by resident health workers. Communities>500 require local HP for mental health and social and emotional well-being, maternal and child health, sexual and reproductive health, public health/ illness prevention, counselling/social work/family violence, and palliative care. For remote communities with a population of <100 there was consensus that services illustrative of 'care of the sick and injured' (excluding pathology and radiology) be provided by resident health worker.
Wilson, M., Bellefeuille, L., D'Amore, A., Mitchell, E.K.L.	2015	Quantitative - prospective cohort: pre and post survey on patient symptoms vaginal and bladder (mean post survey 6.5 months)	To report the necessary skill development for sole CNA practice and some details of the development of the pessary clinic, as well as to summarise patient uptake and outcomes for the initial phase of the clinic	39 referred, 22 took part women - requiring pessary and nurses being trained	Successful fitting occurred in 77% of participants. After 3 months only 4 (24%) participants wore a pessary. Post-intervention questionnaires, at 3 months showed those participants still wearing a pessary had improved voiding or prolapse symptoms compared to those without. No statistics provided. Women had trouble in continuing to use pessaries. For a CNA located in rural health care setting, self-education and acquiring

					appropriate skills is expensive and time-consuming, partly as it requires travel to metro centres. In planning other rural-based, CNA-led pessary services cost in time and money should be considered. New CNA practitioners need mentorship and on-site tuition. Gynaecologists with a rural practice should consider supporting a CNA-led pessary clinic running concurrently with their clinics. Education is needed for women to use pessaries.
Belton, S., Campbell, M., Foxley, S., Hamerton, B., Gladman, J., McGrath, S., Piller, N., Saunders, N., Vaughan, F.	2010	Quantitative - survey	To review the longer-term effectiveness of the maternity emergency care (MEC) course which was developed in consultation with the Australian College of Midwives (ACM) and rural and remote practitioners in 2003	57 rural clinicians, 7 remote health managers. 2 course facilitators (rural remote = 50%)	All ‘‘strongly agreed’’ or ‘‘agreed’’ their skills were increased and were more competent to deal with maternity emergences. Majority responded they were more able to recognise complications, felt skilled and confident to undertake routine and emergency antenatal care, birth and postpartum care, often despite the time since completing the course. 45% had managed a maternity emergency since completing course and 34% reported being the most experienced clinician at the time. All respondents felt it would be necessary to refresh their skills, 82% thought this refresher should occur 2 or 3 yearly. 1 of 4 managers felt antenatal care had improved. No managers felt the standard of postnatal care had improved. Improving course: additional skills around routine antenatal and postnatal care, provision of more courses in more locations, running courses on weekdays and providing refresher courses. Ensure male RAN is never in the same skills station as a female AHW. National data would be useful on numbers pregnant women who reside and receive antenatal care in remote

					communities in comparison to how many midwives are available to provide that care.
Lau, R., Stewart, K., McNamara, K., Jackson, S., Hughes, J., Peterson, G., Bortoletto, D., McDowell, J., Bailey, M., Hsueh, A.J., George, J.	2010	Quantitative - multi-centre prospective RCT	Protocol for an intervention package that could be integrated into the community pharmacy workflow to enable pharmacists to improve patient adherence and/or persistence with antihypertensive medications - Hypertension Adherence Program in Pharmacy (HAPPY).	546 (pharmacies recruiting 182 patient ins 3 arms: intervention/ usual care/ hidden usual care)	Primary: patient adherence/ medication refill data. Secondary: BP change, satisfaction and willingness to pay for service and economic benefits. This is a study protocol, including urban, regional and remote community pharmacies.
Lesjak, M., Flecknoe-Brown, S., Sidford, J., Lyle, D.,	2010	Quantitative - Screening test evaluation pre and post six months Baseline: survey, clinical data collected by nurse, used to measure abdominal aorta. 6 month: survey.	To evaluate the feasibility of a mobile screening service model for abdominal aortic aneurysm (AAA) in a remote population centre in Australia.	516 men 65-74 yrs	5.4% had ectatic and 4.9% a small, moderate or significant aneurysm. Two men with AAA were recommended for surgery. 190 men screened per week. Non-attendance rate less than 2%. 6 months follow up: of those men with an AAA, 89% had been to see a GP or surgeon and 67% had a management plan. Men with AAA had surgery. Screening was around 60% eligible men. Feasible to operate a mobile AAA screening service from moderate sized rural and remote population centres. Model could be scaled up to provide national coverage for rural and remote residents. Potential benefits of AAA screening can be increased by offering older men a basic health check as part of service. Personalised invitation appears best way to attract attention. Targeted one-off screening could be made available to a rural community using a mobile service visiting every 3-5 years, recruiting men within five-year age band, centred around 65 years age. Community

					participation in screening program, with support from service clubs and community service group. Primary health-care facilities would ideally be fully engaged in promotion of program and fully prepared for reception and optimal management of subjects with positive findings.
O'Meara, P.F., Tourle, V., Stirling, C., Walker, J., Pedler, D.	2012	Qualitative - multiple case study methodology among four different models using semi-structured interviews and thematic analyses	To identify trends in the evolving practice of rural paramedics and describes key characteristics, roles and expected outcomes for a Rural Expanded Scope of Practice (RESP) model	17 paramedics, volunteer ambulance officers and other HPs,	Four themes: Community engagement; Clinical response; Scope of practice extension; Educational requirements. Paramedics are increasingly first line primary healthcare providers in small rural communities and developing additional professional responsibilities throughout the cycle of care. RESP has potential to improve patient care and general health of rural communities. Model suited to rural areas with high ambulance 'down-time' and a dearth of other health professionals is evident. Adoption of RESP would mean paramedics undertake 4 broad activities as core components of new role: rural community engagement; emergency response; situated practice; and primary health care. Key feature: capacity to integrate existing paramedic models with other health agencies and health professionals to ensure paramedic care is part of seamless system.
Barrett, A., Terry, D.R., Le, Q., Hoang, H.	2016	Systematic review - studies 1990-2015 that focused on issues experienced by community nurses. Generic & grey literature was also searched.	To better understand the issues and challenges experienced by community nurses working in rural areas and how these factors shape their role.	14 papers	Common issues: poor role definition; shift in role due to community needs and organisational change (conflict between medical and treatment care and primary health focus, health promotion, prevention and education); human resource (high retirement intentions, recruitment retention); workplace factors (relationship issues, confidentiality,

					setting boundaries, system issues, increased exposure to physical and social risks); geographic challenges (not calculated in funding arrangements). Community nurses are flexible, autonomous, adapt care to service delivery setting, and have diversity of knowledge and skills Greater advocacy required to develop role. Need to develop critical thinking, risk assessment and analysis skills among community nurses. Competency and flexibility key to nursing roles required to develop generalist skills and autonomy prior to cultivating specific/specialised skills. Rural community nurses need to partner with clients, academic peers, organisations, (health / non-health professionals) to redesign, implement and enhance services for the community.
Ward, B., Reupert, A., McCormick, F., Waller, S., Kidd, S.	2017	Qualitative - interviews and thematic analyses	To explore practitioners' understandings and practices of family focussed practice (FFP) to support individuals with mental illness within a recovery framework.	11 MH practitioners	Limited understanding of FFP. Enactment of FFP within recovery framework was twofold: encouraging and prompting the family to support their relative with the illness, and by supporting the family and addressing their own needs. Barriers and enablers: family relationships/ service context (high care demand) /shortage of staff/ stigma from self and others, language, and confidentiality. Family-focused recovery framework is needed to assist service planners, practitioners, family members and those with mental health needs, and ensure such care is embedded within practice guidelines. Leaders in acute settings with in-depth understanding of recovery oriented FFP might role model and advocate for family-focused recovery practice training to ensure the

					knowledge of the family is included in the formulation of care plans
Gum, L.F., Prideaux, D., Sweet, L., Greenhill, J.	2012	Qualitative - multi-site collective case study; 44 hours of ethnographic observations, 1 focus group and semi-structured interviews	To explore the influence of interprofessional learning (IPL) on the collaborative culture in rural hospital settings. How does design might impact on interprofessional collaboration.	nurses. admin, GPs, physios, paramedics and ancillary staff	Physical design of nurses' stations and general physical environment major influence on effective collaborative practice. Communication barriers: poor design, lack of space, frequent interruptions, lack of privacy. "Nurses' station" denotes space as primary domain of nurses rather than workspace for healthcare team. Health professions differing understandings of other health professions roles and responsibilities. Confusion about nurse role as being available to both pass on information and care for patients at the bedside. Future design could provide ample desk space and a functional "offstage" area, where staff are not "on show" to public/ privacy of patients can be maintained and space for whiteboard. Timely to consider creating newly designed interprofessional spaces eg Health Team Hubs implies a joint venture.
Perkins, D., Hamilton, M., Saurman, E., Luland, T., Alpren, C., Lyle, D.	2010	Mixed methods - audit and semi-structured interviews	To evaluate an innovative rural service offering comprehensive primary health care for mental health service clients, the community mental health team (CMHT) as part of a GP- clinic.	15 HP and 120 adult clients	Diverse presentations: one third clients had schizophrenia or other psychotic disorders, one-third mood disorder, and remainder a range of diagnoses including substance use, personality disorders and anxiety. Continuing use of GP Clinic for primary health care services was recorded for 40% clients. More clients with psychotic disorders relied on GP Clinic for continuing services. 79% referred to other services. Providers said GP Clinic was not complex service to develop and was straightforward to run, cost neutral and no client had refused clinic referral. Same GP running the MH clinic may have led to strong

					therapeutic relationships/continuity care and consistent sustainable approach. Incremental service development within existing funding models might benefit clients with MH conditions who need comprehensive continuing health care. An innovative service model developed by rural clinicians that improves client access to comprehensive primary health care and closer collaboration between MH specialists and GPs.
Buykx, P., Humphreys, J.S., Tham, R., Kinsman, L., Wakerman, J., Asaid, A., Tuohey, K.	2012	Mixed methods, 6-year longitudinal evaluation - community surveys, audit of service indicators, interviews, focus groups, and observations	To describe how small rural primary health care services sustain themselves in a constantly changing health system environment	N/A	Barriers and enablers to sustainability were mapped against overarching framework of service sustainability requirements. Internal threats: workforce organisation and supply; funding; governance, management and leadership; service linkages; and infrastructure. External threats to environmental enablers: supported policy environment; clearly articulated federal-state roles and responsibilities; strong community involvement. Practice: ongoing monitoring of sentinel service indicators; being attentive to changes that have an impact on sustainability; maintaining community involvement; ongoing succession planning; evaluation funding. Research: health service evaluation should be embedded as an integral aspect of a service; demonstrate benefits for researchers (new knowledge) and health services (quality improvement); use knowledge translation to improve services.
Meade, C., Ward, B., Cronin, H.	2016	Mixed methods - in-depth semi-structured interviews and audit of MBS items pre and post	To describe and examine the effect of a new practice nurse-led team model in residential aged care	3 GPs, 1 PM and I PN	Under new model of care, residents' access to standard general practice consultations increased 6.69 to 14.09/resident/year. GP FTE remained the same. After-hours consultations

			facilities on service provision and GPs in rural general practice.		reduced 0.16 to 0.10/ resident/year. Long consultations decreased. Significant increases in provision of Medicare quality improvement services. GPs reported their workload and stress decreased, while levels of professional satisfaction increased. PN ensure seamless systems such as admin tasks, liaising with family. Model financially viable. Following required for setting model: respect for team members and clear communication; PN's competence and people skills; the general practice's openness to change and RACF's acceptance of the model. Nurse-led GP clinics can improve quality of life of residential aged care residents whilst being economically viable.
O'Hara, R., Jackson, S.	2017	Mixed methods -survey and staff review of the program and processes	To evaluate a new model of care of allied health practitioners conducting review assessments via telehealth among remote patients with neurological conditions.	3 AHPs and 4 students, 10 patients	AHPs and students typically rated each statement higher than clients. Overall satisfaction was high for use, confidentiality, saving time, travel costs. AHP and students felt they gained new clinical knowledge/skills and felt more confident with clinical experts present. This enabled higher quality service to be provided to clients in real-time, while upskilling remote AHPs and students. Challenges were: adjusting the camera to allow expert clinician to see the patient; audio issues. Important to have established relationship with patient as this key to use of and engagement with technology. Dedicated room at each site required. Use telehealth with clinical expert to upskill remote staff and students and potentially increase recruitment and retention. Providing multiple angles cameras. More time between sessions to feedback to students and assessments. Develop video/flyer that explains

					what telehealth is for patient. Training students and HPs in telehealth etiquette. Test equipment prior to appointment
Barraclough, F., Longman, J., Barclay, L.	2015	Mixed methods - case study - analysed documents, quantitative data and qualitative data from individual and group semi-structured interviews and a 'stakeholder meeting'.	To describe a nurse practitioner led primary healthcare rural mental health service and evidence of how the service was integrated with other services and the community	21 service providers and stakeholders	Service was highly regarded. It addressed drug and alcohol and mental health needs of vulnerable rural community. Inception and implementation of service were community driven. Challenges: distance and lack of integration between the service and acute MH and D and A facilities; lack of awareness of other MH staff; professional risk of isolation of NP. Integration with acute MH services to be achieved through: NP work with established protocols and reporting processes; participating in joint education and case conferencing; co-management of some clients including shared home visits. NP can improve MH service provision in underserviced areas. Strong lobbying, community involvement, collaboration between services, and signing of partnership agreement are key to success. Co-location facilitates integration between services at a client and worker level across agencies such as health, housing, transport and employment. A nurse-led mental health service col-located with other services improves care for rural patients.
Barnett, T., Hoang, H., Cross, M., Bridgman, H.	2015	Mixed methods -clinical case study: survey, network analyses, observation and field notes	To investigate the extent to which staff were networked, how collaboratively they practiced and supported student learning, and to elicit the organisation's	19	Four major themes: 1. Community engagement 2. Clinical response 3. Scope of practice extension 4. Educational requirements. Participants were well networked, employed a patient-centred approach; most had a good understanding of other's roles; high levels of reciprocity between staff. Case study of 2 consecutive interprofessional workshops can

			strengths and opportunities regarding IPP and learning		potentially inform organisations models of care and professional roles and strengthen organisations interprofessional capability.
McNamara, K.P., O'Reilly, S.L., George, J., Peterson, G.M., Jackson, S.L., Duncan, G., Howarth, H., Dunbar, J.A.	2015	Mixed methods - measurements: BP -using Omron 1A1B automated BP monitors, weight, height, waist and hip circumference, in accordance with established protocols and lipid profile and blood glucose in accordance with manufacturer protocols using Cholestech LDX Analyzers/Data on medical history, medication use, medication adherence, health behaviours weight management, alcohol intake, physical activity and psychosocial health were collected via an interviewer administered questionnaire	To determine intervention fidelity by pharmacists for behavioural components of a complex educational intervention for CVD prevention.	12 experienced pharmacists from 10 community pharmacies in Victoria and Tasmania (5 rural, 5 metropolitan) had an intensive training/70 patients aged 50–74 years without established CVD, and taking antihypertensive or lipid lowering therapy	Community pharmacists successfully implemented an evidence-based behaviour change intervention for multiple CVD risk factors; community pharmacists recruited appropriate at-risk patients and then recommended suitable goals in collaboration with patients for improving relevant health behaviour. Findings justify development and evaluation of further funding and practice models that enable pharmacists to apply lifestyle modification and medicines adherence support programs more routinely. Medicines adherence was a notable and unexpected exception to the near universal development of goals for other health behaviours.
Campbell, A.M., Brown, J., Simon, D.R., Young, S., Kinsman, L.	2014	Qualitative - semi-structured interviews and inductive content analysis	To understand: 1) factors influencing the decisions of rural general practitioners and GP registrars to practise obstetrics 2) impact on these decisions of an innovative obstetric training and support	22 GPs/ registrars with interest in obstetrics. 1) registrars, 2) GPs who were upskilling 3) established GP obstetricians who	Themes: isolation, work–life balance, safety are substantial barriers for doctor and patient safety. Other themes: Professional support, structured training pathway (community-based bridging posts for registrars; secondment for additional experience; and continuous professional development) and effective leadership. The bridging post in obstetrics after

			program in the Gippsland region of Victoria	supported registrars in training	primary training was highly valued and may increase retention of obstetric GPs. Structured, respectful clinical supervision by senior role models vital to effective postgraduate medical education, with the supervision relationship being more important than the supervision method. Key features of training include: supported transition into community-based GP obstetrics; adequate clinical exposure through secondments; culture supportive of GP obstetrics; building and sustaining professional support networks; and inspirational leadership
Humphreys, J., Wakerman, J.	2018	Qualitative - case study	To describe 1) the rationale for, and development of, an evidence-based rural typology as the basis for an incentive scheme to improve medical workforce retention and thereby help overcome the existing urban–rural workforce maldistribution 2) the process and outline the key factors associated with ensuring that research evidence is translated into rural health policy and implemented in resource allocation programs (using the Modified Monash Model as case study)		Political risk aversion (Who will be the losers?) is foremost in determining which innovations and changes are implemented. How to overcome barriers: sound evidence based on good data and rigorous methodology (understanding the problem is key); transparency (real evidence open to scrutiny); long-term commitment to rural health research support; credibility of the researcher; multiple modes of communication; validation and amplification; patience and persistence. Also, facilitators of knowledge translation include: timing (increasing receptivity of relevant authorities to adopt and implement research evidence); government culture (implementation of evidence in policy is enhanced when government values research). Generating and adopting evidence requires engagement of rural communities, providers of health care services, policy-makers and funders to overcome persistent medical workforce shortages.

Anjou, M.D., Boudville, A.I., Taylor, H.R.	2013	Qualitative - semi-structured interviews, focus groups, stakeholder workshops and meetings	To explore local co-ordination and case management requirements necessary to improve eye care for Indigenous Australians	289 people: interviews 81 community members: focus group 86 individuals: stakeholder workshops 75 people: separate meetings. More precisely, AHS staff (n = 98), community health staff (n = 14), optometrists (n = 31), ophthalmologists (n = 25), hospital staff (n = 35), Division of General Practice staff (n = 10), non-government organisation staff (n = 16), NACCHO affiliate staff (n = 12) and government staff (n = 29)	Many clinic staff, not aware of number and type of visits required in care or best practice guidelines for a normal/average patient journey; Health staff were aware of individual responsibilities within a given section of pathway and their role identifying, assisting and, referring a patient but not well informed about how other system elements worked. Poorly coordinated health services are inefficient, costly and result in poorer outcomes for patients, communities and health care providers. Co-ordinated eye care for Indigenous Australians can be achieved through establishment of clear and shared pathways of care, provision of workforce with well identified roles and responsibilities, case management for high needs patients, and regional and local management and partnership of services and service providers. Where case management was provided, better patient outcomes were achieved, even with complex and difficult problems. Poorly coordinated and organised services tended to discourage patients from seeking and using services
Nancarrow, S.A., Moran, A., Sullivan, R.	2015	Mixed method - semi-structured interviews, focus groups and documentary analysis of competency frameworks and policy documents.	To examine the mechanisms to enable the successful implementation a trainee speech language pathology assistant (SLPA) role in a rehabilitation setting using a traineeship approach	Service managers, qualified practitioners, assistants, service users and their carers: 3 SLPs who work closely with the trainee SLPA; 3 trainee SLPA; 5 allied health (AH) managers involved in	Strong, consultative relationship between Directorate and RTO about development and delivery of AHA training key to implementation of trainee SLPA role. Different perspectives taken into consideration: human resource considerations (SLPA trainee position advertised as a discipline specific trainee, subsequent recruitment process was for 5 generic AHA positions; organisational support (SLPs perceived having support for their roles enabled them to support trainee); impact

				support and development of AHA roles; 4 service users and one carer and 1 activities coordinator who conducted communication-based diversional therapy groups with the trainee once/fortnight on aged care ward.	(employment of trainee increased service capacity - clinical service capacity increased by 28hrs/week and required 3hrs/week total supervision input, equiv. of 38 min/SLP); service user perceptions. Need greater attention to career development opportunities for AHAs; AHA traineeship implementation requires adherence to several enabling mechanisms (strong leadership, good coordination and substantial resources) to support training and supervision. Service users preferred to receive greater quantity and frequency of SLP input during their rehabilitation and were happy be treated by SLPA if it increased volume of treatment received. Staff satisfaction and workload implications - need for greater RTO flexibility so formal learning coincided better with on the job learning.
Pierce, D., Little, F., Bennett-Levy, J., Isaacs, A.N., Bridgman, H., Lutkin, S.J., Carey, T.A., Schlicht, K.G., McCabe-Gusta, Z.P., Martin, E., Martinez, L.A.	2016	Qualitative - case study	To identify and map the different types of activities MHAs (Mental Health Academics) project had undertaken in their regions (under each key performance indicator-KPI)	11 rural and remote sites around Australia	Limited access to MH services in rural and remote areas contributes to MH inequalities. Poorer access to MH services, requires health professionals to widen skills repertoire. Rural and remote areas vulnerable to stigmatisation and confidentiality issues. Australia's Indigenous population: half live in rural and remote locations, experience high-very high psychological distress and double risk for suicide compared to wider community, so local connections, pre-existing and developed by MHAs important to success of initiative. Collaboration: bridging rural divide: MHA initiative illustrates benefits of national collaboration. Flexibility, diversity, connectedness: supporting academics with clinical and community connections to promote

					health and wellbeing worthy of consideration. Promoting recruitment and retention: benefit of locally provided ongoing professional education is the networking and associated peer support that promote professional retention. Collaboration: for MHA role to fully understand local community and service provider needs in supporting the development of quality MH care, reciprocity and commitment required.
Hussain, J., Robinson, A., Stebbing, M., McGrail, M.	2014	Mixed methods - retrospective comparison study of routinely collected data utilising correlation analysis	Are more face-to-face patient-provider consultations, especially those provided by GPs, in a remote health centre associated with reduced need for acute medical evacuations?	20 primary healthcare centres in the Northern Territory servicing more than 5900 residents between July 2008 and June 2010;	More face-to-face healthcare centre GP consultations associated with more, not less, frequent acute medical evacuations to hospital. More cumulative face-to-face healthcare centre consultations, inclusive of all provider types, were associated with more frequent acute medical evacuations. Poor health literacy and the resultant domination of acute medical presentations could be outcompeting opportunities for chronic, preventative health interventions. Increased GP consultations might be reflective of busier doctors, who are then less able to help manage time-consuming events in the clinic, and therefore call for support even if these cases are not life-threatening events. Challenges contemporary wisdom that provision of more clinical consultations at primary healthcare level can reduce the number and economic burden of medical evacuations.
Dunbar, T., Bourke, L.,Murakami-Gold, L.	2019	Qualitative interviews & focus groups – content analysis. 7 remote Aboriginal communities in the NT	To identify how Remote Area Nurse staffing issues are perceived by clinic managers, Remote Area	5 Managers, 29 Remote Area Nurses, 12 Aboriginal staff (some clinics did not have Aboriginal	Having the “right” nurse was more important than having more nurses. Participants highlighted the need for Remote Area Nurses to have advanced clinical and cultural skills. While managers

		with government-run health clinics visited	Nurses themselves, Aboriginal colleagues and community members in seven remote communities in the Northern Territory.	staff) and 56 community residents. 12 focus groups conducted with community members.	and, to a lesser extent, Remote Area Nurses prioritised clinical skills, Aboriginal staff and community residents prioritised cultural skills.
Bell, E., Walker, J., Allen, R., MacCarrick, G., Albert, E.	2010	Qualitative - lit review of published and grey	To explore what non clinical rural and remote competencies are and how they have been described in different contexts	rural and remote nurses	Insufficient evidence to specify how different non clinical rural and remote competencies are from non-clinical competencies per se. However, the models examined suggest that, far from being undefinable, non-clinical rural and remote competencies can be complex and multi-faceted, reflecting the demands of rural and remote contexts. The well-developed models of these competencies that exist and the strong interest in many countries in producing them, suggest their importance for not only better preparation of rural and remote practitioners, but also well-rounded medical professionals generally.
Barnett, T., Hoang, H., Stuart, J., Crocombe, L.	2015	Qualitative - semi structured interviews & thematic analysis. 4 remote communities in outback Queensland	To investigate challenges to providing oral health services by non-dental PHC pract. build skills and knowledge base of PHC workforce in areas underserved by dentists.	35 primary care providers who had experience in providing oral health advice to patients and four dental care providers who had provided oral health services to patients from the four communities.	In the absence of a resident dentist, rural and remote residents presented to non-dental primary care providers with oral health problems (toothache, abscess) for treatment and advice. Themes: communication challenges and strategies to improve oral health. Non-dental care providers commonly advised patients to see a dentist, but rarely communicated with dentist in nearest town. Oral health could be improved by: enabling access to dental practitioners, educating communities on preventive oral healthcare, and building the skills and knowledge base of non-dental primary care providers in the field of oral health.

Kirby, S., McGarron, T., Perkins, D., Lyle, D.	2015	Evaluation - mixed methods implementation evaluation & cost benefit analysis	To test feasibility of nurse led annual cycles of diabetes care. special training on social psychological emotional & motivational aspects of CDM. Longer consults, same nurse, modest cost	21 participants in pilot study in 3 small towns and one remote location	Clinical findings showed significant reductions in HbA1C levels after the nurse-led intervention. Patients reported they trusted the nurse and thought her advice was pitched at their level. Patients were motivated through a process that included emotional response, change identity and acceptance. Estimated cost in CDN hours per 1% drop in HbA1C level was A$242.95). Nurse-led diabetes care motivated patients to manage their diabetes and resulted in a significant improvement in diabetes management in this remote setting.
Motta, L.A., Shephard, M.D.S., Halls, H.J., Barnes, G., Senior, J.	2015	Quantitative - analysis of acceptability, suitability and reliability of point of care testing (PoCT) in general practice	To investigate the analytical quality of several new devices for PoCT, compare their performance with existing devices, and determine whether they could be used, individually or collectively, to optimize the diabetes management service.	60 (out of 61) patients (98% response rate) completed the patient questionnaire	Optimising POT in diabetes care. training of practitioners, several test strips found not reliable in this study. Stat strip, Cholestech & Piccolo found sound for glucose
Tham, R., Hardy, S.	2013	Qualitative - focus groups and structured interviews – thematic analysis	To identify major issues in providing and accessing oral health care in Victorian rural residential aged care services from the perspectives of dentists, aged care staff and residents.	5 dentists, 9 aged care staff and 6 residents. 3 focus groups were conducted with aged care staff.	Challenges – dentists - complexity of care, infrastructure needs, need for skill development. Challenges - aged care staff - lack of skills and confidence in providing oral hygiene care, especially natural teeth, an increasing burden on their daily workload. Residents - concern and shame regarding declining oral health status and increased challenges accessing appropriate oral health care. Need - build and sustain aged care 'oral health teams' - for daily oral hygiene care for residents and mentor staff. Rural dentists need - gerodontic training, portable equipment,

					appropriate workspaces in aged care services. Aged care and oral health services need to establish clear referral and communication pathways.
O'Sullivan, B., Rann, H., McGrail, M.	2019	Mixed methods - cross sectional study - online survey - qualitative free text responses were analysed and grouped thematically.	To explore how commonly specialists providing rural outreach services also use VC to provide clinical service at the outreach site, the aspects of outreach clinical services they consider suitable for VC delivery, whether VC use reduces outreach travel frequency and, if used, has the potential to improve the sustainability of outreach.	390 specialists rural Vic	More than half of specialist doctors complemented rural outreach services with VC. However, VC used infrequently, mainly for one patient per session, for restricted clinical scenarios. Although VC use reduced outreach travel frequency for half of providers, 43% responded that VC takes time than face-to-face clinical service provision. VC potentially useful adjunct to outreach service models, but unlikely to replace face-to-face rural specialist services, particularly for complex care, and may not influence outreach service sustainability in the way it is currently used.
Kurti, L., Rudland, S., Wilkinson, R., Dewitt, D., Zhang, C.	2011	Mixed methods - evaluation framework - Pre- and post-surveys of Pilot site staff, clinician and patient surveys, field visits, interviews	To evaluate the pilot introduction of Physician Assistant (PA) into rural QLD - a new role into rural practice in Q Health.	5 physician assistants; Pre- and post-surveys of Pilot site staff (*n* = 59 pre-Pilot, *n*=40 post-Pilot); Patient surveys (*n* = 99)	PAs provided quality, safe clinical care under the supervision of local medical officers. Most nurses and doctors who worked with the PAs believed they made a positive contribution to the health care team by increasing capacity to meet patient needs; reducing on-call requirements for doctors; liaising with other clinical team members; streamlining procedures for efficient patient throughput; and providing continuity during periods of doctor changeover. Medical and nursing colleagues concerned about impact on profession training. PBS and legislation impacting on prescribing a barrier. Positive enhancement to PHC provision
Parker, E. J., Misan, G., Shearer, M., Richards, L.,	2012	Mixed methods - descriptive analysis - Evaluation of service	To describe the steps and early outcomes of the establishment of an Aboriginal Children's	Aboriginal children and community in one remote town SA - dental service	Participation rate for dental care among the target population increased from 53 to 70%. Collaborative planning and implementation improved cultural appropriateness and

Russell, A., Mills, H.; Jamieson, L. M.		planning & implementation	Dental Program (ACDP) in Port Augusta, including rates of Aboriginal child dental participation in mainstream services prior to implementation, factors influencing participation in mainstream service, framework for delivery of the Aboriginal children's dental service, and participation rates and services delivered during first 3.5 years.		utilisation. Aboriginal health workers were the key to program success.
Jones, M.; Kruger, M., Walsh, S. M.	2016	Qualitative study - focus group - semi-structured - thematic analysis	To explore the regional non-government organization (NGO) workforce views of using a physical health care check list –health improvement profile (HIP) – with people with a serious mental illness (SMI).	7 non-government/ lay workers in regional SA who received training and used the HIP	4 main themes: taking control; accessing services; guiding my conversation; and working with others. Overall meta-theme: lay workers can work effectively to address physical health problems in SMI patients. Training uptake was positive and acceptable, improved access to primary health care. Participant suggested need for inclusion of rural factors - sun care, hydration, and vaccination. Relatively low-cost intervention shows promise in improving access to PHC for MH clients.
Kinsman, L., Tham, R., Symons, J., Jones, M., Campbell, S., Allenby, A.	2016	Mixed methods – observational - survey questionnaires with rural men at high risk of CVD and semi-structured interviews with rural primary care clinicians	To explore the self-reported behaviours and satisfaction with their general practice/ practitioner of men at high risk of CVD, and attitudes of rural primary care clinicians regarding the role of primary care in CVD prevention.	14 general practices serving populations less than 25K; 158 high-risk men completed the questionnaire; rural primary care clinicians (n = 20)	Patients reported high levels of satisfaction with GP. 3 key themes regarding attitudes of rural primary care clinicians to CVD prevention: barriers (access, funding, failure to take advice, time, workforce); strategies to improve CVD care (integration); rewarding prevention and health promotion activities (access, clinical strategies). Need for rethink of preventive care strategies underpinned by a blended payment model, allowing for greater focus on lifestyle

					counselling, prescribing for preventive care and innovative methods of access, including free screening and advice services that travel to the patient. Model requires greater focus on a multidisciplinary PHC team approach to address CVD outcomes, educational and training approaches to address differences in attitudes of clinicians and patients regarding preventive care.
Kruske, S., Kildea, S., Jenkinson, B., Pilcher, J., Robin, S., Rolfe, M., Kornelsen, J., Barclay, L.	2016	Mixed methods - descriptive, cross-sectional study - 35-item survey, including free text - thematic analysis	To explore current provision of maternity care in rural and remote primary maternity units (PMUs) across Australia.	17 PMUs	17 units all in rural none in remote. PMUs, on avg, 56 km/49 minutes from their referral service and provided care to an avg of 59 birthing women/year. Periodic closures or downgrading of services common. Low-risk eligibility criteria universally used, some variability. Medically-led care most widely available model of care. Most PMUs midwives worked shift work involving both nursing and midwifery duties - minimal uptake of recent midwifery workforce innovations. Continuing overreliance on local medical support, and under-utilisation of the midwifery workforce constrain the restoration of maternity services to rural and remote Australia.
Brown, L.J., Mitchell, L.J., Williams, L.T., Macdonald-Wicks, L., Capra, S.	2011	Mixed methods Sequential explanatory - semi-structured interviews	To describe the current demography and explore issues and barrier for dietitians in private practice in rural areas.	15 Dietitians, Dietetic Managers, Health Service Managers	Financial factors were a driver and a barrier; private practice lead to increased job satisfaction; private practice helped augment public practice; perceived barriers in establishing private practice. Education and professional development could increase private practice uptake; research needed on drivers and barriers for private practice in rural areas. Increased dietitians in private practice can reduce burden on public sector; Established

					or managed private practice can reduce financial risk
Barclay, L., Kornelsen, J., Longman, J., Robin, S., Kruske, S., Kildea, S., Pilcher, J., Martin, T., Grzybowski, S., Donoghue, D., Rolfe, M., Morgan, G.	2016	Qualitative - exploratory - 88 semi-structured individual and group interviews; 3 focus groups; 1 group information session	To describe fieldwork participants' perceptions of risk and how these influence the planning or rural and remote maternity services.	Health service employees n=117 (maternity service clinicians and managers) and Consumers n=24	Health service employees perceived clinical risks with rural birthing services (without surgical support); consumer perceived social risks from lack of rural birthing service; closure of maternal health and childbirth services adds social risk; perceived clinical risks is dominant factor in rural and remote maternity service planning. Sub-themes; Health risk (clinical, operational, financial, legal, political) and social risk (cultural, emotional, financial). Definition of risk used by health services incorporate social risk and be implemented as a dimension of a risk assessment in risk management processes. Social risk, as a result of insufficient maternal health and childbirth services increases clinical risk. Can contribute to adverse clinical outcomes. Results important to planning of rural and remote maternity services and other rural health service delivery.
Durey, A., Thompson, S.C.	2012	Qualitative - exploratory Interviews, informal discussions and observations; literature review	To identify institutional and interpersonal practices in mainstream health settings that compromised the health of Indigenous Australian and highlight specific areas for improvement.	3 non-Indigenous medical practitioners in metropolitan WA with experience in the Indigenous health sector	Institutional racism – a lack of institutional responsibility of reviewing practices that compromise Indigenous health outcomes; Interpersonal racism – a lack of awareness and interest in the lived experience of Indigenous Australians; Internalised racism – health care providers need to be more vigilant about the consequences of their attitudes and practices, even where racism is not intended. Engage and work with Indigenous stakeholders to co-construct policies and programs Provide cultural safe health services. Long-term engagement with education support staff to work in a culturally safe manner. Failure to

					effectively address Indigenous health problems and interrogate policies and practices that are discriminatory has long-term consequences for Indigenous Australians
Segal, L., Leach, M.J., May, E., Turnbull, C.	2013	Mixed methods - needs-driven primary care service planning Based on the Health workforce model (Segal, Dalziel & Bolton): Needs analysis using the Workforce Evidence-Based planning model; Estimation of health workforce; Exploration of policy implications	To define the competencies and skill mix required to deliver best-practice diabetes in the primary and community care setting.	Primary health team to support best-practice diabetes care	Primary care team of 22.1 FTE is required to deliver best practice diabetes care to population of 1,000 people with diabetes. Mean 33.75 contact hours per diabetic patient/year. 17 disciplines identified to deliver best-practice diabetes care - dietitians, district nurses and diabetes educators requiring highest FTE. Composition of PHC team does not guarantee best-practice care, additional requirements include sound clinical quality-assurance systems, appropriate funding and well-trained clinicians. Workforce Evidence-Based planning model could be used to determine the workforce for other conditions. Results could be used by service planners to identify ideal composition of a diabetes primary care team.
Stuart, J., Hoang, H., Crocombe, L., Barnett, T.	2017	Qualitative - exploratory Semi-structured interviews	To explore the relationships between dental practitioners and non-dental primary care providers in the provision of oral health services to rural and remote Queensland and identify strategies that could improve collaboration between these disciplines.	Dental practitioners =12; Non-dental primary health providers n=57 Dental practitioners who have provided services in rural and remote Queensland& Non-dental primary health providers who have provide services in rural and remote Queensland	Major themes: lack of communication between dental practitioners and rural care providers – due to high staff turnover and siloed practitioners; relationships between dental and primary care providers – stronger relationships with admin staff, nurses and allied health; maintenance of professional dualism – strong disciplinary boundaries and siloed approaches seen as barrier. Strategies to improve interprofessional relationships: face-to-face meetings; use of technology; oral health for primary care providers; having community based oral health contact person; establishing and maintaining effective communication and referral pathways. Poor communication and

					relationships = primary care providers may not have made most effective use of available community dental services. Development of medical rural generalist program and advanced rural dentist concept may assist in closing this divide and benefit community.
Kildea, S., Gao, Y., Rolfe, M., Josif, C.M., Bar-Zeev, S.J., Steenkamp, M., Kruske, S., Williams, D., Dunbar, T., Barclay, L.M.	2016	Mixed methods cohort study - Manual review and data linkage of medical records was used to report health care utilisation. Cohort 1 – Retrospective data collection. Cohort 2 – Prospective data collection	To compare the quality of care before and after the introduction of the new Midwifery Group Practice.	Cohort 1 n=412. Cohort 2 n=310 Cohort 1 – Aboriginal women from two study communities who gave birth at more than 20 weeks or more than 400 g birth weight. Cohort 2 – same criteria but also had to be a client of the Midwifery Group Practice	Statistically significant improvements for quality of antenatal care (cohort 2) – increased screening, more routine antenatal tests. Treatment of some conditions worsened in cohort 2 - anaemia and urinary infections. No significant difference in neonatal outcomes. Qualitative data - stakeholders believed there was insufficient resourcing and organisation of health services in remote communities. Other barriers – lack of transport, mobility of women, lack of interpreter services and challenges of working cross culturally. Need commitment to improve care for Aboriginal women with stronger clinical governance frameworks and continuous quality improvement programs. Reform needed for system design with Aboriginal leaders. Recommend 'birthing on Country' project be developed to improve maternal and infant health. Improvements in quality of care can have a positive impact maternal and infant health and be cost-effective.
Sutton, K., Isaacs, A.N., Dalziel, K., Maybery, D.	2017	Qualitative descriptive research - Prospective data collection	To explore the roles and competencies of support facilitators engaged in the implementation of the Partners in Recovery initiative in rural Victoria.	32 Stakeholders involved in the Partners in Recovery initiative (support facilitators, Medicare Local staff and other service providers)	Support Facilitators (SFs) competencies – good understanding of local services and resources; competent administrative skills and social skills. SFs role – being a single point of contact for clients and other services; care coordination; assisting the client to become self-reliant; achieving goof outcomes for clients with confronting behaviours; judiciously using

					flexible funding; clearly outlining one's role with clients and maintain boundaries; different role from that of the MH case manager. Research needed in urban and remote areas to obtain comprehensive understanding of roles and competencies of SFs in different settings. Findings important for future MH service policy development, training of MH practitioners and recruitment to care coordination roles.
Rappell, N., Schmidt, D.	2017	Quantitative - component of mixed methods study - dual design interviews & inductive thematic analysis	To evaluate the upskilling of rural speech-language pathologists (SLPs) to deliver special rolling group program.	6 rural SLPs 19 children under 6 years	Against all measures & benchmarks, rural SLPs achieved same outcomes for the children with stuttering. Lidcombe Program (LP) delivered in a rolling-group model by community-based SLPs who do not specialise in stuttering is an effective, timesaving, and viable alternative to individual treatment.
Rappell, N., Schmidt, D.	2017	Qualitative study - community based trial, - component of mixed methods study - semi structured interviews & inductive thematic analysis	To explore the perception of rural SLPs on adoption of rolling group model implementation.	6 rural SLPs	3 themes: logistical challenges, need for managers to proactively support clinicians when moving to a rolling-group model through allocation of time for capacity building, desire to embrace practice change. Practitioners' perspectives important to evaluation and uptake of evidenced based practice.
Muyambi, K., Leach, M., Martinez, L., Cronin, K., McPhail, R., Dennis, S., Walsh, S., Gray, R., Jones, M.	2019	Qualitative research - focus groups	To understand the perspectives of Mental Health Workers practicing in regional and metropolitan settings towards Mental Health Nurse prescribing psychotropic medications.	17 Mental Health Workers (including allied health, nurses, psychiatrist) in South Australia	Key themes: Helping access medication; MH nurse prescribing as part of an expanded clinical role; Nurse prescribing not required in metropolitan; importance of clinical governance, supervision and support for prescribing; Importance of adequate educational preparation; Impact on relationships between MH nurse, consumer and GP. Further research is needed to include other health disciplines involved in MH care such as GPs and include a wider health service region.

					Prescribing rights of MH nurse can help reduce burden due to lack of recruitment and retention of psychiatrists in regional settings
O'Sullivan, B.G., Joyce, C.M., McGrail, M.R.	2014	Quantitative - cross-sectional study - MABEL	To outline the proportion and describe the characteristics of Australian specialist doctors who participate in rural outreach.	4,596 specialist doctors who participate in rural outreach	N=909 (19%) provided rural outreach, N= 146 (16%) provided remote outreach. Outreach work associated with being male, having a rural residence and working in private consulting rooms. Remote outreach associated with increasing age and residing in an outer regional remote location. Specialists based in inner regional areas less likely than metropolitan-based specialists to provide remote outreach. No significant associations found for specialist group or childhood rural background. Research required: explore full extent of rural outreach work such as how frequently outreach services were provided to different communities; longitudinal trends in the context of changes in policy. Findings can inform policy decisions about how to best target workforce.
Nagao, K.J., Koschel, A., Haines, H.M., Bolitho, L.E., Yan, B.	2012	Quantitative - Non-randomised intervention study - data was collected via medical file audit	To examine the feasibility and safety of implementing a Telestroke system at a rural Victorian hospital.	Control group n=36; Intervention group n=54. Acute stroke patients with onset of signs and symptoms, less than 4.5 hours and without intracranial haemorrhage	Intervention group: 24 (44%) patients had Telestroke - 8 patients went through thrombolysis - 16 had no thrombolysis. No symptomatic intracerebral haemorrhages or deaths attributable to thrombolysis. 30 (56%) of patients within the eligible intervention group did not have Telestroke activated. Further research required to include accurate documentation of door-to-CT and door-to-needle times, National Institutes of Health Stroke Scale for all patients and 30-day Modified Rankin Scale. Follow-up is recommended to explore barriers to uptake of

					Telestroke which may address rural–metropolitan inequality in acute stroke care.
O'Sullivan, B.G., McGrail, M.R., Joyce, C.M., Stoelwinder, J.	2016	Quantitative Cross-sectional study - MABEL	To describe service distribution and models of rural outreach by specialist doctors living in metropolitan or rural locations.	902 Specialist doctors who participate in rural outreach	902 specialists provided 1401 rural outreach services. 58% of regional and remote outreach services were provided by metropolitan-based specialist, who mostly provide a fly-in-fly-out service. Rural-based specialist were more likely to provide dive-in-drive-out services in a hub and spoke model. Findings of the study highlight the need for multilevel policy and planning approaches to promote integrated and accessible outreach in rural and remote Australia. Due to the variation of specialist service patterns effort is needed to ensure services are appropriately targeted and coordinated to improve efficiency
Hoang, H., Le, Q., Kilpatrick, S.	2012	Qualitative study - Semi-structured interviews	To explore the experiences and views of maternity health providers across Tasmania on a model of care of maternity units without obstetric services.	20 Maternity health providers across Tasmania (midwives, child health nurse, obstetricians)	3 major themes: Women's difficulties in rural areas – access issues when services not available in local area; disruption from support networks and home environment; anxiety from being away from support networks and home environment; travel related issues to access care; Women's expectation of maternity care - service that provides safety and access; quality of care; maternity units without caesarean delivery capabilities - ensuring safety and back-up systems; concerns about sustainability; concerns about safety. Recommended that safety and sustainability be considered when implementing this model of care in rural communities. Findings provide insights for policy-makers and state government when planning the future of this model of care. Model of care can minimise travel and meet access needs of women living in rural areas.

van de Mortel, T., Silberberg, P.L., Ahern, C.M., Pit, S.	2014	Quantitative research - online survey	To examine attitudes to shared learning, views capacity constraints, and key barriers and facilitators of the model.	1,122 General Practitioner Supervisors, Registrars, prevocational trainees, medical students	88% of GPs had multiple levels of learners in their practice. High uptake (92%) of multiple levels of learners in rural/remote practices. Majority preferred a mix of shared learning and one-to-one. Lack of space reported as an important barrier to shared learning model. All groups believed the model creates training capacity and build collegial relationships. Infrastructure support should be investigated in a way to increase number of multiple levels of learners' practices. Regional training providers should support implementation of shared learning model. Shared learning model can address GP training constraints, provide effective training and build relationships.
Tran, T., Longman, J., Kornelsen, J., Barclay, L.	2016	Mixed methods descriptive research - quantitative data derived from birth registers, semi-structured interviews	To explore the evolution of a rural birthing service in a small town to offer insight into the process of transition which may be helpful to other small healthcare services in rural Australia.	9 - GP obstetrician, midwives, health service manager and consumer representative	Key themes: Development of service on time; Drivers of change (safer than free births, response to increase of unsupervised homebirths, succession planning, importance of a sustainable local maternity service, challenges - limited budget, waiting lists, staffing); Outcomes (consumer stratification, positive staff experiences); Collaborative care and interprofessional practice (reported to be positive attribute by staff). Findings support recommendations of transition of rural maternity care to collaborative arrangements between GP obstetricians, midwives and birthing women in a community. Collaborative care models for maternity care can maximise existing rural workforce potential and create a sustainable rural service into the future.
Squibb, K., Smith, A., Dalton, L., Bull, R.M.	2016	Mixed methods - descriptive and interpretative qualitative	To examine Australian rural radiographers' and their experiences and	Questionnaire n=185; Semi-	Major themes: patient advocacy (to maximise patient healthcare outcomes); direct communication pathways (to ensure that the

		research - questionnaire, semi-structured interviews	perceptions of radiographic interpretation and subsequent disclosure.	structured interviews n=9 Radiographers providing services to areas with a population less than 100,00	doctor does miss significant pathology); barriers to direct communication (lack of formal training on pathology); indirect communication pathways ('side stepping' direct communication or use 'hint and hope' approach). Improve radiographer's image interpretation skills and make communication pathways between radiographers and referrers more explicit. Improved interprofessional communication will positively impact patient care through timely collegial sharing of knowledge.
Lenthall, S., Knight, S., Foxley, S., Gordon, V., Ivanhoe, T., Aitken, R.	2015	Literature review, expert opinion, RAN trial and feedback - Report on research process	To describe the Remote Area Nurses consultation model.	Remote Area Nurses (RANs)	Development of a systematic and comprehensive client consultation approach. Include 7 principles: culturally safe approach; holistic and comprehensive; systematic; shares power with the client; provides coordination and continuity of care; encourages clinical reasoning; promotes clinical safety and quality. 8 steps: open consultation; history; clinical examination; assessment and discussion; negotiate a management plan; reflection. The model encourages RANs to respond to clients and be sensitively proactive, serving needs of people living in remote and Indigenous communities. Model is protective against risk to client, the RAN and health service.
O'Sullivan, B.G., Stoelwinder, J.U., McGrail, M.R.	2015	Quantitative - longitudinal study - MABEL- data was followed over 3 years.	To explore the characteristics of specialist who provide ongoing outreach services, and to determine whether the nature pf their service patterns contributed to ongoing service delivery.	848 Specialist doctors who had competed advanced training and servicing at least one rural or remote location.	440 (51.9%) of specialists provided regular outreach to the same community. Outreach specialist service provision was associated with being male, midcareer and working in mixed, but mostly in private practice. General surgeons and Otolaryngologists were more likely to provide regular outreach services. Travelling further distances to remote

					communities had no effect on ongoing service provision. Outreach to smaller towns was associated with improved stability. A range of strategies is required to promote a more stable rural/remote outreach service, which considers the specialist's career stage, practice conditions and specialty. Financial incentives for specialists likely to increase ongoing outreach work only with specialist working privately.
Currie, F., Nielsen, G., Ervin, K., Koschel, A.	2016	Qualitative – interviews - purposive sampling – thematic analysis. Evaluation of Isolated Practice Endorsed Registered Nurses (RIPERNs)	To determine the perception of GP's and RIPERN's about the RIPERN role, and to identify factors that may facilitate or hinder current and further role development in small rural health services.	N == 10 7 GPs with admitting privileges at the health service and 3 RIPERN‟s who had commenced the extended scope of practice role.	Strong benefits from perspective of GPs and RIPERNs. Benefits: overall improved work-life balance for the GPs, increased confidence and capabilities for the RIPERNs, and overall perceived improvement in the delivery of services at this small rural health service. Negative findings: misconceptions about RIPERN extended scope of practice and increased demands experienced by RIPERNs. Nurses and GPs perceived benefits outweighed challenges: training onerous, limited access to training provider limits achievement of endorsement.
Russell, D.J., Humphreys, J.S., McGrail, M.R., Cameron, W.I., Williams, P.J.	2013	Quantitative - secondary analysis of longitudinal data collected by the NSW Rural Doctors Network for all family physicians working in rural or remote NSW	To identify and quantify the most important factors associated with rural and remote Australian family physician turnover, and to demonstrate how evidence generated by survival analysis of health workforce data can inform rural workforce policy making.	2,783 family physicians	Strong relationship between population size, geographic location and retention. Higher (2.65-fold) turnover risk in small, remote locations compared to small closely settled locations. Family physicians who graduated from UK, USA, NZ Ireland, Canada had higher (1.45-fold) risk of turnover compared to Australian trained (after adjusting for effects of conditional registration). Procedural skills and public hospital admitting rights associated with lower risk of turnover. Risks translate to predicted median survival of 11 years for Australian-trained family physician non-

					proceduralists with hospital admitting rights working in small coastal closely settled locations compared to 3 years for family physicians in remote locations.
Goodyear, M., Maybery, D., Reupert, A., Allchin, R., Fraser, C., Fernbacher, S., Cuff, R.	2017	Quantitative - Family Focused Mental Health Practice Questionnaire and a series of demographic items	To examine the characteristics of practitioners from Australian adult MH services associated with family-focussed practices.	307 practitioners from 10 adult MH services - Victoria	Practitioner experience, sex, working in a rural location, and previous family- or child-related training important in provision of family-focussed practice. More experienced, female, rurally-located, and well-trained practitioners undertake most family-focussed practice. Training in family-focussed practice needs to be promoted, with considerations made for differing needs according to characteristics of adult MH practitioner.
Morgan, M.A.J., Coates, M.J. Dunbar, J.A.	2015	Quantitative - brief report - recs drawn from True Blue study of diabetes & CHD 400 patients in GP practice	To report on the care plan for patients with depression, diabetes, and/or coronary heart disease that was embedded in the TrueBlue study.	TrueBlue trial undertaken by 400 patients (206 intervention, 194 control) from 11 Australian general practices in regional and metropolitan areas	Practice nurses and GPs successfully used care plan to achieve guideline-recommended checks for almost all patients, and successfully monitored depression scores and risk factors, kept pathology results up to date, and identified patient priorities and goals. Clinical outcomes improved compared with usual care. Care plan was used successfully to manage and prioritise multimorbidity. Downstream implications include improving efficiency in patient management, and better health outcomes for patients with complex multimorbidity.
Ahern, C.M., van de Mortel, T.F., Silberberg, P.L., Barling, J.A., Pit, S.W.	2013	Qualitative - semi structured interviews – thematic analysis	To explore stakeholders' perceptions of shared learning in general practices in northern NSW, Australia.	N = 33 9 practices, GPs, managers, registrars & students	Many benefits to shared learning: improved collegiality, morale, financial rewards, better sharing of resources, knowledge and experience, reduced social and professional isolation, and workload. Perceived risks: failure to meet individual needs of all learners. Shared learning models considered unsuitable when learners need to: receive remediation, address a specific deficit or immediate learning needs,

					learn communication or procedural skills, be given personalised feedback or be observed by their supervisor during consultations. Learners' acceptance of shared learning appeared partially dependent on their supervisors' small group teaching and facilitation skills.
Lyle, D., Saurman, E., Kirby, S., Jones, D., Humphreys, J., Wakerman, J.	2017	Qualitative – narrative synthesis	To report on the key findings from seven CRE service evaluations to better understand what made these primary health care (PHC) models work where they worked, and why.	15 articles reporting on 7 Centre of Research Excellence service evaluations of different PHC models published between 2012 and 2015.	3 different contexts for PHC reform evaluated: community, regional and clinic based. Themes: factors that enabled changes to PHC delivery, processes that supported services to improve access to PHC, requirements for service adaptation to promote sustainability. Indigenous and mainstream community settings - active engagement with local communities, and their participation in, or leadership of, shared decision-making reported across three themes. Local governance processes, informed by service activity and impact data, enabled changes to be sustained. Considerations were different for outreach, regional and clinic services that relied on internal processes to drive change as they did not require cooperation of multiple organisations to succeed.
Muyambi, K., McPhail, R., Cronin, K., Gillam, M., Martinez, L., Dennis, S., Bressington, D., Gray, R., Jones, M.	2018	Quantitative - cross sectional survey - modified version of an attitude scale	To examine the attitudes of rural and remote South Australian mental health workers about mental health nurse prescribing.	N = 93 112 participants (from 289), 19 excluded due to missing data on several variables	All respondents reported positive attitudes towards MH nurse prescribing. Concerns expressed: safety, educational preparation and supervision structures. Attitudes of MH workers not a barrier to MH nurse prescribing. Implementation and sustainability of MH nurse prescribing requires training in psychopharm and governance framework to assure quality and safety. Policy-makers need to focus attention on uptake of MH nurse prescribing in parts of Australia that struggle to attract and retain psychiatrists.

Carey, T.A., Sirett, D., Russell, D., Humphreys, J.S., Wakerman, J.	2018	Qualitative - systematic review peer rev lit systematic review of Qin high income western countries	To answer the question "What is the impact or effectiveness when different types of primary health care services visit, rather than reside in, rural and remote communities?"	17 papers	Inadequate evidence base to make decisions about effectiveness of visiting services or how visiting services should be structured to achieve better health outcomes for people living in remote and rural areas. Need more rigorous evaluation of visiting services in meeting community health needs, and that evaluation should be guided by several salient principles.
Carey, T.A., Sirett, D., Wakerman, J., Russell, D., Humphreys, J.S.	2018	Qualitative - systematic review -	To describe a typology of models of health services that visit remote communities.	20 papers	Difficult to develop typology of services – lack of evidence. Central feature of service providers visiting rural and remote districts regularly was consistent, although service provider's geographical base varied and extent to which same service provider should be providing service not consistently endorsed. Set of guiding principles more helpful to service providers and planners. Focusing policy and decision-making on important principles of visiting services, rather than typological features, is likely to be of more benefit to health outcomes of people who live in rural and remote communities.
Beks, H., Healey, C., Schlicht, K.G.	2018	Qualitative - descriptive – interviews – thematic analysis	To explore the management of acute mental health presentations by generalist nurses in small rural EDs and urgent care centres (UCCs).	13 RNs - generalist nurses in small rural EDs and UCCs with limited onsite outpatient services and access to inpatient facilities in Vic	Themes: 'we are the frontline': 'doing our best to provide care'; 'complexities of navigating the system', and 'thinking about change'. Generalist nurses are frontline providers of care for MH consumers in rural EDs and UCCs. Nurses feel ill-equipped for assessing and managing MH presentations, relying heavily on local mental health teams and telephone triage who provide limited onsite support. Need to support nurses through training and mentoring relationships with community MH and improve delivery of MH services in rural areas. Multiple challenges - coordinating transfer of consumers

					to inpatient facilities and feeling inadequately supported. Irrespective of challenges, nurses reported delivering best possible care to consumers despite reporting lack of knowledge and skills.

Appendix 8. Health workforce education in rural Australia

Authors	Year	Study design	Aims/Objectives	Population	Key findings
Reupert, A., Foster, K., Maybery, D., Eddy, K., Fudge, E.	2011	Quantitative - experimental - pre-post-test study	To evaluate the impact of web-based training for rural clinicians caring for families in which one person living with a mental health problem.	n=23	Participants emphasized need to work collaboratively with others, and importance of acknowledging and working with family members, especially children. Participants reported positive changes in knowledge, skill and confidence when working with families affected by parental mental illness. Facilitators highlighted technology issues and need to work interactively with participants when using the resource. Web-based training is feasible and a mechanism to support rural workforce
Mellor, P., Greenhill, J.	2014	Qualitative - focus groups and thematic analysis.	To understand the effectiveness of the nurse transition program and identify the support provided to nurse graduates.	n=21; three focus groups	Participants reported they were underprepared for practice and felt abandoned. Nurse transition programs require better leadership support, clinical supervision and opportunities to build interprofessional support networks.
Hoang, H., Barnett, T., Maine, G., Crocombe, L.	2018	Qualitative - semi-structured interviews and thematic analysis. Training program provided - oral disease, oral screening and oral health care problems.	To understand the perceived impact of an oral health training program on staff practice and staff views on implementation in residential care facilities.	n=20 aged care workers	Barriers associated with roles, time priorities. Regular training to equip staff to overcome challenges
Wearne, S., Greenhill, J., Berryman, C., Sweet, L., Tietz, L.	2011	Qualitative - in-depth interviews and thematic analysis.	To understand the views of rural health clinicians regarding an online education program aimed at supporting them to become clinical educators.	20 health care workers. nurses (n=7); GPs (n= 6) Aboriginal health care worker (n=1) academic (n=1)	Themes: Convenience; Engaging and affirming; Meaningful learning between disciplines; 'Hit and run' learning; challenges. Valued learning experiences; unexpected relationships; capacity to study. Supports for study: workplace; family support; flexible supportive faculty; approaches to study. Online education for rural health workers is convenient, accessible. Thinking is

					required as to how additional support can be provided via face to face workshops.
Kearns, T., Ward, F., Puszka, S., Gundjirryirr, R., Moss, B., Bailie, R.	2017	Mixed methods. Qualitative - focus groups and interviews. to obtain responses to a semi structured questionnaire on anaemia that was quantified using a rating system - and thematic analysis.	To assess anaemia health literacy of community members and health practitioner's knowledge of anaemia best practice guidelines in a remote Aboriginal community where English is not the first language.	n= 39 community members n= 12 health practitioners. Study conducted in a remote Aboriginal community.	Community members - mixed levels of anaemia health literacy with the majority assessed as having 'good' literacy. Health practitioners - 'very good' level of anaemia knowledge that was excellent for one group. Interviewers used local language to engage the community. Innovative and culturally acceptable and management strategies should be given a priority.
Smith, K., Fatima, Y., Knight, S.	2017	Mixed methods - survey - open ended questions (views on factors affecting culturally appropriate service provision) and attitudinal scale (perceived culturally appropriateness of the service)	To understand the culturally appropriateness of primary health services in a remote mining community.	n=24 health care professionals n=54 Aboriginal people	Culturally appropriateness training not enough. Primary Health Services require a strategy to support Aboriginal Health Workers. Involve local community leaders in training. Display Aboriginal art work. Culturally appropriate space required in the service settings. Regular culturally awareness training required for primary health teams, but training not enough
Swain, L., Griffiths, C., Pont, L., Barclay, L.	2014	Quantitative - cross sectional survey - of accredited pharmacists examining attitudes to undertaking Home Medicines Review	To explore the barriers and facilitators from the pharmacists' perspective for the provision of Home Medicines Review to Aboriginal people attending Aboriginal Health Services.	Targeted 945 pharmacists accredited to undertake Home Medicines Review. 187 participated	1. Lack of understanding of cultural issues by pharmacists 2. Lack of awareness of Home Medicines Review Program 3. Difficulties in implementation 4. Burdensome program rules 5. Lack of patient/pharmacist relationship 6. Lack of pharmacist relationship with Aboriginal community. 1. Need to understand how we make Medication Review Program for Aboriginal community more responsive 2. Examine how relationships can be improved between Aboriginal staff and pharmacists.
Caygill, R., Peardon, M., Waite, C.,	2017	Mixed methods. Survey of medical educators and	To explore the attitudes of medical educators to peer review teaching. Views and	31 regional educators	Positive attitudes seen as beneficial for medical educators in rural and remote communities

McIntyre, I., Bradley, D., Wright, J.		interviews using thematic analysis	experiences of medical educators of peer review teaching		
Williams, E.N., McMeeken, J.M.	2014	Qualitative - case study. 6-month PD program (clinical and academic development, weekly tutorials, case studies, rotations across sites and partnerships). Evaluation used purpose-built questionnaires.	A case study describing program to improve local paediatric physiotherapy clinical services, by providing physiotherapists additional access to professional development and a career path to retain these health professionals.	2 trainee physiotherapists	Stakeholder partnerships are important to enable rural health professionals to undertake post graduate training in clinical areas. 1. Critical reflection/cultural safety 2. Clinical expertise does not translate to expertise working with Aboriginal communities.
Goodyer, L., Brown, L.	2016	Quantitative - observational study - retrospective file audit of patients with celiac disease and cross-sectional survey of 25 dieticians examining knowledge	Understanding quality of dietician care and dietician knowledge	n=17 patients and n=18 dieticians	Dietician knowledge varied and variability in care provided to patients. Need for continuing based education for rural based dieticians
Khalil, H., Poon, P., Byrne, A., Ristevski, E.	2019	Quantitative - observational - online survey	To identify challenges with the administration and access to Anticipatory medications (AM) in rural and remote communities with outcomes to guide improved delivery of care	n=18 health service managers; n=29 (from 108) nurses	Limited guidance on use of AM, AM used when patient deteriorates, problems identified accessing AM in remote setting, education on use of AM required in rural settings. Community level planning required to overcome barriers
Gum, L., Greenhill, J., Dix, K.	2010	Qualitative using thematic analysis - interviews with participants of rurally based simulation training and education	Determine how interprofessional simulation training improved maternity emergency care treatment performance	n=17 participants n=4 educators	Collaboration in team building leads to professional role awareness, interpersonal knowledge, mutuality and leadership. Simulation training can support rural clinicians to learn about each other and gain role clarity.
Ervin, K.E., Jeffery, V.	2015	Quantitative - oobservational survey of staff who completed	To understand impact on knowledge, confidence and perception of workplace to	n=19 staff who completed health coaching	Despite increased workplace support through the presence of peer leaders in some organisations, staff confidence and

		health coaching Peer Leadership Training	support implementation into practice Do peer leaders in the workplace improve implementation of self-management support training?		implementation rates of HC training has not improved since previous evaluations. HC training for primary healthcare staff requires an organisational post training plan to support and improve implementation rates.
Ervin, K.E., Jeffery, V., Koschel, A.	2012	Quantitative - observational - post training quantitative evaluation conducted by surveying staff five months post-training.	To explore barriers and enablers to implementation of staff training in health coaching, a model of care employed in primary care to facilitate client self-management of chronic disease.	n=46 health care professionals	Problems in implementation - 68% response rate to surveys. Only 50% of staff trained in Health Coaching reported implementing it into practice. Enabling factors for implementing the training were reported as peer and organisational support. Training staff in isolation of organisational support structures not a good idea.
Elmer, S., Bridgman, H., Williams, A., Bird, M.L., Murray, S., Jones, R., Cheney, M.	2017	Qualitative - focus groups with patients with chronic health conditions	Does health literacy programs improve programs for chronic conditions	n=22 (of 51) patients with chronic physical health conditions	4 themes: Autonomy, Competency, Relatedness and Empowerment. SDT framework a useful and novel approach to explaining evaluation out-comes, application of Ophelia principles' underpinning program design, and the contribution of a multidisciplinary team of academic health professionals.
Tsey, K., Chigeza, P., Holden, C.A., Bulman, J., Gruis, H., Wenitong, M.	2014	Qualitative - in-depth interviews with Module developers, pilot workshops for trainers and health workers, questionnaires and focus group discussions with workshop participants, and participant observations using thematic analysis	How to improve the program - a comprehensive and culturally appropriate Male Health Module developed to enhance the capacity of health workers to improve access to services for Aboriginal and Torres Strait Islander males	n=9 Aboriginal people	Enhancing capacity to facilitate access to health services for men, and Module deemed relevant due to its potential to promote health worker empowerment and wellbeing. Improving access to services for men required male and female health workers working in partnership. Despite overall enthusiasm for the Module, there was deep fear that it would end up 'collecting dust on shelves'. Strategies to improve the Module quality and accessibility are highlighted.
Lindeman, M.A., Kuipers, P., Grant, L.	2013	Qualitative study - interviews using thematic analysis	To understand the perspectives line workers of Aboriginal Youth Suicide	n=22 Workers	Salient contributing factors and service prevention strategies. Workers require strong rural networks, well informed about local social

					economic factors, skilled to work with elders and traditional healers and the need to be well supported in their roles to ensure longevity and relationships.
Marathe, J.A., Woodroffe, J., Ogden, K., Hughes, C.	2015	Quantitative - observational postal survey	To determine GP knowledge and management of genetic cardiac diseases by GP	144 GPs	3/4 of surveyed GP managing patients with GCD reported limited confidence and communication with cardiologists. Training for GP in rural and remote were access to cardiologist is a problem.
Larson, A., Ward, J., Ross, L., Whyatt, D., Weatherston, M., Landau, L.	2010	Quantitative - experimental Impact of training nurses in asthma care, before and after study	To understand the impact of training nurses in asthma care on patient outcomes Asthma accredited nurses with training by a respiratory nurse guided a care pathway	n=83 patients	Patient mean asthma score decreased and patient quality of life increased. Asthma care can be improved by educating asthma nurses in best practice asthma care.
Schoen, D.E., Gausia, K., Glance, D.G., Thompson, S.C.	2016	Quantitative – quasi-experimental. Pre and post-test electronic survey. 3-h education and training workshop in diabetic footcare	To determine knowledge of national guidelines for diabetic foot assessment and risk stratification by rural and remote healthcare professionals in Western Australia and their implementation in practice.	n=246 rural health care professionals	Knowledge improved however application of guidelines was patchy. Before training, knowledge was inadequate. Even after the training, issues remained regarding risk management
Ellis, I.K., Philip, T.	2010	Mixed methods - before and after study and staff interviews with thematic analysis. two-day training course	Does training rural and remote generalists equip them to better manage mental health emergencies?	n=456	Improved confidence themes 1. Changing Attitudes 2. Clinical Practice 3. Communication
Carey, T.A., Martin, K.	2017	Qualitative using thematic analysis. Interviews with rural and remote nurses who attended a training program to manage burnout	To review the development of the self-care workshop after the delivery of 6 workshops over a period of 18 months to understand the impact of the workshop	n=106 participants of the self-care workshop to help remote health professionals cope with the demands of	Further work required to understand what prevents and promotes burnout in rural and remote nurses and the effectiveness of the workshops.

			and how it could be improved.	remote health practice and maintain a sustained level of effective functioning.	
Cooper, S., McConnell-Henry, T., Cant, R., Porter, J., Missen, K., Kinsman, L., Endacott, R., Scholes, J.	2011	Quantitative - experimental before and after study. Simulated training experience	Does a simulated learning environment improve nurses ability to assess and manage patient deterioration?	n=41 nurses	Knowledge improved however, variations in practice continued
Gladman, J., Ryder, C., Walters, LK.	2015	Quantitative - observational - attitudinal survey to measure the cultural climate of rural clinical training schools (RCSs)	To measure and reflect on the attitudes of RCSs to working with Aboriginal Communities.	n=41 clinicians, academic and professional staff at an Australian RCS. Survey response rate 63%.	All 3 groups saw Aboriginal health as a social priority and recognised fundamental role of community control in Aboriginal health. Academics considerably more likely to disagree that Western medical model suited health needs of Aboriginal people. Clinicians more likely to perceive they treated Aboriginal patients the same as other patients. Only weak evidence of future commitments to Aboriginal health. All groups demonstrated differences in cultural safety profile which indicated need for tailored approach to cultural safety learning in future.
Khalil, H., Lee, S.	2018	Qualitative -interviews using thematic analysis	To identify the issues surrounding medication error reporting in community nursing and improvement strategies related to medication safety.	n=10 nurses	1. Interface between primary care and hospital reported as a barrier 2. Lack of clarity about roles 3. Inconsistencies in error reporting. Need for clear guidelines detailing nurses and responsibilities regarding medication administration
Khalil, H., Poon, P., Byrne, A., Ristevski, E.	2019	Mixed methods - online survey and qualitative methodology using thematic analysis from surveys	To explore medication safety issues faced by general and palliative care community nurses working in rural and remote	n=29 workers	1. Errors associated dose 2. Inconsistencies in Medication Reviews 3. High occurrence of medication errors 4. Lack of awareness of medication initiation by nurses. Targeted

			palliative care domiciliary settings.		education addressing issues raised by palliative care nurses.
Kirschbaum, M., Peterson, G., Bridgman, H.	2016	Mixed methods - interviews with pharmacists (using thematic analysis) and an online survey assessing attitudes to Mental Health First Aid (MHFA) training	To establish the MHFA training needs for Australian rural pharmacists in the community setting and explore the barriers to pharmacists providing MHFA support.	n=22	1. Importance of relationships 2. Complexity of Mental Health Need 3. Low confidence 4. Barriers to assisting in acute mental illness. Training in MHFA for rurally based pharmacists.
Bennett-Levy, J., Hawkins, R., Perry, H., Cromarty, P., Mills, J.	2012	Quantitative – experimental. Online CBT Training Program from the United Kingdom	To determine the effectiveness of a 12-week online support program for therapists in the areas of knowledge, skills and confidence with rural and remote mental health professionals Does online CBT improve knowledge, attitudes, confidence and skills acquisition	n=49	Improved knowledge, attitudes, and skills, this effect was enhanced when combined with face to face support. Relevance for rural and remote workforce
Jones, M., Ferguson, M., Walsh, S., Martinez, L., Marsh, M., Cronin, K., Procter, N.	2018	Qualitative – semi-structured interviews using thematic analysis	To explore the views of rural workers regarding suicide prevention training – a one days training on working with people who may be at risk of suicide	n=24 rural workers	Themes: 1. Co-production is key 2. Okay to ask the question 3. Caring for my community 4. I can make a difference. Need to involve people with lived experience in the design and delivery of suicide prevention training.
Campbell, D., Shepherd, I., McGrail, M., Kassell, L., Connolly, M., Williams, B., Nestel, D.	2015	Quantitative - observational using online questionnaires	To determine frequency, use and relevance to clinical practice of procedural skills	n=58 doctors n=94 nurses n=30 paramedics	The more complex the skill, the greater the rehearsal required.

Kitto, S.C., Peller, J.C., Villanueva, E.V., Gruen, R.L., Smith, J.A.	2011	Quantitative - observational using a survey	To understand rural surgeons' attitudes towards use of Evidenced Based Medicine.	n=66 rural and metropolitan surgeons	Good understanding of Evidenced Based Medicine, however EBM is useful but not important to clinical decision making, surgeons confident in clinical judgement not so when in contact with other colleagues. Professional isolation/context important to consider when extending EBM paradigm to rural surgical practice and its uptake
Smith, T., Fisher, K.	2011	Quantitative - observational study using mail questionnaires	To gather information about new X-Ray operators in NSW and their continuing educational needs	n=131 remote x-ray operators	Expressed need for continuing education GP had different support needs to nurses and physios. Recognise special circumstance and isolation under which X-Ray operators work Ongoing educational support Need to benchmark practice against mainstream services
Gray, K., Krogh, K., Newsome, D., Smith, V., Lancaster, D., Nestel, D.	2014	Mixed methods - observational using questionnaires, interviews, audit of practice	To understand the use of tele presence in rural medical education	n=60 completed questionnaires n=33 Interviews n=22 Observation of practice activities	Telepresence beneficial to learning and teaching and superior to other systems participants had used. Best suited for small group activities.
Kinsman, L., Buykx, P., Cant, R., Champion, R., Cooper, S., Endacott, R., McConnell-Henry, T., Missen, K., Porter, J., Scholes, J.	2012	Quantitative - experimental using interrupted time series analysis Impact of feedback incorporating review and simulation techniques on nursing practice in rural health. FIRST ACT Simulation Program. Role of simulation training on rural nursing practice	To explore the impact of feedback incorporating review and simulation techniques on nursing practice in rural health.	n=34 rural nurses, 258 patient records audited before and 242 patient records audited afterwards	Observations Improved
Isaacs, A., Lampitt, B.	2014	Mixed methods - observational - describes what was done, how many attended, a model	To describe the design, implementation and outcomes of an innovative model for the early	n=17 (of 20) Aboriginal males	Of the 17 participants whose data were available, 7 scored significantly (25 or higher) on the psychological assessment and offered follow-up. When conducted on a regular basis,

		for early detection of mental illness in Aboriginal Males. Participants underwent a complete medical examination, blood test for diabetes, psychological assessment using Kessler-10 schedule.	detection of mental illness among rural Aboriginal men.		the Koorie Men's Health Day could be a useful method for early detection of mental illness among rural Aboriginal men in Australia. Research needed to study feasibility and sustainability of model in different settings.
Barnett, T., Hoang, H., Stuart, J., Crocombe, L.	2017	Mixed methods - case studies of 14 rural communities across 3 Australian states.	To examine the impact of oral health problems on primary care providers; how primary care networks could be more effectively utilised to improve provision of dental care, and strategies that could be implemented to improve oral health.	n=105 Primary Care Participants n=12 Dental Care Participants	Diversity in oral health presentations - short term pain relief, antibiotics advice to see a dentist. Rural oral health could be improved by building oral health capacity of non-dental care providers; investing in oral health promotion and prevention activities; introducing more flexible service delivery practices to meet the dental needs of both public and private patients; and establishing more effective communication and referral pathways between rural primary and visiting/regional dental care providers.
Lindeman, M., Dingwall, K., Bell, D.	2014	Qualitative - thematic analysis of an existing data set. Secondary data analysis of two qualitative studies	Public Health Problem Based Learning Module	n=11 n=22	1. Assessment of workforce competency 2. Current approaches to preparing assessment of staff 3. Cross cultural knowledge skills
Gladman, J., Perkins, D.	2012	Qualitative using thematic analysis, using semi structured interviews	Determining the impact of a Problem Based Learning Module in Public Health	n=17 GPs	1. PBL impact 2. Learning modalities 3. Educational needs 4. Educational expectation 5. Educational planning. Tailored PBL programs
Reupert, A., McHugh, C., Maybery, D., Mitchell, D.	2012	Mixed methods - using repeated measures design Qualitative using thematic analysis	To explore the impact of training mental health promotion workers in program evaluation	n=28 participated in repeated measures design n=participated in the interviews	Knowledge, confidence and behaviours improved. Community engagement required in the planning of evaluation programs
Lin, I.B., Coffin, J., O'Sullivan, P.B.	2016	Mixed methods - 3 interventions to improve	To report on a pilot aimed to improve three aspects of	GPs – numbers changed throughout	Improvements reported LBP radiological imagining referrals, GP reported improved

		care - pre/post cohort design evaluated changes in 3 behaviours using clinical audit of LBP care in a six-month period prior to and following implementation. In-depth interviews elicited perspectives of GPs involved. Qualitative analysis guided by theoretical domains framework.	care; reduce inappropriate lower back pain (LBP) radiological imaging referrals, increase psychosocial oriented patient assessment and, increase the provision of LBP self-management information to patients.	the pilot - rural Aboriginal Health Service.	knowledge, adherence to clinical guidelines and increased awareness of inappropriate practices. Systematic approach applicable to other services
McGrail, M.R., Russell, D.J., Campbell, D.G.	2016	Quantitative - Annual panel survey of GPs (MABEL study) who completed vocational training and transitioned to independent practice, 2008-2014. Main outcome measures: Rural practice location in the 5 years after vocational registration.	To investigate associations between general practitioner vocational training location and subsequent practice location, including the effect of rural origin.	n=610 – doctors - four primary cohorts: (1) rural origin/rural training; (2) metropolitan origin/ rural training; (3) rural origin/ metropolitan training; and (4) metropolitan origin/ metropolitan training.	Rural origin doctors who trained in regional communities stayed there, metropolitan cohort remained metropolitan communities. Rural location and rural practice predict were people practice.
Kirby, S., Dennis, S.M., Bazeley, P., Harris, M.F.	2012	Qualitative using interviews, thematic analysis	To explore views of clinicians on how to support patients with chronic disease	n=18 health care workers n=33 patients	HCWs reported patients did not uptake referrals, problems with systems and access. Hospital and GP attributed lame to clinical, social and personal patient factors. Improvements in access to chronic disease self-management services could reduce hospital readmission.
de Witt, A., Cunningham, F. C., Bailie, R., Percival,	2018	Qualitative using thematic analysis. Semi-structured interviews with Aboriginal and non-	To extend existing literature through reporting HCP perspectives on the quality of care provided to	n=17 HCP from Aboriginal Controlled Organisations and 9	1. Culturally safe care 2. Psychological support 3. Determining patient needs 4. Practical assistance 5. Advocating for Indigenous health. Implications: 1. HCPs providing care to

N., Adams, J., Valery, P. C.		Aboriginal people exploring their experience caring for Aboriginal people with cancer in primary health settings	Aboriginal people living with cancer. Overarching aim was to investigate the patterns of care for Aboriginal patients diagnoses with cancer at PHC setting.	HCP across urban, regional and remote geographical settings	Aboriginal people require training and support 2. Additional strategies to provide culturally competent cancer care 3. Promote pathways to encourage Aboriginal participation and completion of tertiary courses.
Mulholland, P., Barnett, T., Spencer, J., Mulholland, P.	2014	Qualitative - Critical review. Search databases MEDLINE, SCOPUS, CINAHL and UTAS electronic library. Specific journal searches of Journal of Emergency Pre-Hospital Care and Journal of Interprofessional Care.	A critical review of literature in the area and identify gaps in which further research is required to further interprofessional learning (IPL) for paramedics.	24 articles	Three major concepts emerged from 24 articles: interprofessional education (IPE), multidisciplinary teamwork, and interprofessional learning. Six articles focused on IPE; nine concerned multidisciplinary teamwork and nine IPL. Examination of the reference lists of these articles revealed a further eight articles with the theme of IPL incorporating paramedics. Predominantly, IPL was associated with new roles for rural paramedics where collaborative practice incorporated community-based care rather than being focused on emergency treatment and transport to hospital. Only two articles reported on a measurable patient care outcome related to IPL. Most articles described programs or interventions without having directly examined the interactions and relationships between professions.
Baker, T., Kumar, K., Kennedy, M.	2017	Qualitative - data collected via 3 focus groups, transcribed and subject to multistage coding	To explore (i) how rural junior doctors learn in the critical care retrieval environment during consultations with retrieval physicians, and (ii) the tensions characterising teaching and learning in this setting.	n = 14. rural junior doctors (n = 8), rural senior doctors (n = 3) and retrievalists (n = 3)	Rural junior doctors believe they learn from interactions with retrieval physicians. Their learning was greatest when the retrieval physician explained his or her clinical reasoning and provided feedback. The level of stress was sometimes overwhelming, and learning ceased. Both groups described limited time for teaching due to the medical needs of the patient and the needs of concurrent patients. Retrieval

					physicians were not certain that rural junior doctors wanted to learn. Rural junior doctors hold retrievalists in very high regard.
Schmidt, D., Kirby, S.	2016	Quantitative - survey - emailed paper questionnaires and phone surveys. Research skill development was assessed using the research spider instrument, a validated tool for assessing research confidence.	To explore the processes and outcomes of the RCBP (Research Capacity Building Program - training to develop research skills in key health workers in collaboration with strategic primary healthcare (PHC) partners).	n=8 RCBP trainees	The RCBP produced measurable improvements in perceived research experience, with mean research spider scores improving from 2.2/5 to 2.8/5, a change that was significant (z=–2.8,p=0.005). Collaborative processes and decentralised capacity building research training model can develop research skills in rural or remote health workers and create potential for ongoing research activity
Girdler, X., Dhu, J., Isaacs, A.	2017	Mixed methods - descriptive case study	To describe the design and implementation of a Diploma of Community Services (Alcohol and other Drugs and Mental Health) in Katherine (NT) by RMIT University in collaboration with Sunrise Health Service Aboriginal Corporation (SHS).	n=24 health workers from Sunrise Health Service Aboriginal Corporation	91% of students received Diploma. Workshops conducted as part of course enabled students to develop cross-agency and cross-sector connections and professional collaborations. After graduation, several students successfully applied for higher paying positions in their own or alternative services. Others went onto further study. Program has since been delivered in Alice Springs, Tennant Creek, Katherine and the remote community of Ngukurr (NT).
Endacott, R., Scholes, J., Cooper, S., McConnell-Henry, T., Porter, J., Missen, K., Kinsman, L., Champion, R.	2012	Mixed methods - Data obtained from: (a) Objective Structured Clinical Examination (OSCE) rating to assess performance of Registered Nurses during 2 simulation exercises (chest pain and respiratory distress); (b) video footage of the simulation exercises; (c) reflective interview	To examine how registered nurses identify and respond to deteriorating patients during in-hospital simulation exercises. Patient actors were employed to reproduce clinical scenarios; each scenario lasted 8 min with the patient/actor simulating deterioration at the 4 min mark. Scenarios were based on patient cases in the	n=34 registered nurses from rural Victorian hospital, each completed two simulation exercises in workplace. Avg age 41 years (range: 22–60, SD = 10.6), 74.3% qualified more than 3 years (range 0– 33 years; mean 13.57: SD = 10.27). 43% had	Themes: (1) exhausting autonomous decision-making; (2) misinterpreting the evidence; (3) conditioned response; and (4) missed cues. Assessment steps were more likely to be omitted in the chest pain simulation, for which there was a hospital protocol in place. The conduct of the scenarios provided opportunity for participants to discuss findings and decisions with the junior doctor; several participants expressed frustration that the doctor was not sufficiently experienced to help with decisions.

		during participants' review of video footage. Qualitative thematic analysis of video and interview data.	hospital used for the research.	postgraduate certificate/diploma: 5 midwifery, 1 cardiac care and 2 critical or intensive care. 1 Master of Nursing.	
Hofer, A., Parker, J., Atkinson, D., Moore, S., Reeve, C., Mak, D.B.	2014	Quantitative – survey. Main outcome measures: extent to which RMOs perceived the development of public health skills and knowledge during the placement, and the degree to which RMOs believe this placement influenced future career pathways and their current practice.	To evaluate the Kimberley Population Health Unit (KPHU) prevocational public health placement in terms of its contribution to resident medical officers' (RMOs) knowledge, skills, career path and aspirations. KPHU, based in Broome, provides population health services to the Kimberley region.	n=27 RMOs who completed a public health placement at the KPHU during 2001–2012 were invited to complete an online survey in September 2012. 23 RMOs (85%) completed the survey.	60% currently working in general practice or public health medicine; of these, 43% have returned to the Kimberley. Over 70% reported the placement developed their knowledge of public health and Aboriginal health to a 'great' or 'very great' extent. 61% felt that their placement influenced their future desire to work in public health 'a lot' or 'a great extent'.
Ferguson, M., Dollman, J.; Jones, M., Cronin, K., James, L., Martinez, L., Procter, N.	2019	Quantitative - post intervention repeated measures design - questionnaire	To evaluate the impact of a brief community-based suicide prevention education program.	248 rural health professionals in SA, participants in brief one day suicide prevention education program	Self-reported significant improvements in confidence and attitudes when working with people vulnerable to suicide. Confirm value of brief interventions. End user input to design identified as critical to success.