Determinants of rural Australian primary health care worker retention: A synthesis of key evidence and implications for policymaking

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AUTHOR CONTRIBUTIONS:

<table>
<thead>
<tr>
<th>CONTRIBUTION to the</th>
<th>Deborah Russell</th>
<th>Matthew McGrail</th>
<th>John Humphreys</th>
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This is the author manuscript accepted for publication and has undergone full peer review but has not been through the copyediting, typesetting, pagination and proofreading process, which may lead to differences between this version and the Version of Record. Please cite this article as doi: 10.1111/AJR.12294

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All authors made substantial contributions to the conception of this paper and to drafting the paper. All authors agree to be accountable for all aspects of the work in this paper and have given their approval for submission of the paper in its current state.

DISCLOSURE STATEMENT:

This research has not been previously published in part or full elsewhere.

ACKNOWLEDGEMENTS:

The authors are members of the Centre of Research Excellence in Rural and Remote Primary Health Care, conducting research in accessible and equitable primary health service provision in rural and remote Australia; and members of the Centre for Research Excellence in Medical Workforce Dynamics. The research reported in this paper is a project of the Australian Primary Health Care Research Institute (APHCRI), which is supported by a grant from the Australian Government Department of Health and Ageing. The information and opinions contained in it do not necessarily reflect the views or policy of the Australian Primary Health Care Research Institute or the Australian Government Department of Health and Ageing.

CONFLICT OF INTEREST:

The authors are not aware of any conflict of interest being present.
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Abstract

**Objective:** To synthesise key Australian empirical rural retention evidence and outline implications and potential applications for policymaking

**Design:** A comprehensive search of Medline, PsychINFO, CINAHL plus, Scopus and EMBASE revealed 8 peer-reviewed empirical studies published since 2000 quantifying factors associated with actual retention

**Setting and participants:** Rural and remote Australian primary health care workers

**Main outcome measures:** Hazard ratios (hazard of leaving rural), mean length of stay in current rural position and odds ratios (odds of leaving rural)

**Results:** A 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 included 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 training, practitioner age group and cognitive behavioural coaching. These findings suggest that retention strategies should be multi-faceted and ‘bundled’, addressing the 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.
Conclusions: The short retention of many Australian rural and remote Allied Health Professionals and GPs, particularly in small, outer regional and remote communities, requires ongoing policy support. The important retention patterns highlighted in this review provide policymakers with direction about where to best target retention initiatives, as well as an indication of what they can do to improve retention.

Key Words
Health policy
Retention
Rural health services
Health manpower
General Practitioners
Allied Health Personnel

What is already known on this subject:
- Optimising the retention of primary health care workers is vital to ensuring adequate provision of PHC services in rural and remote areas, both nationally and internationally.
- The development of effective and sustainable Australian rural primary health care workforce policies requires policymakers to have a thorough understanding of rural health worker retention.
- Until recently, there has been a lack of rigorous, quantitative empirical research investigating the factors associated with Australian rural and remote primary health care worker retention.

What this study adds:
- Specific geographical, professional, financial, educational, regulatory and personal factors that are strongly associated with observed rural and remote primary health care worker retention are identified.
- The sentinel factors include geographical remoteness and population size, health profession, types of professional activities undertaken, ability to take leave, employment grade or payment structures, legislation restricting location of practice, country of primary degree, stage in the training pipeline and practitioner age group.
- The findings suggest that retention strategies should be multi-faceted and ‘bundled’ to ensure that they closely target the combination of factors important for the retention of
Introduction

Improving rural and remote primary health care (PHC) worker retention has been highlighted as an issue of vital importance both globally and nationally. Retention is critical for optimising rural workforce supply, for developing strong therapeutic relationships with patients, and for achieving improved health outcomes. Despite the importance of retention, there is evidence that in some rural and remote regions of Australia, the length of stay of PHC workers is short. The retention of Northern Territory’s Remote Area Nurses and of some groups of NSW GPs in small remote communities, for example, have been shown to average as little as 20 months. To address this problem, many Australian government programs have been funded to support and strengthen rural and remote PHC worker retention. In broad terms, these programs address regionalised education and training, financial incentives, professional support, and regulatory or legislative aspects of location choices made by PHC workers. Evidence of the effectiveness of these programs is scant, however. This relates in part to the difficulties associated with undertaking comprehensive evaluations of complex interventions, but also to a poor understanding (until recently) of how best to measure rural and remote PHC worker retention.

A number of key factors associated with observed retention of PHC workers in rural and remote communities in developed countries have been identified. Chief among them are geographical location of work and training, restrictions relating to obligated service, PHC worker profession or specialty, and practice ownership or employment structure. However, until recently, most quantitative empirical evidence available to Australian policymakers has either been drawn from North American studies of physician retention or from Australian studies which have not specifically quantified actual retention or its association with the various factors thought to be important. These are important distinctions to make, because the Australian rural and remote PHC context differs substantially from the US context. Additionally, studies of rural or remote PHC worker retention intentions and preferences may not correlate strongly with actual behaviour, particularly in settings where the level of control over the workplace is low or where risk of burnout is high.

The development of an effective and sustainable Australian rural and remote PHC workforce necessitates policymakers having a thorough understanding of PHC worker retention and its many determinants as they apply specifically to Australian rural and remote contexts. The aims of this paper, therefore, are twofold. First, to synthesise current empirical quantitative evidence on factors associated with the actual retention of Australian rural and remote PHC workers. Secondly, to outline implications and potential applications of these results for Australian PHC policymaking designed to ensure an adequate workforce for rural and remote Australia.

Methods

A comprehensive literature search was conducted using Ovid Medline, PsychINFO, CINAHL plus, Scopus and EMBase databases using keywords and synonyms as detailed in Table 1. Based on key search terms relevant to the aims of This article is protected by copyright. All rights reserved
This study, 854 potential publications were identified. After removal of genuine duplicates and screening of titles, abstracts and full papers (as per the review process outlined in Figure 1), only 8 studies met the inclusion criteria for this review (see Table 2). One reviewer extracted data from the 8 included studies using MS Excel (Microsoft Corporation 2010; Redmond, Washington) and a second, senior reviewer verified the accuracy and completeness of extracted data.

Retention profiles captured in this review included retention in rural or remote communities, health services, geographical regions, or in a practitioner’s current position. Definitions of ‘rural’ or ‘remote’ were left to the discretion of the authors of each paper. The retention outcome measures captured in this review included hazard ratios (hazard of individuals leaving rural), mean length of stay in current position, and odds ratios (odds of individuals leaving rural).

This synthesis uses a modified version of the conceptual framework of factors affecting rural retention developed by Humphreys et al. to organise the main empirical evidence. Results are reported according to 6 broad domains: geographical location and community factors; professional and organisational factors; financial and economic factors; regulatory factors; educational factors; and family and personal factors.

Results

The 8 studies included in this review investigated the actual length of stay (retention) of Australian rural and remote PHC workers across multiple professions, including General Practitioners (GPs), nurses, Allied Health Professionals (AHPs) and Aboriginal Health Workers (AHWs) (Table 3). The studies sourced workforce data from surveys and administrative databases, or a combination of both. Study sample sizes ranged from the relatively small study of 70 former Tasmanian GP Registrars to 4223 Australian rural GPs. The 8 studies used a range of different analytical methods. Several studies tested differences in proportions or differences in means without taking any potential confounders into account. More sophisticated analytical approaches used regression models (including linear, logistic and Cox Proportional Hazards models) which adjusted for multiple factors at once. The highest quality studies were large and able to account for how long PHC workers had already been working in a rural location when assessing the risk of leaving.

Multiple factors, including some from each of the 6 broad domains of retention, were consistently found to be significantly associated with rural retention. Table 4 comprehensively and systematically captures each of these significant factors from the 8 studies, synthesises the findings according to the 6 retention domains and outlines policy implications and applications. Whilst the specific findings are not repeated here in text, sentinel findings are summarised in the following paragraphs.

Overall, geography was most strongly associated with retention – GPs working in small, remote communities had almost triple the risk of leaving compared to GPs working in small, inner regional communities (HR 2.65). Factors related to health worker profession were also strongly associated with retention – Podiatrists had twice the risk of leaving a health service compared to Occupational therapists (HR 2.13), while Doctors and AHPs were also almost

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twice as likely to leave (HR 1.80) compared to Nurses and AHWs. Employment as a junior AHP (grade 1) was also associated with a significantly higher risk of leaving compared to employment at a more senior grade (HR 1.75).

Collectively, the multiple different factors shown in Table 4 explain a large proportion of the observed differences in rural health worker retention. To illustrate, one study found that five factors associated with GP retention – geographical remoteness and population size, coastal location, country of training, procedural activity, and hospital activity – together accounted for the average difference between a fully registered GP staying 20 months and staying 20 years in a rural community.

**Discussion**

This synthesis of empirical evidence found that many factors are significantly associated with actual retention of Australian rural and remote PHC workers. Whilst specific findings, such as the strong association between geographical remoteness and population size and GP retention, have important implications for specific programs, it is critical that the overall importance of the many different findings is not overlooked. The key implications from these findings are that rural and remote PHC workforce retention policy must both

a. address the full range of factors known to be associated with rural and remote PHC worker retention; and

b. be carefully targeted to where workforce supply and retention is most problematic.

Addressing the broad range of retention factors is likely to require retention interventions to be packaged into multi-faceted bundles that include attractive financial incentives providing flexibility for individuals to address issues specific to their personal retention. This flexibility is important because immense health worker dissatisfaction in any single area may be enough to repeatedly trigger withdrawal of rural services. Of course, some factors are more easily modified than others, and there may also be some situations where the scope to improve retention through bundled incentives remains limited. For example, in certain ‘hostile’ environments, retention may only ever be comparatively short. In these situations a package of support measures that ensures that the position is sufficiently attractive and will at least keep rural and remote PHC workers for an optimal length of time, whilst also ensuring that they can be replaced relatively easily when the need arises may work best.

This synthesis identifies groups of rural and remote PHC workers that are at comparatively higher risk of leaving. It is these groups that rural retention strategies should preferentially target if improving health care access and reducing inequities in health outcomes remain key priorities of the Australian health system. In general terms, the higher risk professions are Doctors and AHPs. In more specific terms, they include GPs working in small and medium sized rural and remote communities and health workers providing public PHC services in certain AHP disciplines, such as Podiatry.

In addition to providing policymakers with direction about where to best target retention initiatives, this research also provides policymakers with some indication of what they can do to improve retention. Longer rural GP retention, for example, is associated with many factors: restriction of provider number access, provision of hospital
services, provision of procedural services, undergraduate training in Australia, taking annual leave, and business and employment structures. These findings suggest that rural GP retention strategies may be most effective if they comprise a combination of interventions – including various ‘carrots’ (for example, better financial rewards, easily accessible and subsidised locums, excellent opportunities for procedural and emergency skill acquisition and maintenance) together with ‘sticks’ (for example, ensuring obligated rural service is for a sufficiently long time period).

The strength of evidence and the range of retention factors investigated for AHPs is weaker than for GPs. This limits the direct evidence available to policymakers to inform how they target retention interventions to AHPs. Nevertheless, this research suggests that policymakers could investigate strengthening AHP rural career paths.

This review is inevitably limited by the quality of included empirical studies. Limitations include their observational study designs and the quality and availability of Australian rural and remote PHC workforce data analysed (especially for AHPs, but also for AHWs). This review and synthesis, too, has limitations, including that the literature search did not specifically include each of the many different health professions and its focus on retention without considering the impact of recruitment on health worker supply. Nevertheless, this synthesis, and the empirical studies which it captures, are ground-breaking and fill a major gap in the peer-reviewed Australian literature that will be of great use to workforce planners and policymakers.

Clearly, however, many questions of great interest to Australian rural and remote PHC workforce policymakers remain unanswered – particularly questions relating to the 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 much-needed 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.

**Conclusion**

The retention of many rural and remote AHPs and GPs, particularly in small, remote communities, is suboptimal with average retention as short as 20 months. Such poor retention results in significant costs to the health service and government and contributes to poorer health outcomes for these populations. The different geographical, professional, financial, regulatory, educational, and community factors found to have significant and substantial associations with retention provides important clues as to how policy might be developed to improve rural and remote PHC worker retention. Our review suggests that health workforce planners would be well-advised to ensure that PHC workers interested in working in small rural and remote communities receive sufficient high quality rural and remote training to prepare them for successful independent procedural, hospital and community practice. Further, it is important that systems are introduced so that rural and remote PHC workers feel well-supported in their workplaces and communities and have well-developed rural career paths open to them. Enabling rural PHC
workers to take regular and sufficient leave and to have ready access to appropriate psychological, professional and financial supports may also help alleviate stressors and support retention.

References


### Tables

#### Table 1: Literature search terms

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<thead>
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<th>Concept</th>
<th>Search Terms</th>
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Table 2: Inclusion criteria

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<th>Inclusion Criteria:</th>
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<tr>
<td>1. Empirical study</td>
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<tr>
<td>2. Quantitative analysis</td>
</tr>
<tr>
<td>3. Actual retention as a health professional (length of stay) is measured (not intentions or preferences)</td>
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<td>4. Australian rural or remote Primary Health Care professionals</td>
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<td>5. Recent data (2000 to August 2015)</td>
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<td>6. Published in peer-reviewed journal</td>
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<tr>
<td>7. Quantifies factors associated with retention and reports statistical significance of any differences between groups</td>
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<td>8. English language</td>
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<td>Study</td>
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<tr>
<td>McGrail and Humphreys</td>
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<tr>
<td>Russell, Wakerman et al.</td>
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<td>Russell, Humphreys et al.</td>
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<td>Gardiner et al.</td>
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<td>Russell, McGrail et al.</td>
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<td>Chisholm et al.</td>
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<td>Professionals</td>
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<td>Smith et al.</td>
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†RRMA Rural and Remote Metropolitan Area; ‡MABEL Medicine in Australia, Balancing Employment and Life
<table>
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<tr>
<th>Significant factors associated with observed rural retention</th>
<th>Implications and potential applications</th>
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<tr>
<td><strong>Geographical location and community factors</strong></td>
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<tr>
<td>1. The hazard of GPs leaving a community is highest in small, remote centres (HR^1^ 2.65), and intermediate in small, outer regional centres (HR 1.33), compared to everywhere else (HR 1.00)^6^</td>
<td>Remoteness and population size should both be taken into account when devising payment of retention incentives to GPs^7^</td>
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<tr>
<td></td>
<td>GPs in small/medium rural towns are more likely to leave rural practice (OR^2^ 3.04/3.96) compared to regional centres (OR 1.00)^26^</td>
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<td>The hazard of Nurses leaving a health service is higher in remote centres (HR 1.53) than in small rural centres (HR 1.00)^25^</td>
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<tr>
<td><strong>Professional and organisational factors</strong></td>
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<tr>
<td>2. GPs/AHPs have an increased hazard of leaving rural or remote health services (HR 1.81/1.84) compared to Nurses/AHWs (HR 1.00/0.97)^23^</td>
<td>Selection and training of ‘home grown’ nurse and AHW students may underlie longer retention. This needs to be better understood so it can be applied, where appropriate, to AHPs/GPs</td>
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<td></td>
<td>Retention varies by AHP discipline. Podiatrists are more likely to leave a public rural health service (HR 2.13) than OTs^3^ (HR 1.00)^24^</td>
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<td></td>
<td>Pharmacists (16.5 years), Optometrists (17.6 years) and Physios (12.8 years) have longer than average retention for AHPs (10.3 years)^29^</td>
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<td><strong>b. GPs: Hospital work, Procedural work, Annual leave</strong></td>
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<td></td>
<td>Non- VMO GPs (HR 1.49) compared to VMOs (HR 1.00)^6^</td>
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<td></td>
<td>Non procedural GPs have an increased risk of leaving a rural community (HR 1.42) compared to procedural GPs (HR 1.00)^6^</td>
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<td>Each week of annual leave taken by a GP in the past year is associated with 3% longer GP retention in their current position^25^</td>
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<td><strong>c. AHPs: Grade of employment</strong></td>
<td>Grade 1/2 AHPs have a higher risk of leaving a rural health service (HR 1.75/HR 1.33) compared to grade 3 AHPs (HR 1.00) (^{24})</td>
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<td><strong>3. Financial and economic factors</strong></td>
<td>Salaried/contracted GPs have ~30% shorter retention than average (^{25})</td>
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<td>GPs paid by fee-for-service have 50% longer retention than average (^{25})</td>
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<td></td>
<td>GP practice owners have 70% longer retention than average (^{25})</td>
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<tr>
<td></td>
<td>Salaried/contracted GPs are more likely to leave rural practice (OR 3.89/5.18 compared to GP principals and partners (OR 1.00)) (^{26})</td>
</tr>
<tr>
<td><strong>4. Regulatory factors</strong></td>
<td>GPs with restricted access to Medicare provider numbers (conditional registration) have 52% shorter retention than non-restricted GPs (^{26})</td>
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<td>Conditionally registered GPs have a lower risk of leaving a rural community (HR 0.67) compared to fully registered GPs (HR 1.00) (^{6})</td>
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<tr>
<td><strong>5. Educational factors</strong></td>
<td>GPs trained overseas (^{6}) have an increased risk of leaving a rural community (HR 1.45) compared to Australian graduates (HR 1.00) (^{6})</td>
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<td>GP Registrars have been in their current practice for about half as long as non-Registrars (^{25})</td>
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<td><strong>6. Family and personal factors</strong></td>
<td>GPs aged 35-60 have a reduced risk of leaving a rural community (HR 0.65, 0.74) compared to younger and older colleagues (HR 1.00) (^{6})</td>
</tr>
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<td>Cognitive behaviourally coached GPs are less likely to leave rural practice within 3 years (OR 0.25) compared to other GPs (OR 1.00) (^{27})</td>
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<td>Former GP Registrars who were un-partnered or partnered with a non-doctor were more likely to remain as Tasmanian GPs compared</td>
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to those partnered with a doctor\textsuperscript{28} workers in all professions, has substantial upside

\textsuperscript{†} GP General Practitioner
\textsuperscript{‡} HR Hazard Ratio
\textsuperscript{§} OR Odds Ratio
\textsuperscript{¶} AHP Allied Health Professional
\textsuperscript{α} AHW Aboriginal Health Worker
\textsuperscript{β} OT Occupational Therapist
\textsuperscript{γ} VMO Visiting Medical Officer

\textsuperscript{δ} in countries other than Australia, United Kingdom, Ireland, Canada, United States or New Zealand
Figures

Figure 1: Flowchart of review process

Records identified through database searching (n = 854)

Additional records identified through other sources (n = 0)

Records after duplicates removed (n = 324)

Records title screened (n = 324)

Records excluded after title screen (n = 216)

Records abstract screened (n = 108)

Records excluded, with reasons (n = 80)

Full-text articles assessed for eligibility (n = 27)

Studies included in synthesis (n = 8)
Author/s:
Russell, DJ; McGrail, MR; Humphreys, JS

Title:
Determinants of rural Australian primary health care worker retention: A synthesis of key evidence and implications for policymaking.

Date:
2017-02

Citation:

Persistent Link:
http://hdl.handle.net/11343/291178