

What are effective approaches for recruiting and retaining rural primary care health professionals?

Answer: Some strategies are effective in recruiting providers to rural areas, but less so in retaining health professionals in these settings. While few approaches have a positive effect on both recruitment and retention, combining individual interventions may be the most effective way to expand and maintain the rural primary care workforce. Among the individual approaches shown to increase recruitment but not necessarily retention are: (1) educational scholarships, (2) loans, (3) post-graduate loan repayment, (4) salary increases and other direct payments, (5) short-term rural placements for students, and (6) curriculum tailored to rural practice. The strategies shown to have some positive effect on *both* recruitment and retention are: (1) targeted recruitment of specific groups, such as those with existing ties to rural communities, (2) professional development opportunities for rural practitioners, and (3) taking actions to ensure a stable, well-resourced work environment. Services to help health professionals cope with rural life have yielded mixed results.

Context for this review

AcademyHealth undertook this review from the perspective of a regional policymaker or funder considering interventions to improve the recruitment and retention of health professionals who provide primary care services to rural populations. We examined previously synthesized evidence concerning the effectiveness of specific recruitment and retention strategies and factors associated with health professionals' decisions to locate in a given geographic setting. At the direction of the funder, we excluded studies of telehealth as a tool to extend patient access or support professional practice in remote areas as well as efforts to expand non-physicians' scopes of practice. We included evidence from other countries if it examined strategies relevant to the United States.

Findings

There are multiple approaches to recruitment and retention that target different periods of health professionals' careers (see Figure 1 on page 5):

- **“Bundled” interventions.** No one intervention has been proven to be highly effective for recruitment or retention. However, combining multiple strategies may improve the effectiveness of individual interventions for both recruitment and retention.^{2,9,11}
- **Targeted recruitment efforts**, such as those that focus on health professionals who already have ties to a particular rural area, appear to be particularly effective for both recruitment and retention.^{5,12,14}
- **International recruitment efforts** that provide visas and professional credentials to foreign health professionals in return for service in a rural area are similarly effective in attracting providers, but retention drops after their service obligation is complete.^{2,4,9}
- **Financial incentives** that require or entice service in a rural area in return for educational financial aid, a higher salary, or other direct monetary payments are also effective in recruitment, but the magnitude of the impact can vary widely.^{5,8} In addition, many of these providers do not remain in rural areas after completing their service requirement.^{6,8,11,13,15}
- **Providing personal and professional support.** Factors such as recognition, job satisfaction, working and living conditions, supervision, and professional development opportunities are generally more powerful motivators to work in a rural setting than is financial remuneration.^{1,12} While the body of evidence is limited, continuing medical education credit opportunities², flexible working conditions², and personal support programs⁷ have yielded positive results.
- **Educational strategies** that expose trainees to rural health care through rotations or curricular content appear effective in recruiting such individuals upon graduation. However, the research supporting this conclusion does not account for the possibility that students participating in these programs may already be motivated to locate in rural areas.^{1,4,5,7,9}

AcademyHealth conducted this rapid review over a five-week period using an established protocol that emphasizes timeliness, efficiency, and responsiveness to the funder's needs. It synthesizes peer-reviewed systematic reviews published between 2004 and 2017. Two AcademyHealth analysts undertook the review and revised an initial draft based on input from two external experts with significant knowledge of research concerning the health care workforce. Appendix 3 lists the search terms and databases used to identify relevant systematic reviews.

Additional considerations

- Efforts to measure the effectiveness of retention strategies use widely disparate approaches, limiting the ability to make direct comparisons between programs or draw conclusions about long-term impacts.^{6,7}
- Sample sizes in many studies may be too small to find actual impacts.¹⁶
- There are significant amounts of grey literature evaluating interventions in the United States that have not been captured in systematic reviews.¹⁶

Appendix 1: Summary of Evidence

AcademyHealth identified 11 systematic reviews and four reviews of reviews published since 2004 evaluating the effectiveness of strategies and interventions for increasing recruitment and retention of health care professionals to rural areas or the factors that motivate health professionals to locate or remain in a given geographic location. In most cases, the research focuses on physicians or health professionals in general; we did not find research that focused specifically on providers of primary care services. In addition, most of the systematic reviews considered research from both the United States and other countries. We included evidence from other countries if it examined strategies relevant to the United States.

What do we mean by recruitment and retention?

While the research reviewed used a consistent definition of “recruitment,” measuring “retention” proved much more difficult due to the high variability in definitions and methods. In each case, “recruitment” refers to programs that entice (or compel) health professionals to practice in a rural setting. However, the research contains a variety of different approaches to measure the concept of “retention,” or how long professionals remain in rural practice. Studies reported retention as length of service, settlement rates, turnover rates (the proportion of the workforce leaving jobs within a period of time)⁶, the proportion of health workers staying in rural areas, and survival rates over time⁷. In addition, the length of time over which retention is measured varies, and researchers do not necessarily have data on previous or subsequent employment, making it difficult to assess whether providers were already working in a rural setting when recruited or remained in rural areas in later jobs.⁶

Approaches to recruitment and retention

As laid out in Table 1, interventions to recruit or retain health professionals in rural areas fall into five general categories:^{5,14} (1) financial incentives, (2) targeted recruitment, (3) international recruitment, (4) educational interventions, and (5) efforts to provide professional or personal support to rural health workers. Figure 1 shows how these interventions target different periods of health professionals’ careers. At least some interventions in each of these categories appear to be effective in recruiting health professionals to rural areas, but the evidence about whether they influence retention is mixed. In addition, it can be difficult to analyze specific strategies for recruitment or retention and the respective outcomes of interest, as most interventions studied had multiple effects that spanned the spectrum from attraction through recruitment, retention, and performance.⁷ The majority of studies evaluating intervention results and effects were conducted for educational programs and regulatory interventions, even though policymakers frequently turn to financial incentive programs as a solution when confronted with workforce shortages, and health workers most value professional and personal support programs.⁷

- **Financial incentive** programs⁸ require or entice service in a rural area in return for educational scholarships or loans, assistance in repaying educational loans, or direct payments in the form of salary increases, living allowances, or lump-sums.⁵ None of the systematic reviews identified and included in this review specifically mentioned another type of financial incentive, loans with favorable terms provided to rural practices.¹⁶ In one systematic review¹¹ of the effectiveness of financial incentives, all studies achieved the primary goal of short-term recruitment, although proportions can vary widely (33-100 percent in one review⁸). And physicians with contracts that require service in an underserved area are more likely than those without to practice rurally.¹¹

However, the evidence is mixed about the efficacy of financial incentives for retention and ability to improve overall distribution of health professionals to rural areas.² Financial incentives yield positive outcomes for short-term retention (i.e. while participants fulfill return of service obligations), but they do not necessarily improve long-term retention after financial support ceases.^{6,8,11,13,15} Compared to non-obligated health workers in comparable sites, participants in financial-incentive programs were found to be significantly more likely to leave their site of practice after completion of obligatory service of similar time length, although still more likely to practice in an underserved area than non-participant peers.⁸ Furthermore, data shows that financial considerations are only one of many important factors health workers consider when deciding whether to leave or stay.⁶ Intrinsic factors such as recognition and job satisfaction were some of the most important determinants of both recruitment and retention of general practitioners, when compared with extrinsic factors such as financial remuneration.¹ Among providers who relocate away from rural settings, family preferences and professional dissatisfaction were generally more influential than financial incentives.⁴

- **Educational interventions** include modifying health professional training curriculum to focus on issues specifically related to rural health care^{5,7} and opportunities for training and rotations in rural locations.^{4,9} Research indicates that educational exposure to rural settings and issues is associated with students' subsequent decisions to work in these areas post-graduation. However, available studies do not control for other factors that could confound the results, such as the possibility that students with a predisposition to working in rural locations might choose these educational experiences.^{1,4,5,7,9} Locating medical schools and other health training programs in rural areas had mixed (i.e. both positive and negative) results in recruiting and retaining providers post-graduation.^{4,5}
- **Targeted recruitment programs** rely on research showing that there are identifiable characteristics¹ of many health workers who decide to locate and remain in rural areas. In particular, one review¹² focusing on systematic review findings relevant to developing countries found that rural background and rural origin were the most important personal factors associated with recruitment and retention. There is strong evidence that students with a rural origin (usually defined as completion of primary and/or secondary school in a rural area) students who indicate intent to practice in rural areas are more likely to practice rural medicine.⁹ This finding has been the basis for promising strategies that recruit or give preferential admission for medical schools and training programs to such students.¹⁴
- **International recruitment strategies** include granting visas to foreign health care professionals and/or accepting their foreign training credentials in return for service in rural areas.¹⁷ Research has found that international recruitment programs have been effective in bringing providers to rural and other underserved areas, but retention appears to decrease once providers complete their service obligations^{2,4,9} (though policymakers might still consider this type of program a success if it secures these professionals' service only for the length of the "payback" period). As with other studies of retention, these results are limited by differences in the definition and measurement of the concept.
- **Personal and professional support** interventions focus on fostering a supportive environment for health workers, and encompass mentoring, close supervision, supportive, effective management, having a sufficient health care infrastructure, as well as professional and career development opportunities.⁵ While the body of evidence is limited, continuing medical education credit opportunities², flexible working conditions², and personal support programs⁷ have all yielded positive results. In addition, surveys of rural health professionals indicate that the most important professional and social factors influencing decisions about where to work include the quality of the living environment, working conditions (workload, professional and peer support, autonomy, etc.), and opportunities for professional development and career advancement.^{1,12} While job satisfaction is a significant predictor of retention and low pay is associated with job dissatisfaction, health care workers indicate that increases in income would not compensate for other sources of dissatisfaction with working in a rural setting.¹

"Bundled" approaches to retention

Although the evidence about the effectiveness of individual interventions in assuring long-term retention of rural workers is mixed or weak⁹, there is some evidence to suggest combining different strategies may be effective.² One multi-pronged program found 34 percent of its graduates practicing rurally, with 5-10 year retention at 87 percent.¹¹ Financial incentives have been successful over the long term when tied in with other strategies, such as recruiting trainees and workers who have an existing relationship to the underserved area, providing more flexibility for career opportunities, and longer periods of service obligation.² The authors of one review suggest that models which focus on multiple stages of health professionals' careers are required for effective retention. In such programs, they suggested, medical schools and residency programs would prepare motivated students for rural practice, and once professionals are working in these settings, their workplaces and communities would provide professional and personal support, and governments would assure adequate compensation.¹¹

Additional considerations

In addition to the limitations in the evidence outlined above, subject matter experts commenting on a draft of this review noted that there is a significant amount of evidence in the grey literature not included in systematic reviews examining the effectiveness of recent programs initiated to recruit and retain rural providers. Two examples of these programs are the U.S. Health Services and Resources Administration's Rural Track Training Technical Assistance initiative and Boise State University's Community Apgar program. Furthermore, sample sizes in original research studies of some programs may be too small to find actual impacts.¹⁶

Figure 1: Rural recruitment and retention efforts can target multiple periods of a health professional's career

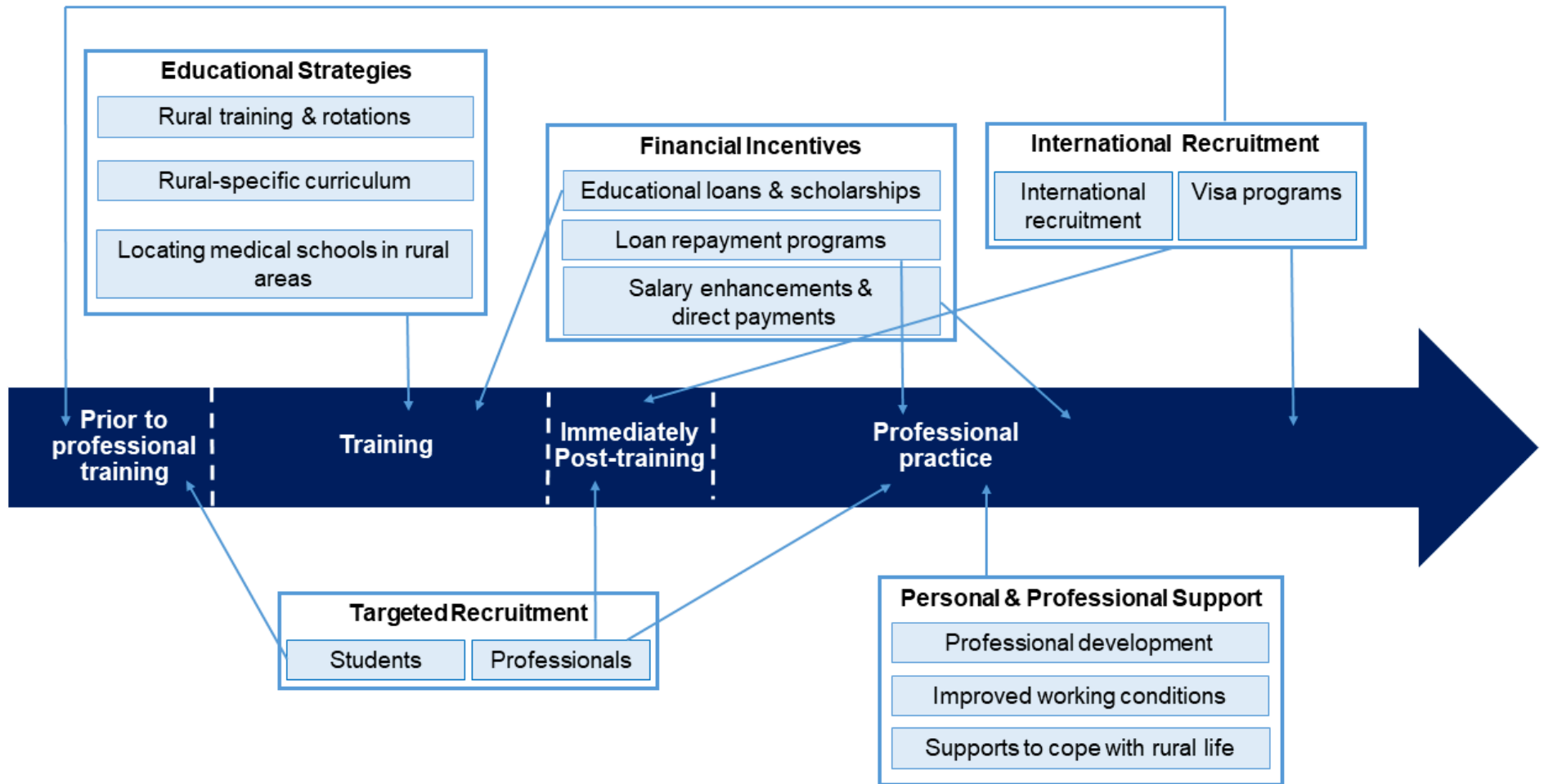


Table 1: Summary of evidence by type of intervention

Intervention Category	Intervention Type	Review	Summary of Findings
Bundling of interventions	Combining individual interventions into a bundle	Sempowski ¹¹ Wilson et al. ⁹ Verma et al. ²	Integrating financial incentives with other strategies may improve the effectiveness of individual interventions included in the bundle.
Financial incentives	Educational loans or scholarships in return for service commitment in a rural area	Sempowski ¹¹ Wilson et al. ⁹ Willis-Shattuck et al. ¹⁰ Barnighausen and Bloom ⁸ Buykx et al. ⁶ Hempel et al. ⁴ Verma et al. ² Marchand and Peckham ¹	Financial incentives are effective for recruiting individuals to rural practice, though they may be less effective for retention. Evidence on retention is weaker than for recruitment because of different approaches to measuring retention and with variation in lengths of follow-up. This is a consistent issue for most research examining retention.
	Educational loan repayment in return for service commitment in a rural area	Hempel et al. ⁴	Loan repayment programs likely play a role in provider choice to practice in a rural area, and may influence retention.
	Direct financial incentives to practice in rural areas (higher salaries; financial rewards for relocating/ remaining in rural areas)	Willis-Shattuck et al. ¹⁰ Hempel et al. ⁴ Dolea et al. ⁷ Wilson et al. ⁹ Willis-Shattuck et al. ¹⁰ Buykx et al. ⁶ Hempel et al. ⁴	Higher salaries and other direct financial incentives can influence choice of practice site. Salary may also play a role in decisions to remain in or relocate from rural areas.
Targeted recruitment	Targeting specific groups for recruitment	Grobler et al. ⁵ Wilson et al. ⁹ Hempel et al. ⁴ Verma et al. ²	Recruiting and prioritizing applicants from rural areas for medical school and other health professional training programs can be effective for improving recruitment to rural areas. Students with a rural origin are more likely to practice in a rural setting. Men are more likely than women to practice rural medicine. Students with intent to practice rural medicine at entry to a program are more likely to do so.
International recruitment	International recruitment and visas for providers (e.g. J-1 Visa Waiver Program in the U.S.) coupled with requirement to practice in rural areas	Wilson et al. ⁹ Hempel et al. ⁴ Verma et al. ²	Recruiting foreign doctors and limiting them to rural practice can be effective for recruitment. Evidence shows mixed results for retention. The evidence is often based on studies of policies in other countries, and therefore may not be relevant to U.S. settings.

Educational interventions	Training/rotation in a rural setting; changes in curriculum content	Wilson et al. ⁹ Grobler et al. ⁵ Hempel et al. ⁴ Marchand and Peckham ¹ Dolea et al. ⁷	<p>Educational exposure to rural settings may influence students to practice in rural areas.</p> <p>Specific curriculums focused on primary care or work in rural settings improve recruitment and retention of graduates practicing in rural areas.</p> <p>Studies do not control for selection bias as students who were more motivated to work in rural areas may deliberately choose rural tracks or training programs.</p>
	Location of schools	Grobler et al. ⁵ Hempel et al. ⁴	Locating medical schools in rural areas has mixed (both positive and negative) results as a means of increasing the rural workforce.
Personal and professional supports	Professional development opportunities	Wilson et al. ⁹ Grobler et al. ⁵ Verma et al. ² Willis-Shattuck et al. ¹⁰ Buykx et al. ⁶	Providing opportunities for professional development can help retain rural providers. Career advancement is an important motivator for health professionals to move.
	Work environment	Verma et al. ² Marchand and Peckham ¹ Willis-Shattuck et al. ¹⁰ Buykx et al. ⁶ Hempel et al. ⁴	<p>Allowing providers greater flexibility in their schedules and contract conditions may help retention.</p> <p>A health work environment fostering professional satisfaction, recognition, and appreciation is an important motivator to practice in a given setting.</p> <p>Adequate clinic infrastructure, sufficient and stable staffing, and supervision are important factors influencing health workers' choice of work setting and retention.</p>
	Personal support	Dolea et al. ⁷	Providing support systems through peer and mentorship opportunities yields mixed results for the retention of rural health workers.

Appendix 2: Search Strategy

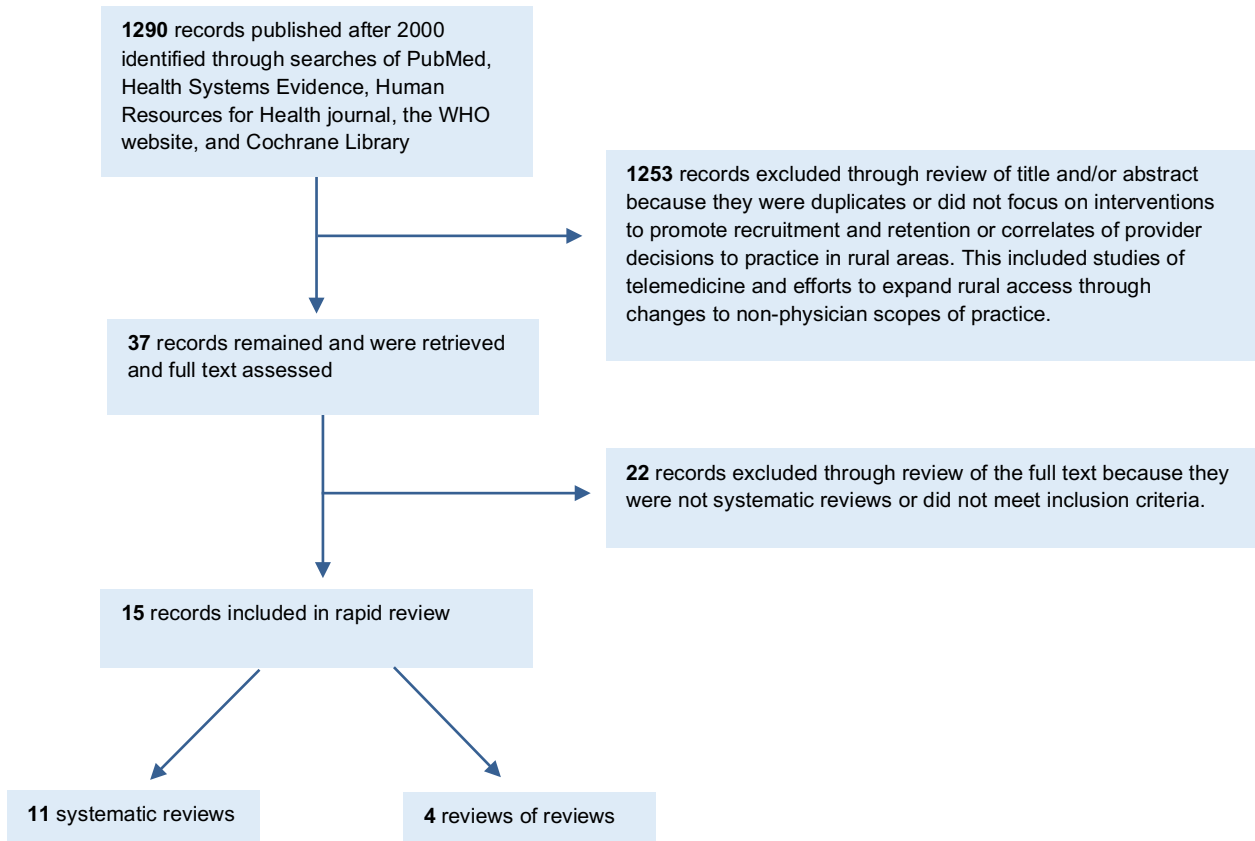
Table 2 shows the basic Boolean search term strategy used for the review, and Figure 2 lays out the process for selecting articles identified through the search process for inclusion in the rapid review.

We modified searches as appropriate to reflect the search capabilities of each database used. Initial searches began with a search for a “worker” search term combined with a “workforce” term. We added a “setting” term to narrow results if the first step yielded too many disparate results. We searched the following databases and websites: Health Systems Evidence, the Cochrane Library, PubMed, the *Human Resources for Health* journal, and the website of the World Health Organization.

Table 2: Search terms used

‘Worker’ search terms		‘Workforce’ search terms		‘Setting’ search terms
Health worker	AND	Recruit*	AND	Rural
Primary care		Retention OR retain		Underserved
Physicians		Workforce		Underresourced
Health professional		Human resource		
Nurse		Shortage		
Practitioner				
Physician assistant				
Doctor				

Figure 2: Process for selecting articles for inclusion in this rapid review



Appendix 3a: Systematic Reviews

Systematic reviews are presented in reverse chronological order.

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
<p>Marchand C, Peckham S. Addressing the crisis of GP recruitment and retention: a systematic review. British Journal of General Practice. 2017.</p>	<p>Evidence on different approaches to recruitment and retention of general practitioners (GPs), such as contextual factors and intrinsic versus extrinsic motivational determinants.</p>	<p>Date range: 1990-2016</p> <p>Inclusion criteria: Reviews from countries with health systems similar to that of the U.K.; English-language studies in journals from Organisation for Economic Cooperation and Development (OECD) countries; original research papers and empirical studies. Literature search included all systematic reviews, journal articles, meta-analyses, review articles, reports, and grey literature.</p> <p>Exclusion criteria: Studies not meeting above criteria or duplicates.</p>	<p>Studies included: 36 qualitative and quantitative studies. Mix of cohort studies, original research, systematic reviews, literature reviews, cross-sectional studies, comparative studies, and national surveys.</p> <p>High-level findings: There is some evidence to support strategies to improve the breadth of training for candidates seeking to work in geographies where it is hard to recruit trainees, training hubs, and targeted support.</p> <p>Recruitment: The review found that early exposure to primary care practice, a significant experience in a primary care setting, and the fit between skills and attributes were some of the most important determinants for increasing recruitment in primary care. Reviewers found some evidence supporting strategies focused on improving the breadth of training, training hubs, and targeted support of candidates.</p> <p>Retention: Important factors for retention included sub-specialization and portfolio careers (defined as having multiple jobs or doing multiple types of work), and job satisfaction.</p> <p>Intrinsic factors such as recognition were found to be the most important determinants of recruitment and retention, rather than extrinsic factors such as income.</p>	<p>There are a limited number of studies examining specific recruitment and retention strategies for the GP workforce in general; most are not focused on attracting professionals to rural areas.</p> <p>The reviewed evidence points to potential factors that may support development of specific strategies for recruitment and retention.</p>	<p>Not focused on the rural workforce but on general recruitment and retention of GPs. However, some of the evidence for recommended strategies builds on literature about rural training and rural contexts, specifically training hubs and targeted support.</p>

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
<p>Verma P et al. A systematic review of strategies to recruit and retain primary care doctors internationally. BMC Health Services Research. 2016 16:126.</p>	<p>Interventions and strategies used to recruit and retain primary care doctors internationally.</p>	<p>Date range: Database inception through January 2015.</p> <p>Inclusion criteria: Study evaluated a defined intervention to recruit or retain primary care physicians (PCPs); from OECD countries; medical specialties other than primary care if results deemed transferable to primary care; all study designs, languages, and follow-up periods.</p> <p>Exclusion criteria: Studies from lower- or middle-income countries; focus on non-physician medical professionals; studies without a specific intervention.</p>	<p>Studies included: 51 studies – of those studies, there were 38 cross-sectional, 30 of which were without controls; 13 longitudinal, six (6) of which were without controls, six (6) compared parallel groups and one (1) was a before-and-after comparison.</p> <p>High-level findings: There is weak evidence supporting use of postgraduate placements or placements during medical school in underserved areas, undergraduate rural placements, and recruiting students to medical school from rural areas. A marketing campaign was associated with lower recruitment, but the evidence is weak. The evidence is too weak to draw conclusions about supporting professional development of rural providers and using specialized recruiters. There is weak evidence supporting a positive impact of combining financial incentives, rotations for students and physicians in rural locations, and continuing medical education credits.</p> <p>There is mixed evidence about programs to recruit and retain international medical graduates.</p> <p>There is relatively strong evidence with mixed results (both positive and negative) about financial incentives.</p>	<p>The overall methodological quality of included studies was low due to lack of control groups, comparators, or randomization.</p>	<p>The review focuses on physicians only. The robust search and inclusion of all study designs provides evidence from a large number of studies and interventions; however, this is at the cost of the quality of that evidence and certainty of findings.</p>
<p>Liu X et al. Analysis of context factors in compulsory and incentive strategies for improving attraction and retention of</p>	<p>Context specific factors influencing the implementation of interventions to attract and retain rural health workers.</p>	<p>Date range: Search dates not provided, but included studies range from 1980 to 2014.</p> <p>Inclusion criteria: Studies focused on financial incentives or compulsory rural service, usually in combination with financial incentives; target of</p>	<p>Studies included: 40 studies: 15 from high-income countries (HICs), 20 from low- and middle-income countries (LMICs), five from a mix. 18 of the 40 studies were only descriptive studies of interventions. The remaining studies were cohort design (10), cross-sectional survey</p>	<p>Contextual factors from LMICs may not be relevant to the U.S. (e.g. post-conflict countries, abolishment of apartheid in South Africa, Asian cultural reluctance to borrow money from outside the family).</p>	<p>Does not focus on the effectiveness of interventions – only on whether articles mention contextual factors related to their adoption and implementation.</p>

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
health workers in rural and remote areas: a systematic review . Human Resources for Health. 2015 13:61.		<p>programs are existing health professionals and medical students; studies include discussion of context or process of intervention.</p> <p>Exclusion criteria: No intervention or interventions other than those listed above.</p>	<p>(6), qualitative (4), case-control (1), and cost-benefit analysis (1).</p> <p>High-level findings: Macro-level context: Six studies reported political factors including national efforts to reduce disparities, post-conflict nations, and upcoming elections. 15 reported economic factors including fiscal capacity of implementing government or organization, rising medical education costs in HICs, and need for transportation and lunch allowances in LMICs. Seven studies reported social factors including traditional culture and ethics that may affect intervention effectiveness.</p> <p>Meso-level (health system) context: 34 studies reported workforce maldistribution; Ten reported factors related to the presence or use of private health services. Six reported decentralization of the health system as a factor. Five reported the health financing context as a factor.</p> <p>Micro-level (implementation) context: Ten studies mentioned efforts to monitor and evaluate the intervention as a factor. 26 studies reported the lack of a clear understanding of who was involved in implementing the intervention. 22 identified sources of intervention funding. Seven studies discussed the legislative policy development and implementation process.</p>		
Hempel S et al. Rural Healthcare Workforce: A Systematic Review . US Department of	Five key questions (KQs): KQ1: Projected healthcare needs; KQ2: factors	<p>Date range: 2005-2015</p> <p>Inclusion criteria for KQ3-4: Interventions to increase recruitment and retention of health care providers in rural U.S. health care settings;</p>	<p>Studies included: For KQ3 (recruitment), five (5) evaluations aimed at practicing providers; for KQ4 (retention), no studies specifically on retention found, but retention was an outcome measure for recruitment studies.</p>	All five included studies had post-intervention-only designs (no comparator).	For KQ2, Hempel at al finds that growing up in a rural community is the most consistent factor associated with practice location.

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
Veterans Affairs, Health Services Research & Development Service, Evidence-based Synthesis Program. December 2015.	influencing providers' geographic choices; KQ3: interventions to increase recruitment; KQ4: interventions to increase retention; KQ5: efficacy of rural-specific and healthcare professional student training and education efforts.	RCTs and pre-post designs; post-only designs when reporting on distinct cohort of participants. Exclusion criteria: Studies not meeting above criteria or duplicates.	High-level findings: In Washington state-level physician J-1 visa waiver programs, one-third of participants were placed in rural areas. 53% did not complete their obligations, but among those that did, 84% remained a median of 23 months longer than required. There is some evidence for the effectiveness of loan forgiveness programs: <ul style="list-style-type: none"> - MN: 86% of physicians surveyed continued practicing at the sponsoring facility. - CO: Among J-1 waiver recipients in various health professions, 74% were already working in rural areas when they became aware of the program. 38% of those working in rural areas reported loan repayment as important to retention. - OK: For physicians and nurses obligated to practice in rural areas, 84% were still practicing in those areas, including 28% who had completed their service obligation. - VA: 80% of placed providers (various health professions) remained at the initial placement site post-obligation. 		
Grobler L et al. Interventions for increasing the proportion of health professionals practicing in rural and underserved areas . Cochrane Database of	The effectiveness of interventions aimed at increasing the proportion of health professionals working in rural and	Date range: Studies published through 2014. Inclusion criteria: Randomized control trials, non-randomized trials, controlled before-and-after studies, or interrupted time series studies that have evaluated the effects of various interventions on	Studies included: One (1) interrupted time series study conducted in Taiwan. High-level findings: The study found that the 1995 National Health Insurance scheme implemented in Taiwan made medical care more affordable for all citizens in both rural and urban areas, which may have led	The review authors judged the certainty of evidence to be very low. The authors noted the limited availability of reliable evidence regarding the effects of interventions aimed at addressing inequitable distribution of health professionals.	Authors categorized interventions into four major categories: educational, financial, regulatory, personal and professional support services

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
Systematic Reviews. 2015.	underserved areas.	<p>outcomes of interest (proportion of health care professionals that initially choose or continue to work in a rural or urban underserved environment after exposure to an intervention).</p> <p>Exclusion criteria: Studies with outcome measures that were surrogate markers for recruitment and retention.</p>	to improved geographical distribution of physicians and dentists.		
<p>Buykx P et al. Systemic review of effective retention incentives for health workers in rural and remote areas: Towards evidence-based policy. Aust J. Rural Health. 2010. 18: 102-109</p>	Effectiveness of interventions to retain rural health workers on length of employment.	<p>Date range: 2000-2009</p> <p>Inclusion criteria: Studies in English; conducted in Australia or internationally but filtered to take account of level of economic development, health system type, and degree of rurality; focused on an intervention to increase health workforce length of stay in rural/remote areas or reduce turnover; includes evidence of impact.</p> <p>Exclusion criteria: Studies not meeting inclusion criteria; focus on secondary or tertiary health care, prevocational education and training, and personal coping strategies.</p>	<p>Studies included: 14 peer-reviewed articles: six (6) program evaluations and eight (8) review articles.</p> <p>High-level findings: There is very little evidence demonstrating the effectiveness of any specific retention strategy. The balance of evidence suggests that the most common strategy, financial incentives, might assist with recruitment and short-term retention, but not long-term retention.</p> <p>Strategies incorporating health worker obligation may be effective in retaining workers for the duration of the agreement. It is uncertain if these strategies have a residual effect on retention once obligation is complete.</p> <p>Several studies indicate retention is related to multiple personal and work-related factors, suggesting that retention strategies may need to bundle multiple interventions. No rigorous evidence exists about such approaches.</p> <p>Authors suggest a framework for potential components of bundled retention efforts: maintaining adequate, stable staff; providing appropriate and adequate</p>	<p>Among included studies, the concept of retention was rarely sufficiently differentiated from recruitment. Policies need to distinguish better between retention and prevention of turnover.</p> <p>Evaluations often lacked pre-intervention data.</p>	

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
			<p>infrastructure; maintaining realistic and competitive remuneration; fostering effective, sustainable workplace organization; professional environment that rewards individuals making significant contribution to patient care; ensuring social, family and community support for workers.</p>		
<p>Dolea C et al. Evaluated strategies to increase attraction and retention of health workers in remote and rural areas. Department of Human Resources for Health, World Health Organization. 2010.</p>	<p>Impact evaluations of effectiveness of interventions to attract and retain health workers in remote and rural areas.</p>	<p>Date range: 1995-2009</p> <p>Inclusion criteria: Studies from developed and developing countries that reported on the results/effects of an intervention to increase availability of all types of health workers in rural or remote areas and that included a clear description of study design and methodology.</p> <p>Exclusion criteria: Studies that focused on misdistribution, surveys of contextual factors influencing practice choices, had no direct link to a specific intervention, or only described a potential intervention. News, editorials, policy briefs, and commentaries were also not included.</p>	<p>Studies included: 27 studies included: No randomized controlled trials, five (5) longitudinal cohort, three (3) retrospective cohort, five (5) before-and-after, one (1) used a control group, 12 cross-sectional observational</p> <p>High-level findings:</p> <p>Results were presented within a framework of four dimensions on which policy interventions can have an effect:</p> <ul style="list-style-type: none"> - Attractiveness of rural/remote areas for students and/or health workers (12 studies – mainly education-focused, addressing attraction). - Recruitment/deployment (seven studies – educational programs and compulsory service schemes showed an increase in recruitment, but for other types of interventions the size of effect was relatively small). - Retention – measured by length of service, proportion of health workers staying in rural areas, survival rates, turn-over rates, and settlement rates. Proportion of health workers remaining varied among studies, from 20% retention in a bonding scheme in 	<p>The majority of evaluations were conducted for educational programs and regulatory interventions, despite the fact that policymakers frequently use financial incentive programs and health workers most value professional and personal support programs.</p> <p>Almost all studies evaluated programs targeting only physicians or medical school graduates, to the exclusion of other categories of health workers.</p> <p>Many studies relied on surveys and questionnaires which did not always account for biases, sampling, and design, which may make it difficult to make inferences.</p> <p>Variability in the reported outcomes, specifically on retention, make it difficult to judge the magnitude of intervention effects.</p> <p>Most evidence comes from high-income countries with very few studies from developing countries, and no evaluations are from the eastern Mediterranean.</p>	<p>“Bonding schemes” are considered a regulatory intervention, along with compulsory service.</p>

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
			<p>the U.S. to 86% for a financial incentives program in Australia.</p> <ul style="list-style-type: none"> - Performance of health workforce or health system (ten studies – most of the interventions had multiple effects on the continuum, from attraction through recruitment, retention, and health workforce or health systems performance). 	<p>Interventions should respond to factors that health workers value, but rural retention interventions rarely analyze the preferences of health workers to practice in these areas before implementing.</p>	
<p>Bärnighausen T, Bloom D. Financial incentives for return of service in underserved areas: a systematic review. BMC Health Services Research. 2009. 9:86.</p>	<p>Evaluating outcomes of financial-incentive programs</p>	<p>Date range: Database inception through February 2009</p> <p>Inclusion criteria: Articles were included if they reported data from a quantitative study of results, effects, or impacts of programs providing financial incentives in exchange for return-of-service</p> <p>Exclusion criteria: Studies were excluded if recruitment efforts were primarily non-financial, studied attractiveness of hypothetical financial incentive programs, or if the financial incentives were for return of military service, research, or specific residency programs (unless related to work in underserved areas). Reviews, commentaries, editorials, policy briefs, and news articles were also excluded.</p>	<p>Studies included: 43 studies – 34 investigated financial-incentive programs in the U.S., five (5) in Japan, two (2) in Canada, one (1) in New Zealand, one (1) in South Africa</p> <p>High-level findings: There are five different types of financial-incentive programs for return of service:</p> <ul style="list-style-type: none"> - Service-requiring scholarships - Educational loans with service requirements - Service-option educational loans - Loan repayment programs - Direct financial incentives <p>Studies reported recruitment proportions varying between 33%-100% across programs.</p> <p>Program participants who remained in underserved areas after their obligations were complete ranged from 12%-90%. However, the reported proportions could not be meaningfully compared due to wide variation in definition of retention and measurement.</p> <p>Financial incentive programs are effective at placing health workers in underserved areas, although participants are less likely to remain at the original placement site than</p>	<p>Most of the evaluated programs were located in the US but as the US market for health care education is unusual (large debts), the strategies for recruitment may not be as successful elsewhere.</p> <p>No existing studies can rule out selection effects are the reason for observed differences between participants and non-participants, which means evidence does not allow inference that the programs have caused increases in health worker supply to underserved areas.</p>	<p>Included in review by Mbemba et al. 2013</p> <p>References Sempowski 2004 study</p>

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
<p>Wilson NW et al. A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. Rural and Remote Health. 2009. 9:1060</p>	<p>Interventions to increase recruitment and retention of health professionals to rural or remote areas.</p>	<p>Date range: PubMed inception through July 3, 2008.</p> <p>Inclusion criteria: Primary research studies on the outcome of actual interventions focused on recruitment or retention in rural or remote areas; prospective, retrospective observational, and questionnaire-based designs.</p> <p>Exclusion criteria: Studies not meeting inclusion criteria.</p>	<p>non-participants. Financial-incentive programs substantially varied in participant satisfaction levels. There is no clear evidence that financial-incentive programs had a significant impact on the supply of health workers to underserved areas.</p> <p>Studies included: 110 studies covering five categories of interventions: selection (selecting students for training based on factors likely to lead to practice in rural and remote areas); education (optimizing medical training to stimulate participation in community-based medicine); coercion (methods to obligate health professionals into rural practice); support while practicing in rural areas.</p> <p>High-level findings: There is strong evidence (consistent findings from multiple studies where multivariate analysis confirms independent effects) for efforts to select students who are men, have rural origins, or indicate intent to practice in rural areas.</p> <p>Studies showed moderate evidence (consistent findings from multiple studies without multivariate analysis) for clinical rotations in rural settings (though there is potential for selection bias), recruiting foreign-trained medical personnel, direct financial incentives, and loans/scholarships with an enforceable rural service requirement.</p> <p>There is weak evidence (only one study or inconsistent findings across studies) for selecting students whose ethnicity matches underserved populations or report volunteer</p>	<p>No RCTs for interventions found as of 2009.</p> <p>Inconsistent definitions of rural and remote across studies.</p>	

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
			<p>activities, pre-vocational rural training, required rural service, or support interventions including ongoing professional development, time-off, and efforts to support family and lifestyle issues.</p> <p>There is no evidence about the impact of pre-vocational curriculum to influence choice of rural practice.</p>		
<p>Willis-Shattuck M et al. Motivation and retention of health workers in developing countries: a systematic review. BMC Health Services Research. 2008.</p>	<p>Impact of financial and non-financial incentives on motivation and retention.</p>	<p>Date range: 1980-2007</p> <p>Inclusion criteria: Studies had to be available in English and contain:</p> <ul style="list-style-type: none"> - Clear reasons stated for implementation of specific motivations - Recommended intervention can be linked to motivation - Conducted in a developing country - Used primary data <p>Exclusion criteria: Any studies that did not meet the inclusion criteria listed above.</p>	<p>Studies included: 20 studies – eight (8) qualitative, eight (8) quantitative, four (4) mixed-methods</p> <p>High-level findings: Seven major motivational themes emerged</p> <ul style="list-style-type: none"> - Financial rewards - Career development - Continuing education - Hospital infrastructure - Resource availability - Hospital management - Recognition/appreciation <p>Financial incentives were found to have a limited effect on retention. Most studies identified the need for a mix of financial and non-financial incentives.</p> <p>Insufficient evidence to support comparison of how motivational factors affect different types of health workers (doctor vs. non-clinical staff).</p>	<p>Inconsistent interpretation of motivation related variables</p> <p>Many studies were exploratory, with small sample sizes. Lack of consistency in the study designs and different methodologies.</p> <p>Only studies in English were included, and humanities/social science databases were not searched.</p>	
<p>Sempowski IP. Effectiveness of financial incentives in exchange for rural and underserved area return-of-service</p>	<p>Effectiveness of financial incentive programs for physicians in exchange for rural or underserved area return-of-</p>	<p>Date range: 1966-2002</p> <p>Inclusion criteria: Articles addressing financial support for physicians in exchange for restrictions on practice location. All countries and all research designs accepted.</p>	<p>Studies included: Ten (10) studies – one (1) retrospective cohort, one (1) prospective cohort, eight (8) cross-sectional survey – from Canada (3), New Zealand (1), and the U.S. (6).</p> <p>High-level findings: Programs that offer financial incentives in exchange for return-of-service commitment</p>	<p>Low quality of evidence with limited applicability</p> <p>U.S. focus of the literature is a bias</p>	

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
commitments: systematic review of the literature . Canadian Journal of Rural Medicine. 2004.	service commitment.	Exclusion criteria: Articles that involved financial incentives to change physician behavior or enhance clinic profits were not included, as well as those not applicable to the Canadian health system.	achieve short-term recruitment goals. Effectiveness is dampened in the U.S. by opportunities to “buyout”. There is also less success in regards to long-term retention in programs that are not multi-dimensional, and focus exclusively on financial incentives.		

Appendix 3b: Reviews of Reviews

Articles are presented in reverse chronological order. Each of the following resources was an overview of systematic reviews – not a systematic review itself.

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
<p>Mbemba G et al. Factors Influencing Recruitment and Retention of Healthcare Workers in Rural and Remote Areas in Developed and Developing Countries: An Overview. Journal of Public Health in Africa. 2016</p>	<p>Synthesizes work looking at contextual factors impacting recruitment and retention in rural and remote areas, and identifies those relevant for developing countries.</p>	<p>Date range: January 1, 2000 to August 31, 2014</p> <p>Inclusion criteria: Publications were included if they were derived from a systematic review; involved health care professionals; reported on factors related to recruitment and retention in rural and/or remote areas; and were published in English or French.</p> <p>Exclusion criteria: Studies that were not reviews, not related to recruitment and retention of health care workers, did not concern rural and remote areas, or were published in other languages were not included.</p>	<p>Studies included: 15 reviews: four (4) focused on recruitment, four (4) focused on retention, and seven (7) focused on both.</p> <p>High-level findings:</p> <p><u>Recruitment:</u> The most important factors influencing recruitment were rural background and rural origin, followed by opportunities for career development.</p> <p><u>Retention:</u> Impacted by opportunities for professional advancement, professional support networks, and financial incentives (only mentioned in two reviews).</p> <p>An effective strategy for recruiting and retaining health professionals in developing countries is focusing on training for rural practice. There is little evidence regarding financial interventions such as loan repayment schemes and scholarships in developing countries.</p>	<p>The review was limited by heterogeneity and limited methodological quality of included studies.</p> <p>The limited number of reviews focused on recruitment and retention factors in developing countries make it difficult to explore differences between developing and developed countries.</p> <p>All factors identified and strategies highlighted will require additional evidence to support their implementation.</p>	
<p>Misfeldt R et al. Incentives for improving human resource outcomes in health care: overview of reviews. J Hlth Services</p>	<p>Examines incentives for improving health workforce outcomes to support evidence-based recruitment and retention</p>	<p>Date range: 2000-2012</p> <p>Inclusion criteria: Cochrane, systematic or narrative review of financial and nonfinancial incentives and their effectiveness for human resource outcomes for health care providers; focus on Canada, U.S., or publicly</p>	<p>Studies included: 13 reviews</p> <p>High-level findings: Financial incentives (including higher wages) may have a positive influence on job satisfaction, recruitment of providers and initial stages of retention, but effectiveness for retention declines after five years. Financial compensation is less effective than a</p>	<p>The quality of reviews varied, with some only including RCTs; others included qualitative studies or were not peer-reviewed.</p> <p>The authors' search strategy and inclusion criteria resulted in only half the incentives</p>	

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
Res & Policy. 2014. 19(1) 52-61	strategies generally (including but not limited to rural workforce).	funded health care systems of other high income countries. Reviews were included if they were rated as of moderate or high quality using the Assessment of Multiple Systematic Reviews tool. Exclusion criteria: Studies not meeting inclusion criteria.	positive work environment and other professional factors in retaining nurses. Financial compensation, scholarship schemes, loan repayment and other financial benefits are important elements in effective incentive packages for recruiting medical students and physicians to rural areas, but there is less evidence they are important for retention. The most promising strategies for improving job satisfaction and retention for health professionals in any setting are related to professional autonomy and work-life balance. Mixed evidence for the effects of clinical social support like stress management courses on outcomes (job satisfaction, retention, absenteeism). There is a positive relationship between supports for career and professional development and workforce outcomes. Mixed evidence on the effectiveness of restructuring staffing models and re-engineering work practices.	searched for being found; some reviews may have been missed.	
Mbemba G et al. Interventions for supporting nurse retention in rural and remote areas: an umbrella review. Human Resources for Health. 2013	Synthesizes current evidence on interventions to promote nurse retention in rural or remote areas.	Date range: January 1, 1990 – July 31, 2012 Inclusion criteria: - Derived from a systematic review - Involved nursing professionals - Assessed factors that influenced retention in rural or remote areas - Published in English, French, or Spanish	Studies included: Five (5) systematic reviews High-level findings: Important factors influencing nurse retention in rural and remote areas include supportive relationships, information and communication technologies support, and rural health career pathways. There is substantial evidence for financial-incentive programs to improve the distribution of human resources. However there is limited	Acceptable quality of reviews Varying strength of evidence for the four types of interventions for nurse retention in rural areas: - Education and continuous professional development (moderate) - Regulatory (low) - Financial incentives (low – moderate) - Personal and professional support (moderate – strong)	

Citation	Focus of review	Methods	Relevant findings	Limitations and quality of the evidence as reported by the author	Notes
		<p>Exclusion criteria: Studies were not included if they were not reviews, did not involve nurses, did not specifically concern rural or remote areas, or published in other languages</p>	<p>evidence on the impact on rural retention.</p> <p>There are four types of interventions:</p> <ul style="list-style-type: none"> - Education and continuous professional development - Regulatory - Financial incentives - Personal and professional support 	<p>Limited by the fact that only one review was focused in a low-resource country and the rest on the U.S. Additionally, the number of studies including nurses was not provided.</p>	
<p>Chopra M et al. Effects of policy options for human resources for health: an analysis of systematic reviews. Lancet. 2008. 371: 668-74.</p>	<p>Examines systematic reviews on the effects of policies affecting health care human resources.</p>	<p>Date range: January 1979 – September 2006</p> <p>Inclusion criteria: Systematic reviews published in English examining the effects of polices that could affect the training, distribution, regulation, financing, management, organization, or performance of health workers; included reviews must contain explicit selection criteria.</p> <p>Exclusion criteria: Studies not meeting inclusion criteria.</p>	<p>Studies included: 28 systematic reviews</p> <p>High-level findings related to recruitment and retention in rural areas: There is no reliable evidence to support compulsory service or financial assistance for training in return for rural service.</p> <p>There is low quality of evidence supporting the effectiveness of financial incentives to attract practitioners to rural areas; 29% remained in practice after eight years.</p>	<p>Findings from subsequent research and systematic reviews supplant findings from this article.</p>	<p>Covers all aspects of health worker human resources, not only recruitment and retention in rural areas.</p> <p>Goal of article is to identify policy options for LMICs, but evidence drawn mainly from higher income countries.</p>

Endnotes

- ¹ Marchand C, Peckham S. (2017). Addressing the crisis of GP recruitment and retention: a systematic review. *British Journal of General Practice*.
- ² Verma P et al. (2016). A systematic review of strategies to recruit and retain primary care doctors. *BMC Health Services Research*, 16:126.
- ³ Liu X et al. (2015). Analysis of context factors in compulsory and incentive strategies for improving attraction and retention of health workers in rural and remote areas: a systematic review. *Human Resources for Health*, 13:61.
- ⁴ Hempel S et al. (2015). *Rural Healthcare Workforce: A Systematic Review*. US Department of Veterans Affairs, Health Services Research & Development Service, Evidence-based Synthesis Program.
- ⁵ Grobler L et al. (2015). Interventions for increasing the proportion of health professionals practicing in rural and underserved areas. *Cochrane Database of Systematic Reviews*.
- ⁶ Buykx P et al. (2010). Systemic review of effective retention incentives for health workers in rural and remote areas: Towards evidence-based policy. *Aust J. Rural Health*, 18: 102-109.
- ⁷ Dolea C et al. (2010). *Evaluated strategies to increase attraction and retention of health workers in remote and rural areas*. Department of Human Resources for Health, World Health Organization.
- ⁸ Bärnighausen T, Bloom DE. (2009). Financial incentives for return of service in underserved areas: a systematic review. *BMC Health Services Research*, 9:86.
- ⁹ Wilson NW et al. (2009). A critical review of interventions to redress the inequitable distribution of healthcare professionals to rural and remote areas. *Rural and Remote Health*, 9:1060.
- ¹⁰ Willis-Shattuck M et al. (2008). Motivation and retention of health workers in developing countries: a systematic review. *BMC Health Services Research*.
- ¹¹ Sempowski IP. (2004). Effectiveness of financial incentives in exchange for rural and underserved area return-of-service commitments: systematic review of the literature. *Canadian Journal of Rural Medicine*.
- ¹² Mbemba G et al. (2016). Factors influencing recruitment and retention of healthcare workers in rural and remote areas in developed and developing countries: an overview. *Journal of Public Health in Africa*.
- ¹³ Misfeldt R et al. (2014). Incentives for improving human resource outcomes in health care: overview of reviews. *J Hlth Services Res & Policy*, 19(1) 52-61.
- ¹⁴ Mbemba G et al. (2013). Interventions for supporting nurse retention in rural and remote areas: an umbrella review. *Human Resources for Health*.
- ¹⁵ Chopra M et al. (2008). Effects of policy options for human resources for health: an analysis of systematic reviews. *Lancet*, 371: 668-74.
- ¹⁶ Bazemore A. personal communication, Director, Robert Graham Center, Washington, DC, December 18, 2017.
- ¹⁷ Foreign medical graduates can come to the United States on either a J1 training visa or an H1B work visa. The J-1 program allows for education in the United States. With a J-1 visa waiver, these providers can stay in the United States in return for three years of service in an underserved area. H-1B visas are initiated by employers and do not require such service. As the number of H-1B visas for all professions has grown, the proportion of foreign medical graduates here on a H-1B relative to those with J-1 waivers has grown. In 2014, about half of the 3,000 foreign physicians practicing in the United States had H-1B visas with the other half holding J-1s waivers. Coopey J et al. *FMB/J1 Visa Waiver Physicians*. Policy Paper. National Rural Health Association. February 2014. Accessed December 19, 2017 at <https://www.ruralhealthweb.org/getattachment/Advocate/Policy-Documents/FMG4.pdf.aspx?lang=en-US>. Bazemore A, personal communication, Director, Robert Graham Center, Washington, DC, December 18, 2017.