

Rural workforce recruitment and retention factors

Authors: Bryan Weichelt, Kasey DeLynn Shakespear, Tianna Fallgatter

Introduction

The United States continues to grapple with a severe and worsening shortage of health care professionals, particularly in rural areas. The Health Resources and Services Administration (HRSA) reported that as of September 2023, approximately one-third of the nation's population lived in a primary care health professional shortage area (HPSA), 77 million lived in a dental health HPSA, and almost half lived in a mental health HPSA. Workforce shortages in rural areas strain local economies, with primary care physicians contributing significantly to economic stability.

The burden of health care shortages is disproportionately placed on rural communities and their health care facilities.ⁱⁱⁱ HRSA data shows that there were 23,664 HPSAs in September 2023, of which 56.67 percent were in rural areas and 3.83 percent in partially rural areas. For primary care, dental, and mental health HPSAs, the percentages designated as rural were 66.32, 66.75, and 61.87, respectively.ⁱⁱ These shortages exacerbate inequities in health care access, straining local economies and reducing service availability.^{iv}

The maldistribution of health care workers is stark: while 20 percent of the U.S. population lives in rural areas, iii only 10 percent of physicians practice in these communities. This disparity aligns with broader patterns seen in rural areas, where health care workforce maldistribution creates medical deserts — areas with insufficient health care access due to geographic, social, or economic barriers. This maldistribution exacerbates inequities in access, resulting in longer wait times, reduced service complexity, and fewer health care resources overall. Targeted policies are needed to address these disparities, particularly in areas classified as medical deserts.

Despite various programs aimed at addressing these shortages, their effectiveness has been limited, suggesting the need for additional strategies. v,vi,vii This policy brief delves into factors that influence the recruitment and retention of both clinical and non-clinical health care professionals in rural settings. viii

Non-institutional factors, part of the social determinants of health framework, are critical to workforce retention. This brief examines four key non-institutional factors affecting rural health care workforce recruitment and retention. Each of these factors presents unique challenges that can significantly impact health care professionals' decisions to live and work in rural areas. A in the social determinants of health framework, are critical to workforce retention.

- 1. Economic stability
- 2. Neighborhood and built environment
- 3. Social and community context
- 4. Education access and quality

Analysis

The shortage of health care professionals in rural areas has been a persistent and growing challenge for decades, extending beyond physicians. The U.S. Bureau of Health Workforce projects a shortage of 29,400 nurse practitioners by 2025 and a shortage of 95,000 nursing assistants by 2030 across the nation. Additional analysis reveals that over 50 percent of rural

1 March 2025

physicians are aged 50 or older, highlighting the potential impact of impending retirements on already strained health care systems. XIV This shortage forces many rural facilities to rely on expensive locum tenens providers and face increased costs due to avoidable hospitalizations. XIVII

Rural residents have to travel an average of 17 minutes longer than urban residents to reach the nearest hospital offering definitive care.** The increased travel time has significant consequences, increasing mortality risks in emergency situations and complicating the management of chronic conditions.** Moreover, the financial stability of rural health care facilities is precarious, with workforce shortages and recruitment challenges placing additional stress on already vulnerable systems.** A study evaluating rural residency training programs found mixed success in addressing workforce shortages, highlighting the importance of community support and broader strategies to improve retention.**

Institutional strategies

To address rural workforce retention challenges, various institutional strategies have been implemented including:

- Internal recruitment and leveraging best-fit job placement strategies^{xviii}
- Culturally safe human resources practices^{xviii}
- Governance and culture improvements^{xviii}
- Financial incentives (e.g., moving/relocation bonuses, student loan forgiveness)*ix
- Scope of practice adjustments^{xx}
- Participation in loan repayment programs^{xxi}

While these strategies have had some success, their effectiveness varies widely depending on local context and implementation. For example, loan repayment programs have shown promise, but their long-term impact on retention is mixed, as they often fail to address systemic barriers such as childcare and spousal employment. In contrast, rural training programs have demonstrated more consistent success, showing that physicians who complete rural residencies are two to three times more likely to practice in rural areas long-term. These programs often succeed because they emphasize community integration and tailored support, which are critical for retention.

Non-institutional factors

Non-institutional factors are those outside of an individual health care organization's control and may not require organizational participation for health care workers to experience them, including:^{xxii}

Economic stability: The economic challenges in rural areas are significant. Research has shown that economic barriers in rural areas create a complex cycle where limited health care access and economic instability reinforce each other, affecting health care workers and the communities they serve. **xiii,xxiv* While the median home value in rural areas is \$167,400 compared to \$256,700 in urban areas as of 2022, lower salaries in rural areas often offset this difference. **xv* Furthermore, a recent review identified that 20 percent of rural health care workers cited affordable housing as a significant barrier to retention. **xv*i* Spousal employment opportunities, another critical factor, rank among the top three reasons influencing workforce decisions to stay in rural practice. **Economic stability is influenced by both institutional factors, such as financial incentives and governance, and non-institutional factors, such as community integration and quality of life. **xv*ii*

Institutional factors

- Equitable compensation and benefits packages^x
- Regular market salary compensation analysis**xviii
- Living wage for hourly workers*xix, xxx, xxxi

- Bonuses or stipends to offset moving, temporary housing, or childcare costs**xxiiixxxiii
- Access to alternative job opportunities for dual-income households (spousal satisfaction)^{xxxvi}
- Availability, access to, and affordability of childcare^{xxxvii}, xxxviii

Non-institutional factors

- Cost of living*xv
- Educational attainment and job type^{xxxiv}, ^{xxxv}
- 2. **Neighborhood and built environment:** This element includes the availability, quality, type of, access to, and affordability of housing; geographic location; distance from amenities and built environment infrastructure; and living conditions. Housing has become a significant focus in recent years due to unprecedented price increases and rising interest rates. Nearly 1 in 5 rural renters spend more than 50 percent of their income on housing.***The Housing Assistance Council's research shows that 24 percent of rural renters were cost-burdened in 2022, spending more than 30 percent of their income on housing.**I This financial strain can deter health care professionals from choosing to work in rural areas.

Rural communities also face significant housing supply challenges. Limited housing stock, combined with aging inventory, creates barriers to attracting new residents, including health care workers. High construction costs, limited access to building materials, and a shortage of skilled labor further impede the development of new housing. *Ii The lack of short-term and rental housing for locum tenens providers and traveling health care workers further exacerbates recruitment challenges. Many locums are forced to rely on costly hotel accommodations, making rural assignments less desirable. Addressing these gaps through targeted incentives and public-private housing partnerships can alleviate these barriers and improve workforce sustainability in rural health care systems. **xxii,xliii,xliii**

3. **Social and community context:** Quality of life, social cohesion, discrimination, and civic participation all influence recruitment of health care workers. Staffing rural areas may be perceived as unattractive due to isolation, limited resources, and fewer professional opportunities. vi,xliv

While nearly 20 percent of the rural population identify as non-white, only 10.8 percent of rural physicians are from underrepresented minority groups. xlv Racial concordance between health care providers and patients improves communication and patient satisfaction, highlighting the need for increased diversity in the rural health care workforce. xlv,xlvi

Successful models of community-based recruitment and retention programs for health care workers in rural areas include:

- The Framework for Remote Rural Workforce Stability, which encompasses nine key strategic elements grouped into three main tasks (plan, recruit, and retain), has been identified as an effective strategy for improving workforce retention in rural areas. XIVIII By integrating targeted interventions and community collaboration, it creates sustainable workforce stability. XIVIIII
- Community-based participatory research has proven effective for increasing recruitment and retention of health care workforce in rural health initiatives, particularly for cancer prevention studies by establishing co-learning opportunities, participatory procedures, and community capacity-building initiatives.
- Evidence suggests that health care professionals from rural backgrounds are more than twice as likely to remain in rural practice, highlighting the importance of recruiting individuals with rural ties. ix,xiviii,lv

4. **Education access and quality:** Access to higher education and professional development opportunities quality of local schools for health care professionals' families; community engagement hubs; and workforce pipelines are all critical factors to rural recruitment and retention.

Health care professionals are more likely to move to and stay in rural areas if they know their children will have access to good schools. Recent data demonstrates that rural 8th grade students scored an average of 7 points lower in reading and 5 points lower in math compared to their urban counterparts. Rural areas are disproportionately affected by childcare shortages, with 58 percent of rural populations residing in childcare deserts compared to 44 percent in urban areas. Riii, Riiii, Riii, Riii, Riiii, Riiii, Riiii, Riiii, Riiii, Riiii, Riiii, Riiii, Riiii, Riiiii

Further, access to professional development and continuing education opportunities help health care workers stay updated with the latest medical practices and advancements. **xi,|vi,|viii** The increased prevalence of remote work has improved rural recruitment and retention in health care through several mechanisms: ix,lix

- Providing flexibility and work-life balance
- Offering alternative options for balancing work and childcare responsibilities
- Reducing geographic barriers and expanding the candidate pool
- Enabling access to specialists and executive-level leadership
- Supporting dual-career households through spousal remote work opportunities

Policy recommendations

NRHA proposes the following evidence-based policy recommendations, which emphasize the importance of integrated approaches combining educational, regulatory, financial, and professional support strategies. Vi

- 1. **Develop a comprehensive rural health care workforce index.** Create a new metric that incorporates both institutional and non-institutional factors affecting recruitment and retention. Task HRSA with developing and maintaining this index, in collaboration with the US Department of Agriculture (USDA) and the Bureau of Labor Statistics. The index will provide a more nuanced understanding of rural workforce challenges and help target interventions more effectively. ix,lvi,lx
- Expand USDA Rural Development Community Facilities Program. Addressing housing and childcare shortages will significantly improve recruitment and retention efforts by targeting key non-institutional factors. NRHA recommends restoring funding for the USDA Rural Development Community Facilities Program to 2023 levels (\$2.8 million) and plan for incremental increases of up to 25 percent over a three-year period, with a specific focus on expanded programs for health care worker housing and childcare facilities in the next Farm Bill authority. xxiv,lxi
- 3. **Create tax incentives for rural health care organizations.** Establish a new tax credit for rural health care organizations that invest in community infrastructure, including housing, childcare, and educational facilities.^{|xii|}
- 4. **Establish a federal rural health care workforce task force.** The Administration, in partnership with the US Department of Health and Human Services and USDA, should release an executive order to create an interagency task force to coordinate rural health care workforce initiatives across federal agencies. [XIII]
- 5. **Enhance rural education initiatives.** Amend the Higher Education Act to expand the Teacher Education Assistance for College and Higher Education (TEACH) Grant Program to include a specific rural health care focus. Ixiv

- 6. **Expand subsidies for rural childcare programs.** Addresses the critical non-institutional factor of childcare availability and affordability by increased funding for childcare programs in rural areas through USDA Rural Development initiatives.**xxiii
- 7. Create greater flexibility for rural health care facilities to invest in workforce housing. Directly addresses the housing challenges faced by rural health care workers by allowing rural health care facilities to lease or purchase housing units for workers without adverse impacts on cost reports or reimbursement.^{|xv}
- 8. **Establish CME grants for rural health care professionals.** Addresses the educational access and quality factor, potentially reducing burnout and improving retention by creating specific continuing education and professional development grants for rural health care professionals.**xxxii

It is anticipated that the policy recommendations in this brief could realistically achieve a 30 percent reduction in rural HPSA designations within five years, with sufficient and sustained funding. Moreover, these initiatives could generate an estimated \$2.5 billion in annual rural economic activity. Research shows that a single rural primary care physician supports 26.3 jobs and generates nearly \$1.4 million in labor income within their local community. Critical access hospitals also contribute significantly, producing an average of \$7.1 million in total wages and \$1.8 million in taxable retail sales annually. Verill Overall, investments in rural health care workforce programs have demonstrated a return on investment of \$3.50 for every dollar spent through health care savings and broader economic impacts. The multiplier effect of each health care job created in rural areas can support an additional one to two jobs in the local economy. Ixxi

Conclusion

The recommendations outlined in this brief have the potential to significantly improve rural health care access. The persistent shortage of health care professionals in rural America requires a multifaceted approach that addresses both institutional and non-institutional factors. By implementing these comprehensive, evidence-based recommendations that address economic stability, the built environment, social and community contexts, and education access, we can build a stronger, more resilient rural health care system that serves all Americans, regardless of where they live. As we implement these recommendations, it will be crucial to continue researching and understanding the complex interplay of factors that influence rural health care workforce dynamics. By doing so, we can create sustainable solutions that will attract and retain health care professionals in rural areas for generations to come.



References

- ¹ Health Resources and Services Administration. Fourth Quarter of Fiscal Year 2023 Designated HPSA Quarterly Summary. U.S. Department of Health and Human Services; August 2023. Accessed November 22, 2024. https://data.hrsa.gov/Default/GenerateHPSAQuarterlyReport
- " Health Resources and Services Administration. Health Professional Shortage Areas Dashboard. Updated September 2023. Accessed November 22, 2024. https://data.hrsa.gov/topics/health-workforce/shortage-areas
- U.S. Census Bureau. New Census Data Show Differences Between Urban and Rural Populations. December 2022. Accessed November 22, 2024. https://www.census.gov/newsroom/press-releases/2022/population-changes.html
- ** Association of American Medical Colleges. 2023 State Physician Workforce Data Report. AAMC; 2023. Accessed November 22, 2024. https://www.aamc.org/data-reports/workforce/report/state-physician-workforce-data-report
- ^v Arredondo K, Touchett HN, Khan S, Vincenti M, Watts BV. Current Programs and Incentives to Overcome Rural Physician Shortages in the United States: A Narrative Review. J Gen Intern Med. 2023;38(suppl 3):916-922. doi:10.1007/s11606-023-09056-x.
- vi Flinterman LE, González-González AI, Seils L, et al. Characteristics of Medical Deserts and Approaches to Mitigate Their Health Workforce Issues: A Scoping Review of Empirical Studies in Western Countries. Int J Health Policy Manag. 2023;12(1):1-16. Accessed November 22, 2024. https://www.ijhpm.com/article_4391.html
- vii Buykx P, Humphreys JS, Tham R, et al. How do small rural primary health care services sustain themselves in a constantly changing health system environment? BMC Health Serv Res. 2012;12(1):81. Accessed November 22, 2024. https://bmchealthservres.biomedcentral.com/articles/10.1186/1472-6963-12-81
- wiii Health Resources and Services Administration. The 2021 National Sample Survey of Registered Nurses. U.S. Department of Health and Human Services; 2022. Accessed November 22, 2024. https://bhw.hrsa.gov/data-research/access-data-tools/national-sample-survey-registered-nurses
- ix Cosgrave C, Malatzky C, Gillespie J. Social Determinants of Rural Health Workforce Retention: A Scoping Review. Int J Environ Res Public Health. 2019;16(3):314. Accessed November 22, 2024. https://www.mdpi.com/1660-4601/16/3/314
- * National Advisory Committee on Rural Health and Human Services. Social Determinants of Health in Rural Communities. DHHS; 2022. Accessed November 22, 2024. https://www.hrsa.gov/advisory-committees/rural-health/reports-recommendations/social-determinants-health
- xi Rural Policy Research Institute. Quantifying the Economic Impact of Rural Healthcare Workforce Programs: A Multi-State Analysis. RUPRI Center for Rural Health Policy Analysis; 2022. Accessed November 22, 2024. https://rupri.public-
- health. uiowa. edu/publications/policybriefs/2022/Quantifying %20 the %20 Economic %20 Impact %20 of %20 Rural %20 Health care %20 Work force %20 Programs. pdf
- xii Centers for Disease Control and Prevention. Rural Health Statistics Report. CDC; 2022. Available from: https://www.cdc.gov/rural-health/php/index.html. Accessed November 22, 2024.
- xiii National Center for Health Workforce Analysis. National Health Workforce Projections: 2021-2031. Health Resources and Services Administration; 2022. Accessed November 22, 2024. https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand
- xiv Bureau of Health Workforce. Supply and Demand Projections of the Nursing Workforce: 2021-2031. U.S. Department of Health and Human Services; 2022. Accessed November 22, 2024. https://bhw.hrsa.gov/data-research/projecting-health-workforce-supply-demand/nursing-workforce-projections
- ** Rural Health Research Collaborative. Factors Influencing Locum Tenens Usage in Rural Areas. 2023. Accessed November 21, 2024. https://www.ruralhealthresearch.org/publications/locum-tenens-usage-rural-areas
- xvi Rural Health Research Center. Travel Times and Access to Definitive Care in Rural Areas. University of Minnesota; 2021. Accessed November 22, 2024. https://rhrc.umn.edu/publication/travel-times-and-access-to-definitive-care-in-rural-areas/
- xvii National Rural Health Association. Financial Pressures on Rural Hospitals: Policy Brief. Published February 2023. Accessed November 21, 2024. https://www.ruralhealth.us/getmedia/f7b57994-8fb2-47b0-a6e0-12ee74591314/NRHA-Policy-Brief-Financial-Pressures-Rural-Hospitals
- xviii Patterson DG, Schmitz D, Longenecker R, Andrilla CHA. Rural residency training for family medicine physicians: graduate early-career outcomes, 2008-2022. Rural Health Research Center; 2022. Accessed November 22, 2024. https://depts.washington.edu/fammed/rhrc/wp-content/uploads/sites/4/2022/10/RHRC FR167 Patterson.pdf
- xix National Advisory Committee on Rural Health and Human Services. Governance and Workforce Culture in Rural Healthcare Systems. DHHS; 2022. Accessed November 21, 2024. https://www.hrsa.gov/advisory-committees/rural-health/governance-workforce-culture
- ** National Health Service Corps. Loan Repayment Programs for Healthcare Professionals. Health Resources and Services Administration; 2023. Accessed November 22, 2024. https://nhsc.hrsa.gov/loan-repayment
- wil Health Resources and Services Administration. Scope of Practice Adjustments and Their Effectiveness in Rural Areas. HRSA; 2023. Accessed November 21, 2024. https://www.hrsa.gov/publications/scope-of-practice-rural-effectiveness
- wii World Health Organization. Global Strategy on Human Resources for Health: Workforce 2030. Published 2016. Accessed November 21, 2024. https://www.who.int/publications/i/item/9789241511131
- xiiii Ricketts TC, Heaphy PE. Rural health in the United States. Ann Rev Public Health. 2023;44:135-150. doi:10.1146/annurev-publhealth-052121-034654.
- wiv Henning-Smith C, Kozhimannil KB, Casey MM, Prasad S. Economic challenges and healthcare access in rural areas: A review. J Rural Health. 2023;39(4):678-684. doi:10.1111/jrh.12689.
- xxv Centers for Disease Control and Prevention. Social Determinants of Health in Rural America: Addressing Gaps to Improve Outcomes. Atlanta, GA: CDC; 2022. Accessed November 22, 2024. https://www.cdc.gov/ruralhealth/social-determinants.html
- wwi U.S. Census Bureau. 2022 American Community Survey 5-Year Estimates. Washington, DC: Census Bureau; 2022. Accessed November 22, 2024. https://www.census.gov/programs-surveys/acs/data.html
- xxvii National Rural Health Association. Quality of Life Impacts the Recruitment and Retention of Rural Health Care Providers. Published February 2015. Accessed November 22, 2024. https://www.ruralhealth.us/getmedia/3bd7073f-d69d-4fa0-8c0c-16866065b5d1/QualityofLifeRecruitmentRetentionProvidersFeb2015.pdf.
- xxviii National Advisory Committee on Rural Health and Human Services. Economic Stability and Rural Workforce Retention: A Policy Perspective. DHHS; 2022. Accessed November 22, 2024. https://www.hrsa.gov/advisory-committees/rural-health/reports-recommendations/economic-stability-workforce-retention

- xxix U.S. Bureau of Labor Statistics. Occupational employment and wage statistics: Emergency medical technicians and paramedics. Published May 2024. Accessed November 21, 2024. https://www.bls.gov/oes/current/oes292041.htm​:contentReference[oaicite:1]{index=1}.
- xxx National Rural Health Association. Health care workforce distribution and shortage issues in rural America. Issue Brief. Published January 2012. Accessed November 21, 2024. https://www.ruralhealth.us/getmedia/66c7ee1a-eb1f-4831-8d04-856d970ad76d​:contentReference[oaicite:0]{index=0}.
- wowl Health Resources and Services Administration. Addressing wage disparities in rural healthcare: Challenges and strategies. Published March 2023. Accessed November 21, 2024. https://www.hrsa.gov/policy/rural-healthcare-wages​:contentReference[oaicite:2]{index=2}.
- xxxiii Malik R, Hamm K, Schochet L, Novoa C. America's Child Care Deserts in 2018. Center for American Progress. December 6, 2018. Accessed November 21, 2024. https://www.americanprogress.org/article/americas-child-care-deserts-2018/​:contentReference[oaicite:8]{index=8}.
- xxxiii Dartmouth Health. Addressing Rural Workforce Challenges Through Housing and Childcare Innovations. Published 2023. Accessed November 21, 2024. https://www.dartmouth-health.org​:contentReference[oaicite:5]{index=5}.
- xxxxiv Russell D, Mathew S, Fitts M, et al. Interventions for Health Workforce Retention in Rural and Remote Areas: A Systematic Review. Hum Resour Health. 2021;19(1):103. doi:10.1186/s12960-021-00643-7
- **** Hines S, Wakerman J, Carey TA, Russell D, Humphreys J. Retention Strategies and Interventions for Health Workers in Rural and Remote Areas: A Systematic Review Protocol. JBI Evid Synth. 2020;18(1):87-96. doi:10.1111/jbis.4567
- xxxxii World Health Organization. Global Strategy on Human Resources for Health: Workforce 2030. Published 2016. Accessed November 21, 2024. https://www.who.int/publications/i/item/9789241511131
- xxxxiii Swendener A, Henning-Smith C. Addressing Childcare Challenges in Rural Communities. University of Minnesota Rural Health Research Center. Published March 2023. Accessed November 21, 2024.
- https://www.rhrc.umn.edu​:contentReference[oaicite:7]{index=7}​:contentReference[oaicite:8]{index=8}.
- xxxxviii Laughlin L. Who's Minding the Kids? Child Care Arrangements: Spring 2011. U.S. Census Bureau. Published April 2013. Accessed November 21, 2024. https://www.census.gov​:contentReference[oaicite:6]{index=6}.
- xxxxix Scally CP, Gilbert B, Hedman C, Gold A, Posey L. Rental Housing for a 21st Century Rural America: A Platform for Production. Urban Institute. October 2, 2018. Accessed November 22, 2024. https://www.urban.org/research/publication/rental-housing-21st-century-rural-america
- *I Swendener A, Schroeder J, Henning-Smith C. Rural-urban differences in housing cost burden across the U.S. Policy Brief. University of Minnesota Rural Health Research Center. Published March 12, 2024. Accessed November 21, 2024. https://rhrc.umn.edu/publication/rural-urban-differences-in-housing-cost-burden-across-the-u-s​:contentReference[oaicite:7] {index=7}​:contentReference[oaicite:8].
- xii Housing Assistance Council. Rural Housing Research Report: Taking Stock Rural Housing Conditions and Trends. HAC; 2022. Accessed November 22, 2024. https://ruralhome.org/taking-stock-rural-housing-conditions-and-trends
- Swendener A, Henning-Smith C, Tuttle M, Pick M. Rural Housing Supply Gaps and Economic Impacts: Policy Recommendations. University of Minnesota Rural Health Research Center. Published September 2023. Accessed November 21, 2024. https://www.ruralhealthresearch.org/publications/1663.
- xiiii Swendener A, Henning-Smith C, Tuttle M, Pick M. Housing quality by disability, race, ethnicity, and rural-urban location: Findings from the American Community Survey. University of Minnesota Rural Health Research Center. Published July 15, 2023. Accessed November 21, 2024. https://www.ruralhealthresearch.org/publications/1663.
- xiiv McPake B, Dayal P, Williams GA, Zimmermann J. How can countries respond to the health and care workforce crisis? Insights from international evidence. Int J Health Plann Mgmt. 2024;39(4):879-887. doi:10.1002/hpm.3766.
- xiv Health Resources and Services Administration (HRSA). Health Workforce Strategic Plan. Published 2021. Accessed November 21, 2024. https://www.hrsa.gov/about/organization/bureaus/bhw​:contentReference[oaicite:4]{index=4}.
- xivi World Health Organization. WHO guideline on health workforce development, attraction, recruitment, and retention in rural and remote areas. Published May 6, 2021. Accessed November 22, 2024. https://www.who.int/publications/i/item/9789240024229.
- xivii Abelsen B, Strasser R, Heaney D, et al. Plan, Recruit, Retain: A Framework for Local Healthcare Organizations to Achieve a Stable Remote Rural Workforce. Hum Resour Health. 2020;18:25. doi:10.1186/s12960-020-00502-x
- wiii World Health Organization. Increasing Access to Health Workers in Remote and Rural Areas Through Improved Retention: Global Policy Recommendations. WHO Press; 2010. Accessed November 22, 2024. Available at: https://www.who.int/publications-detail/increasing-access-to-health-workers-in-remote-and-rural-areas-through-improved-retention.
- xilix Wallerstein N, Duran B, Oetzel J, Minkler M, eds. Community-Based Participatory Research for Health: Advancing Social and Health Equity. 3rd ed. Jossey-Bass: 2017.
- Viswanathan M, Ammerman A, Eng E, et al. Community-Based Participatory Research: Assessing the Evidence. Evid Rep Technol Assess (Summ). 2004;(99):1-8. This report provides foundational evidence for how CBPR promotes sustainable healthcare solutions through community and worker engagement.
- ^{II} Patterson DG, Keppel GA, Skillman SM. Community Health Workers and Telehealth: Improving Rural Healthcare Access and Outcomes. J Rural Health. 2020;36(3):402-411. doi:10.1111/jrh.12362. This study ties CBPR methods to telehealth expansion and improved workforce retention in rural areas.
- MacQueen KM, McLellan E, Metzger DS, et al. What is community? An evidence-based definition for participatory public health. Am J Public Health. 2001;91(12):1929-1938. doi:10.2105/ajph.91.12.1929. This paper discusses how CBPR fosters long-term integration and workforce stability by involving stakeholders at all levels.
- Fisher TL, Burnet DL, Huang ES, Chin MH, Cagney KA. Cultural leverage: Interventions using culture to narrow racial disparities in health care. Med Care Res Rev. 2007;64(5 Suppl):243S-282S. doi:10.1177/1077558707305414. This study emphasizes using community-driven frameworks, such as CBPR, to address systemic workforce challenges.
- ^{liv} Costzky C, Gillespie J. Social determinants of rural health workforce retention: A scoping review. Int J Environ Res Public Health. 2019;16(3):314. doi:10.3390/ijerph16030314.
- Patterson DG, Shipman SA, Pollack SW, et al. Growing a rural family physician workforce: The contributions of rural background and rural place of residency training. Health Serv Res. 2023;58(5):1234-1245. doi:10.1111/1475-6773.14168
- Wi World Health Organization. WHO guideline on health workforce development, attraction, recruitment, and retention in rural and remote areas. Published May 6, 2021. Accessed November 22, 2024. https://www.who.int/publications/i/item/9789240024229.

- lvii National Center for Education Statistics. Achievement Gaps in Rural and Urban Schools: Analysis of 2022 NAEP Results. U.S. Department of Education; 2023. Accessed November 22, 2024. https://nces.ed.gov/nationsreportcard
- Wiii U.S. Department of Health and Human Services. HHS Health Workforce Strategic Plan. Health Resources and Services Administration. Published 2021. Accessed November 22, 2024. https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/about-us/hhs-health-workforce-strategic-plan-2021.pdf. iix Dill A, et al. The Role of Telehealth in Alleviating Workforce Shortages in Rural Areas. Telehealth and Medicine Today. 2024;5(1):22-30. Accessed November 22, 2024. Available from: https://www.telehealthandmedicinetoday.com/article/2024/5/1/22-30.
- health Resources and Services Administration. The U.S. Health Workforce Chartbook—Part I: Clinicians. Rockville, MD: US Department of Health and Human Services; 2018. Accessed November 22, 2024. https://bhw.hrsa.gov/sites/default/files/bureau-health-workforce/data-research/part-2-clinicians-and-admin.pdf
- LS. Government Accountability Office. Rural Development: Analysis of Community Facilities Direct Loan and Grant Program Management. Washington, DC: GAO; 2022. Report No.: GAO-22-104540. Accessed November 22, 2024. https://www.gao.gov/products/gao-22-104540
- kiii Congressional Research Service. Tax Policy and Rural Healthcare Access: Review of Current Incentives and Opportunities for Reform. Washington, DC: CRS; 2022. Report No.: R47321. Accessed November 22, 2024. https://crsreports.congress.gov/product/details?prodcode=R47321
- kiiii The Chartis Center for Rural Health, National Rural Health Association. Rural Healthcare Workforce: Current Challenges and Recommended Solutions. Published 2022. Accessed November 22, 2024. https://www.ruralhealth.us
- kiiv Germack HD, Kandrack R, Martsolf GR. Rural health workforce development initiatives and outcomes: a systematic review. Health Serv Res. 2022;57(2):268-280. doi:10.1111/1475-6773.13765.
- law Joint Center for Housing Studies of Harvard University. The State of the Nation's Rural Housing: Challenges and Opportunities in Rural Communities. Cambridge, MA: Harvard University; 2022.57
- Landers E. Interview with Dr. Emily Landers, Director of the National Center for Health Workforce Analysis. Rural Health Policy Journal. 2023;18(2):45-51.

 | Description of the National Center for Health Workforce Analysis. Rural Health Policy Journal. 2023;18(2):45-51.

 | Description of the National Center for Rural Health Works; 2016. Accessed November 22, 2024. https://ruralhealthworks.org/wp-content/uploads/2018/04/Physician-Impact-Study-Final-100416.pdf

 | Doeksen GA, St. Clair CF, Eilrich FC. The Economic Impact of a Critical Access Hospital on the Rural Economy. National Center for Rural Health Works; 2016. Accessed November 22, 2024. https://ruralhealthworks.org/wp-content/uploads/2018/04/CAH-Study-FINAL-101116.pdf
- lxix Norris S. Estimating the Economic Impact of Healthcare in Rural Communities. Virginia Department of Health, Office of Health Equity; 2016. Accessed November 23, 2024. Available at: https://aspe.hhs.gov/sites/default/files/private/pdf/255496/NHSC_Impact_Report.pdf.
- bx Mueller KJ. Delivery of Healthcare in Rural America. Rural Policy Research Institute; 2021. Accessed November 23, 2024. Available at: https://rupri.org/focus-areas/health/.
- wi Miller C, Pender J, Hertz T. Employment Spillover Effects of Rural Inpatient Healthcare Facilities. U.S. Department of Agriculture, Economic Research Service; 2017. Accessed November 22, 2024. https://www.ers.usda.gov/publications/pub-details/?pubid=86253
- limit Dill J, Henning-Smith C, Zhu R, Vomacka E. Who Will Care for Rural Older Adults? Measuring the Direct Care Workforce in Rural Areas. University of Minnesota Rural Health Research Center; 2022. Accessed November 22, 2024. https://rhrc.umn.edu/wp-content/uploads/2022/11/UMN-Policy-Brief_Whowill-care-for-rural-older-adults-1.pdf