THE IMPACT OF FAMILY PHYSICIANS ON RURAL COMMUNITIES

An Annotated Bibliography

Robert Graham Center

Haley Porter

Yalda Jabbarpour, MD MPH

Table of Contents

Introduction

The rural workforce shortage has been well documented in the literature for some time. This annotated bibliography will be informative for policy makers and committee members by showing evidence for the impact of a rural family physician on their communities both inside and outside of clinic walls. It was also discuss the shortages, composition, and challenges of the rural primary care workforce. Lastly, it will cover research related to attracting and retaining rural family physicians to rural communities. This annotated bibliography was constructed through a focused literature review of relevant PubMed articles and will serve as an entry point to educate policy makers on the impacts of rural family physicians, workforce challenges, and strategies to increase the rural family physician workforce.

This bibliography contains three major sections: rural community impacts, rural workforce and challenges, and recruitment and retention. Part one includes the subtopics of access to care, scope of practice and economic and community contributions. Part two includes shortages, physician demographics, and barriers to choosing rural practice. Part three includes strategies and incentives to attract and retain family physicians to rural communities. The analysis underlines why family physicians are an important component of rural communities, describes challenges within the rural workforce, and how we can increase the rural workforce for generations to come as this is essential for health of rural populations in the United States.

Part 1: Rural Community Impacts

Access to Care

Tong ST, Eden AR, Morgan ZJ, Bazemore AW, Peterson LE. The Essential Role of Family Physicians in Providing Cesarean Sections in Rural Communities. J Am Board Fam Med. 2021 Jan-Feb;34(1):10-11. doi: 10.3122/jabfm.2021.01.200132. PMID: 33452077

Tong et al. describes the importance of having local obstetric services in rural communities. This is associated with lower perinatal morbidity and mortality and decreased health care utilization and cost. Of family physicians who perform cesarean section as the primary surgeon, 57.3% did so in a rural county and 38.6% did so in a county without any obstetrician/gynecologists. Having more family physicians who provide obstetric care could improve obstetric outcomes, prevent the closing of obstetric units, and fill "obstetrical desert" gaps in rural communities.

Waits JB, Smith L, Hurst D. Effect of Access to Obstetrical Care in Rural Alabama on Perinatal, Neonatal, and Infant Outcomes: 2003-2017. Ann Fam Med. 2020 Sep;18(5):446-451. doi: 10.1370/afm.2580. PMID: 32928761; PMCID: PMC7489970

Waits et al. compared county level data in rural Alabama counties with labor and delivery (L&D) units and those without them from the year 2003-2017. In counties with no obstetrical care, the infant mortality rate was 9.23 per 1,000 live births compared to counties with continuous access to obstetrical units was 7.89. The percentage of babies with low birth rate was 10.61% in counties with no obstetrical care and 9.86% in counties with continuous access. The perinatal mortality rate in counties with no L&D services was 10.82 per 1,000 still + live births compare with 8.89 in counties with an active L&D. The neonatal mortality rate was 5.67 per 1,000 live births in counties with no L&D versus 4.74 in counties with L&D services. Infant outcomes were improved with access to obstetrical services and family physicians are often the doctors providing this care in rural communities.

Peterson LE, Dodoo M, Bennett KJ, Bazemore A, Phillips RL Jr. Nonemergency medicine-trained physician coverage in rural emergency departments. J Rural Health. 2008 Spring;24(2):183-8. doi: 10.1111/j.1748-0361.2008.00156.x. PMID: 18397454

Peterson et al. aim to describe the composition of the emergency physician workforce by county and how this changes with rurality using the 2003 Area Resource File, Medicare Part B Physician/Supplier Limited Data Set, and the Rural-Urban Continuum Code to assess rurality. The likelihood of seeing an emergency medicine physician decreases 5-fold as rurality increased. Being seen by a family physician in the emergency department increased by 7-fold as rurality increases. Family physicians provide a large amount of emergency care in rural communities across the U.S, so it is important for family physician to be competent in high-quality emergency care.

Jensen EJ, Mendenhall T, Futoransky C, Clark K. Family Medicine Physicians' Perspectives Regarding Rural Behavioral Health Care: Informing Ideas for Increasing Access to High-Quality Services. J Behav Health Serv Res. 2021 Oct;48(4):554-565. doi: 10.1007/s11414-021-09752-6. Epub 2021 Apr 6. PMID: 33825160; PMCID: PMC8023776

Decreased access to behavioral health care in rural communities places family physicians on the front lines in addressing these barriers. Jensen et al. explores these barriers and designed a qualitative study interviewing rural family medicine physicians to develop more ideas in overcoming challenges for rural behavioral health care. Many of the family physicians noted that their unique role in treating the whole family often times resulted in awareness off family dynamics and stressor that impact their patients' behavioral health. Increasing training in behavioral health, medication management, providers and resources would ease some of the difficulties FPs experience.

Scope of Practice

Nasim U, Morgan ZJ, Peterson LE. The Declining Scope of Practice of Family Physicians Is Limited to Urban Areas. J Rural Health. 2021 Sep;37(4):734-744. doi: 10.1111/jrh.12540. Epub 2020 Nov 26. PMID: 33244807.

Nasim et al. discuss the concern of family physician's (FPs) scope of practice decreasing across urban and rural counties using county-level data from Area Health Resources File, Rural Urban Continuum Codes, and scope of practice scores. Declining scope of practice was found to be largely an urban phenomenon; however, persistent poverty in a county (that increases as rurality increases) was associated with decreased scope of practice likely reflecting decreased access to health care in these populations. Also, the study found an increased scope of FP practice in counties with more primary care physicians, specialists, and working with a PA. Reasoning could be due to competition for patients or the ability or FPs to do more with the safety net of specialists taking up care. More NPs in a county was associated with a lower scope. Multiple factors contribute to scope of practice, but overall, the decreasing scope of practice for FPs was only significant for urban FPs.

Skariah JM, Rasmussen C, Hollander-Rodriguez J, Carney PA, Dexter E, Waller E, Eiff MP. Rural Curricular Guidelines Based on Practice Scope of Recent Residency Graduates Practicing in Small Communities. Fam Med. 2017 Sep;49(8):594-599. PMID: 28953290

Skariah et al. surveyed family medicine graduates 18 months after residency between 2007 and 2014. Compared to graduates in larger communities, those practicing in small communities were more likely to report a broader scope of clinical practice including: adult hospital care (59% vs 35%), vaginal deliveries (23% vs 12%), C sections as primary surgeon (14% vs 5%) and assistant (21% vs 8%), newborn hospital care (45% vs 24%), and procedures such as endometrial biopsy (46% vs 33%), joint injections and aspirations (89% vs 79%), and fracture care (58% vs 42%). Additionally, physicians practicing in smaller communities engaged more in

assessing community health needs (78% vs 64%) and developing community interventions (67% vs 51%) compared to graduates in larger communities; however, graduates in small communities were less likely to have integrated behavioral health (26% vs 46%) and case management support (37% vs 52%). Rural practice curriculums in residency should reflect the training necessary to deliver care focused on the needs of rural populations.

Edwards JK, Norris TE. Colonoscopy in rural communities: can family physicians perform the procedure with safe and efficacious results? J Am Board Fam Pract. 2004 Sep-Oct;17(5):353-8. doi: 10.3122/jabfm.17.5.353. PMID: 15355949

Colonoscopies are effective preventive screening procedures to diagnose and/or treat colon cancer. Edwards and Norris discuss the importance of family physicians (FPs) ability to perform colonoscopies to improve health outcomes in rural communities since the majority of rural doctors are FPs and geography presents challenges in reaching a larger city for the procedure. Data was collected prospectively on 200 consecutive colonoscopy procedures performed by FPs over a two year period. The benchmarks of success included ability to reach the cecum greater than 90% of the time, completion in a reasonable amount of time, and ability to find and diagnose all significant pathologic lesions all with minimal risk of complications and patient discomfort. The FPs all succeed in these benchmarks of quality showing that adequately trained FPs can provide safe and competent colonoscopies in rural settings.

Economic and Community Contributions

Doeksen, G. A., Clair, C. F. S., & Eilrich, F. C. 2016 October. Economic Impact of Rural Health Care. 9. http://ruralhealthworks.org/wp-content/uploads/2018/04/Summary-Economic-Impact-Rural-Health-FINAL-100716.pdf

According to Doeksen et al. fourteen percent of total employment in rural communities is attributed to the health sector. Furthermore, one rural primary care physician generates direct clinic employment impact of five jobs with $0.4 million in wages, salaries, and benefits and direct hospital employment impact of 14.5 jobs with $0.7 million in wages, salaries, and benefits. The total direct impacts of a rural primary care physician are 19.5 jobs with $1.2 million in wages, salaries, and benefits. Total impact of a rural primary care physicians (direct and secondary impact) is 26.3 jobs with $1.4 million in wages, salaries, and benefits as derived from a sample of 1,261 independent rural health clinics and 102 critical access hospitals in 19 states.

Mui P, Gonzalez MM, Etz R. What Is the Impact on Rural Area Residents When the Local Physician Leaves? Fam Med. 2020 May;52(5):352-356. doi: 10.22454/FamMed.2020.337280. PMID: 32401327

Mui et al. qualitative study explore how access to care, both inside and outside clinic walls, changes when a rural community loses its family physician (FP). Study participants were individuals who lived in a rural area of Virginia and had experienced the loss of their local FP in the last 5 years. Emerging themes included rural access to care that discussed difficulties with transportation to another clinic outside of the community, decrease in preventive care due to a lack of family physician, and changing healthcare paradigm with a more bureaucratic feel. Another major theme was community/care-based relationships that brought up the importance of familiarity and a lack of a "country doctor persona" that was more challenging for residents to relate to. The final major theme was the loss of integrated health leaders that described the health clinic as a form of community center to fellowship with other community members as well as loss of a community leader. Rural family physicians are valuable to their community for the health of its members as well as the local health leadership.

Avery DM Jr, Hooper DE, McDonald JT Jr, Love MW, Tucker MT, Parton JM. The economic impact of rural family physicians practicing obstetrics. J Am Board Fam Med. 2014 Sep-Oct;27(5):602-10. doi: 10.3122/jabfm.2014.05.140052. PMID: 25201930

Avery et al. sent questionnaires to family medicine obstetrics fellowship graduates who practice obstetrics in rural Alabama. The average economic impact of an individual physician on their rural community was $688,560. The average economic impact of a family medicine physician on a rural community is $1,000,000 per year. A family physician practicing obstetrics must reduce their other clinic duties which decreases the economic impact to $800,000 per year. When $688,560 is added for practicing obstetrics to $800,000 a year, the total economic impact for a family physician practicing obstetrics is $1,488,560. The investment in an obstetric fellowship paid off and benefitted the rural communities in which the graduates chose to practice.

Part 2: Rural Workforce and Challenges

Shortage

Barreto T, Jetty A, Eden AR, Petterson S, Bazemore A, Peterson LE. Distribution of Physician Specialties by Rurality. J Rural Health. 2021 Sep;37(4):714-722. doi: 10.1111/jrh.12548. Epub 2020 Dec 4. PMID: 33274780

Using the Rural-Urban Continuum Code (RUCC) Barreto et al. assessed physician availability by specialty analyzing counties with a RUCC between 4 and 9. Specialties included emergency medicine, anesthesiology, cardiology, psychiatry, diagnostic radiology, general surgery, and OB/GYN and were all less available than primary care physicians. Out of all the primary care specialties, family medicine was most likely to be present in rural counties and distributed evenly across the rural continuum. Family physician presence had a probability of 1.0 in RUCC 4 and 0.88 in RUCC 9. The probability of a rural county having a PCP was highest in RUCC 4 and 5 and lowest in RUCC 8 and 9 demonstrated a workforce shortage increase as rurality increases.

Meyers P, Wilkinson E, Petterson S, Patterson DG, Longenecker R, Schmitz D, Bazemore A. Rural Workforce Years: Quantifying the Rural Workforce Contribution of Family Medicine Residency Graduates. J Grad Med Educ. 2020 Dec;12(6):717-726. doi: 10.4300/JGME-D-20-00122.1. Epub 2020 Dec 4. PMID: 33391596; PMCID: PMC7771603

To better understand the rural primary care workforce, Meyers et al. created a measurement tool called the "rural workforce year." Rural communities in the U.S. continue to experience shortages in workforce despite decades of state and federal investments in workforce initiatives. This retrospective cohort study compares rural training track graduates to geographically matched non-rurally trained family physicians across a ten year period. Rurally trained family physicians contribute more rural workforce years and practice more frequently in a rural setting. It would take nearly three non-rurally trained physicians to replace the rural workforce years produced by one graduate from the rural training track cohort. This information can be utilized as evidence to fund more rural training tracks in residency to combat the rural workforce shortage.

Physician Demographics

Xierali IM, Nivet MA. The Racial and Ethnic Composition and Distribution of Primary Care Physicians. J Health Care Poor Underserved. 2018;29(1):556-570. doi: 10.1353/hpu.2018.0036. PMID: 29503317; PMCID: PMC5871929.

Xierali and Nivet studied variations in physician practice locations by physician race and ethnicity stratified by their specialties in this retrospective cohort study using the American Medical Associations (AMA) Physician Masterfile. While Black, Native American, and Hispanic groups have higher proportions practicing in underserved areas, White primary care physicians have the highest proportion practicing in rural areas compared to Black or Hispanic groups. Native Americans have the highest

proportion practicing in rural areas overall. Family medicine physicians are most likely to practice in rural areas compared to other specialties. Increasing representation from Black, Hispanic, and Native American physicians may help reduce the persistent geographic maldistribution of the physician, and therefore, rural workforce.

Goodfellow A, Ulloa JG, Dowling PT, Talamantes E, Chheda S, Bone C, Moreno G. Predictors of Primary Care Physician Practice Location in Underserved Urban or Rural Areas in the United States: A Systematic Literature Review. Acad Med. 2016 Sep;91(9):1313-21. doi: 10.1097/ACM.0000000000001203. PMID: 27119328; PMCID: PMC5007145.

Goodfellow et al.'s systematic review of peer-reviewed studies identified factors that had a positive association with practicing in underserved or physician shortage area. The factors with the most studies with positivie association include physicians that identify as a racial-ethnic minority (12 studies), grew up in a rural area (7 studies), was an international medical graduate (8 studies), received NHSC scholarship (8 studies), participated in a pre-doctoral rural medicine program in medical school (14 studies), chose family medicine as a specialty (7 studies), and participated in a family medicine rural training track in residency (19 studies). This study did not further differentiate between underserved practice and rural practice; however, underrepresented minorities in medicine tend to have more interest in working with underserved populations, which is important information in striving to reduce the disparities in the geographic distribution of primary care physicians.

Stutzman K, Ray Karpen R, Naidoo P, Toevs SE, Weidner A, Baker E, Schmitz D. Support for rural practice: female physicians and the life-career interface. Rural Remote Health. 2020 Jan;20(1):5341. doi: 10.22605/RRH5341. Epub 2020 Jan 19. PMID: 31961700

Stutzman et al. describe the phenomenon of female physicians being more likely to choose family medicine as a specialty but less likely to practice in rural areas. They also note that female physicians are more likely to attend

to births and women's health issues than their male colleagues. With rural areas already suffering from a shortage of obstetrical services, it is even more important to increase female physicians in rural communities. This qualitative study interviewed twenty physician graduates from the same rurally focused residency. Major themes noted were spousal support, relationships with other providers and patients, self-support and resilience, and desire to feel a part of their community. This shows that residencies training for rural practice must acknowledge the need for supports systems and teach how to build and sustain them.

Barriers to Choosing Rural Practice

Nielsen M, D'Agostino D, Gregory P. Addressing Rural Health Challenges Head On. Mo Med. 2017;114(5):363-366.

Nielson et al. discuss the positive aspects of rural practice such as strong doctor-patient relationships, living in an area with a lower cost of living, and a slower pace of life but also point out the unique challenges that are specific to rural practice. Major challenges include the workforce shortage and lack of support from sub-specialists, hospitalists, or emergency physicians requiring rural family physicians to treat a wide variety of conditions with lack of access to high-level technologies. Another challenge is the limited amount of rural training opportunities as 99 percent of residencies are located in urban or suburban areas and physicians are more likely to live near where they train for residency. Also, rural populations tend to be older, sicker, less well insured, more likely to delay care due to location, and have poorer social determinants of health than patients in urban areas. The study proposes a solution to this is providing more exposure and training for the unique challenges of caring for rural communities.

Jetty A, Petterson S, Jabbarpour Y. Proportion of Family Physicians in Solo and Small Practices is on the Decline. J Am Board Fam Med. 2021 Mar-Apr;34(2):266-267. doi: 10.3122/jabfm.2021.02.200457. PMID: 33832995

Jetty et al. utilized the 2014-2018 American Board of Family Medicine (ABFM) Family Medicine Certification Examination Application data on practice size of respondents' primary practice to assess the changes in practice settings. The study found that family physicians (FPs) practicing in solo and small (2 to 5 physicians and clinicians) practices decreased over time in urban areas. The amount of FPs practicing in solo practices decreased over time in rural areas. Jetty et al. posed that this may reflect the ongoing trends in consolidation which disproportionately affects rural practices that may have fewer resources to sustain market pressures, which could be an added challenge to practicing in rural locations.

Weeks WB, Wallace AE. Rural-urban differences in primary care physicians' practice patterns, characteristics, and incomes. J Rural Health. 2008 Spring;24(2):161-70. doi: 10.1111/j.1748-0361.2008.00153.x. PMID: 18397451

Weeks and Wallace conducted this study using survey data from the American Medical Association's annual survey of physicians between 1992 and 2002 to address the perceived barriers of low salaries and difficult work conditions in recruiting primary care physicians to rural practice. The study found that rural primary care physicians' unadjusted annual incomes were similar to their urban counterparts, but they tended to work longer hours, complete more patient visits, and have a much greater proportion of Medicaid patients. After adjusting for work effort, physician characteristics, and practice characteristics, primary care physician in rural settings made $9,585 (5%) less than their urban counterparts. Addressing the differences in income, work hours, and greater dependence on Medicaid reimbursement could assist in attracting and retaining rural primary care physicians.

Part 3: Recruitment and Retention

Strategies and Incentives

Raymond Guilbault RW, Vinson JA. Clinical medical education in rural and underserved areas and eventual practice outcomes: A systematic review and meta-

analysis. Educ Health (Abingdon). 2017 May-Aug;30(2):146-155. doi: 10.4103/efh.EfH_226_16. PMID: 28928345.

Raymond and Vinson conducted a systematic review and qualitative meta-analysis to assess the impact of exposure to rural and underserved medicine and practice outcome. Ten of the seven hundred and nine articles initially found were used for the qualitative analysis and five were included for control groups. The study found that medical students with clinical training in underserved areas are almost three times as likely to practice in underserved areas than students who do not train in those areas (relative risk [RR] = 2.94; 95% confidence interval [CI]: 2.17, 4.00). Furthermore, medical students training in underserved areas are about four times as likely to practice primary care in underserved areas than students who do not train in those locations (RR = 4.35; 95% CI: 1.56, 12.10). This is useful for the importance of implementing rural and underserved training to fill workforce gaps in the future.

Holst J. Increasing Rural Recruitment and Retention through Rural Exposure during Undergraduate Training: An Integrative Review. Int J Environ Res Public Health. 2020 Sep 3;17(17):6423. doi: 10.3390/ijerph17176423. PMID: 32899356; PMCID: PMC7503328.

Holst aimed to identify quantitative research through a literature review to assess the impact of undergraduate rural medical training interventions on the factual practice of graduates in rural or remote areas. Rural exposure during medical education increased the likelihood of later rural practice by more than four times (4.2) on average, but with a wide variation ranging between 1.34 and 19.1 (standard deviation 3.92). Of important note, the study also found that rural upbringing of medical students or their partners turns out to be the strongest predictor for rural medical practice. In addition, rural medical training tracks and internships had the greatest effect on future medical students with a rural background.

Renner DM, Westfall JM, Wilroy LA, Ginde AA. The influence of loan repayment on rural healthcare provider recruitment and retention in Colorado. Rural Remote Health. 2010 Oct-Dec;10(4):1605. Epub 2010 Nov 9. PMID: 21070088.

Renner et al. sent a survey to 122 healthcare providers in one of three loan repayment programs in Colorado between 1992 and 2007 and the Rural Urban Commuting Area Codes was used to differentiate between rural and urban communities. 74% of the rural respondents were already working in or intending to work in a rural community regardless of loan repayment. Those planning to work in a rural community regardless of loan repayment, 43% reported an influence on the rural community they chose. 38% of those already working in a rural community reported loan repayment being an important factor in their retention. Overall, physicians practicing in rural communities would have practiced there regardless of loan repayment, but could play a role on the specific community they choose to practice in. Loan repayment may also have a limited influence on provider retention.

Schmitz DF, Baker E, Nukui A, Epperly T. Idaho rural family physician workforce study: the Community Apgar Questionnaire. Rural Remote Health. 2011;11(3):1769. Epub 2011 Jul 25. PMID: 21790262.

Schmitz et al. developed the Community Apgar Questionnaire (CAQ) as a quantitative instrument to evaluate the assets and capabilities of Idaho communities in relation to physician recruitment and retention. Eleven Idaho communities were selected differing in geography and other variables such as community economics, scope of practice, medical support, and hospital and community support. Interviews with physicians and CEOs of the communities were used to rate each category. Alpha and beta communities were identified with alpha communities historically having more success in recruitment and retention and beta communities have more challenges. The CAQ is a quantitative approach, rather than more common qualitative approaches, to discriminate between communities and track a community's progress over time to improve recruitment and retention of physicians to these ares.

Hustedde C, Paladine H, Wendling A, Prasad R, Sola O, Bjorkman S, Phillips J. Women in rural family medicine: a qualitative exploration of practice attributes that promote physician satisfaction. Rural Remote Health. 2018 Apr;18(2):4355. doi: 10.22605/RRH4355. Epub 2018 Apr 18. PMID: 29665695

Hustedde et al. explore practice attributes valued by rural women family physicians to help rural health systems and practices attract and retain women family physicians. Twenty-five women family physicians were interviewed by phone using a semi-structured format. Three major themes emerged from the analyzed data through an immersion and crystallization approach. Professional relationships, practice characteristics, and support during times of transition like maternity leave were all important factors that promote women physician satisfaction. Relationships with professionals inside and outside their practice were the most important. Rural women physicians also enjoyed an expanded scope of care and loan repayment opportunities.

Ward ZD, Morgan ZJ, Peterson LE. Family Physician Burnout Does Not Differ With Rurality. J Rural Health. 2021 Sep;37(4):755-761. doi: 10.1111/jrh.12515. Epub 2020 Sep 14. PMID: 32929816

Ward et al. examine whether rural practice is associate with family physician (FP) burnout. Data was collected from the 2017 and 2018 American Board of Family Medicine Family Medicine Certification examination registration questionnaire. Burnout was measured on the questionnaire via two questions validated against the Maslach Burnout Inventory. No rural/urban differences were found between job satisfaction, practice environment, workload, and job stress. Although the large national study found a high rate of burnout, rural location was not associated with burnout when controlling for personal and practice characteristics. Additionally, a broad scope of practice may be a protective factor against burnout in rural FPs.