The Problem

Health workforce distribution is a pressing and complex issue that moves beyond a "more is better" approach to workforce policy. Although the overall supply of primary care providers is important, distribution accounts not just for supply but also for *location and specialty* since all three elements affect access to health services.

Workforce distribution is categorized in many ways, e.g., age, race, gender, specialty, and location. Recognizing the breadth of distribution challenges, this evidence review focuses specifically on the geographic distribution of primary care providers in rural and other underserved areas. This focus is not designed to negate the importance of other distributional challenges; it is simply a practical starting point.

Geographic maldistribution of primary care providers presents a long-standing challenge in access to care in the United States. Primary care providers – including family medicine (FM), internal medicine (IM), pediatricians, obstetrician/gynecologists (OBGYNs), nurse practitioners (NPs), and physician assistants (PAs) – improve health outcomes and prevent unnecessary health-related costs but are not always located in areas where they are needed.

Rural locations experience many barriers in recruiting, supporting, and retaining an adequate clinician workforce to meet the population's needs. Rural populations often rely on generalists for care, especially given a lack of specialists in these areas.[1–3] While 16% of the U.S. population lives in rural areas, only 8% of primary care providers practice in these areas.[4] The primary care provider to population ratio is 93/100,000 in metropolitan areas, compared to 55/100,000 in non-metropolitan areas.[5] Compounding these disparities are several factors, including an aging healthcare workforce in rural areas,[6] a rural workforce where some providers split time between rural *and* urban settings,[7] and an increase in rural hospital closures.[8] Given these barriers, patients in rural areas travel significant distances to access care: two to three times farther for general care than urban populations[1] and at least 30 additional miles for hospital-based maternity care.[9]

Several system-level and individual factors contribute to this maldistribution. While a minimum population size and financial resources are needed to support the delivery of many health services, healthcare systems tend to favor high-tech and specialty services which generate higher reimbursement.[10] Generally, rural communities offer limited educational, social, cultural, and economic opportunities,[11,12] which may make them less attractive to highly educated individuals, including health practitioners.[7,13] Providers also indicate that income, access to recreation, and spousal job opportunities are important considerations in deciding where to practice.[3,11,12,14–16] In addition, most medical education institutions are located in urban areas, and providers tend to practice in the state where they are trained.[17,18] Locations that have higher rates of uninsured or lower rates of Medicaid reimbursement may be less appealing to providers.[3] Lastly, given the challenges of starting up an independent practice,[19] providers tend to go where practice systems (and practice infrastructure) already exist.[6,19,19] This pattern tends to reinforce a cycle of maldistribution.

Problem Statement

The primary care workforce tends to reside and practice in well-resourced communities. As a result, the primary care provider to population ratio is 93/100,000 in metropolitan areas, compared to 55/100,000 in non-metropolitan areas, leaving many rural and underserved communities with challenges in accessing care.

Relationship to Health Equity

The United States consistently ranks poorly on health outcomes, and the relationship between access to primary care providers and health outcomes has been well-documented for over 30 years. Studies from the 1990s found that states with higher ratios of primary care physicians to population demonstrated better health outcomes, including lower rates of all causes of mortality, mortality from heart disease, cancer, or stroke; infant mortality; and low birth weight.[20–22]

More recent studies find that areas with a higher supply of primary care providers have lower mortality, fewer ambulatory case-sensitive condition hospitalizations, and no significant differences in Medicare spending.[22,23] A 2017 study found that just one additional primary care provider per 10,000 population is associated with 83 fewer deaths, 161 fewer hospitalizations, and 712 fewer emergency department visits for the Medicare population.[24] For all age groups, rural counties have significantly higher rates of hospitalization for case-sensitive ambulatory conditions than urban counties.[25] Surveys and qualitative studies also find that rural populations identify access to primary care[26] and distance to primary care[27] as significant barriers.

Worse maternal health outcomes are also associated with the maldistribution of providers. U.S. regions with lower per-population availability of maternal health providers have higher maternal mortality rates than the national average.[28] In addition, women living in maternity care deserts have higher risks of death during pregnancy and up to one year postpartum compared to women in counties with at least one hospital providing obstetric care and 60 obstetric providers per 10,000 births.[29] Maternal health outcomes are also related to rural hospital closures. Between 2004-2014, 179 rural counties lost hospital-based obstetric services, leaving more than half of rural U.S. counties with no hospital-based obstetric services.[30]

Generally, utilization of primary care services and increases in evidence-based preventive health measures such as vaccination (127%), colonoscopy (122%), and mammography (75%) are linked.[31] However, there is no consensus on differences in utilization by rural and urban populations. A 2006 study of rural Medicare beneficiaries found that patients had 10% fewer provider visits than urban patients.[1] However, a more recent (2021) Medicare Payment Advisory Commission report found that rural and urban Medicare beneficiaries had similar healthcare utilization rates.[32] The relationship between geographic distribution and utilization should be studied further.

Health Workforce Distribution is a Health Equity Issue

Maldistribution is a persistent problem that contributes to poorer health status and health disparities for people living in rural and underserved communities. Research shows that maldistribution of primary care providers in rural and underserved areas results in higher mortality and more ambulatory case-sensitive condition hospitalizations, exacerbating health disparities that already exist in these communities.

Policies & Programs Designed to Address Maldistribution

Primary care workforce distribution is complex and dynamic, and the problem is unlikely to be solved through a single "silver bullet" solution. However, there are many policy and program levers that have the potential to help address this persistent problem, including changes in health professions' training, federal policies and programs, and health systems-level practice changes.

Health Professions Training & Loan Repayment Programs

As described in Evidence Review 2, a growing body of literature demonstrates the role of health professions' training programs in mitigating workforce distribution challenges, particularly for the physician workforce. While evidence suggests that growing up in a rural area is the most consistent factor leading to rural practice for physicians,[33] medical school applicants from rural backgrounds have declined in recent years.[34] Several schools employ strategies specifically to recruit students likely to practice in rural areas, ranging from career counseling and mentoring to academic enhancement and admissions preparation.[35,36]

Training programs may also benefit from partnering with community colleges and developing articulation agreements to identify and attract qualified applicants. Literature suggests that physicians who attended community college during their educational journey were 26% more likely to practice in underserved settings and were 47% more likely to train in family medicine.[37,38] However, medical schools may be less likely to select community college graduates than graduates of four-year universities who did not attend community college. One study found that applicants who attended a community college after high school before a four-year university were 68% less likely to be accepted to medical school compared to applicants who did not attend community college after controlling for personal and academic characteristics.[38]

Numerous studies show the impact of "imprinting" conferred by training location. Medical students trained and residents who completed their graduate medical education (GME) in rural settings were more likely to practice in those areas after completing their training.[36,39–42] In the next few years, new rural residency and rural training track programs funded by the Health Resources and Services Administration (HRSA) will become available and have the potential to

expand this impact.[43] In addition, career counseling and mentorship is critical in rural and underserved settings, where the patient population may experience social drivers of health that differ from those in more traditional urban education programs.[35,44–46]

Loan repayment and direct financial incentives have shown broad success in helping to remedy maldistribution.[47] The National Health Service Corps (NHSC) provides funding through scholarships and loan repayment in exchange for service in underserved areas. Scholarships have effectively addressed equity issues, while loan repayment programs target individuals after they have completed training and might be a more efficient means of addressing the maldistribution of providers. A study of 1,000 primary care providers in Florida found that participants of the NHSC were five times more likely to serve in rural areas than those who had never participated in the NHSC,[48] and 79% of NHSC participants continue to work in primary care HPSAs one year after completing their NHSC service.[49] However, one limitation of the NHSC model design is that providers must have a job or job offer before they are eligible. This means that many NHSC participants already work in those settings before applying. Those seeking new employment to qualify for loan repayment must go where practices exist rather than open new practices in areas of high need. Another obstacle to large-scale success of the program is funding. While demand to enter the NHSC program has grown over time, the budget has not kept pace with demand, resulting in providers who would participate being turned away.[50]

In addition to the NHSC, the Conrad 30 waiver program allows J-1 international medical graduates (IMGs) to waive the two-year foreign residency requirement after GME training to practice in a medically underserved area. IMGs participating in the Conrad program often remain with their waiver employers beyond their obligation period, and most spend over half their time serving primarily underserved patients.[51] In a California study of 432 IMGs, those with temporary visas were significantly more likely to intend to practice in HPSAs than U.S. graduates and permanent IMGs.[52] However, empirical studies of IMGs' work in underserved areas reveal mixed results, as the contribution of IMGs to the rural workforce varies greatly by state, and commitment to practice in these areas differs greatly by the IMG's birthplace.[51,53–55]

Federal Policies & Programs

The federal government plays a vital role in allocating grants, subsidies, and payments for health services. Federal designation as a provider shortage area is a critical aspect of determining the need for these subsidies. To do this, HRSA designates geographic areas with an inadequate supply of providers as Health Professional Shortage Areas (HPSAs). As of 2021, 84 million people live in primary care HPSAs, 62 million in dental HPSAs, and 129 million in mental health HPSAs.[56] Over 30 federal programs rely on the HPSA designation to allocate public resources, including incentive payments.[5,57,58]

There has been a long-standing debate over ways to improve this measurement system, but like any system for allocating financial benefit, change activates those who could lose resources more than those who would gain. As a result, past efforts to update the methods have not resulted in change.[5,58] Specific steps to remediate concerns with HPSAs are accounting for the supply of advanced practice clinicians and adequately assessing population-level healthcare needs.

However, when the Department of Health and Human Services convened a rule-making committee in 2011 to revise the formula and recommended a revised index called the Index of Primary Care Needs,[58] new measures were not adopted.

Medicare also plays an outsized role in the area of workforce distribution, as it provides by far the largest funding stream for GME – estimated to be $15 billion in 2018.[59] As Medicare GME links payments to the hospital setting, basing them on the number of residents a hospital trains and the number of Medicare patients it treats, larger hospitals – typically urban – are at a relative advantage compared with smaller – typically rural – hospitals.[60,61] This gap between larger urban and smaller rural hospitals became further entrenched after the passage of the Balanced Budget Act of 1997, which set a cap on GME-funded resident positions;[62] small programs, including ones that were in the process of expanding, could not grow their programs – and obtain more funding – because of the cap. The Medicare Modernization Act of 2003 attempted to redistribute residency slots but resulted in a more extensive growth in non-primary care training than in primary care training, as well as few hospitals in rural areas receiving additional positions.[61] These policies have left an ongoing problem of residency training program maldistribution with few sites in rural settings or community-based health clinics. This affects both *specialty* distribution – by focusing on hospital-based specialties over primary care – and *geographic* distribution – by focusing on urban, academic settings. This becomes particularly concerning as most physicians practice in the state where they completed their GME.[17] Reassessing the GME formula could make funding available for redistribution to address other U.S. health workforce needs.[63]

In part to address shortcomings in the GME payment system, the Teaching Health Center (THC) GME program was funded in 2010 through the Affordable Care Act. It supports primary care physician training in Community Health Centers (CHCs) in rural and underserved communities by directing GME payments to community-based health centers, unlike Medicare, which links payments to hospitals. THC graduates must meet all the same didactic and practical requirements as residents in hospital-based settings but have far greater exposure to practice in rural and underserved outpatient settings. THC residents also have increased opportunities for mentorship – and potential imprinting – from providers currently practicing in these settings. A study published in 2021 finds that these graduates are more likely to practice in primary care, rural, and underserved than the general U.S. physician population.[45] However, the THC program has faced challenges related to long-term funding stability. While the American Rescue Plan[64] provides significant new funding to the Teaching Health Center Graduate Medical Education (THCGME) program ($330 million), THCGME funding is just a small fraction of annual Medicare GME support, which was estimated to be approximately $15 billion in 2018.[59]

Another critical federal funding stream sustains the network of Federally Qualified Health Centers (FQHCs) and Rural Health Clinics (RHCs). FQHCs and RHCs are the primary care safety net in the United States. They provide comprehensive health services to the medically underserved in urban and rural areas, regardless of their ability to pay. Of the 14,500 FQHC service sites, over 6,000 are rural.[65] In addition, nearly 4,800 RHCs provide care for rural populations. Both FQHCs receive HRSA grants and enhanced reimbursement rates in Medicare and Medicaid.[66] Both types of clinics are essential vehicles for recruiting practitioners into rural and underserved areas.[67,68]

Research suggests that FQHCs and RHCs improve access to primary care and improve outcomes, such as hospitalization rates among the uninsured.[69–71] However, both types of clinics continue to face continuing workforce shortages, and RHCs, in particular, have challenges with the retention of providers.[72]

Critical Access Hospitals (CAH) also serve as an important service provider in rural areas. The CAH designation was created through the Balanced Budget Act of 1997 in response to the closure of over 400 rural hospitals in the 1980s and 1990s. CAHs must be rural, at least 35 driving miles from another hospital (or 15 driving miles by secondary roads/mountainous terrain), and they receive enhanced reimbursement rates in Medicare and Medicaid. While some previous research suggested that CAHs offer a lower quality of care, more recent studies find similar surgical outcomes and patient satisfaction compared with non-critical access hospitals.[73,74]

Emerging Models of Care

Some health systems turn to nurse practitioners (NPs) and physician assistants (PAs) to increase overall supply and capacity. The presence of NPs is growing, and by 2016, NPs made up 25.2% of providers in rural and 23% in nonrural practices.[75] NPs and PAs perform as well as physicians on health outcomes and, in some cases, are better at patient communication and chronic disease management and are more likely to care for the underserved and practice in rural communities.[76–78] However, scope-of-practice (SOP) laws in many states prevent NPs and PAs from practicing at the top of their education and license.[79,80] Studies have shown that in states with expanded SOP for NPs, their numbers tend to increase,[81] leading to speculation that expanded SOP policies could improve access in rural areas.

A very successful model has been the hub-and-spoke approach used by Project ECHO, in which specialists at a Center of Excellence (the hub) connect virtually with rural and underserved community providers (the spokes) to support case-based learning for rural practitioners, with special attention to social determinants of health (housing, transportation, etc.).[82] Studies of Project ECHO find that "spoke" providers treat patients as effectively as the specialists at the "hub" and report that participation in Project ECHO has enhanced their professional satisfaction.[83,84] Project ECHO also serves as an example of how technology can address specific challenges in areas where primary care providers are few and far between.

Telemedicine has expanded in recent years and could serve as an avenue to increase access to care. Telehealth has proven effective for home-based diabetes, hypertension, and heart failure management.[85] However, before the onset of the COVID-19 pandemic, less than 2% of most providers offered outpatient visits via telehealth; 4-5% of mental health providers did so.[86] When the option of an in-person visit declined dramatically at the onset of the pandemic, the federal government[87,88] and states[89,90] rapidly implemented policies that expanded reimbursement for and modalities of telehealth to improve access. Recent research by Mullan Institute researchers (submitted for publication in 2021) finds that telehealth uptake did improve among rural populations during COVID-19, but it remains to be seen whether these policies will become permanent, therefore allowing telehealth as a viable strategy to address access to care challenges where there are problems of maldistribution.

Policies and Programs that Impact Health Workforce Distribution

Evidence suggests that Medicare GME and scope of practice laws for advanced practice clinicians represent barriers to improving health workforce distribution. One policy with a mixed effect is the designation of HPSAs, which allocates federal resources in underserved areas but is overdue for updating the designation formula. Policies and programs that can improve distribution include:

- recruitment of medical students from rural areas,
- partnerships between medical schools and community colleges,
- rural training tracks for graduate medical education programs,
- career counseling and mentoring in rural and underserved settings,
- scholarships and loan repayment programs such as the National Health Service Corps, and
- hub-and-spoke models of care in rural settings such as Project ECHO.

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