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Closing the Gap in Primary Care: A Systematic Review and Interpretation

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Abstract

Objective: The United States faces a health care provider shortage yearly in many areas of the country, but most of all the rural areas are most impacted. The aim of this paper is 2-fold: To understand the factors that drive a medical student's specialty choice through a systematic review article and how government initiatives consider what is important to students, to understand how other clinicians can help close the gap in primary care in the United States and what policies or barriers prevent them from doing so. Methods: This paper looks at nationally collected data, as well as meta-analysis reviews on the topic to help the reader better understand the issue of health care provider shortages. Conclusion: We must change the way we look at primary care and rural medicine. Rather than investing money in avenues that yield little return on investment, we as a nation should strategically fund and advance the scope of practice for rural medicine to make it attractive and competitive for clinicians to pursue. Being in a large deficit of clinical providers in general in our country, we must try to find new pathways to grow coverage in rural areas before our health care system is no longer equitable.

Keywords

Rural Medicine, Healthcare Shortage, Primary Care

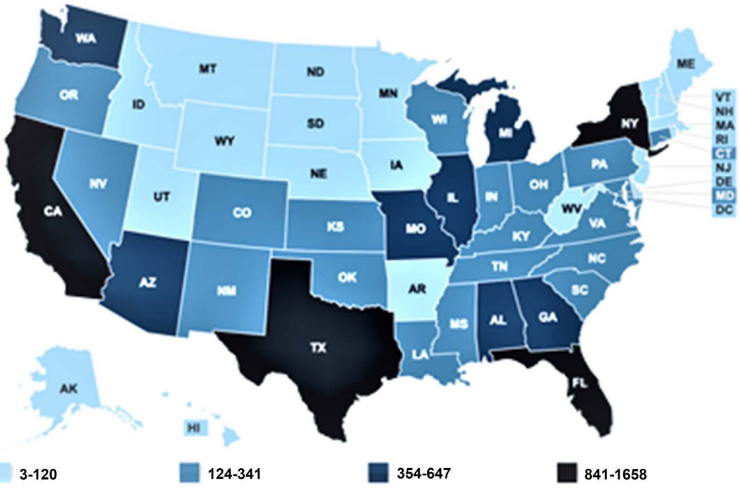
1. Introduction

Roughly 20% of the United States lives in a rural area yet only 9% of physicians practice medicine there and only 3% of recent medical school graduates plan to do so. [1] [2] Rural areas are defined by the census bureau as any area that is not urban (less than 50,000 people or clusters of less than 2500 people) and contains residents whose income is at least $9000 lower than the per capita income, have

limited transportation, limited bandwidth for internet access and have a higher prevalence of chronic diseases such as diabetes and coronary heart disease than those who live in the urban area. [3] There are many other obstacles and factors that play into why clinicians prefer not to practice medicine in rural, underserved areas in addition to the socioeconomic and geographical issues that present themselves there. Some of these influences include but are not limited to family, economic decisions, career advancement, exposure to rural medicine during college, lifestyle, workload, specialty, and medical resources.

As **Figure 1** shows, every state in our country to some degree lacks a number of primary care physicians (PCPs); they need to not be considered a shortage area. This is an important issue considering primary care physicians are normally the specialty of doctor that provides continuous maintenance care to both rural and urban populations. "Over the next nine years, the country will be short 61,700 to 94,700 doctors, the Association of American Medical Colleges predicts. But the shortage is spread unevenly across the country, with some states suffering far more than others." [3] When you look at the numbers and distribution of our country's healthcare providers that specialize in primary care, you can easily see how healthcare accessibility has become a major issue for many rural living individuals in our country. The Institute for Healthcare Improvement defines an equitable health system as one that is consistent across all settings and prides itself on a standard of care that does not discriminate. In light of this, the U.S. health system is missing the mark of equity within the rural population.

These problems have not been ignored by those in power, and many initiatives have been taken to mitigate the shortage. Medical schools are adjusting the qualities and backgrounds they look for in candidates, Title VII grants fund



Bureau of Health Workforce, Health Resources and Services Administration (HRSA), U.S. Department of Health & Human Services, Designated Health Professional Shortage Areas Statistics: Designated HPSA Quarterly Summary, as of December 31, 2018.

Figure 1. Number of PCP's needed to not be considered a health professional shortage area.

primary care leadership, faculty development programs and innovative curricula for medical schools concerning primary care medicine and new osteopathic and allopathic medical schools are popping up in rural regions across the country. Although many measures have been taken, this paper looks to evaluate and understand the specific aims that provide one with a better understanding of how to fix the problems we face in providing primary care to rural communities.

The specific aims of this paper are:

1) To understand the factors that drive a medical student's specialty choice through a systematic review article and how government initiatives take into account what is important to students.

2) To understand how other clinicians can help close the gap in primary care in the United States and what policies or barriers prevent them from doing so.

In our healthcare system, we cannot simply assign physicians to areas of need, but rather we rely on them to choose where and what they wish to practice. This system has its pros and cons. Looking at what makes a student want to practice a certain specialty in a certain area can be used to a health system's advantage to help create and fund more desirable locations that fill the needs of our nation. On top of this, healthcare is a team sport, and it is not enough just to look to physicians to help with this problem. The scope of practice of physician assistants (PAs) and advanced practice registered nurses (APRNs) must also be widened.

2. Conceptual Framework

The aims of this paper deal with two different potential solutions to the same problem. To cohesively build the narrative of this paper, we will focus first on the systematic review of what medical students find important when deciding on a specialty. With this article, we will align current government funding and medical education initiatives to evaluate their impact on closing the gap within the PCP specialty and inevitably affecting the care of underserved populations. Next, we will look at the role of a PA and an APRN or, more specifically, a nurse practitioner (NP) within our health system. An evaluation of their usefulness in our current primary care problem and a look at health policies that affect their scope of practice will be accounted for and discussed to build upon the multi-prong approach to a dynamic accessibility problem.

3. Factors Influencing Subspecialty Choice among Medical Students: A Systematic Review and Meta-Analysis

With aging populations and an increase in the prevalence of chronic diseases, there is an ever-growing need for physicians. Some specialties, such as family medicine, are experiencing a massive shortage, whereas others, such as cardiology; ophthalmology; ear; nose and throat surgery are highly competitive specialties with low success rates for candidates. [4] The cited study, looking at more than just the United States, takes into consideration the variables that affect what specialty a student chooses. A student often enters medical school with one spe-

cialty in mind and leaves following a whole new path. The purpose of this study is to examine what factors have the most influence on student decisions in an effort to increase the accuracy of policy building and funding to aid in physician shortages around the world in certain specialties. Using multiple databases of previously researched articles, this systematic review and meta-analysis used two trained investigators to extract data from 75 cross-sectional studies (34 in the U.S), including almost 900,000 individuals between 1977 and 2018. [4] A meta-analysis was then performed on 12 influencing factors, and all were found to be significant ($P < 0.0001$). [4]

The results of their meta-analysis make it clear that, in the developed world, academic interest far succeeds the influence of any of the other factors. This is followed by workload, patient service, and mentors. The bottom half of the influences illustrates that factors such as income, prestige, and training length were the least influential.

4. Government Initiatives and Closing the Gap

Under the Affordable Care Act (ACA), the government tried to initiate a few loan forgiveness or loan repayment models as well as make enhancements to Title VII programs. Some of the loan plans provided students with lower interest rates for serving in primary care or, in the cases of the National Health Service Corps, paying off student loan debt all together for those willing to serve in primary care roles in underserved/rural areas.6 The American Recovery and Reinvestment Act of 2009 (ARRA) provided $300 million in student debt repayment and another $283 million from the ACA. [5] Title VII programs, which are used to increase interest and training for primary care physicians and medical students, also received funding under these government initiatives.

With reference to the factors that influence what specialty medical students want to pursue, it seems as though government funding could be used in more precise ways to engage students and entice them into primary care and rural medicine. With exception to the Title VII program funding, which helps get students primary care experiences in medical school, all other initiatives deal directly with student debt and loan forgiveness which correlates to a financial factor in the bottom third of influence factors according to the systematic review. [4] These debt forgiveness programs often also come with strict lifestyle mandates and large workloads due to understaffed areas. [6] According to the meta-analysis, students care more about what they are doing rather than their financial situation or how much they are making. What is not seen in the government initiatives is the workload relief that medical students value in a potential future career or the importance of the academic aspects of the interest of a primary care physician.

5. Physicians Assistants and Advanced Practice Registered Nurses

A PA is a healthcare professional that is licensed to practice medicine under the

supervision of a physician. Their scope of practice includes physical exams, diagnosing and treating illnesses, ordering and interpreting tests, counseling on preventive health care, assisting in surgery, writing prescriptions, education, research, and administrative services. [7] The scope of practice for PAs allows them to practice medicine in every specialty and oftentimes work with patients without the need for much collaboration with physicians in general. Using relative value units (RVUs; indicators of service effort used for Medicare reimbursement) that reflect personnel time and level of skill involved with care, PAs have almost as many RVUs as family practitioners (48% to a physician's 52%). [7] The 2009 numbers above suggest that hiring a PA could be equivalent to having 0.73 - 0.96 full-time Family Medicine Doctors. [7] This being said, PAs are often found outside of teaching hospitals and more rurally located areas with 34% practicing in primary care. This number, however, has been on a downward trend. It is important to realize the value that a PA can bring to practice in the rural community and how much workload strain they can take off a physician. PAs are more readily going into surgical subspecialities (~25%) as of late, a trend that should be kept in mind when constructing policy and initiatives going forward to close the gap in primary care.

APRNs are comprised of four groups but only two of those groups are relevant for primary care (Nurse Practitioners and Midwives). NPs, much like PAs, have an advanced scope of practice. Without the supervision of a physician, an Advanced Practice Nurse sees patients, diagnoses diseases, prescribes medications, orders tests, makes referrals to specialists, and teaches and counsels patients about health and illness. [8] There are well over 150,000 NPs in the U.S., and they can work in a variety of settings, including hospitals, clinics, drug stores, and schools. RVU numbers for NPs are lower, suggesting more use in administrative tasks, but still offset the work of 70% to 90% of full-time family medicine/primary care physicians, on average. [8] Just like the PA, NPs can free up much of the workload that a primary care physician in a rural area might experience. Additionally, NPs can reduce the cost of a visit due to the fact that NPs are reimbursed at a lower rate than physicians. Problems do arise with NPs, however, since the scope of practice laws can vary from state to state. For instance, an NP in one state may have autonomy while an NP in another must collaborate with a physician before executing their duties which can cause inefficiencies.

6. Critiques

Before critiquing the initiatives set forth to close the gap in primary care, we must first discuss the limitations of our systematic review and meta-analysis used to detect the factors influencing medical students' specialty choices. First, the articles interviewed physicians at different times in their career or year of schooling. This means the stage of life upon which they were reflecting on what factors were important was not unanimous and could have been at different times depending on the study. Another limitation to keep in mind is that, al-

though almost half of the articles in the meta-analysis were from U.S. based studies, the rest were from other countries in both the developed and undeveloped world. These factors could have an effect on the data that was derived, but for the purposes of our analysis, we did not see these limitations as significant barriers to its usage in our critiques.

With regards to government spending and closing the gap in primary care, it is essential to shift our focus to what students find important pertaining to their specialty choices. Advancements in Title VII are a good start as supporting medical schools' rural medicine and primary care teaching programs are an important aspect of providing a positive experience for the student during their clinical rotations before they match into a specialty. Increased government funding for primary care research topics and expanding their scope of practice would also benefit PCPs by investing in their academic interest and career advancement.

Loan repayment programs are another potential solution. They provide an avenue for students to get out of debt in a timelier manner. However, the physicians are often times thrown into environments where they have a workload that they can barely handle and have little vacation time as mandated by the National Health Service Corps. [5] This workload and lifestyle factor that was rated highly in the meta-analysis can be mitigated by the employment of both NPs and PAs. Not only can these alternative clinicians alleviate the workload, but they are also cheaper for the patient to meet with than a normal doctor's visit.

The scope of practice laws in the United States allows full autonomy of trained duties to NPs in only 21 states currently. [9] The reasoning behind this is the concern of educational gaps in the NP curriculum leading policy makers to believe they are unsafe to treat patients without supervision. As more patients receive and use their health insurance after the implementation of the ACA, the need for primary care clinicians will only rise. According to the Kaiser Family Foundation External link, "in 2013, more than 20 states took legislative or regulatory action favorable to NPs' ability to practice more fully." [9] The scope of the NP's practice in every state is unknown at the time being, but as the need for PCPs grows, the scope seems to be widening for NPs as well.

Regarding the PA and their role in primary care, "demographics associated with an increased likelihood of primary care practice among PAs appear to be similar to those of medical students who choose primary care." [10] Factors such as academic interest going into graduate school and socioeconomic status are influencers that are just as prevalent in the PA field as the physicians. A similar approach should be taken within the PA realm to how it is with medical students. There should be a little less emphasis on lifestyle and workload but a strong engagement in primary care during their clinical rotations and engaging their academic interest in the field of rural medicine.

7. Discussion

We must change the way we look at primary care and rural medicine. Instead of

throwing money aimlessly at the problem of PCP shortages, our health system must strategically fund and advance the scope of practice for rural medicine to make it attractive for clinicians to pursue it. After researching this topic, it is recommended that we go beyond just financially supporting the surge in rural medicine and primary care and widen the scope of the physicians' abilities by training them in key aspects of specialties that are relevant to what they will see (OB/GYN, General Surgery, Dentistry, etc.). This not only provides patients with a clinician who has basic skills to cover an array of problems, but it also attracts students to a field of medicine that allows them to practice a few multiple specialties while still getting the patient-provider relationship of being a PCP. The downside of this is that training would be more than the 3 years it is currently. However, as seen in Figure 2, training time is not a large factor in a student's decision. Patients could get immediate acute care from their PCP to hold them over until they reach a specialist in a nearby city, much like how battlefield medicine works.

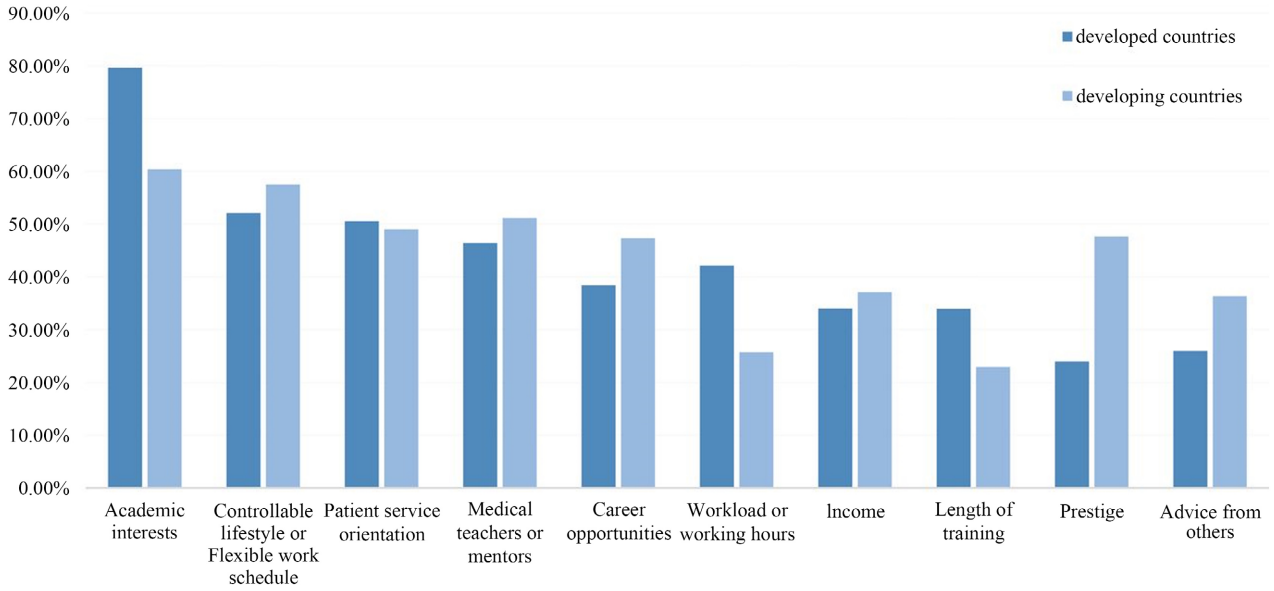


Figure 2. Bar graph of the meta-analyses of the factors influencing medical students' choice of subspecialty stratified by region. [5]

We are already in a large deficit when it comes to PCPs and clinical providers in general in our country. If we do not do something to change our situation and entice all types of clinicians to pursue primary care and rural medicine, then we will be overpaying for a healthcare system that is not even equitable. Even if everyone in our country has health insurance, it does not mean they have proper access to clinical care and that should be the main focus going forward in future research and future funding at all levels of government.

Conflicts of Interest and Funding

This paper was constructed with no funding from an outside entity. This paper

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