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An Investigation of the Influence of Current Public Health Policies on the Prevalence of Rural Health Professional Shortage Areas in the United States

Hayne Noh
Public Health
Virginia Commonwealth University
Richmond, Virginia 23220 USA

Faculty Advisor: Dr. Mary C. Boyes

Abstract

The overall healthcare professional shortage or maldistribution severely limits access to sufficient health care, affecting many Americans, particularly in rural areas. There is a range of studies that agree that the health professional shortage is a pressing issue, but none that specifically evaluate the overall effectiveness and improvements to be made to government funded programs, such as loan repayment (LRPs) and scholarship programs (SPs) aimed at attracting physicians to these rural underserved areas. This study analyzes data from 18 peer-reviewed journals and articles about rural primary care Health Professional Shortage Areas (HPSAs), Title-VII funded schools, and rural primary health care. Although LRPs and SPs are both necessary and potentially effective programs to attracting primary care physicians to rural areas, these programs may be improved by lifting stringent contract policies, limiting the use of HPSAs in determining need, growing collaboration between state programs and national programs, increasing the overall allure of rural health care by early exposure to medical students through rural focused medical school curricula, and sending physicians to underserved areas in groups. This work reveals innovative steps these programs may take in order to provide a greater number of rural Americans access to proper healthcare.

Keywords: Rural Healthcare, Health Professional Shortage Areas (HPSA), Primary Care

1. Background

Primary care acts as the foundation of the United States healthcare system. Not only are primary care physicians (PCPs) typically the first professionals patients seek out for care, as the majority of specialists require referrals from PCPs in order to utilize specialty services, but PCPs are also the main source of administering preventative care. Physician Glen Cheng from Rutgers University claims that by increasing the number of PCPs in the United States, a potential of around "$26.5 billion"[1] in federal funding could be saved by the increase in preventative care that would lower the prevalence of common chronic diseases such as obesity. However, as essential as primary care is to the United States healthcare system, Cheng goes on to note that the overall proportion of primary care physicians in the United States "comprises 35% of all practicing physicians and is rapidly declining," since less than 20% of U.S. medical students now enter into primary care fields[2]. Although the looming primary care shortage has large implications for the entire country, rural areas of the United States have been particularly affected.

In order to identify places of medical professional need, the Human Resource and Service Administration (HRSA), a branch of the U.S. Department of Health and Human Services (HHS), quantifies the amount of need for health professionals in a county through the designation of a health professional shortage area (HPSA). HRSA designates separate areas of medical need based on primary, dental, and mental health care, and defines a primary

care HPSAs as areas with less than 1 physician per every 3,500 people. HPSAs are given a score from 1-25, scores of 1 being areas with low areas of need to scores of 25, where the physician to population ratio, age of the population, and cultural barriers all play a role in the severity of the health professional shortage in the region.

There are federal and state run programs that aim to relieve these shortages by providing physicians with monetary incentives to practice in rural and other underserved areas. The programs investigated in this research fall into two subsets: loan repayment programs (LRPs) and scholarship programs (SPs). Through LRPs, physicians are compensated for serving under contract in a medically underserved area for 1-2 years and the total sum of money granted to the physician from the program must be used chiefly to repay medical school debt. Scholarship programs differ from loan repayment programs in that scholarship programs pay for tuition, fees, and other living expenses for those who have committed to primary care at an accredited medical university after the applicant agrees to work in a designated HPSA following graduation. Although different programs have various regulations, these related programs, in essence, require service under contract in an underserved area in exchange for monetary compensation.

2. Introduction

The question remains, however, why primary care health professional shortage areas still exist in the rural United States, in light of the millions of dollars and thousands of human resources poured into the issue through government run LRPs and SPs. The number of HPSAs has not decreased, but has in fact increased over the last several years. According to the HHS as of April 17, 2016, there are currently 6,385 designated HPSAs[3] in the United States, whereas David A. Claud of the University of Illinois reports that "there were 2,736 primary medical HPSAs" in 1994[4]. Government funded programs such as LRPs and SPs have the potential to alleviate the rural primary care health professional shortage, but are unable to in part because of the ambiguity in the root cause of the shortage itself. However, despite this uncertainty, there are clearly defined shortfalls of LRPs and SPs that, once restructured, would allow these programs to increase efficiency at decreasing the number HPSAs in rural areas.

The shortage of primary care doctors in rural areas drastically limits access to quality primary care, and although effective public policies such as LRPs and SPs are necessary in relieving this shortage, both increasing the attractiveness of rural health care as well as redesigning the organization of these programs may improve these current projects. These programs may be improved by lifting stringent policies in the case of a contract breach, sending doctors out in cohorts rather than individually, early exposure of physicians through medical school curricula, increasing the collaboration between State programs and National Health Service Corp programs, and limiting the use of Health Professional Shortage Areas in determining need. With several key adjustments to these programs, LRPs and SPs are viable methods to recruiting and retaining primary care physicians, which would effectively open healthcare availability to millions of rural Americans.

3. The Use of Loan Repayment Programs (LRPs) and Scholarship Programs (SPs)

There is a shortage of physicians particularly in rural primary healthcare in the United States, limiting the ease of access for rural citizens that loan repayment and scholarship programs are currently in place to solve. Rural healthcare is especially affected by the shortage of physicians as rurual geography itself is isolated and the areas are sparsely populated. Olga Khazan, journalist for *The Atlantic*, notes in her article "Why Are There So Few Doctors in Rural America?" that " about a fifth of Americans live in rural areas, but barely a tenth of physicians practice there"[5]. Khazan notes the disparity between rural areas in comparison with the rest of the United States further, as she asserts "rural areas have about 68 primary care doctors per 100,000 people, compared with 84 in urban centers"[6]. In fact, researchers found that "65% of rural counties lack adequate health professional workforces" to treat the population[7]. The primary care physician shortage exists as an issue overall in the United States, but the impact on an already diminishing rural healthcare system is brutal. LRPs and SPs send physicians directly to HPSAs in both rural and non-rural areas in an effort to alleviate the shortage. However, it has become evident that these shortages still persist even with the use of these programs.

While loan repayment programs and scholarship programs are necessary and partially effective in order for the United States to alleviate health care disparities, the current system is too restrictive for potential physicians. The National Health Service Corps' (NHSC) upholds LRPs and SPs as essential to relieving health professional shortages in rural areas. As it stands, the NHSC is the largest and most well recognized entity working to bring

physicians to underserved rural areas. In fact, Glen Cheng argues that the NHSC is "one of the primary means of reducing the shortage of primary care physicians in underserved or rural areas"[8]. The NHSC's LRPs and SPs, which aim to recruit and retain physicians to underserved areas using HPSA designations, is easily the most recognized physician aid program that works to relieve the health professional shortage. Researchers at the University of North Carolina Cecil G. Sheps Center for Health Services research claim that the NHSC is already the largest of its kind[9], and in 2012, the program was "bolstered with $200 million additional funding from the American Recovery and Reinvestment Act (ARRA) to more than double its workforce size to over 8,000 practitioners in all 50 states"[10]. LRPs and SPs aim to recruit physicians, which Pathman et al., claim is " important because low recruitment is generally the reason shortages arise"[11] in the first place. Further, these programs require a minimum two-year agreement to work in a designated HPSA. LRPs and SPs are beneficial agreements for both the recruited physicians as well as the rural underserved areas, as patients in underserved areas are provided with the care they need, and the physicians are able to receive financial support for their educational debt, which has increased substantially over the past years.

Researchers at the University of Texas Health Science Center, primarily agree with Glen Chen's previous assertion of the necessity of these programs because "tuition at United States medical schools has increased substantially in the last 30 years, by approximately 400% at private schools and 250% at public institutions"[12]. In fact, after interviewing medical students and residents, Price et al. found that in response to the tuition spike, "52% of students and 38% of residents responded positively"[13] to interest in a loan repayment program that would require them to serve under contract in an underserved area, suggesting that the interest for these programs is clear, particularly among medical school students. In addition, Rosenblatt and Moscovice, from the University of Minnesota and the University of Washington respectively, assert, "25 percent of entering medical school classes will receive substantial loans and scholarships in return for which they will provide service in health manpower shortage areas"[14], which is the chief reason Rosenblatt and Moscovice claim make LRPs and SPs a very popular choice for new medical school graduates.

The interest in loan repayment programs and scholarship programs is clear, and funding for the National Health Service Corp is relatively stable. Pathman et al., affiliates of the University of North Carolina Cecil G. Sheps Center for Health Services research, also point out the necessity of state LRPs and SPs in their article, "States' Experiences With Loan Repayment Programs for Healthcare Professionals in a Time of State Budget Cuts and NHSC Expansion". By interviewing 28 state representatives for these programs, Pathman et al. found that "no respondents stated that they wanted their states to give up their joint state-federal or solely state-funded programs"[15] even in the midst of an increasingly funded National Health Service Corp. The interviewees noted that "their states had returned the federal funds received for their joint state-federal programs" because of legislature budget cuts and "not because the state-federal program was unvalued"[16]. Both state and NHSC programs are not as effective as they have the potential to be due to shortcomings that could easily be adjusted.

4. Stringent Contract policies of LRPs and SPs

It has become clear that as necessary as these programs are to reliving the primary care shortage in rural areas, these projects have not been able to reduce the prevalence of HPSAs in rural areas. Although LRPs and SPs undoubtedly bring more physicians to rural underserved areas than if they had not ever existed, there are several drawbacks to the programs that may significantly impede the positive impact these programs could have. Admitting there are hindrances to these programs, there are also possible solutions. The fundamental objective of LRPs and SPs is to attract as many physicians as possible, yet certain obstacles discourage physicians from even applying in the first place. While it is important to note that LRPs and SPs are beneficial to both the physician and the patients living in the area in need, doctors receive a very lucrative salary more so in specialties and advanced urban medical centers in comparison to primary care in rural settings.

One of the potential barriers that may deter prospective PCPs from applying to LRPs and SPs is the extensive and binding contract that physicians are committed to once accepted into either program. For example, the NHSC LRPs have extremely stringent policies in the case of contract breaches, which may dissuade well-qualified physicians from even applying to these programs. According to the NHSC, the penalty for a breach of contract for a full time clinician is:

> (1) The amount of the loan repayments paid to the participant representing any period of obligated service not completed; (2) $7,500 multiplied by the number of months of obligated service not completed; AND (3) Interest on the above amounts at the maximum legal prevailing rate, as determined by the Treasurer of the United States, from the date of breach.[17]

Physicians who are unable to fulfill the full term of their contract, which is usually around 2 years, are subject to substantial fines. For example, a physician who must leave their service 12 months before the end of their contract would owe the amount of money paid for service not completed in addition to $90,000, as well as interest on those two amounts. The final sum would be almost equivalent to the cost of four years of medical school itself, where the majority of graduates expect to accrue debt exceeding $100,000[18]. Stringent policies such as high interest and fines on contract infractions dissuade physicians from taking the first step to apply to LRPs and SPs because these programs are binding commitments. Although these contract policies are beneficial in dissuading physicians from leaving their area of obligation prematurely, the consequence of these stringent policies is a decrease in the number of physicians applying to the program, and a subsequent decrease in the quality of these programs.

In contrast, other strategies, such as the LRPs under the Patient Protection and Affordable Care Act (PPCA), have eased contract policies in order to make their program more attractive to prospective physicians. In analyzing the Patient Protection and Affordable Care Act, Glen Cheng of Radford University notes that "the PPACA now requires students to practice in primary care for ten years or until full loan repayment—whichever occurs earlier"[19] whereas previously, the PPACA "required students to practice in primary care until the date the loan was repaid in full," which could extend well past 10 years[20]. The PPACA program is an extended program, in comparison to the LRPs and SPs run by the NHSC and similar state entities, but the principle behind these programs is the same. Both programs aim to attract physicians to underserved areas and both, at one point, struggled to achieve their goals because of the unattractiveness of the program regulations. Alterations to the PPACA programs came from the realization that these programs should be to encourage physicians to at the very least apply to the programs with fewer reservations about impending contract penalties or excessive long-term commitments. The NHSC LRPs and SPs, by lifting harsh contract breach policies, would be able to attract a greater number of physicians, who would fixate less on the repercussions of contract violations and apply to these programs more eagerly.

Although recruiting physicians who will remain dedicated to their service area is a large part of reducing the prevalence of physician shortage areas, attracting a larger pool of applicants will not only increase the competitiveness and recognition of these programs, but also expose physicians to rural healthcare. Simply attracting more physicians to rural underserved areas will likely increase the effectiveness of these programs, as the majority of the physicians that participate in the LRPs and SPs remain in their designated areas even after their contracts have ended. Glen Cheng notes "more than seventy-five percent of NHSC participants voluntarily continue to serve in their HPSA location even after their obligation is fulfilled"[21]. The high retention of physicians in these areas implies that recruitment may be the major reason why rural areas continue to see a rise in health professional shortages. In concurrence with Cheng, Pathman et al. also assert that "physician retention is minimally or not at all worse in rural underserved communities than in rural non-underserved communities"[22], which suggests that lower recruitment to rural underserved communities in comparison to rural non-underserved communities is the major factor that sets underserved rural communities apart from well staffed ones. This occurrence is likely due to the fact that exposure to these underserved areas fosters a sense of obligation in practicing physicians, not only through the connections to the community formed during the years of service but also the obligation to serve communities in need. Therefore, LRPs and SPs may focus their goal towards recruitment of physicians, as retention seems to be a nonissue.

LRPs and SPs are also restrictive in the fact that they are only open to a specific set of professionals and are not extended to other qualified positions in general care such as general surgery. According to the National Health Service Corp, the scholarship program is only open to "Physicians (MD or DO), Dentists, Nurse Practitioners (postgraduate degree with clinical practice focus), Certified Nurse-Midwives, and Physician Assistants"[23], while the NHSC LRP is open to the healthcare professionals eligible for the SP in addition to the mental or behavioral health specialists such as "HSP, LCSW, PNS, MFT, LPC"[24]. These programs do not include certain types of medical professionals that may be useful in underserved areas such as general surgery. Price et al. found that "21% of students and 14% of residents" were considering a career in general surgery, but "the National Health Service Corps scholarship and medical school loan repayment programs for service in underserved rural or inner-city locations are not available for surgeons"[25]. Opening the LRPs and SPs to a greater number of general specialties would not only encourage more physicians to apply to these programs but also attract qualified and specialized physicians to these underserved rural populations.

5. The Physicians' Negative View of Rural Health Care

The perceived disadvantages of working in rural health care create a stigma among physicians that LRPs and SPs must effectively combat in order to attract physicians to these areas. Rural PCPs are known to have heavier workloads in addition to lower salaries in comparison to physicians working in urban areas. For example, a 2008 study found that rural PCPs had more patient visits than urban physicians; "22% more for general practitioners, 14% for family physicians, 19% for general internists, and 13% for pediatricians, all P <.001)"[26]. Often times, income averages can be skewed due to extraneous variables, yet even "after adjusting for work effort, physician characteristics, and practice characteristics, primary care physicians who practiced in rural settings made $9,585 (5%) less than their urban counterparts (95% confidence intervals: −$14,569,−$4,602, P < .001)"[27]. Although LRPs and SPs attract physicians through monetary incentives, physicians seeking to make more money long term may see working in rural areas as a disadvantage. In addition, physicians may also view strenuous work schedules as a negative aspect to rural healthcare. In order for LRPs and SPs to effectively attract physicians to their programs, changes made to the strategies may directly address the issue of fair work hours and equal compensation.

In addition to the difference between rural and urban physician life, there lies a disparity within rural HPSAs and rural non-HPSAs. Firstly, the work hours of physicians in rural HPSAs are statistically more difficult than those of physicians in rural non-HPSAs, just as rural PCPs have more work hours than urban PCPs. According to Donald E. Pathman, Thomas R. Konrad, Rebekkah Dann, and Gary Koch, researchers at the University of North Carolina Cecil G. Sheps Center for Health Services research, in their article, "Retention of Primary Care Physicians in Rural Health Professional Shortage Areas", the proportion of rural physicians working in HPSAs who worked three or more nights on call was "64.2% vs. 45.6%, P=.001" for non-HPSA rural primary care physicians[28].

Additionally, in a similar parallel between rural and urban PCPs, Pathman et al. found that physicians working in rural HPSAs received a lower mean per capita income, $12436 vs. $14172, P<.001[29], in comparison to rural non HPSA PCPs, which the researchers claim are deterring factors for rural healthcare. In short, physicians who work in rural HPSAs are forced to work longer and receive lower pay in comparison to both rural non-HPSA PCPs and urban PCPs. The disparity in physician quality of life between rural HPSAs to rural non-HPSAs, implies that there is a difference not only between rural healthcare and other geographical locations, but also within rural areas themselves. When comparing the size of different rural clinics, researchers found that the number of patients seen is statistically equal[30], around 16 patients a day. Rosenblatt and Moscovice found in their analysis that rural healthcare systems usually saw 900-1000 encounters per quarter, regardless of the number of physicians working in the practice and the overall size of the rural practice[31]. Therefore in HPSAs, where the number of physicians is significantly less than in non-HPSAs, the few physicians available must work longer hours to see the same number of patients as with relatively larger rural hospitals. Overall, practices with fewer PCPs would have to work much harder in order to support the same amount of people as a larger practice. The strenuous workload placed on PCPs working in HPSAs is a clear negative to working in underserved areas that discourages potential PCPs from working in these rural areas and subsequently from applying to LRPs and SPs. In order to decrease the burden placed on physicians practicing in rural HPSAs, sending physicians to these areas in a collective group distribute the workload more optimally, and as a result encourage more physicians to apply to LRP and SP.

In fact, isolation is a large deterring factor for physicians entering the rural health care field, particularly for physicians in the ethnic minority. Sending physicians in teams may help solidify or increase interest in LRPs and SPs. Noting the large responsibility placed on PCPs working in rural HPSAs, Roger Rosenblatt and Ira Moscovice, researchers at the University of Washington and the University of Minnesota respectively, found that solo NHSC physicians did not remain in the communities where they were placed as the lack of interaction and the "burden of total responsibility led to their almost inevitable departure"[32]. Physicians who enter LRPs and SPs are sent to areas in where they have no preexisting connection to the community, or experience with the community dynamics in rural healthcare. An aspect of rural health care shortages unaddressed by programs such as LRPs and SPs is the idea of race as a contributing factor to whether or not physicians apply to these programs, and accommodating physician life at their obligation sites. Michelle A. Price et al. found that "Hispanic (63%) and black (55%) residents were more likely than white (36%) and Asian (22%) residents to express interest in a loan repayment program (p 0.001)"[33] (9). In contrast, the demographics of rural areas in the United States consist overall of white (77.8%), black (8.2%), Hispanic (9.3%), and Asian (1.0%)[34]. The same races most likely to be interested in these programs are the ones who are the minority in rural areas. In addition, after conducting research on reasons why physicians practice in rural areas, Hancock et al. found that among the four major factors, familiarity and a sense of place were the main reasons physicians chose to work in rural areas[35]. Therefore, not only are racial minority physicians sent to areas foreign to them, but they are also in social environments alien to them. The issue with the current LRPs and

SPs is the fact that these programs fail to foster a sense of community engagement and to take into account the importance of physician contentment at their obligation sites as influential factors of physician recruitment and retention.

In addition to race, LRPs and SPs also do not take into account the upbringing of physicians when accepting physicians into the program. Determining the upbringing of physicians allows LRPs and SPs to target candidates likely to establish a community bond. In fact, Lee and Nichols note, "rural residents cited growing up in rural settings as the most important factor in choosing to practice rural medicine"[36]. Rural residents are not the only ones interested in LRPs and SPs, as Lee and Nichols found that "urban residents indicated that it was their exposure to rural practice during medical school or residency that influenced their decision to engage in rural practice"[37]. Hancock et al. agree with Lee and Nichols, arguing that "of all of the factors involved in effective recruitment," rural upbringing, "defined as spending all of one's childhood in a rural location, more than ten years in a rural location, or calling a rural place one's childhood home, is the strongest predictor of rural practice choice"[38]. Ultimately, assertions by Lee and Nichols, and Hancock et al., reveal the importance of exposure to rural healthcare in attracting physicians to these programs. In order for physicians to develop a genuine interest in applying for LRPs and SPs, they must have had some exposure to rural or underserved medical care at some point in their medical education or career.

Overall, Pathman et al. assert that "the most straightforward interpretation of current evidence is that local rural shortages generally develop when too few physicians are recruited, which often occurs when local amenities, economies, and practice situations are unattractive"[39]. In addition to these factors and apparent desire for familiarly, Dane M. Lee and Tommy Nichols claim "there is the human dynamic where spousal perspectives and raising young children always plays a role in practice location"[40]. All these elements, from longer working hours, lower pay, lack of amenities, family and social life conjoin to determine whether a physician remain in their designated area or whether a physician applies to the program in the first place.

Although changes to reform rural living is a task beyond the scope of this article, changes made specifically to LRPs and SRPs in terms of facilitating physician work schedules and living may be incorporated into these programs. Addressing these issues, it may be beneficial to send physicians in teams rather than individually, which programs currently do. Physicians sent to underserved rural areas in groups may be able to divide the workload evenly in order to alleviate the high stress of bearing the sole burden for a rural practice. In addition, physicians may also feel more comfortable in a new surrounding if sent with other familiar team members. A sense of both familiarity and community encourage physicians to remain in their practice sites, leading to both improved physician retention and recruitment.

6. Lack of Exposure to Rural Healthcare for Medical Students

Medical school curricula currently does not contain required programs exposing students to rural primary care, and as a result, since course are taught chiefly by specialists, fewer students leave medical school with the aspirations of working in primary rural healthcare. In order for LRPs and SPs to attract more students to primary care rather than only to specialties, these strategies may look to the endorsement of Title-VII funds, rural focused programs, and curricula taught by general physicians. To combat the growing trend of physician specialization and congregation to non-underserved areas, medical school curricula needs to contain more programs exposing students to rural primary care in order to attract more students to rural healthcare. LRPs and SPs would benefit from the increase in PCPs because there would be a larger pool of applicants to their programs. LRPs and SPs may focus on educating students about rural healthcare shortages in an effort to combat the growing number of specialists, who would otherwise be unable to apply to LRPs and SPs. Medical schools that receive funding for a primary care focused curriculum are known as Title-VII funded schools, in contrast with non-Title-VII funded schools which are not obligated to teach a primary care centered curriculum. According to Diana R. Rittenhouse et al., researchers at the University of California San Francisco, "3.0% of physicians who attended Title VII–funded medical schools worked in CHCs [Community Health Centers] in 2001-2003, compared with 1.9% of physicians who attended medical schools that were not Title-VII funded ($P < .001$)"[41]. Although the percentage difference is slight, Rittenhouse et al.'s statistically significant findings illustrate the impact that medical school curricula makes in encouraging students to enter the medical field in order to serve HPSAs. Rittenhouse et al. also asserts that "attending Title VII- funded medical schools and residency programs were independently associated with participation in the NHSC LRP as well as independently associated with working in a CHC"[42]. The assertions made by Rittenhouse et al. imply that students who attend schools with a focus on primary care are more likely to express interest in LRPs and SPs, as well as work

in underserved communities. LRPs and SPs now are able to target medical schools that consistently produce students already interested in serving rural or underserved communities.

In addition, Price et al. also stress the importance of early exposure to rural settings in finding that "approximately 52% of students" whereas only "38% of residents indicated an interest in participating in a loan repayment program that involved service in a medically underserved area"[43]. The clear difference between the interests of students in comparison to the interest of residents suggests that LRPs and SPs may consider focusing recruitment efforts towards students rather than residents who have likely already chosen their specialty and general career path. While SPs are targeted towards students, LRPs have a broader pool of applicants, which usually contains practicing physicians, which is why together, both these programs are necessary. It is essential for LRPs and SPs to make themselves known to medical students before students settle on a subspecialty and begin solidifying their career paths. After surveying 6 medical school programs in Texas, Price et al. claim "an evaluation of the career choices of these graduates showed that those with higher debt favored subspecialties and internal medicine over family practice"[44]. However, these graduates with higher debt may not have realized that there are options available such as LRPs and SPs that would allow them to repay their debt, once more highlighting the importance of publicizing these programs to medical school students.

Lee and Nichols, in their article "Physician Recruitment and Retention in Rural and Underserved Areas" suggest "that rural education during medical school has a significantly greater influence to choose rural practice on physicians raised in urban areas than on physicians raised in rural areas" and that "physicians with an urban upbringing constitute the main source for rural PCPs, accounting for two-thirds of new rural physicians"[45]. Lee and Nichols assert that another possibility to directing more physicians to rural areas comes even before education in medical school, and during the medical school admissions process. Programs designed to recruit physicians with the intention of practicing rural medicine fosters the gradual growth of primary rural healthcare, and encourages aspiring physicians to consider rural healthcare as a potential career option. Lee and Nichols claim, "the greatest success for recruiting rural PCPs is for medical school staff to develop strategies to increase rural applicants with plans to practice family medicine"[46]. Rittenhouse et al. agree, concluding, "ongoing federal investment in the medical education pipeline to prepare and motivate physicians to participate in the NHSC and to work in CHCs should be considered an integral component of efforts to improve access to care for the underserved"[47]. Acknowledging the importance of rural health education in medical schools will allow LRPs and SPs to target students who have been exposed to these types of programs as well as create a societal norm of rural health education by encouraging students to gain knowledge about healthcare in rural areas.

7. Competition Between State and Local Loan Repayment and Scholarship Programs

State programs and national programs have the potential to work complementary with one another, but this ideal is far from reality. While Pathman et al. observed the importance of state programs, they noted that in interviews conducted with state program representatives, one interviewee mentioned that "the Corps has taken all of my applicants"[48]. With both state and national programs running in a similar fashion, these programs overlap to the point where in certain instances, their strategies seem indistinguishable from one another. In the case with competition between state and national programs, the national program has greater name recognition and prestige, downplaying the importance of the state programs. Pathman et al. continue to assert that "states programs may be better able to respond to the rapidly changing environment and the economic turbulence of state budgets" and know the state-specific needs better than the NHSC[50]. State programs are tailored to address specific needs in a community, whereas the national programs have the stable funding and name recognition required to bring the bulk of physicians to underserved areas. The only issue that arises is when programs contend for the same pool of applicants and federal funding. Increasing the pool applicants will aid in decreasing the overlap in state and national programs. It is essential for both state and national programs to work collaboratively and complementary, while remaining two distinct entities.

State programs and the NHSC programs must work together in order to most effectively tackle the issue of rural primary health shortages because current programs compete for applicants and adequate funding. There are limitations to the NHSC programs, particularly in the fact that the NHSC only accepts health professionals in primary, dental, or mental care. State LRPs and SPs are beneficial because they fill in coverage gaps, particularly with respect to general surgeons, where the national programs cannot. More specifically, according to Price et al., "in the absence of federally funded programs, state funded and privately funded (by hospitals or practice groups) loan repayment programs are becoming an increasingly important incentive for the recruitment and retention of general surgeons entering the workforce"[51]. Because the national programs have not yet extended to specialties, state

programs attract subspecialty physicians willing to work in underserved areas within the state. Therefore, the state and national programs can decrease the contention between the programs if the state programs begin to focus on the specific, specialty needs of the state, while the national programs act as a sort of umbrella, covering a wider range of general areas of need.

8. The Inaccuracy of HPSAs as a Designation of Need and the Role of Other Health Professionals

Health Professional Shortage Areas are considered to be an inaccurate evaluation of need, and because LRPs and SPs use HPSAs to determine where to place physicians, these designations fail to distribute physicians optimally. According to the NHSC, a location, such as a clinic or hospital, must be located in a designated HPSA in order to receive the NHSC physician recruitment and retention services[52]. The inaccuracy of HPSA scores has been observed in the field of rural health care specifically with respect to LRPs and SPs by both researchers and program administrators. In fact, in an interview study conducted by Pathman et al., interviewers found that from the opinion of state LRP and SP representatives, "eliminating the HPSA threshold score requirements for site eligibility was the change noted most often and was nearly uniformly perceived as positive"[53] out of all other changes made to the national programs including budget reform and contract changes. According to Pathman et al., the new regulations for LRPs prioritizes "awards and provides a larger loan repayment amount to clinicians seeking placement in sites with higher HPSA scores, to incent the neediest sites without making sites with lower score completely ineligible[54]. Decreasing the reliance on HPSAs as the ultimate determinate of need was a much-needed step, but there is a clear drawback. Although the national program has ceased to use a minimum HPSA score requirement in order to be eligible to be considered a physician site, an area must still have a HPSA designation in order to receive physicians through LRPs and SPs, and the application for an official HPSA designation can take years to receive.

One of the main shortcomings of HPSA designations are that it does it does not accurately quantify the amount of practitioners in an area. In a Government Accountability Office Report, researchers claim "that HHS's methodology did not account for certain types of primary care providers already serving in a HPSA, which can result in an overstatement of the provider shortage"[55]. Much of the overstatement of health professional shortages comes from the fact that only primary care doctors are counted in to determine the physician to population ratio of 1:3500. Even HRSA admits, "the formula used to designate primary care HPSAs does not take into account the availability of additional primary care services provided by nurse practitioners and physician assistants in an area"[56]. LRPs and SPs include nurse practitioners and physician assistants in its applicant pool and therefore would optimally use a methodology to determining need that includes these positions as well. One county may have fewer PCPs and a greater number of nurse practitioners (NPs) and physician assistants (PAs) who are able to provide the same level of primary care as PCPs, whereas another county may have more physicians but no other health professionals practicing in the area. As a result, in certain cases, physicians are being sent to areas with an ample amount of practitioners, while other more needy areas are essentially ignored.

In addition to the prevalent overstatement of need, there is also no strict methodology to assigning HPSA scores. Keri Tonn, J.D., M.S., from the University of Chicago, goes on to report that "the healthcare community should not have to use antiquated methodology when trying to structure modem physician recruitment arrangements" with respect to HPSAs[57]. In fact, excess and superfluous factors go into HPSA designations, potentially skewing the measuring of need in a county. Although the physician to population ratio of 1:3500 was once a strict guideline used to determine areas of need, HRSA asserts, "While the 1:3500 ratio has been a long standing ratio used to identify high need areas, it is important to note that there is no generally accepted ratio of physician to population ratio"[58]. There is a high level of variability when assigning HPSA scores and other factors such as age of the population and the proportion of uninsured may affect the scores as well. Tonn suggests that "automating the scoring process and unnecessary time-consuming measures to gain designation, and including designations such as the percentage of elderly or uninsured individuals in an area"[59] may help increase the accuracy of HPSA scores.

In order to accurately measure the amount of need in an area, HRSA may look at practitioner to population ratios rather than physician to population ratios, or an automated process to better quantify the need in a specific area. The main issue addressed with the use of HPSAs in order to determine health care need in an area is that HPSAs overstate the need in an area by not taking into account the NPs and PAs practicing in the county. By relying on the 1:3500 physician to population ratio in HPSA designations, LRPs and SPs may be sending physicians to areas that have a sufficient amount of primary care available to patients, as Pas and NPs are able to give almost analogous care to PCPs. Therefore, incorporating practitioners into the ratio will improve the accuracy of the HPSA designations.

In addition, incorporating factors such as age of the patients and whether the patients are insured increases the inaccuracy of the HPSA score designation. As a result, removing these excess variables when computing HPSA scores will allow for an increase in the precision of quantifying need.

9. Conclusion

At its current rate, rural healthcare is rapidly deteriorating. However, LRPs and SPs have the potential to reverse this trend. The issues encountered with the administration of these programs stem from stringent contract terms, a lack of amenities for physicians, a paucity of early exposure to rural healthcare for medical school students, competition between state and national programs, and the use of HPSAs in the determination of need. These shortcomings may be directly countered by repealing harsh policies, sending physicians to obligation areas in groups, educating medical students on rural primary care, collaboration between state and national programs, and forming methods to determine needs in an area. By attracting primary care physicians to rural areas where they are truly needed, access to healthcare could be opened to millions of rural Americans.

Rather than do away with LRPs and SPs altogether, the resources poured into these programs can be optimized through minor changes to current strategies. Redesigning these programs would be both more cost effective and more manageable than completely discarding existing programs and creating new methods. The changes suggested in this research are relatively modest and cost effective, but the implied impact of these alterations is worth considering.

The advancement of rural healthcare has the potential to increase the overall quality of life for millions of rural Americans as well as save both the federal government and patients money from the administration of preventative healthcare. There is no conceivable downside to having a stable rural healthcare system—the only obstacle preventing action towards an improved rural healthcare system is the resistance to change. However, even the most minor alterations made to the current policies can have an enduring impact of the future of the American rural healthcare system, and open healthcare access to rural citizens in desperate need of care.

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