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Does the Healthcare Workforce Need Stitches? Exploring Policy Approaches in Western North Carolina

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Abstract

Americans are not as healthy as we could be. According to the Centers for Disease Control and Prevention (CDC), roughly 6 in 10 Americans have at least one chronic disease. Many factors play a role in determining the health of Americans. One major contributor is healthcare. Quality of healthcare can be affected by having an available, well-trained workforce to meet the needs of a population. However, there is currently a healthcare workforce shortage in Western North Carolina. This paper will focus on the healthcare workforce shortage and explore possible policies that may be most effective addressing this concern. The research included a review of secondary resources and engagements with professionals in the healthcare industry. The author found that multiple factors impact current healthcare recruitment and retention. These factors include but are not limited to education pathways, practice and system finances, and workplace burnout. Regional, state, and national policies addressing these factors can mitigate current and future healthcare workforce shortages. Understanding factors contributing to the healthcare workforce shortage and developing policies that address the various needs of healthcare workers and workplace inequalities is beneficial to the region's current and future healthcare workforce system.

Introduction

The health of Americans across the nation continues to decline. Nationally, the Center for Disease Control and Prevention (CDC), estimated 129 million people in the US have at least 1 major chronic disease, as defined by the US Department of Health and Human Services (Benavidez et al., 2024). Many factors play a role in determining the health of Americans, such as economic instability, poor nutrition, and limited exercise (2024). Healthcare quality and access also is a critical factor. However, according to the American Hospital Association, limited healthcare access could jeopardize access to care and quality of care to patients in various communities (2021). One of the factors contributing to limited healthcare access is the healthcare workforce shortage. A large body of research in the USA and regionally indicates that a shortage of healthcare workers results in "decreased capacity of hospitals to serve patients overall. The efficiency and effectiveness of the entire healthcare system could be at risk at a time when hospital workers are already under increased stress" (Howard, 2022).

According to Džakula et al, a healthcare workforce shortage can be characterized as "not having the right number of people with the right skills in the right place at the right time, to provide the right services to the right people" (2022). Addressing the shortage is a priority to prevent increased negative outcomes including medical mortality, chronic conditions, and mental health problems. According to Milbank Memorial Fund (2024), the result of the healthcare shortage in the US is a continuing decline in average life expectancy. Moreover, according to the Milbank Memorial Fund (2024), health disparities in preventive services and other basic primary care services continue, contributing to 60,000 excess deaths each year.

In Western North Carolina, more than 16.3% respondents to the 2024 community health assessment were unable to access needed healthcare due in part to healthcare workforce shortages in the region (WNC Health Network, 2024). In 2023, all the counties in WNC had health professional to population ratios below the state ratio of 21 per 10,000 (see Figure 1 Sheps Health Workforce).

In 2025, Mountain Area Health Education Center (MAHEC) data indicated all sixteen WNC counties are areas of health care professional shortages. Many healthcare workers left the field as a result of Covid-19 due to increased hours, stress, and exposure to disease and patient death. Although time has passed since the Covid-19 pandemic, staffing challenges are expected to continue to worsen as hiring processes remain stalled for frontline professions, even for healthcare systems and hospitals that have been able to increase pay and other incentives. Furthermore, discussions held by the Western North Carolina Health Policy Initiative (HPI) in spring 2025 indicate factors such as childcare, transportation, and housing affordability remain frequent and persistent barriers to healthcare employees, creating absenteeism and retention difficulties. According to Carolina et al (2024), healthcare systems and hospitals, especially in the state's rural areas, cannot match rising wages offered by urban healthcare systems and wage growth in broader private districts. North Carolina's 11th congressional district offers an example of one of many regions in the state experiencing healthcare professional shortages in rural areas related to wage disparities. According to Stroudwater Associates, the majority of healthcare workers in North Carolina's 11th congressional district are present in non-rural areas. Only 22.2% of the healthcare workforce is represented in rural areas. The number increases slightly in rural areas for family medicine, general practitioners, and oral health. The data show that patients requiring specialists are required to travel to urban areas to receive care (Stroudwater Associates, 2025).

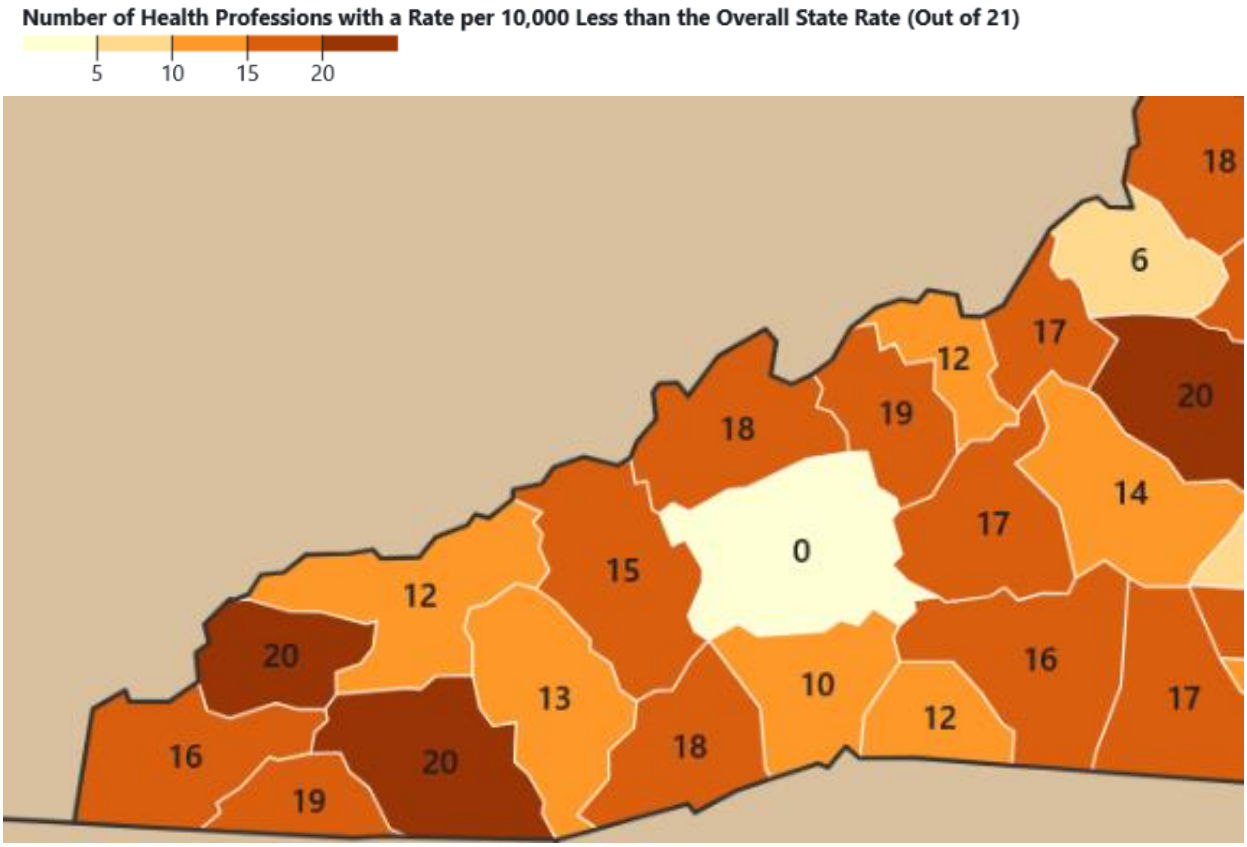

Figure 1. Number of health professions with a rate per 10,000 less than the overall state rate, by county in WNC in 2025.

Note: North Carolina (NC) counties in analysis are based on counties that require both **emergency work**, including individual assistance and public assistance for FEMA categories A-B (debris removal and emergency protective measures) **and permanent work**, including individual assistance and public assistance for FEMA categories C-G (work on roads and bridges, water control facilities, public buildings and equipment, public utilities, and parks, recreational, and other facilities) by FEMA in North Carolina Disaster Declaration Number FEMA-4827-DR, published October 15,2024.

Source: UNC Sheps Health Workforce NC (Moore et al., 2025).

Health Policy Initiative (HPI)

One group influencing health policy changes in Western North Carolina is the Western North Carolina Health Policy Initiative (HPI). The group is currently working to understand and address the healthcare workforce shortage in the state's western region. Their mission is to inform strategies for improving the health and wellbeing of Western North Carolinians through scholarship, collaboration, policy development, and advocacy. The group serves as a hub of information regarding policy makers, healthcare leadership professionals, community-based service organizations, educational and research institutions, and community members (WNC Health Policy Initiative., n.d.)

Discussions held by WNC HPI in spring 2025 indicate that Western North Carolina currently faces a significant shortage of healthcare professionals, including but not limited to nurses, physicians, pharmacists, and other pivotal roles. The HPI discussions also indicate that the region struggles to maintain an adequate number of qualified mental health and substance abuse professionals, resulting in long wait times and further limited access to care.

Understanding the contributing factors to the healthcare workforce shortage in Western North Carolina and what promising approaches exist to address the current and future workforce shortages will inform how to proceed with limited resources. Thus, this paper aims to answer the following questions:

1) What are the contributing factors to the healthcare workforce shortage, particularly in WNC?
2) What are strategies, including policies, to address the workforce shortage?

Methods

To answer the research questions, the author utilized a cross-sectional design, reviewing secondary sources at one point in time. In addition, the author attended meetings and engaged in informal conversations with experts in the healthcare environment in Western North Carolina in the summer of 2025.

The author used keyword searches on google scholar and google search engine, to find secondary sources, including reports, news articles, and journal articles.

Due to limited regional information, research included broader and WNC-focused workforce shortage sources. Table 1 includes search terms.

Table 1. Secondary Research Search Terms

Geography challenges	Mobile Health
Covid-19	Access
Healthcare workforce burnout	Policy
Western North Carolina	Diversity
Medicaid	Additional search terms were incorporated as ongoing research indicated their relevance

In addition, the author completed an internship with the HPI group in summer of 2025. The author reviewed documents and attended meetings of the Health Policy Initiative and workgroup on healthcare access to learn about the healthcare workforce shortage. These meetings included:

- Hodge, Bryan. (2025, April 16) *WNC Healthcare Provider Coverage Data/Discussion (Part 2)* [Powerpoint slides]Healthcare Workforce Needs in Western North Carolina.4.4.25.pptx - Google Slides
- Hodge, Bryan (2025, May 16). *Addressing Healthcare Workforce Needs in Western North Carolina*, [Powerpoint slides] Healthcare Workforce Needs in Western North Carolina.Follow-up.pptx - Google Slides Mountain Area Health Education Center, Asheville, NC, United States
- WNC Health Policy Initiative (2025, May 30)., *AtHC Workgroup/Graduate Medical Education leadership strategy session.*[Conference] Mountain Area Health Education Center, Asheville, NC, United States
- WNC Health Policy Initiative (2025, June 6). *Project Access Needs Assessment Findings w/Western Carolina Medical Society + MAHEC Internal Medicine Residents* [Conference] Mountain Area Health Education Center, Asheville, NC, United States
- WNC Health Policy Initiative (2025, June 13) *HPI + MHA + HPRCC leadership meeting* [Conference] Mountain Area Health Education Center, Asheville, NC, United States

Furthermore, the author consulted with experts in the healthcare environment in Western North Carolina for a real-world perspective.

- Bryan Hodge, DO, Chief Academic Officer, chair of the Department of Community and Public Health at UNC Health Sciences at MAHEC (2025, June 25)
- Kae Livsey, PhD, MPH, RN, College of Health and Human Sciences School of Nursing at Western Carolina University. (2025, June 27)
- Marc Malloy, Founder and CEO of Sevenya, LLC. (2025, June 27)

The author found 51 resources, including 25 professional journals, 3 websites, 13 advocacy group publications, 5 federal and state government issued documents, 2 news reports, and 3 HPI meeting minutes. Keywords such as healthcare shortage, healthcare access, and policy were used to obtain results related to the specific research objectives. Sources were selected based on specific criteria, such as year of publication, relevance to research questions, and credibility. The author drew from the information in the secondary documents and meetings and conversations to draft the paper, focusing first on the contributing factors and then following with promising strategies for addressing the healthcare workforce shortage, particularly in WNC.

Findings

Key Factors Contributing to the Workforce Shortage

The primary factors contributing to the shortage of healthcare workforce were found to include childcare, Covid-19, representation, education pathways, housing and transportation, practice and system finances, and workplace burnout. Key contributing factors are presented in alphabetical order. Furthermore, the factors are not listed in order of importance as each play a vital role contributing to the healthcare workforce shortage.

Childcare

Research found that parents in nursing fields experienced conflicts with work and family life and often neglected self-care (Ong et al., 2023). An inability to afford or access childcare can prevent employed healthcare workers from working efficiently and medical students from completing training programs. According to a WNC HPI report (2025), 65 of North Carolina's 100 counties show a net loss of childcare programs. Access to quality childcare programs has been limited by facility closures, staffing shortages, and financial strains on families. According to HPI, waitlists for childcare can be years long, and the cost of keeping even one child in childcare can equal or exceed the cost of a mortgage. The same report found health systems, medical providers, and care facilities that provide health services rely on access to childcare to recruit and retain staff while remaining open, functional, and responsive in times of need. In Western North Carolina, ensuring childcare access to healthcare and other workforce sectors has become a top priority, a situation that was exacerbated in the aftermath of Hurricane Helene. The WNC Legislative Summit on Childcare indicated that Hurricane Helene further increased stress on childcare institutions in Western North Carolina, when childcare centers were faced with closures, damage and revenue losses (*Five Things to Know about Childcare in WNC in 2025,* 2025). The Summit highlighted the value of childcare access to healthcare providers in allowing them to quickly return to work in the wake of the storm. According to an NC Chamber of Commerce Foundation Survey (Carlson, 2024), 26% of parents left the workforce because of an inability to find affordable childcare.

Covid-19

Health Resources and Services Administration (HRSA, 2024) found the Covid-19 pandemic generated additional workforce stress as frontline healthcare workers faced long hours, exhaustion, and an increased exposure to death, while fearing for their own health and safety. Research found the resulting high levels of stress and burnout led many healthcare workers to second-guess career choices. A Mayo Clinic survey found physicians' satisfaction with professional fulfillment and work-life balance decreased during the Covid-19 pandemic (Health Resources and Services Administration, 2024). According to Carolina et al. (2024) research found many providers still struggle to meet staffing needs now, despite the passing of the pandemic and its resulting tighter labor markets. Negative perceptions of healthcare professions, especially prominent during the Covid pandemic, continue to spread as social media use increases. According to Alexander et al (2025), the public trusts that their health care will be available and of high quality. This social contract in which patients trust in health care workers to be healers delivering high quality care was disrupted during the pandemic, creating negative perceptions of the healthcare workforce. This research did not reveal any published sources tailored specifically to the impact of Covid-19 on WNC.

Representation

A lack of racial, ethnic, religious, cultural, and sexual orientation diversity in the overall healthcare workforce can present difficulties in workforce recruiting and retention, especially in rural and other areas lacking diversity. According to Togioka and Young (2023), increasing diversity in the healthcare system has positive benefits for workers by confronting and disproving negative or limiting stereotypes, allowing providers and teams to become more effective and provide better care for patients. Despite benefits that a diverse healthcare workforce provides, minority groups

remain underrepresented at all career levels in medicine, nursing, and other health professions (Hill et al., 2025). Another concern is that healthcare professionals from underrepresented populations tend to seek out areas with higher patient ratios from the same background (Vereen, 2024). As a result, healthcare professionals from underrepresented backgrounds often leave rural areas in favor of more diverse urban settings, furthering healthcare shortages in rural regions and contributing to overall healthcare worker maldistribution and lack of rural diversity. Wingfield (2025) shared findings that indicated discriminatory barriers include punishing schedules that are incompatible with cultural expectations surrounding caregiving; sexual harassment in male-dominated specialty areas like surgery and anesthesiology; and underrepresentation in leadership roles.

Education and Training

Education and training challenges have created a further bottleneck on the healthcare workforce. (Lynn, 2022) found nurse faculty pipelines are not refilling, creating a shortage of educators needed to teach incoming generations of nurses. According to RTI International, in 2022, one in 10 of all nursing instructors in the University of North Carolina system left their jobs driven by factors such as retirement, budget constraints, and competition from higher-paying roles offered by clinical sites and travel nursing positions (Carolina et al., 2024). Researchers at the American Hospital Association found nurse faculty are aging, with an average age of 65 for nursing professors in the U.S (2021). The lack of educators has meant that some nurses early in their careers are entering the workforce without the benefit of mentoring from veterans with a broad range of knowledge and experience in the healthcare system and practice (Lynn, 2022). Furthermore, the high cost of obtaining a medical degree presents recruitment barriers. A study by Park & Coles (2022) found that increasing debt and concerns over being able to secure well-paid employment reduced chances of graduates choosing a “public interest” job, including public health fields.

Housing and Transportation

As with the general population, healthcare workers face challenges with housing and transportation, especially in rural communities, which can result in providers traveling long distances to their practice sites or being unable to secure reliable transportation to work. According to Carolina et al. (2024), increases in the costs of housing and transportation to meet patients create financial strains that damage workforce productivity and participation, especially for workers/workforce sectors receiving lower wages. Insufficient private sector housing hinders employees’ ability to find and keep employment. These challenges result in increased absenteeism as well as difficulties in workforce hiring and retention. According to Malakapalli (2024), North Carolina’s rural landscape has created additional challenges due to the geographical dispersion of healthcare facilities in rural areas, further exacerbating the challenge of reaching patients for basic care and resulting in delayed appointments and complications that could have been avoidable. According to Malakapalli (2024), disconnection between the patient and provider can worsen patient dissatisfaction, deterring individuals from traveling long distances and seeking necessary care. This disconnection and reduced patient satisfaction can additionally affect healthcare workers’ feelings of job satisfaction.

Practice and System Finances

Current research indicates that financial challenges play a large role in the healthcare workforce shortage. Financial instability exacerbates existing workforce challenges. Challenges include issues relating to a provider's ability to utilize new technology, disparities in pay, high debt loads, payment structure incentives, and instabilities caused by our increasingly complex insurance landscape. Marc Malloy, founder and CEO of Sevenya, LLC, a health care consultancy, noted that the increasing number of insurance payers and growing complexity of billing and reimbursement structures also complicates administrative processes, which in turn leads to increased workloads for staff. "The influx of patients with varying insurance coverage creates confusion in care accessibility and billing, leading to further burnout among workers…Administrative costs consume disproportionate amounts of healthcare budgets." Furthermore, if practices are unable to hire additional staff to provide these services, the physicians must do the tasks themselves, further contributing to workplace burnout. In rural populations, patients are more likely to be uninsured or insured through Medicaid and Medicare. The difficulty in creating a financially sustainable practice in those areas is a critical challenge for attracting workforce into rural areas where shortages are the most acute.

Workplace Burnout

Many factors contribute to the burnout of healthcare workers, including an absence of a supportive environment, significantly affecting mental well-being (Sipos et al, 2024). Burned-out healthcare workers display feelings of disillusionment and emotional exhaustion, which leads to detachment from work and decreased empathy, which impacts overall staff well-being and patient care quality. As a result, a self-perpetuating cycle of burned-out healthcare workers can be generated (Sipos et al., 2024). Staffing ratios are another critical contributing factor to healthcare workers' burnout and can be exacerbated by an aging workforce, pre-existing workforce burn out, and staff members seeking less stressful specialties. Low staffing in healthcare facilities creates excessive patient loads for hospital workers, and working conditions become more challenging as the patient overload reaches high levels (Mansour et al., 2024). Many healthcare workers have identified burnout and workplace stress as a reason for leaving their professions. Although burnout is likely a challenge for Western North Carolina healthcare workers in keeping with state and national data, this research did not find any published sources of regionalized data on this issue.

Strategies and Policies to Address the Healthcare Workforce Shortage

As the previous section indicates, there are many challenges contributing to the healthcare workforce shortage, regionally and at the state and national levels. Recruitment, training, and retention are all core "pillars" of workforce development, and organizations need to adopt strategies across all three of these in order to maintain and grow their workforce. Continuing changes to the healthcare policy landscape at federal and state levels mean that the policies and strategies necessary to address these issues need to be adaptable and updated to meet current realities. The following section is divided into key strategy areas based on the findings from the literature review, each covering a variety of potential policies or strategies to address the

healthcare workforce shortage. As in the previous section, strategies are presented in alphabetical order

Childcare

Panelists at the 2025 WNC Legislative Summit on Childcare (*Five things to know about childcare in WNC in 2025,* 2025) indicated that creative approaches and partnerships are being explored to help make childcare more affordable in Western North Carolina. To increase supply in rural counties, some partnerships and solutions proposed include federal and state level systematic and sustainable public investment, public and private partnerships, economic development, and Helene recovery relief initiatives and funding to increase childcare access and affordability.

On-Site Childcare: (Carolina et al., 2024) found that expanding on-site childcare and/or expanding childcare vouchers to be potential solutions to help reduce parent nursing student barriers to completing their programs. Healthcare workers such as nurses preferred on-site childcare facilities over private centers due to shift work accommodations and flexible hours (Ong et al., 2023). However, workers often had difficulties utilizing on-site childcare facilities due to limited capacity and cost. Establishing on-site or nearby childcare centers with longer operating hours to accommodate healthcare workers' shifts can relieve the stress of childcare concerns for working parents. Furthermore,as cost can be a significant barrier, financial support or subsidies for childcare costs should also be considered.

Family-Friendly Scheduling and Leave Policies: Healthcare workers emphasized the need for organizational flexibility and improvisation in childcare policies. To address childcare issues interfering with healthcare operations, Ong et al (2023) suggests revising parental leave policies to be more family friendly, which can support working parents. Hospitals can also consider alternative shift structures, including shifts with more days off combined with longer working hours and overlapping shifts to ensure adequate staffing so that new parents have time to re-transition to work while balancing professional and parental demands (2023). Possible solutions include introducing shift arrangements that avoid consecutive night shifts, offering workers the option to choose shifts they prefer, and providing predictable schedules to minimize family life disruptions. Family-friendly policy also includes ensuring workers are not penalized in terms of career progression when becoming new parents or needing to take childcare-related leave. Managers and organizations who showed understanding of parents' needs were highly valued and appreciated (2023).

Statewide Childcare Reimbursement Subsidy Floor: According to the WNC HPI's *Building a Foundation for the Future* report (2025), government financial assistance subsidy rates for childcare differ between counties based on the market rate, meaning that in rural areas (where need and costs can often be higher), reimbursement is lower due to church and after-school programs providing high demand, low- or no-cost childcare. Implementing a reimbursement subsidy floor is crucial to create consistent funding structures regardless of geographic location. This would improve access in rural and low-income areas, creating more availability to healthcare workers in those areas who need childcare in order to work.

Increasing Childcare Supply: One issue causing problems with childcare access for the workforce is the limited number of childcare slots available. The WNC HPI report cited above also

noted some policy considerations that would reduce barriers to opening more childcare centers and family childcare homes (in-home childcare businesses). Potential approaches to increasing available childcare supply involve creating a health plan that early childhood education employers can offer to staff. According to the WNC HPI's *Building a Foundation for the Future* report (2025), health plans can include "capacity-building funds, implementing regulatory, liability, and land-use reforms to make it easier for childcare centers and family childcare homes to open and operate" (p.6, 2025). These would also help early childhood care businesses be more financially stable and reduce operating and childcare costs, potentially reducing costs and increasing childcare center availability to healthcare workers.

Childcare Workforce Supports: Supporting childcare workers by increasing certification, recruitment, and retention of early childhood educators in turn increases available classrooms, childcare slots, and care quality. Other suggestions from the WNC HPI's *Building a Foundation for the Future* report include policies that would offer free childcare, professional development opportunities, mental health support, financial support for training and credentialing, and increased training opportunities and programs for childcare workers (p.6, 2025). These provide multiple pathways to address the current childcare worker shortages, which in turn creates more childcare availability and access for all areas of the workforce, including childcare.

Education, Training, Recruitment

Education and on-the-job training can offer another solution to healthcare workforce shortages in North Carolina and the state's Western regions. The NC Center on the Workforce for Health found that providing resources to support teaching staff, classroom space, technology and expanding clinical training positions could further increase capacity (2024). By paying educators more, expanding clinical teaching sites, and embracing mini-qualifications with micro-credentials, educational opportunities for the healthcare workforce could be expanded, creating a positive impact on the workforce shortage.

Training on-site: In Western North Carolina, MAHEC is attempting to promote a successful model of healthcare education training and improve their workforce development pipeline by building residency housing for medical students. By encouraging training on-site, medical students can both practice and receive training in the same environment. "Accelerated" programs at institutions such as Mission Hospital also support career advancement by providing training programs for medical assistants and other healthcare roles (MAHEC, 2025).

Expanding Training Sites: To address the current deficit of on-the-job training, Carolina et al (2024) suggests expanding opportunities for clinical placements or their equivalents. Researchers found there were a limited number of sites and nurses with bachelor's degrees to supervise nursing students in clinical environments, and stated that increasing funding for public institutions to reimburse preceptors can help programs compete more successfully with private institutions. Expanding simulation labs as alternatives to physical placement in some clinical settings is another potential opportunity in giving students on-the-job training if physical settings are unavailable. Documents provided by researchers with the NC Area Health Education Centers Program (AHEC) suggested that creating curriculums requiring students to be assigned rural health mentors and requiring training in rural hospitals will give medical students a more well-rounded education and vital on-the-job training and preparation (Galloway, 2025).

Faculty Support and Retention: Carolina et al (2024) recommended that creating more long-lasting nursing pipelines begins with meeting the needs of qualified instructors, including addressing pay disparities between medical educators and their peers in active practice. Addressing wage gaps between practicing nursing positions and instructor pay allows for qualified nursing instructors needs to be met (Carolina et al., 2024). With instructor pay lagging so far behind practice salaries, recruiting healthcare educators remains challenging, further hindering workforce development, due to reduced opportunities for students to enter healthcare training programs. RTI International also found that increasing faculty pay is important both for recruiting instructors and keeping existing staff from retiring or taking other jobs (2024).

Strengthen Pre-Health Advising: To prepare future healthcare students to better serve underrepresented rural communities in Western North Carolina, researchers with AHEC suggested strengthening pre-health advising systems at each of the UNC system schools (Galloway, 2025). This would serve to effectively prepare interested students for medical careers by offering supportive resources (i.e. websites and webinars) and specific advisors training. Suggestions include collaborations with existing and evolving master's programs in the UNC system to offer stronger biomedical science core and integrated clinical components for bachelor's degree holders interested in rural medicine but needing additional preparation before applying to medical school. AHEC researchers suggest focusing on key program factors such as mentorship and curriculums focusing on professional skills and information is vital for healthcare workers academic preparation. Other strategies to increase educational opportunities and support to increase the number of potential trainees include expanding medical school graduate education efforts based on regional needs, but can also include solutions such as increasing high school AP classes in pre-med sciences, early assurance programs, and increasing training sites (2025).

Improving the Perceptions of Healthcare Careers: At the Health Policy Initiative meeting on April 16, 2025, attendees shared that addressing negative perceptions of healthcare as a career could support education and recruitment strategies to ensure that early-career and college-age individuals have the necessary educational support and capacity to move into healthcare fields. Overcoming the current negative reputation of healthcare as a career involves publicizing job satisfaction and benefits to providers that come from working in the healthcare field. Organizations and policy makers need to create a strong buy-in for healthcare as a career to support workforce development initiatives. One of the contributors to a negative perception of healthcare work is the potential for graduating with a high debt load (HPI, 2025). Therefore, this is another factor that financial debt relief programs and navigation support for medical residents can address.

Micro-Credentialing: Rather than being specialists or generalists, encouraging providers to become "versatileists" possessing deep knowledge in a wide variety of topics is essential for healthcare workers to gain positions (Frasier, 2022). Micro-credentials give providers a chance to demonstrate skills in a variety of fields, as well as enhance existing skills and develop new ones. Furthermore, micro-credentials can help address care team skill gaps and create a culture of continuous learning, which can prevent organizations from struggling to find workers with relevant skill sets (2022). Micro-credentialing also allows healthcare workers to have more flexibility in their career fields, which in turn increases job satisfaction and retention. Programs for micro-credentialing are shorter and more affordable than formal training, giving workers a chance to learn skills on their own time.

Financial

Medicaid: Since providing services to patients with a wide variety of medical coverage can create increased challenges for healthcare providers, enabling providers to create a sustainable balance of commercial payers, Medicaid, Medicare, and self-paid patients will ease workforce issues related to administrative and payer mix. One solution is to eliminate the disparity between reimbursement rates. Increasing Medicaid reimbursement to balance out or approximate commercial payers can improve financial stability and reduce administrative burdens. Additionally, higher fee levels increase the chances that providers will accept Medicaid patients, thereby reducing disparities in healthcare access (Malloy, 2025). Medicaid expansion is another potential solution to attract workers. RTI International researchers found that Medicaid expansion could add more than 20,000 healthcare jobs across the state of North Carolina (Carolina et al., 2024). Medicaid expansion will be significant in rural parts of the state where a larger percentage of residents rely on Medicaid for healthcare coverage and where healthcare wage growth could be most increased. According to Manpower Development Corp, although Medicaid expansion currently exists in North Carolina, recent federal policy changes have threatened its status (2025).

Primary Care Funding: A report published by the Milbank Memorial Fund (2024) found that a lack of investment in primary care was associated with a decline in the average lifespan of Americans. Although primary care physicians make up for 35% of all healthcare visits, primary care systems remain under-resourced. The ncIMPACT Initiative found businesses offering more competitive pay and benefits to be one potential solution to addressing the healthcare shortage deficit by attracting a younger generation of workers (Howard 2022). In 2019, New Zealand implemented a new pay agreement at the national level to increase pay for nurses (Park et al., 2019). The new pay policy showed positive effects, as the number of nurses increased. Furthermore, there was a decline in workers reporting difficulties in finding employment and an increase in application rates to nursing schools. The same model found institutions unwilling to raise nursing pay reported negative effects on retention and recruitment.

Staffing Fatigue: According to Hoban (2022), hospitals spend, on average, $11,592 per nurse per year hoping to prevent exhaustion. Solutions to reduce staff burnout and overwork include increasing vacation time, spending more for full-time staff to share workloads, creating programs to improve patient safety, quality to improve job satisfaction, and providing chances for professional development for nurses. Furthermore, “government investment in crucial private programs is critical,” for supporting workforce development and establishing training programs (Park et al., 2019).

Medical Graduate Education Funding: Financial support for graduate medical students is another important approach for addressing healthcare worker shortages. Student loan forgiveness and repayment options remain important approaches for reducing the financial burden of medical education, which in turn can improve recruitment of future students into the healthcare workforce field. A variety of loan forgiveness programs already exist, including some specifically tailored to areas with critical workforce needs, such as rural practice (Barclay et al., 2025). One example, the “Public Service Loan Forgiveness (PSLF)” program, forgives “remaining Direct Loan balances held by the U.S. Department of Education after borrowers have made 120 qualifying monthly payments towards one of the PSLF accepted repayment plans” (Barclay et al. p.4, 2025). Qualifying payments are made while the individual works full-time for an eligible employer, which can be at any level of government organizations, non-profit organizations, and other non-profit organizations

that commit a majority of full-time equivalent employees to offering certain qualifying public services, including non-profit hospitals that are not organizations. Given the value of these programs, it is important to ensure they remain fully funded, that more programs are developed to address gaps in eligibility within the workforce, and that students have support in understanding and navigating program requirements.

Housing and Transportation

Researching potential policies surrounding healthcare workers' housing and transportation access led to limited results regarding government policy solutions. However, telehealth was mentioned repetitively as a potential solution addressing difficulties with transportation and even housing.

Low-Interest Home Loans: According to Barclay et al. (p.4, 2025), "despite perceptions that life in a rural community is less expensive, cost of living has increasingly become a concern for rural residents." As a result, high costs of living make staff retention difficult. Some potential strategies to address living costs for health care workers include providing low-interest home loans for staff, relocation stipends, assistance finding employment opportunities for a staff's significant others, and connecting staff to local daycare options (Barclay et al., 2025).

Telehealth: Improving access and delivery of telehealth services may include strategies such as maintaining broad telehealth access post pandemic, creating remote "hubs" where patients can access secure telehealth technology, and utilizing benefits such as digital technologies to broaden access (Milbank Memorial Fund, 2023). Serchen et al (2025) found that ensuring access to telehealth is a vital factor expanding health care access with the potential to aid in the healthcare workforce shortage by allowing for hospital space to be utilized for life-threatening emergencies. Since patients attend virtually, physicians have fewer cancellations and are able to treat a wider range of patients, increasing practice stability. Giving healthcare workers the option to see patients electronically can help with retention by increasing job satisfaction (Frasier, 2022).

Building Income-Based Homes: Other strategies that have addressed difficulties with housing involve building new income restricted, affordable home structures reserved for local healthcare workers. MAHEC meetings suggested hospitals building affordable housing condos for residents or staff based on what they are paying is another solution to address housing barriers among healthcare workers. To address the shortage of physician housing in rural communities, MAHEC has taken action to increase housing opportunities for medical students in Western North Carolina. In 2024, MAHEC built four 350-square-foot unit tiny houses in Sylva, NC. Each of the homes houses a student of medicine, pharmacy, behavioral health or another health science discipline, generally for a two-to-four-week rotation in Sylva or the surrounding area (Sonmez, 2024). Each home offers students the necessities of any regular home: a porch, a full bath, high-speed internet, washer, dryers, and a combined living room-bedroom-kitchen. Hodge said the homes are positioned close to downtown as well as locations of primary care practice students can travel to without fear of lacking transportation.

Residency Programs: For some workers, housing may best be located between clinical sites to minimize commuting. According to Barclay et al. (p.4, 2025), personal considerations such as housing "are the primary driver for potential employees when choosing where to work." Rural residency programs can help connect residents to realtors, which helps residential workers secure

long-term rentals, offering place-based stipends for residents living within city limits; purchasing a house in partnership with a local foundation; or building townhouses near hospitals (Zolotor, 2024).

Representation

According to Hill et al., (2025), increasing healthcare practitioner diversity can help address workforce shortages, increase patient trust in health care systems, and decrease health disparities in underrepresented groups. According to Hill et al., (2025) "minoritized staff and faculty can be critical in recruiting minoritized students and junior staff, which may create a virtuous cycle of increased DEI over time." Ensuring diversity is also important to create a training environment representative of the region's lived experience, which will improve the practice of medicine for the workforce and their patients.

Diversity in Training: To address the lack of racial diversity in the healthcare workforce in North Carolina's rural community, increasing medical school graduate diversity is critical. According to Goode and Landfeld (2019), evidence shows that increasing the number of healthcare providers from diverse backgrounds, including those from underrepresented racial and ethnic groups, rural communities, and low socioeconomic status (SES), is crucial in tackling primary-care physician shortage and healthcare disparities, while also providing more patient-centered and patient-concordant care. Including a greater use of adversity scores in admissions to identify challenging financial, educational, and environmental circumstances among applicants can additionally bring to light other structural inequalities that limit underrepresented groups from applying for medical school (Zephyrin, 2023).

Student Diversity: Addressing educational differences between underrepresented groups is another way to address a lack of diversity in the healthcare workforce. According to Goode and Landfeld (2019), in the United States, school districts serving large populations of students of color and students from low-income families receive significantly less funding than those serving white and more affluent students. Goode and Landfeld (2019) found various methods to examine how to improve underrepresented groups in educational environments, including examining the education pathways from K-12 through college and on to professional schools. Supporting universities that have a higher proportion of students of color can also improve student recruitment, graduation, and career readiness.

Diverse Mentorship: Improving diversity among health profession faculty ensures healthcare trainees have representative mentors and are exposed to varying cultural perspectives. Ensuring students have mentors from similar backgrounds is key to recruiting and retaining a broader, more diverse workforce. Students exposed to a wide range of diverse racial, ethnic, socioeconomic, and other groups during education training felt better prepared to care for patients later in their careers. According to Hill et al., (2025), staff and faculty representing underrepresented groups can also be crucial recruiting underrepresented students and junior staff, which may create a cycle of increased diverse group recruitment. Education focusing on improving practitioner cultural knowledge is also important, as increased cultural knowledge of practitioners, regardless of their own background, has been shown to be linked with patient care satisfaction. According to the North Carolina Medical Society, expanding cultural competence education for all levels of healthcare positions could also bridge the gap in diversity among medical school graduates (Ferrante, et al, 2020).

Educational Inclusion: Broadening education on cultural responsiveness and skills can increase diversity in the healthcare workforce, since students are more likely to join a workforce that is inclusive and representative of their identity, race, and orientation. According to Charles et al, a study conducted in the US showed "nearly half of medical students displayed explicit bias against LGBTQ individuals and most showed some implicit bias"(n.d), which can deter students' willingness to apply to medical school. Increasing the percentage of underrepresented groups as part of the medical school training curriculum can help reduce patient feelings of being negatively judged by a physician, which allows patients to access appropriate care without judgement and encourages individuals from minority populations to apply for medical school. Informing students about specific health issues, vulnerabilities and barriers to healthcare access that underrepresented populations experience can broaden education on cultural responsiveness. Furthermore, allowing more exposure to underrepresented populations through preclinical curricula and clinical rotations may better prepare students to treat a wide variety of patients (Charles et al, n.d).

Community and Advocacy Engagement: Engaging with local communities and schools ensures that individuals from underrepresented groups receive early exposure to healthcare fields (Zephyrin, 2023). Promoting awareness of and advocacy for healthcare issues within underserved populations is another possible strategy. Partnering with local advocacy groups to better understand the healthcare needs of underrepresented patients can also be another way to expose students to diverse populations.

Reintroduction of Military Veterans into the Workforce: Re-introducing military trained medical professionals into the healthcare workforce is another pathway to improve workforce diversity and address healthcare worker shortages. Military medics have unique experiences and exposures to a variety of specific health issues having worked in combat. Military medical professionals also understand and can effectively address the needs of the veteran population overall. This potential workforce has existing medical training and experience, reducing the need to recruit and train new providers, and can additionally help ensure that veteran patients and healthcare workers are both represented and feel seen in healthcare settings (Keita, 2015).

Representation in Organizations: Integrating stakeholders from all levels of organizations ensures that all perspectives are included in discussions to establish and maintain diversity and inclusion efforts (Zephyrin 2023). "Diversity, equity, and inclusion (DEI) in the existing workforce is particularly important because faculty, staff, and leaders at healthcare organizations and health professional schools may have disproportionate power over their organization's culture and priorities" (Hill et al., 2025). Ensuring that diversity and inclusion are ingrained into institutional elements and identifies diverse talent for leadership at all levels is key (Stanford, 2020). Furthermore, sharing previous diversity inclusion strategy successes and failures with similar organizations allows reflection on the strengths and weaknesses in previous diversity and inclusion strategies.

Monitoring the Impact of Policy Changes: Recording the effects of policies and legislation on diversity in health care is important to monitor the effectiveness of initiatives and programs (Zephyrin 2023). According to Hill et al (2025), there is a lack of research exploring interventions to increase diversity recruitment in students currently enrolled in a health professional program, or individuals who are already working in their selected healthcare field. Since much information remains unknown about current actions to promote diversity recruitment in healthcare fields, a

review of existing research is necessary. Having a scoping review allows for a proper examination of the strengths and weaknesses of prior studies and literature gaps in the field. Reviewing existing research and research gaps is an important avenue of exploration for future researchers hoping to evaluate how to increase diversity in the field.

Policies to Promote Increased Rural Practice: Another method to approach increased diversity in the healthcare workforce includes legislative approaches to incentivize providers to practice in rural or underserved settings, especially providers who are representative of those regions' demographics. At the HPI meeting on May 16, 2025, attendees also found that medical schools are disincentivized to encourage rural practice in their graduates, since deployment into more prestigious hospitals improved the schools' reputation and recruiting. This is also an area where policies that provide financial support or incentives could shift action to address rural shortages.

Technology

Technology provides additional solutions to address healthcare workforce shortages. (Carolina et al. 2024) found that although care models are still changing and practitioners are exploring the variety of settings in which such technologies can be used, evidence shows a variety of benefits that can help address healthcare workforce needs. Benefits technology may offer to the healthcare workforce shortage include: Reducing patient time in emergency rooms; retaining nurses struggling to meet full-time bedside care physical demands; attracting experienced nurses to return to the healthcare workforce who previously left; allowing one nurse to monitor multiple patients at once; mentoring inexperienced nurses by remote observation (Sipos et al., 2024).

Virtual Patient Monitoring: According to Carolina et al., (2024), healthcare systems such as Atrium Health are utilizing virtual care and monitoring technology to increase bedside nurses capacity, emergency room intake functions, and specialty care. Carolina et al., (2024) found using systems such as Atrium Health allows one nurse to monitor multiple patients at the same time, which frees bedside staff time to spend with people with most urgent care needs.

Technology Financial Accessibility: To address financial barriers and adopt health informatics in rural healthcare settings, policymakers, healthcare organizations, and technology vendors can explore various strategies (Abdul et al 2024). To address financial burdens to utilizing technology, rural healthcare organizations may need to utilize alternative financing options, such as grants, subsidies, or partnerships with government agencies, healthcare networks, or technology vendors (2024). Some further solutions may include providing financial incentives to support implementing healthcare technology services in rural areas. Offering flexible financing options, such as subscription-based pricing models, promoting collaborative partnerships and resource-sharing arrangements among rural healthcare organizations is another potential solution.

Increasing Digital Access and Literacy: (Abdul et al 2024) reported addressing limited digital access in rural healthcare requires an approach from multiple angles, including: investments to improve internet connectivity; increasing access to affordable devices; and programs to increase digital literacy among older adults and low-income individuals. Additionally, healthcare providers and organizations can use strategies ensuring telemedicine and online health resources are accessible and user-friendly for individuals with varying levels of digital literacy and socioeconomic backgrounds. By addressing inequalities in digital literacy differences and access, online patient

visits can be increased, leaving physical hospital space for life-threatening emergencies and easing workplace burdens on healthcare staff.

Robotic Assistance: A large portion of nursing homes and assisted living communities are under staffed (Frasier, 2022). Incorporating more teleoperated robotic assistance can help reduce staffing fatigue and complete necessary tasks unable to be performed by a lack of employees. Technology such as robotic work aids can perform meager tasks such as fetching equipment, transporting medication and transferring patients (2022), allowing medical staff to prioritize working directly on patients' medical needs.

Other Potential Benefits: Endalamaw et al., (2024) found that healthcare workers struggling with high workloads leads to constricted availability of services. Technology can provide solutions to healthcare workers while also offering benefits to patient outcomes and satisfaction, which supports provider job satisfaction and potentially improves retention and reduces burnout. Endalamaw et al., (2024) found potential solutions include mobile health and ensuring a consistent supply of sufficient resources are vital components of developing primary health care workforce.

Workplace Stress/Burnout

This section provides strategies for both promoting strategies to improve the work environment for healthcare workers and healthcare worker burnout. According to Endalamaw et al., “having a sufficient and well-functioning health workforce is crucial for reducing the burden of disease and premature death” (2024). Minimizing workplace burnout is crucial to improve the mental wellbeing of healthcare workers, therefore allowing healthcare to be more accessible and efficient.

Healthcare Worker Wellbeing: (Ong et al., 2023) found that supportive interventions such as mindfulness programs and exercise classes can promote worker wellbeing. The authors concluded that mindfulness programs have been proven to show promising effects in reducing stress, which helps grant nurses necessary skills to work and manage clinical stress. Group-based sessions can also provide nurses with additional support and social interactions with colleagues outside work settings, in turn creating a sense of mutual support within healthcare workforce communities. Other solutions to support the healthcare workers in balancing their professional and personal lives include hospitals providing well-being resources such as mental health and self-care support resources, such as stress management programs (2023).

Team-Based Care in Healthcare Settings: Dr. Kae Livsey, Western Carolina University professor of College of Health and Human Sciences and School of Nursing, suggests team-based care as a solution to improving worker efficiency and patient care quality. The goal of team-based care is to share tasks in a way that makes best use of healthcare workers’ skills while delivering high quality, efficient care. According to Livsey, the current health system has no mechanisms in primary care spaces to encourage development of highly effective teams. She emphasized the importance of designing teams that utilize the full skillset of its constituent healthcare professionals to address patient needs. By implementing team-based care into the healthcare system and encouraging workers to share tasks, burnout and stress has the potential to be minimized while patient care quality increases. According to Sipos et al. (2024), for example, by working in a care team with a broad range of competencies, overloaded physicians can delegate tasks, making patient care more manageable and efficient. Likewise, by shifting administrative work to administrative support employees, healthcare professionals can refocus their time and energy on patient care, thereby

delaying workplace burnout. Livsey further noted that another potential approach includes utilizing coaches to help practices understand how to create effective teams. Furthermore, the impact of these changes can be evaluated by examining measurable outcomes on costs of delivering services and the quality of services that are delivered to identify future solutions.

Artificial Intelligence (AI) for Automating Routine Tasks: According to Bienefeld (2024), AI has potential to help workplace burnout and the healthcare system by enabling more diagnostic accuracy through advanced image analysis, clinical decision and care support, charting and note-taking, and predictive modeling. Although concerns exist around the privacy and accuracy of AI, which need to be addressed before integrating into any practice, by automating routine tasks, AI allows healthcare professionals to focus more on complex patient care and decision-making. By utilizing AI, physicians and nurses are able to concentrate on patient diagnosis and care. AI automation for monitoring medical data, documenting medical information, and analyzing medical data could result in a decrease in burnout and workforce overload by relieving clinicians from administrative duties, allowing them to focus on patient care (Bienefield et al., 2024).

Establishing Staffing Ratios in Accordance with Best Practices: Policies addressing provider/patient ratios to align with established best practices can help address stress and burnout caused by understaffing and the associated negative impacts on the provision of high-quality patient care. In 2024, nursing members of Health Professionals and Allied Employees (HPAE) ratified a contract establishing patient-to-nurse ratios for the first time at their hospital. HPAE nurses at Englewood Hospital and Medical Center and Cooper University Health Care also ratified new contracts that include enforceable staffing ratios (Department for Professional Employees, 2024). Registered Nurses (RN) and other healthcare professional members of the United Health Professionals of New Mexico also established a Labor-Management Committee to address low staffing to patient ratios. The committee, among other actions, will address safe staffing ratios and pursue job protections (2024).

Community Health Workers: A Community Health Worker (CHW) is a public health worker who has a significant understanding of the community they serve. CHW's serve as a link between health and social services and their community to help improve access to services and improve quality and cultural capability of service delivery (Nelson, 2016). CHW's can also help reduce staffing burnout by taking on health support roles to allow doctors and nurses more time to focus on patients with urgent or complex care needs. CHW's can also help by promoting primary and follow-up care for disease prevention and management within their communities, help patients keep appointments, boost prescribed medication adherence, and educate patients on needed behavior changes. Increasing CHW involvement can also increase healthcare workers' abilities to improve community health outcomes in an efficient manner (Nelson, 2016).

This section summarizes a variety of strategies and policies used to address multiple factors contributing to the health care shortage. These strategies and policies have been used and have been shown to effectively minimize the impacts of the healthcare workforce shortage. These policies and strategies also contribute to reducing the shortage overall. Future research is needed to further determine policy and strategy effectiveness and to explore other future recommendations.

Conclusion

This paper establishes factors contributing to the healthcare workforce shortage in Western North Carolina. This paper is only a brief overview of key workforce shortage factors and what needs to be done to minimize and reverse the healthcare workforce shortage in the region. Future research will need to include more primary research to address potential policies and solutions to take action to increase the number of healthcare workers and accessible healthcare in WNC. Kuhlmann (2024) found policies to improve access to care or increase workforce do not often address root causes and are not always effectively implemented. As a result, changes those policies are intended to create are rarely sustainable. Political interventions can also be stalled due to global demand and supply market complexities and/or an unwillingness to push back against corporate or economic interests that incentivize "lean staffing" and other administrative practices that can underlie shortages (2024). Additionally, as policies are set into place to address healthcare shortages, systematic collection of data will need to be carried out and policies will need to be regularly monitored to gauge their effectiveness and to identify the emergence of negative outcomes, perverse incentives, or other areas for improvement (Park et al, 2019). While some WNC information is included, more information may not have been found and addressed in this report as WNC-specific information is limited. Furthermore, as current healthcare policies are changing at federal and state levels, this report is only a snapshot of one point in time. The minimal supply of healthcare workers is only one piece of the complex puzzle making sure all North Carolinians have access to quality healthcare. According to Kuhlmann (2024), "The 'human face' of the HCWF crisis—the impact on working conditions, mental health and the individual needs of HCWs—is still not understood, or simply ignored despite available evidence". However, there are many promising strategies and policy areas that can be explored to address healthcare workforce challenges and bottlenecks, and support the physical, mental, professional and financial sustainability of our critical healthcare workforce. Helping our healthcare workforce with policies allows workers to deliver quality and efficient care to community members, which can positively impact the health of American and North Carolinians.

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