

Developing the healthcare leaders of tomorrow by providing interprofessional leadership development to health professions trainees today

Future Clinician Leaders College

Compendium of White Papers
on Problems Facing
Healthcare

North Carolina Medical Society

Future Clinician Leaders College (FCLC)

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to health professions trainees today**

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Note: This compendium of white papers contains the final leadership & advocacy projects for students enrolled in the inaugural year of the Future Clinician Leaders College Program (2019-2020).

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INTRODUCTION

By Roy Strowd & Kristina Natt och Dag

Training the next generation of clinician leaders has never been more important. Medical students (e.g. D.O. and M.D.), physician assistants, students in nursing, nurse anesthesia, pharmacy, and other healthcare trainees enter a work place that increasingly demands strong team leadership.¹ Unfortunately, existing medical curricula are packed full of content and often cannot devote sufficient time to leadership, advocacy, teamwork or policy.² In addition, the attention to interprofessional leadership and teamwork is limited.

North Carolina is fortunate to have many strong health professions training programs in the state including programs for medical students, physician assistants, nurses, nurse anesthetists, pharmacists, and other allied health professionals. At the same time, numerous healthcare gaps exist for patients in North Carolina.^{3,4} There are major physician shortages in the state as well as disparities in access to care;^{5,6} higher than the national average maternal mortality;^{7,8} diverse challenges in the social determinants that effect western Appalachia vs eastern farmlands in the state;^{9,10} and other important contributors to the health of the state.

It is critical to address these needs by developing a strong next generation of clinician leaders that is passionate, capable, and ready to tackle these challenges. The Future Clinician Leaders College (FCLC) responds to this need by providing interprofessional leadership development for students in health professions training programs across North Carolina. Leadership development is, however, a broad term. A successful program recognizes that building leader identity requires addressing underlying mind-sets, and identify “below the surface” thoughts, feelings, assumptions, and beliefs, which is usually a precondition of behavioral change. To that end, the core pillar to the program builds around self-awareness.

Research shows that self-awareness is crucial to building a sustainable platform for effective leadership and is fundamental to developing confidence and self-worth as a leader.¹¹⁻¹³ The FCLC program challenges students to take a deeply introspective look at their own personal

leadership journal, act in alignment with his/her core values as a leader, and link leadership development to patient care.

The program introduces four “P’s” of clinician leadership: leading **P**atients to change in the clinic, leading **P**eers as mentors in the classroom, leading **P**roviders in interprofessional healthcare teams, and leading **P**olicy change as healthcare advocates. Leadership among patients, peers, and providers is immediately important to the day-to-day practice for most trainees. For future practice, it is also critical to develop socially responsible and societally engaged healthcare advocates. Advocacy and engagement is a spark best ignited early in healthcare training. To fulfil this mission, the FCLC program challenged this cohort of future leaders to tackle five major advocacy problems facing healthcare today:

1. Opioid epidemic
2. Population health and social determinants
3. Equity and diversity in healthcare
4. Cost of healthcare
5. Provider shortages

Each white paper is the result of an interprofessional collaboration between students from multiple healthcare disciplines and locations across North Carolina. Each group selected a specific topic within their broader problem facing healthcare and address the following four aspects in the white paper: (1) statement of the problem, (2) background and significance, (3) impact on North Carolina, and (4) proposed solutions.

Following each white paper is an invited commentary from an expert who helps to interpret the proposed solutions in today’s healthcare context – either providing a legislative, policy, or societal perspective.

On a personal note, these students are phenomes and have been amongst the most rewarding to teach, lead, and from which to learn. We need strong leaders to tackle the challenges we face in health-care and are in great hands with these rising stars. Be on the lookout for these future clinical leaders.

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CHAPTER 1 – Opioid Epidemic

Discordant MAT Prescribing Policies as a Barrier to Opioid Use Disorder Treatment

By Florian Capobianco III, Geoff Jones, Luci New, Briana Sullivan, Garrett Thomas, Marissa Yates (not pictured)



The Problem

The Drug Addiction Treatment Act (DATA) of 2000 allows for broader access to treatment for opioid dependence. However, to prescribe Medication-Assisted Therapy (MAT), such as buprenorphine, practitioners must first fulfill requirements for the addition of an X-license through the Drug Enforcement Agency (DEA). Unlike full opioid agonists, this medication has a ceiling effect that lowers the risk of misuse, dependence, and negative side effects. DATA 2000 requires qualified physicians to obtain a waiver from the requirements put in place by the Narcotic Addict Treatment Act of 1974 in order to prescribe buprenorphine; this is achieved by undergoing 8 hours of online or in-person training. This licensure is also available to advanced practice providers (APPs) through the Comprehensive Addiction and Recovery Act (CARA) of 2016, which includes specific provisions for APPs to complete 24 hours of Medication-Assisted Treatment (MAT) Waiver training and prescribe buprenorphine.

The opioid epidemic has negatively impacted our communities in myriad ways and the need for treatment is undeniable. Opioids are prescribed in a variety of settings, including both in the primary care setting as well as inpatient, acute care. According to the CDC, clinicians in 2012 wrote for more than 250 million opioid prescriptions (“Opioid Painkiller Prescribing”, 2018). The paradigm of evidence-based medicine requires providers to look to the literature and data in order to elevate patient outcomes through both the community and population lens. As such, MAT is an available answer supported both by data and policy. In December of 2019, the DEA published a statement of support for MAT for treatment of opioid use disorder. In the memo, the agency confirms the effectiveness of a collaborative effort between the DEA and addiction treatment community as well as their intent to expand access to MAT for those who can benefit. There has been a thirty percent increase in the number of X-waived prescribers over the past year, totaling over 70,000. The DEA’s stated goal is to continue to increase the number of authorized MAT prescribers and expand access to care.

Whereas other medication treatment therapies must be prescribed and dispensed in a tightly regulated clinical environment, buprenorphine’s safety profile allows physicians and APPs to treat opioid-dependent patients in a multitude of settings such as health departments, outpatient offices, and community hospitals. Under the Controlled Substances Act as amended by the Comprehensive Addiction and Recovery Act of 2016, state law can dictate that NPs and PAs must work in collaboration with a physician who meets one or more of several very specific criteria in order to prescribe MAT. North Carolina is one such state in which these requirements have been maintained. Some states have opted to remove these barriers to combating the national opioid epidemic. For example, the state medical licensing boards of New Mexico and Wisconsin resolved in 2018 to let PAs who are waived by the DEA to prescribe buprenorphine do so without having to work with a supervising physician who meets the criteria of a “qualifying physician” per the CARA Act. As it stands in North Carolina, the ambiguous language of this policy inadvertently

prevents federally-qualified buprenorphine prescribers from providing treatment to their patients.

Clarity could not come at a more appropriate time, as MD, PA, and NP schools across the country are beginning to equip their learners with the proper training in order to prescribe MAT upon graduation. The DEA-X waiver was a policy-driven effort to respond to the opioid epidemic and as medical trainees whose training involves DEA-X preparedness, every graduating cohort strengthens a workforce capable of providing care to those afflicted with opioid use disorder. Nearly half of all PA programs in the country are now having their students complete MAT training during their time in school. One such program that has incorporated best practices for substance use disorder into their curriculum is the Duke University PA program. Duke matriculates 90 students per year and throughout their two years in Durham, they engage in both the online and in-person training required by the DEA to prescribe buprenorphine. Down the road, educators at Wake Forest School of Medicine initiated the 'Wake PROUD' curriculum, which graduates all MD students having fulfilled requirements for DEA-X. Similar to APPs, MD residents are also unable to prescribe buprenorphine if they work with a physician who does not as they operate under a training license during residency.

Programs like these, that invoke a bottom-up approach to the opioid epidemic with trainees learning new best practices and that influence care models of more senior providers, are clearly already underway. As a result, mechanisms to empower APPs and residents to prescribe to the level of their license may not only influence care positively in North Carolina, but also encourage more senior providers to acknowledge shifts in pain prescribing practice in this era of the opioid epidemic. Our intent with this white paper is to shed additional light on this regulatory burden and advocate for thoughtful adjustment in current policies that allow qualified practitioners to help patients suffering from opioid dependence. Additionally, we seek to advocate for continued and increasing bottom-up policies that equip medical learners with the tools and training necessary to care for patients in our community suffering from opioid-use disorder.

Background & Significance

Over the past several decades the number of prescriptions written for opioid pain medications have been increasing at alarming rates. After the World Health Organization developed pain treatment guidelines in 1986 for cancer patients and first recognized the treatment of pain as a patient right, the American Pain Society (APS) started the campaign that pain should be included in patient's vital signs and be termed the Fifth Vital Sign (Tompkins, Hobelmann, & Compton, 2017). With this campaign came the advocacy for change in the philosophy of how to treat chronic pain which included the usage of opioids to improve quality of life (Tompkins et al., 2017). In response to this campaign by the APS, the Veteran's Health Administration adopted the initiative of including pain as the fifth vital sign in 1999 (Tompkins et al., 2017). The pharmaceutical companies have not been without fault in this epidemic; Purdue Pharma has been implicated in the misbranding of Oxycontin to medical providers, the healthcare industry and the public (Jones, et al., 2018).

The Joint Commission (2017) introduced pain as the fifth vital sign beginning in 2001. Clinics, facilities, and hospitals across the United States began to incorporate the new standards into their patient evaluations and screening tools. In 2016, the Joint Commission released another statement defending their position, however stating that the position did not include what treatment options should or should not be used by the providers, leaving that decision up to the expertise of the provider. From 2001 to 2016 there was a 292% increase in the number of deaths related to opioid usage and abuse across the nation (Gomes, Tadrous, & Mamdani, 2018). As of 2013, there were four times as many opioid deaths as there were in 1999 (Baldwin, 2015). There have been 145,000 documented deaths in the United States from opioid use over the past 10 years (Baldwin, 2015).

Change cannot come sooner as the detrimental effects of long-term opioid treatment become increasingly apparent. A 2012 systematic review took an organ-based approach in their analysis which ultimately supported a more judicious approach in opioid prescription. Badlani et al. discovered increased morbidity associated with sleep-disordered breathing, constipation-related psychological distress and emergency room visits, gastrointestinal bleeding, adverse cardiac events, falls, hyperalgesia, higher risk of bone fractures, hormonal perturbations, and immunosuppression (Badlani, 2012). These systemic effects, in tandem with rampant rates of addiction and opioid-related deaths, serve as a clear impetus for both local and national policy reform.

Impact on North Carolina

In 2017, there were an estimated 1,953 deaths related to overdose secondary to the use of an opioid in North Carolina alone (National Institute on Drug Abuse, 2019). As the opioid epidemic continues across the United States, it seems that North Carolina is being affected more significantly than other states. The death rate in North Carolina associated with opioid overdose is 19.8 per 100,000 people, which is higher than the national average at 14.6 deaths per 100,000 people. Prescription opioid-involved deaths have not statistically changed in the past several years with 659 reported deaths in 2017 (National Institute on Drug Abuse, 2019). This demonstrates that the increase in overdose deaths from opioids in North Carolina may not be due to prescribing opioids, but may be due to the lack of availability when it comes to accessing safe and adequate opioid addiction treatment.

Specifically pertaining to PAs, as North Carolina's PA prescribing practice regulations are currently written, it is unclear whether an X-licensed PA needs their supervising physician to also hold the ability to prescribe Buprenorphine. In March of 2018, the North Carolina Academy of Physician Assistants appealed to the North Carolina Medical Board for help in advocating for a rule change to PA prescriptive authority (21 NCAC 32S .0212) so that this unnecessary barrier to prescribing evidence-based treatment for opioid dependence could be removed.

The statistics and current legislature are significant and insinuate the desperate need for change here in North Carolina. The important question is given the rise in opioid prescriptions and opioid related deaths, what opioid alternatives can providers in North Carolina utilize and what barriers to change will be faced?

Proposed Solutions

Mitigating the opioid crisis in North Carolina requires a collaborative, multi-disciplinary approach which maximizes the use of proven interventions while simultaneously minimizing obstacles for those willing and capable of providing treatment. Our solution for reducing the morbidity and mortality associated with opioid use disorder specifically addresses current legislation which requires APPs be supervised by a X-waivered physician when providing MAT; Should North Carolina follow in the footsteps of Wisconsin and New Mexico by allowing APPs to independently prescribe buprenorphine through MAT programs, a massive cohort of qualified, adept PAs and NPs could provide safe and effective therapy and reduced opioid-related deaths substantially.

Our unique perspective as a group of students, new professionals, and experienced providers empowers us to highlight a key adjunct to this proposed policy change that would support its revision long-term. Medical programs in North Carolina have already begun to integrate X-waiver training into their curriculums. As more interdisciplinary schools join this trend, each year will graduate a growing number of providers who are qualified, eager, and licensed to prescribe MAT. We feel strongly that this steady, sustainable source of X-waivered APPs and resident physicians should instill confidence in policy-makers that reinterpretation of their stance on the Comprehensive Addiction and Recovery Act of 2016 would unequivocally benefit the citizens of North Carolina that suffer from Opioid Use Disorder.

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Invited Commentary – Anna Stein, JD, MPH

By Anna Stein, JD, MPH, Legal Specialist, North Carolina Department of Health and Human Services

Buprenorphine is a life-saving treatment for opioid use disorder; however, access to the drug is not consonant with its efficacy and safety profile. The federal policy choice to require a DEA-X waiver to prescribe buprenorphine is based on decades of stigma surrounding people who use drugs; it is not based on scientific evidence. As long as this waiver requirement exists, we will not realize the full potential of buprenorphine to save lives. While the federal waiver requirement remains in place, states must work to mitigate its negative consequences.

As highlighted in this white paper, we know North Carolina does not have sufficient numbers of waived providers, most notably in rural areas. We also know that the growth in workforce of advance practice providers (APPs) in rural areas of our state far outstrips the growth of the physician workforce in those areas. Thus, our strategy to improve access to opioid use disorder treatment in North Carolina must utilize APPs. The North Carolina Opioid Action Plan was launched in June 2017 and Opioid Action Plan 2.0 released in June 2019 to combat the opioid crisis. As proposed in this white paper, the plan calls for integration of training on buprenorphine prescribing into APP programs, and there has been encouraging progress on this front; in 2019, seven APP programs incorporated waiver trainings funded by NC DHHS and led by the Mountain Area Health Education Center (MAHEC). In addition, NC DHHS has provided resources to ECHO programs at UNC-Chapel Hill and MAHEC and to the NC Governors Institute to provide technical assistance to waived APPs. Finally, NC DHHS is engaged in discussions with the NC Medical Board and the NC Board of Nursing regarding how best to maximize the potential of APPs to prescribe buprenorphine.



CHAPTER 2 – Population and Social Determinants of Health Chlamydia and Gonorrhea, Sexually Transmitted Infections

By Shannon Brown, Jaimee Watts, Macelyn Batten, Carissa Sedlacek, Niki Winters



The Problem

Early efforts in medicine and healthcare were aimed at understanding, evaluating, and improving health at an individual level. Today, we have come to learn the importance of broadening our scope and examining the health of entire populations of patients. The term ‘population health’, coined in the early 2000s, is defined as ‘the health outcomes of a group of individuals’, including the distribution of such outcomes within the group and focuses on health outcomes, determinants of health, and the policies and interventions that connect them.¹ Factors that affect health start early, before the individual is even born, and include an entire host of conditions throughout their lives. These factors include where they are born, along with where they grow, live, work, and play. These are known as social determinants of health (SDoH). These conditions account for health inequities, or the unjust and often inescapable differences in health status that exist within our own country and across the globe.

By developing policies and interventions focused on early childhood development, women and gender inequality, employee health, and the health of vulnerable populations, healthcare and public health professionals can more efficiently collaborate to address SDoH.² People living in North Carolina (NC) face SDoH such as transportation barriers, geographical access, and socioeconomics, leaving them susceptible to unmet health-related social needs such as homelessness, food insecurity, intimate partner violence, sex trafficking, and substance use disorders. The NC Department of Health & Human Services (USDHHS) has positioned the state’s Division of Public Health to be a timely and innovative source for disease prevention and health promotion of NC residents. Current efforts focus on the health of the child and newborn, drug and opioid overdose response, and communicable disease screening and prevention.^{3,4,5}

In the state of North Carolina, the number of chlamydia, gonorrhea, and syphilis cases continues to grow and serve as a public health concern due to drug use, poverty, stigma, and decreased condom use among vulnerable groups such as gay men, bisexual men, and adolescents.⁶ According to the CDC, current data suggest multiple factors are contributing to the overall increase in sexually transmitted infections (STIs) including those listed above and cuts to STI [RS1] programs at the state and local level.⁶ Due to budget cuts, more than half of local programs have experienced clinic closures, reduced screening, staff loss, and reduced patient follow-up and linkage to patient care services. The USDHHS is developing an STI Federal Action Plan for 2020 to address and reverse the nation’s epidemic.⁷ The goals of this plan are to prevent new STIs, reduce adverse outcomes of STIs, reduce STI-related health disparities, and achieve integrated, coordinated efforts that address the STI epidemics across federal programs.⁷

Due to the current STI epidemic facing our nation and our state, an increased capacity to respond to STI surveillance, investigation, and reporting is needed. However, community level interventions are heavily driven by available funding

and current funding has been limited, leading to inadequate resources to combat NC's rising STI rates. Other factors that impact these efforts include the substantial amount of time associated with investigation and reporting, increased and more comprehensive testing and the increased number of positive diagnoses as a result.

The stigma around STIs and lack of follow-up due to inappropriate screening, inappropriate treatment, and loss of follow-up due to discharge or changes in healthcare, needs to be addressed in both the inpatient and outpatient healthcare setting. This paper aims to examine the rise in STI rates in North Carolina, acknowledge health inequities and SDoH related to the problem, and identify innovative methods for prevention, early detection and treatment in various settings where healthcare is offered.

Background & Significance

The alarming increase in the rate of sexually transmitted infections (STIs) in the United States continues to threaten the health of many Americans. According to the annual Sexually Transmitted Disease (STI) Surveillance Report released by the Centers for Disease Control and Prevention (CDC), combined cases of syphilis, gonorrhea, and chlamydia reached an all-time high in the US in 2018.⁶ Multiple factors were considered when trying to identify the potential causes for the continued increase in reported STI numbers. For example, the CDC suggests increased drug use, poverty levels, and unstable housing as factors that could contribute to reduced access to proper STI screening and treatment.⁶ The CDC also targets decreased condom use among “vulnerable” groups including young people and gay and bisexual men as a potential source for the increase in numbers.⁶ Lack of funding and financial support for local STI prevention programs may also play a role in the increasing number of reported STIs due to lack of available care within certain high-risk regions. While this increase in STI prevalence continues to rise, US citizens may potentially be left with many life-altering adverse effects such as infertility, ectopic pregnancy, and an increased risk in human immunodeficiency virus (HIV).⁶

The World Health Organization (WHO) defines a comprehensive STI control strategy as being community-specific, with targeted interventions that promote and provide the means of prevention and clinical services necessary to prevent and reduce STIs, as well as reliable data to direct this response.⁸ In order to guide where STI interventions can be made in a specific community, the Basic Reproductive Rate Equation has been used, specifically by Maine's Health Department (MHP). Maine has one of the lowest rates of Chlamydia and Gonorrhea per 100,000 people in the United States (among the lowest 5 states) (US):⁹

Basic Reproductive Rate (R_0) = Transmissibility (T) x Number of Sexual Contacts (C) x Duration of infectiousness (D)

Implementing this equation, MHP targets transmissibility and duration of infectiousness by increasing screening and treating rapidly and appropriately.¹⁰ This has been aided by implementing the Expedited Partner Therapy Law that covers both *Gonorrhea* and *Chlamydia* infections, which means “prescribing, dispensing, furnishing, or otherwise providing prescription antibiotic drugs to the sexual partner(s) of a person clinically diagnosed with a sexually transmitted disease without physical examination of the partner(s).”¹¹ North Carolina currently requires partners with Gonorrhea to be seen in a clinical setting, as Ceftriaxone, an intramuscular injection (IM) medication only to be given by health professionals is used as first-line treatment.¹² To circumvent this, Maine uses Cefixime, oral, as first-line treatment for Gonorrhea.¹³

Some states have focused more on screening, treating and preventing STIs in subgroups within their states that are at highest risk. Omaha, Nebraska implemented a novel Public Library-Based STI Screening Program that more effectively reached young, asymptomatic, and predominantly black high-risk groups compared to local health departments.¹³ In 2016, New Hampshire (among the 5 states with the lowest numbers of chlamydia and gonorrhea per 100,000 people), proposed to allocate their family planning services funds to vendors that could promote healthcare to men and women in rural and urban settings that are affected by economic disparities or financial instability, often due to unintended pregnancies.¹⁴

The social impact of these diseases is multilayered and affects certain groups disproportionately. One such group is females, especially African American (AA) females. Current CDC's screening recommendations for curable STIs are

directed primarily at women and do not include routine screening for men, despite the likelihood that men are contributing to the increasing rates of curable STIs in females by acting as asymptomatic reservoirs of gonorrhea and chlamydia.¹⁵ Another consideration is the emotional, as well as often financial, impact of untreated gonorrhea and chlamydia, again experienced more frequently by women. Pelvic Inflammatory disease (PID), endometriosis, chronic pelvic pain, tubal & ectopic pregnancies and infertility are the health consequences women can experience from untreated disease. Men are at greater risk of epididymitis, sterility and gonococcal arthritis and everyone is at increased risk of contracting HIV.¹⁶ As STIs continue to rise, it is difficult to know just how great the financial and social impact on both the state and the residents will ultimately be.

Implication for North Carolina

In the CDC's 2018 STI Surveillance Report, North Carolina was among the top 20 states for chlamydia, gonorrhea, and primary and secondary syphilis-- ranking sixth for chlamydia, ninth for gonorrhea and fifteenth for primary and secondary syphilis in the nation.⁹ In 2018, the number of chlamydia and gonorrhea cases both increased since 2017. Diagnosed chlamydia cases increased from 62,988 cases to 66,763 cases and gonorrhea cases increased from 22,736 to 23,593.¹⁶ The number of reported primary and secondary syphilis cases remained relatively the same, from 1,919 in 2017 to 1,914 in 2018.¹⁷ The increasing rates of STIs throughout North Carolina is important to consider when reviewing current protocols for STI screening.

The 2013 North Carolina HIV/STI Epidemiologic Profile reported that, based off of the North Carolina Comprehensive HIV Prevention Plan, the recommended populations to screen at that time were persons living with HIV infection, persons exposed to HIV or STIs through heterosexual contact, men who have sex with men (MSM), and injection drug users.¹⁸ Lack of recent updates to this epidemiologic profile make it hard to determine if other populations should be preemptively screened. The North Carolina Department of Health and Human Services (NCDHHS) continually advocates for the use of free STI testing within local health departments as a mainstay of STI screening and prevention. Another NCDHHS campaign against STI spread involves the use of the Integrated Targeted Testing Services (ITTS) Project to provide HIV, syphilis, gonorrhea, chlamydia, and hepatitis C testing to people in areas known to be frequented by people who are at high risk for those diseases. This project actively incorporates STI screening in locations like homeless shelters, jails, drug treatment centers, migrant health centers, nightclubs, and colleges.¹⁹ Creating opportunities for testing at local community centers and places where people congregate like local sporting events, churches and places where individuals socialize could help broadening this testing to additional groups. The North Carolina Communicable Disease Branch of the NCDHHS also provides Disease Intervention Specialists (DISs). The main jobs of these specialists are to help provide adequate information and resources to those people who are newly infected with HIV or other STIs, and to also maintain adequate follow up with these people in order to help prevent the further spread of these diseases.²⁰ While programs like those described above are seemingly helpful at further targeting the populations in need of increased screening and establishing the continuity and effective treatment among those who are newly infected, results proving or disproving their effectiveness have not yet been reported. North Carolina remains among the top 10 states with the highest cases of chlamydia and gonorrhea per 100,000 people.^{16,17}

Like for much of the nation, the increase in STI rates in North Carolina has both economic and social implications. Costs related to diagnosis and treatment of STIs place a significant burden on the US economy with estimates as high as 742 million dollars annually for curable STIs.¹⁷ It is expected that these estimates have only increased since last reported in 2013. Of these curable STIs, chlamydia is the most common and therefore the most costly.⁶ Research has shown that federal funding for STI prevention activities has a marked effect on reduction of rates of chlamydia and gonorrhea, thereby helping to reduce the financial burden related to these curable STIs.²¹ It is expected that continued or increased state funding of STI prevention activities will save money that can then be put back into prevention services for the coming year.

Proposed Solutions

The populations identified in NC as being of higher risk for contracting and transmitting STIs include: men who have sex with men, LGBT communities, adolescents, and those with a history of substance use. In addition to those high-risk groups, health inequities play a major role in this public health problem and should be considered within our solution. Due to the stigma around STIs and minimal education on screening, we propose a web-based intervention to increase knowledge about STIs, identify high risk individuals, and provide information on where people can get tested and treated in North Carolina for minimal to no cost. In 2017, web-based interventions proved to more effectively engage young females about sexual activity decision making through sexual health education and HIV/STI prevention.²²

The web-based intervention we envision, similar to program mentioned above, would be advertised to at-risk populations using social media like Facebook, Instagram, or Twitter. In light of the rise of telehealth during today's COVID-19 pandemic, this program can be implemented to broaden outreach to patients of different socioeconomic backgrounds. This web-based intervention would include an engaging, interactive quiz that identifies individuals at risk for STIs. As the participant answers questions that determine they are at risk, information will be provided on why they are considered at risk based on their sexual practices or symptomatology. Education offered in Spanish and English about STIs and safe sex practices will also be discussed throughout the quiz. At the end of the quiz, if a person is deemed "at-risk" by the questionnaire or the person is interested in more information, they will be directed to programs already available in NC that provide free to low cost STI screening and treatment located near them. These programs will include, but are not limited to, local health departments, Carolinas Care Partnership, and Gateway Women's Care. Users can also learn about the expedited partner treatment (EPT) option available to them and their partners which allows for the provider to write a prescription for the affected party's partner without counseling required for certain patient populations.

Through this web-based intervention, we aim to reach high risk groups, alleviate stigma by allowing individuals to complete the quiz in the privacy of their own home, utilize programs that are already in place to screen and treat patients, by drawing more attention to them, and increase education on safe sex practices, condom use, and personal hygiene. Lastly, increasing the amount of "at-risk" individuals that go in for testing, allows the opportunity for community health workers to identify and assist patients with other untapped social determinants of health, like food insecurity or substance abuse, often found in these high risk groups.²³

In summary, a web-based intervention through social media would be an easy way to reach the undereducated and underserved populations in North Carolina in the privacy of their own homes or through their phones. It would allow us to screen for STI risk factors, provide information on the risks of untreated STIs, appropriate personal hygiene, and free clinics to go to for STI education, testing, and treatment.

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Invited Commentary – Scott Rhodes, PhD, MPH

By Scott D. Rhodes, PhD, MPH, Professor and Chair of Social Sciences and Health Policy, Director for the Program in Community-Engaged Research, Wake Forest School of Medicine



As noted by colleagues S. Brown, J. Watts, M. Batten, C. Sedlacek, and N. Winters, sexually transmitted infections (STIs) are major health challenges in the United States. STIs disproportionately affect marginalized and under-resourced populations including young persons, sexual and gender minorities, persons of color, and the U.S. South. North Carolina has some of the country's highest rates of reported cases of chlamydia, gonorrhea, and primary and secondary syphilis. Complex issues contribute to these high STI rates.

As highlighted in this whitepaper, web-based interventions have become increasingly used to reach at-risk populations for variety of health concerns and are a promising, albeit insufficiently tapped, strategy to sexual health promotion. While members of many marginalized and under-resourced populations have limited access to desktop and laptop computers, the digital divide is rapidly shrinking. The proliferation of smartphones has made reaching at-risk populations with web- and social media-based interventions more realistic. Smartphone ownership is rapidly growing in the United States, and research suggests that smartphones are common in low-income households, including the working poor or the financially vulnerable.² Thus, interventions that are web- and social media-based can reach those at increase risk at the time when they are searching for information and ready for intervention.

The authors of this whitepaper also point out that while there is a lack of funding for STI prevention programming nationally and locally in North Carolina, web- and social media-based interventions can be cost effective. After being developed and found effective, these types of interventions can be automated and then disseminated broadly with less cost than programs that require more personnel and other resources to reach equal numbers of at-risk persons.

Finally, the authors remind us that stigma is a profound barrier to STI screening and treatment. As they note, individuals can utilize web- and social media based interventions privately. They do not have to be in a public place for intervention exposure. This is particularly critical given the stigma associated with being at risk for STIs, including being a member of sexual and gender minority communities.

The first step in stymieing the STI epidemic is identifying those who are positive and getting them treated as early after exposure to prevent further transmission. The authors remind us that while public health departments and clinics provide free and/or low-cost STI screening and treatment, these resources are not being used as much as they need to be. What we have done in the past to increase timely screening and treatment has not been sufficient; STI rates continue to rise within some populations. Innovative approaches such as web- and social media-based interventions are needed.

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CHAPTER 3 – Equity and Diversity in Healthcare

Health Equity: North Carolina’s Health Care Workforce Diversity and Representation

By Christopher Ferrante, DO; Lauren Forbes, MD Candidate, MPH; Deborah Granick, MPH, LCSW, MSN, PMHNP-BC; Christina Montes, MSN; Laura Okolie, PA/MBA Candidate



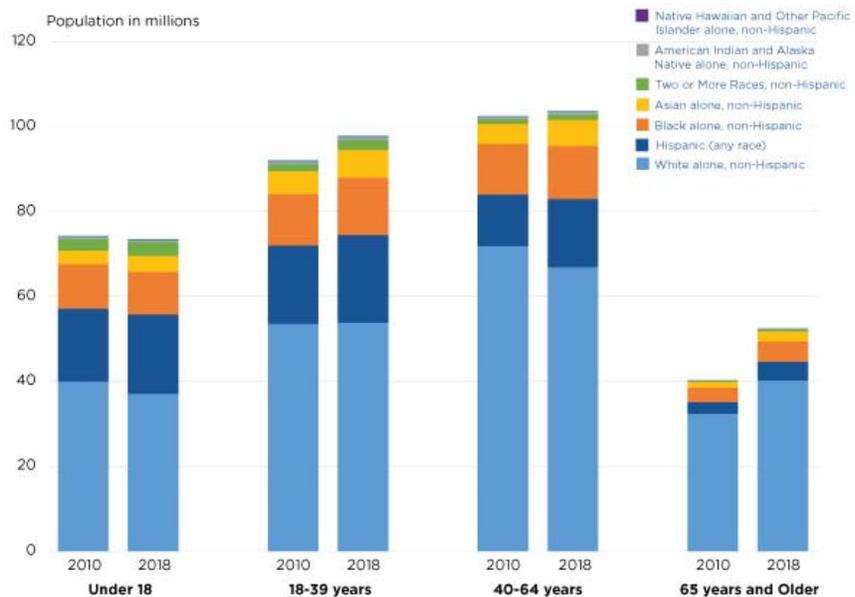
The Problem

Over the past few decades, the population of the United States (US) has become more diverse. The US Census data from 2010 shows that 72.4% of the population identifies as white, 12.6% identifies as black, and 16.3% as Hispanic or Latino. This is a substantial shift since 2000, when 75.1% identified as white, 12.3% as black, and 12.5% as Hispanic or Latino. Census estimates in 2018 continued to identify an increasingly diverse nation with no indication of stopping (Fig 1).

To provide optimal health care, the US requires a diverse health care workforce able to adapt with the changing US demographics and deliver culturally competent, high quality care to the population it serves. This goal requires identifying, recruiting, and training professionals from underrepresented minority (URM) groups in health care. North Carolina (NC) shares this need. Currently, 33% of NC residents while only 17% of health care professionals identify as non-

A More Diverse Nation

Distribution of Race and Hispanic Origin by Age Groups



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<https://www.census.gov/library/visualizations/2019/comm/age-race-distribution.html>; date of release June 20, 2019.

white. This disparity is a global trend across all health care professions within the state and reflects an overall lack of diversity within the profession. Fortunately, these data are not static. From 1994 to 2009, the population of healthcare providers identifying as non-white has increased by 7% with the largest increase in primary care physicians (14%) and pharmacists (8%).

While the increasing diversity is a step towards delivery of high quality medical care, the diversity is not equally dispersed amongst the state. The data show highly diverse medical professionals are clustered near the NC's major metropolitan areas including Mecklenburg, Wake, Durham, Guilford, Forsyth, Pitt, and Cumberland counties. Similarly, approximately four out of five non-white healthcare practitioners are located within these counties. This leaves patients in rural NC to receive care from a predominantly white workforce that may not understand the cultural differences in the patients they serve.

The overwhelming majority of patients within the state of North Carolina are not served by a healthcare provider that is representative of their cultural or ethnic background. In one study in Oakland, California, black men were more likely to engage in preventive health care when offered by a physician of the same race. This effect was most pronounced among men with little experience with routine health care. The study also found that patients were more likely to talk to a black doctor about their health problems. If the demographic gap between patients and providers is not ameliorated, these pervasive health disparities will continue to compromise the health of North Carolinians.

Background & Significance

Racial and ethnic health disparities and inequities are pervasive in health outcomes across NC. Provider-patient relationship factors such as trust and communication style have been linked to disparities in patient choice and satisfaction, access to care, the delivery of preventative healthcare services, the appropriate use of referrals, and patient's adherence with treatment recommendations. The provider-patient relationship is hindered or strengthened by the provider's relatability factor or the patient's perception to see the provider as one who has a similar background, life experience, set of values, personal beliefs, communication style, or cultural competence. Though research on patient preferences for providers of a certain race is scant, there is research supporting patient experience of trust with a provider as vital to treatment plan adherence, and satisfaction with care. In their study of older African American's experience in the healthcare system, provider empathy, desire to understand them culturally, willingness to learn about their culture were all very important aspects of the health care experience. Participants in the study voiced a desire for their culture, their typical diets, their background, to be understood. Though patients did not expressly request Black physicians, it is clear that diversity among healthcare providers would be appreciated and valued by study participants. Therefore, the lack of diversity among the health care workforce contributes to racial and ethnic health disparities.

As the US population becomes increasingly diverse, it is essential that the health care workforce, particularly health diagnosis and treating occupations, mirror the diversity of the populations served. In order for this to be done, it is necessary that we define how diversity in the health occupations is measured, recognize the diversity of upcoming healthcare providers, and disseminate this workforce into communities that need it most--rural, medically underserved, and URM communities.

Diversity is a conglomerate term defined as the inclusion of individuals representing more than one national origin, color, religion, socioeconomic stratum, sexual orientation, or frame of thought, and can be measured in various ways. In health occupations, according to the Health Resources and Services Administration (HRSA) Bureau of Health Workforce, diversity is measured by the representation of minority groups in health occupational fields relative to that group's representation in the U.S. workforce. This means that a lower representation of racial/ethnic group members in a health occupation in comparison to the number represented in the general population indicates that the particular racial/ethnic group is underrepresented within that population. The U.S workforce is defined as anyone who is 16 years of age or older who is either employed or able to work.

The most recent US Census data from 2018 estimates that 76.5% of the population identifies as white, 13.4% identifies as black, and 18.3% as Hispanic or Latino. These percentages vastly differ in the health diagnosis and treating practitioner occupations across the country (Table 1).

Clearly, there are multiple minority groups that are underrepresented in the health diagnosing and treating practitioner occupations, and this must be effectively addressed to help mitigate health disparities among minority groups, especially as the US continues to become more diverse.

Table 1

	PHYSICIANS	PHYSICIAN ASSISTANTS	ADVANCED PRACTICE NURSES
White	67%	72.7%	84%
Black	4.8%	7.1%	5.7%
Hispanic	6.3%	10%	4.5%
Asian	19.6%	7.3%	4.1%
Statistics cited from the U.S Department of Health and Human Services. ^{20, 22}			

One way to impact the diversity in the health care professions is to examine the gateway into the health professions: health professional schools. There are currently hundreds of health professional schools within the United States that graduate healthcare providers every year. In the last ten years, there has been a greater push to enhance the application, matriculation, and graduation of URM's in the health professions.

Table 2

	MEDICAL SCHOOL APPLICANTS	MEDICAL SCHOOL MATRICULATES	MEDICAL SCHOOL GRADUATES
White	46.8%	49.9%	54%
Black	8.4%	7.1%	6.2%
Hispanic	6.2%	6.2%	5.3%
Asian	21.3%	22.1%	21.6%
Statistics cited from the American Association of Medical Colleges. ^{7,8,9}			

According to the American Association of American Colleges for the 2018-2019 academic year, 46.8% of applicants to U.S. medical schools identified as white, 8.4% identified as black, 6.2% identified as Hispanic or Latino, and 21.3% identified as Asian. Among those that matriculated into medical school in 2018, 49.9% identified as white, 7.1% identified as black, 6.2% identified as Hispanic or Latino, and 22.1% identified as Asian. Among those who graduated from medical school in 2019, 54% identified as white, 6.2% identified as black, 5.3% identified as Hispanic or Latino, and 21.6% identified as Asian (Table 2).

According to the Physician Assistant Education Association for the 2017-2018 academic year, 74.4% of applicants to physician assistant (PA) schools identified as white, 7.3% identified as black, 10.5% identified as Hispanic, and 13.7% identified as Asian (Table 3). Among those who matriculated into PA schools in 2018, 71.8% identified as white, 3.8% identified as black, 8.1% identified as Hispanic, and 9.3% identified as Asian. Among those who graduated from PA school in 2018, 66.6% identified as white, 2.7% identified as black, 6.1% identified as Hispanic, and 7% as Asian.

According to a 2017 survey by the National Council of State Boards of Nursing (NCSBN), nurses from minority backgrounds represent 19.2% of registered nurses (RN). The RN population was 80.8% white, 6.2% African American, 0/4% Hispanic, and 7.5% Asian. According to the American Association of Colleges of Nursing's 2018-2019 report on enrollment, students from minority backgrounds represent 34.2% of Bachelor of Science in Nursing programs, 34.7% of Master of Science in Nursing programs, and 34.6% of Doctorate of Nursing Practice programs. These numbers indicate that people who identified as black or Hispanic or Latino are underrepresented minorities in many health diagnosing and

treating practitioner occupations as well as their education programs.

In addition to graduating a diverse workforce, enhanced diversity among the health diagnosing and treating practitioner occupations in rural and medically underserved communities could help ameliorate health disparities. On a whole, data detailing racial and ethnic demographics within the health diagnosing and treating practitioner occupations has not been released. However, the HRSA Bureau of Health Workforce reported in 2014 that sections

Table 3

	PA SCHOOL APPLICANTS	PA SCHOOL MATRICULANTS	PA SCHOOL GRADUATES
White	74.4%	71.8%	66.6%
Black	7.3%	3.8%	2.7%
Hispanic	10.5%	8.1%	6.1%
Asian	13.7%	9.3%	7%
Statistics cited from the Physician Assistant Education Association. ^{16,17,19}			

of the health care workforce had proportionately fewer providers living in rural areas regardless of the amount of training or education. For example, there are 13.1 physicians and surgeons per 10,000 people in rural areas compared to 31.2 in urban areas. There are 2.3 physician assistants per 10,000 people in rural areas compared to 3.4 in urban communities. Unfortunately, data were not presented for advanced practice registered nurses. A key limitation of this analysis is that data were presented for practitioners who reside in rural communities and not specifically those working in rural communities. Thus, these data may overestimate the number of providers who serve rural communities which highlights the need to reform strategies for recruiting and retaining the health care workforce.

Impact on North Carolina

Major disparities and inequities in health status and outcomes for minority populations stem from extensive, complex socioeconomic and cultural factors that create a disjointed healthcare infrastructure. Social determinants of health include the conditions in which people live, work, grow, and age and the wider forces and systems that shape the conditions of their daily life. Research demonstrates that even when access-related factors are eliminated, racial and ethnic minorities still face poorer quality of care that confers significant consequences. According to the Institute of Medicine Unequal Treatment report, minority patients reported poorer communication and mistrust resulting in poor compliance or non-compliance with treatment regimens and less engagement in accessing health care services. Racial concordance between patients and their health care provider improved outcomes, satisfaction, and communication, reinforcing the necessity of increasing diversity in providers. In 2019, NC ranked 36th in the nation in overall health status in *America's Health Rankings*, a report analyzing state health behaviors, environment, policy, and outcomes. Health status is strongly impacted by the health outcomes and status of minorities and underserved populations, particularly in NC as an ethnically and racially diverse state. Nationwide, the incidence of preterm births, HIV, diabetes, coronary artery disease, stroke, and hypertension are exponentially higher among minority populations. The 2018 North Carolina Health Equity Report analyzes population health by assessing social and economic well-being, maternal/child health, child and adolescent health, risk factors, mortality rates, communicable diseases, violence and injury, and access to care. Every category shows significant disparities in minority populations in contrast to the non-minority referent group, mirroring the nationwide discordance.

Proposed Solutions

An interdisciplinary issue such as the lack of diversity and representation in NC's health care workforces requires a longitudinal and comprehensive approach. First, health care training programs can continue to diversify the trainees they select to better represent the state in which they are training by:

- *Investing in and strengthening existing pipeline programs for underrepresented minorities and military trained medical professionals;*

- *Recognizing programs that demonstrate commitment to recruiting, retaining, and graduating underrepresented minorities;*
- *Expanding education on cultural competence for all levels of health care positions; and*
- *Diversifying health professions faculty so healthcare trainees have representative mentors and are exposed to unique cultural perspectives;*
- *Expanding loan repayment options for all levels of health care positions; and*
- *Strengthening support systems for full-time health professional students who also work full-time.*

Second, legislation must incentivize practicing in rural or underserved settings, particularly for those providers that are representative of the area's demographics by:

- *Expanding existing pipeline programs to include rural students;*
- *Investing in rural health care residencies, fellowships, or advanced training programs;*
- *Prioritizing loan repayment options for rural health care providers;*
- *Improving data tracking among stakeholders and institutions to evaluate strategies and program to increase diverse provider presence in rural communities; and*
- *Sharing best practices and evidence-based policies.*

While the above proposals may increase the diversity in NC's health care workforce over decades, the need to lessen the disparity in representation should also be addressed today. Health professional schools should consider novel ways to reach rural and URM applicants including, but not limited to, tele-mentoring programs or virtual "day in the life" showcases for various health professions. Ultimately, these initiatives may increase the number and diversity of health care workers in the state and the quality of health care for North Carolinians.

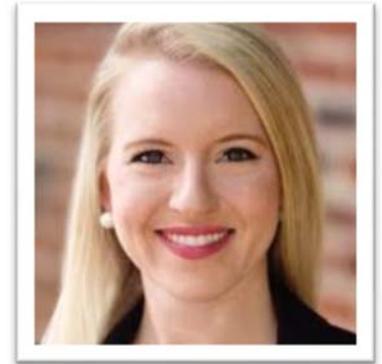
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Invited Commentary – Sue Ann Forrest, MPA

By Sue Ann Forrest, MPA, Director of Legislative Relations, North Carolina Medical Society



Legislative Commentary

Health inequality and health disparities disproportionately impact patient outcomes in North Carolina. As highlighted in the North Carolina Institute of Medicine’s Healthy NC 2030, minority populations are negatively affected in many of the key health indicators where race/ethnicity data was available. This includes poverty, unemployment, short term suspensions, incarceration rates and third grade reading proficiency. As indicated in the white paper, these are currently major challenges to equitable healthcare in North Carolina.

At present, major steps are being made to raise awareness and take action on disparities in healthcare delivery. On June 4, 2020, North Carolina Governor, Roy Cooper, signed Executive Order 143 which creates a Health Equity Task Force to address racial and ethnic health disparities. The specific topics the group will consider include: access to health care, patient engagement in health settings, economic opportunities in business and employment, environmental justice, and education.

Additionally, The North Carolina General Assembly has passed legislation to study the diversity of the State’s public school k-12 teacher workforce. The Program Evaluation Division is in the process of collecting the data needed to present to the Joint Legislative Oversight Program Evaluation Committee. In 2017, the legislature created a non-standing Committee on Access to Healthcare in Rural North Carolina. This group covered many of the proposed solutions mentioned in this white paper including investment in rural training, and loan repayment options.

These steps illustrate a desire by elected officials to better understand how North Carolina can improve diversity efforts. There is still much more to be done to address health professional diversity which will ultimately lead to better health outcomes. All of the proposed solutions mentioned in this white paper would make meaningful improvements. However, a specific request to the legislature to direct the Program Evaluation Division to study North Carolina’s health professional workforce would help educate legislators and provide meaningful data to use to create potential legislation.

Healthy NC 2030

<http://nciom.org/wp-content/uploads/2020/01/HNC-REPORT-FINAL-Spread2.pdf>

Program Evaluation Study

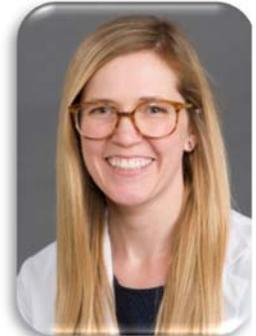
<https://www.ncleg.net/PED/CurrentEvaluations/TeacherDiversity.html>

NCGA Committee on Access Healthcare in Rural NC

<https://www.ncleg.gov/Committees/CommitteeInfo/NonStanding/6715#April%2012,%202018>

CHAPTER 4 – Cost of Healthcare The Rising Cost of Insulin

By Brinda Bhaskar; Jaimie Colica-Ekness, MSW, LICSW; Sharon Gallagher DNP, MSN, RN, FNP-C; Hannah Norton; Abigail Wehner



The Problem

Over 34.2 million Americans, 10.5% of the population, live with diabetes, and almost 1.1 million of them are North Carolinians.^{1,2} Both type 1 diabetes and type 2 diabetes complicate the body's relationship with insulin, a hormone required by the body to control blood glucose levels and properly use glucose for energy. An absence or deficiency of insulin can quickly lead to life-threatening complications. All people with type 1 diabetes require daily exogenous insulin, and many patients with type 2 diabetes also utilize injections of the hormone, to stabilize blood glucose levels.³ Overall, there are 7.4 million people in our country that are dependent on insulin.⁴ The cost of diabetes is high for North Carolina, costing over 10 billion dollars annually.² The disease has a high rate of complications and comorbidities, which can be held at bay by consistent management of blood glucose levels. The cost of insulin, a mainstay of treatment for both type 1 diabetes and type 2 diabetes, is skyrocketing, leaving many to make impossible choices when it comes to their medical care.

Insulin's Unaffordable Costs

There are severe consequences of not having adequate control of blood glucose, including kidney and heart disease, stroke, neuropathic pain, and limb amputation, and even death.² Dr. Kasia Lipska, Assistant Professor of Medicine (Endocrinology) at the Yale School of Medicine, and her team found that 1 in 4 (25.5%)^{4,5} reported using less insulin than prescribed over the past year. Insulin rationing was prevalent across all different prescription coverage plans and most demographic factors. The specific reason identified was due to cost.⁴ In the past two decades, prices for the most prescribed insulins have increased from about \$20 per vial to over \$250 per vial—a more than 700% increase after adjusting for inflation.⁴ Factors that contribute to rising cost include lack of transparency in financial agreements between stakeholders in the supply chain, geographical differences in price, and variations in insurance coverage.^{4,6}

Just this year, the North Carolina legislature filed its first bill in over five years, addressing the rising costs of prescription drugs.⁷ *SB 658* targets the issue of prescription drug transparency, particularly for prescriptions that will have a substantial cost increase, defined as greater than 10% in 12 months.⁸ However, *SB 658* continues to sit undisturbed in the *Rules and Operations in the Senate Committee*.⁷

The Health Care Costs Institute, an independent research group partially funded by Aetna, United Healthcare, Humana, and Kaiser Permanente, holds data on over 50 million commercially insured individuals annually.⁹ Health Care Costs

Institute reports that from 2012 to 2016, annual insulin costs have nearly doubled.⁹ A person with type 1 diabetes spent, on average, \$5705 on insulin in 2016, an increase of \$2841 per person since 2012.⁹ The Health Care Costs Institute goes on to clarify that while this expense is in part due to more expensive insulins on the market, the primary issue remains that all insulins are increasing in cost. In contrast, usage remains relatively stable, with only a 3% increase in the average daily insulin unit's usage.⁹

Why Insulin

The discoverers of insulin initially sold the insulin patent in 1923 for one dollar.¹⁰ This purposeful decision was intended to keep this essential treatment available to anyone in need. Yet today, many people with diabetes often find themselves weighing short term solutions and choosing between necessities of daily life and insulin.⁶ Of adults with diabetes earning below the poverty level, 24% use insulin.⁶ The American Diabetes Association exemplifies this common scenario: "Michael K. was paying more than \$700 per month for [his] Humalog. This 'cost of staying alive' is 59% of [his] monthly mortgage payment and 143% of [his] monthly insurance premium"¹¹ while "Brigid D ... will starve to reduce [her] insulin needs to ensure [she] have enough insulin for [her] child."¹¹ At this time, health care does not have any solutions for long term sustainability of supplying insulin at affordable costs.⁴

The World Health Organization identifies insulin as a *Model List of Essential Medications*, meaning that insulin should be available "at all times... at a price the individual and the community can afford."¹² This is not a reality. Insulin rationing occurs because it is too expensive. The problem with insulin rationing is that it leads to health complications and, eventually, death. With this paper, we will consider the issues associated with high insulin costs, the impact this has on North Carolinians, and viable solutions needed to ensure a healthier North Carolina.

Background & Significance

A myriad of reasons has led to the excessive insulin costs, a crisis facing over 7.4 million Americans.⁶ First, there is a lack of manufacturer competition. There are three primary manufacturers: Indianapolis-based Eli Lilly and Company, Danish drug maker Novo Nordisk A/S, and France's Sanofi S.A..⁶ With America's free-market approach, pharmaceutical companies are free to negotiate costs with commercial insurance companies.⁶ At the same time, Medicare, the nation's largest buyer of medications, is barred from negotiating drug prices, as it is the government health program for people over 65 years of age.¹³ While innovation is costly, it does not explain the increase in older insulin products. When Ely Lilly's Humalog insulin came out in 1996, a month's supply of insulin cost \$21.¹⁴ In 2001, this same vial cost approximately \$35.¹⁴ Since 2001, Humalog increased to \$275 per vial, a 1200% increase in its original price.¹⁴

Insulin's Financial Journey

The Health Care Costs Institute reviewed insurance claims from 2012 to 2016 and identified a rapid increase in total healthcare spending, primarily being driven by insulin costs.⁹ While newer insulins are more expensive, the Health Care Costs Institute concluded the leading cause for the increase in healthcare spending was the insulin prices themselves increasing.⁹ From 2012 to 2016, the average cost of insulin rose from thirteen cents per unit to twenty-five cents per unit.⁹ The average person's daily price, using sixty units per day, increased from \$7.80 in 2012 to \$15 in 2016.⁹

Insulin's Financial Stakeholders in America

If you stop most Americans on the street and ask them where their medications come from, they are unlikely to know the real answer. Insulin has a particularly complicated supply chain and a large number of stakeholders that all want a piece of the pie. In general, the medication itself starts at the manufacturer before traveling to a wholesaler, then a pharmacy, and then to the patient.^{6, 15} (See Figure 1) However, the money that is changed hands follows a much more convoluted path. Health insurers will pay pharmacies for the distribution of a drug. Wholesalers might charge more than the list price for the drugs they are providing. All the up-charges or confusing money avenues lead to downstream effects that can negatively impact patients.^{6, 15} (See Figure 1)

Insulin's American Middlemen

The middlemen influence the cost of insulin and healthcare.¹⁶ Whomever, the middleman, is: insurance companies, the pharmacy benefit manager, or the government,^{6, 15, 16} (See Figure 1) the provider is obliged to prescribe from a select pharmaceutical list while also balancing the brazen cost of insulin. The three primary insulin companies: Eli Lilly and Co, Novo Nordisk A/S, and Sanofi S.A.,⁶ each vying to provide the most substantial rebate to insurance companies; hence, buying their way onto the insurance companies' formulary.¹⁷ The multiple layers of the insulin supply chain,^{6, 15} (See Figure 1) leave incentives for each entity, adding to the end cost of insulin for the consumer, as explained by William Cefalu, M.D., with the American Diabetes Association, testifying before the U.S. Senate's Special Committee on Aging, in 2018.¹⁸

Insulin Supply Chain: A Complex System

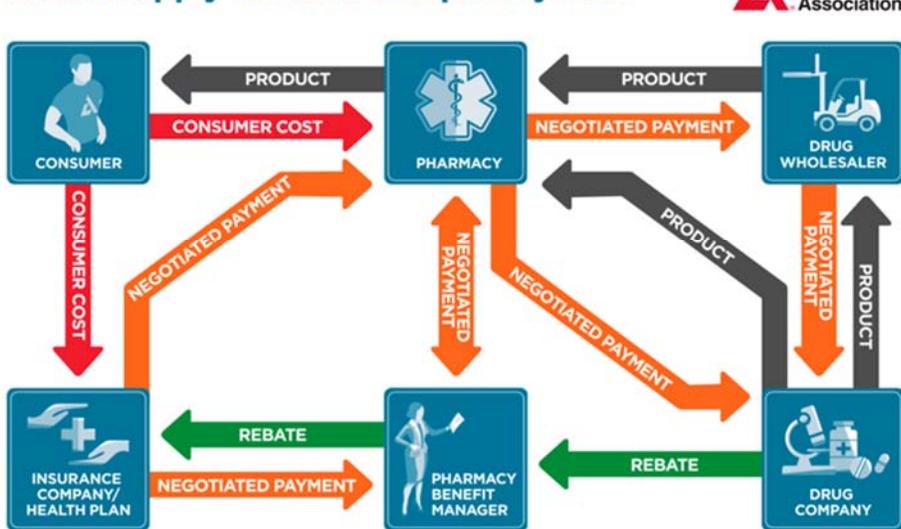


Figure 1: Insulin Supply Chain: A Complex System^{6, 15}

Reproduced with permission from:

<https://care.diabetesjournals.org/content/archive/41/6/1299/1>.

Theoretically, patents are used to ensure that rival businesspeople do not copy products. Pharmaceuticals are developed and brought into the market with a 20-year patent. The intent is that after 20 years, patents are ended, and competitors can develop generic medications. Manufacturers have skirted the intent by taking medications that are nearing the end of their patent and combining it with a different medication; hence, a new drug accompanied by an extended patent.^{16, 18} Sanofi, the developer of Lantus, a leading insulin for type 1 diabetes, has filed over 70 secondary patent applications since Lantus's conception in 2000. If approved, this will entitle Sanofi 37 additional patent years.¹⁹

Currently, in America, insulin manufacturers set insulin costs without the need for explanation or limitation.¹⁸ Manufacturers collaborate with pharmacy benefit managers^{6, 15} (See Figure 1) to be added to their formularies in exchange for rebates⁶ again, terms of an agreement that do not have to be disclosed.¹⁸

A Contrasting Approach to Minimizing Pharmaceutical Cost

Internationally, countries have recognized and responded to the need to mitigate pharmaceutical costs. If left unchecked, pharmaceutical costs will exceed the typical profit margin and exceed availability for consumers. High costs are especially worrisome if such medications are life-sustaining, like insulin. Countries that currently include a valid pharmaceutical check and balance are the United Kingdom, China, India, South Africa,²⁰ and Canada.²¹

In Canada, several factors equate to the cost of an insulin vial being one-tenth of the cost of Insulin in America,²² and the mean annual per-patient cost of diabetic medications, devices, and supplies is 1500 Canadian dollars, approximately

\$1100 US dollars²² versus \$9601 in America.²³ Canada, a monarchical government, sustains several strategies to decrease healthcare costs. Focusing on pharmacological costs, the Canadian government heavily regulates the cost of medications, and negotiates directly with drug manufacturers to keep costs low²¹; as opposed to the complex pharmaceutical pricing process in America. Canada uses a federal level semi-judicial body that controls several aspects, to include: drug-factory exit prices, formulary management to standardize access, to maximize generic medication usage, price-freezing, and capping mark-ups.²⁴ In 1987, Canada developed the federal Patented Medicine Prices Review Board (PMPRB); a cohesive federal governmental agency whose responsibility it is to regulate pharmaceutical costs.²⁴

The PMPRB incorporates a multifaceted approach to ensure that the initial factory-set drug prices are not extreme.²⁴ Initially, PMPRB determines whether the new patented medication is a new dosage of current medicine, a breakthrough medication, or a new drug or dosage form of an existing medicine that has an insignificant benefit over current medications.²⁴ The PMPRB also evaluates the price to ensure it is not considered "excessive".²⁴ Guidelines to safeguard medicine is not regarded as excessive include: a) the existing patented drug cost cannot increase by more than the Consumer Price Index, b) the new drug costs must remain in the range of existing drugs in the same therapeutic class, c) the new drug price is limited to the median cost of the same medication in the United States, Switzerland, Germany, France, Sweden, Britain, and Italy.²⁴ The PMPRB has the authority not only to determine "excessive" cost but to act by reducing the patented drug cost, as well as impose other financial repercussions.²⁴

Impact on North Carolina

Currently, in Raleigh, North Carolina, a vial of Insulin Aspart costs between \$173 and \$191 for the generic version and \$310 and \$353 for a vial of brand name, Novolog.²⁵ The average person with type 1 diabetes uses two to three vials per month.¹⁸ People with type 2 diabetes can average up to five or six vials a month.¹⁸ Insulin Lispro, or its brand Humalog, another insulin, costs roughly the same per vial.²⁵ With the median monthly income in Raleigh being approximately \$5474 and a 14% poverty rate, the cost of insulin for many residents quickly becomes unmanageable.²⁶

North Carolina's medical providers across specialties have countless stories of patients who suffer due to insulin's financial burden. Many of these patients shoulder the invisible pain of stress and anxiety from the unwieldy cost, and others are victim to more clinically apparent issues such as vision, heart, and kidney problems, from missing doses due to unaffordable insulin. As students of the health professions, we see these patients, too. A patient on the internal medicine service, Mr. W., was recovering from a partial amputation of his foot, a complication from his long-standing type 2 diabetes. He told us how he often had to choose between groceries for his family or insulin for himself. Here was a stark representation: the cost of insulin for this man was higher than an unaffordable bill; it quite literally cost him a limb. Unfortunately, Mr. W. is not unique in his plight. Each student and each provider have stories of patients like him.

Proposed Solutions

Last year, U.S. Representatives Diana DeGette (D-CO) and Tom Reed (R-NY), introduced a bill known as the *Insulin Price Reduction Act*, aimed at drastically reducing the price of insulin products.¹⁷ The recommended legislation incentivizes the nation's insulin manufacturers to lower the list price of their products to their 2006 cost, from \$300 to \$68 a vial.¹⁷ In exchange, the legislation protects manufacturers from having to offer additional rebates to insurers. The bill prohibits insurers from "refusing to cover any insulin product that had its price reduced under the terms of the bill".¹⁷ Unfortunately, while this bill has bipartisan support, the reality is it is unlikely to be passed during an election year with a pandemic at the forefront. Hence, we are nowhere nearer the sweeping change needed from federal legislation. The lack of federal action leaves it to the states to fill in the gap. North Carolina's leaders can and should protect our citizens by implementing creative solutions to decrease the cost of insulin and increase access to this life-saving medication.

As the cost of insulin continues to rise and patients' lives are at risk, we must act now to prevent further needless negative impacts. The solution to increasing insulin costs will not be easy, but there are steps we can take as a state to help people with insulin costs. One possible solution is to pass a statewide cap on the cost of insulin, such as what was passed in the state of Colorado last year. In 2019, the bill in Colorado placed a \$100 cap on the cost of insulin monthly, independent of

how much insulin a person uses.²⁷ In addition to capping the cost, the bill tasked the attorney general of the state to investigate rising costs.²⁷ While the law in Colorado goes a long way in making insulin more affordable, it is not a final solution. This bill only applies to people who are covered by insurance, thus leaving out many people.²⁷ Also, \$100 a month for one medication is still quite expensive for many people with limited incomes who may be on multiple other medications.

Illinois and New Mexico have followed suit with laws of their own placing caps on the monthly cost of insulin.^{28, 29} New Mexico was able to pass a bill that caps monthly insulin costs at \$25,²⁹ the lowest thus far. Multiple other states have insulin cap bills in the work that have not been signed into law yet. Unfortunately, North Carolina is not one of these states. North Carolina can and should join with these states in capping the cost of insulin for both insured and uninsured alike. Additionally, it is time to bring SB 658^{7, 8} back to the forefront, and encourage transparency in prescription drug pricing, particularly with insulin. With both a price cap and increased transparency, we can begin to ensure fewer North Carolinians have to make impossible choices to afford their insulin.

Conclusion

Insulin is a natural, required hormone that can mean the difference between life and death. When first developed, the insulin patent was sold for a dollar to lead by example as to the importance of it to remain affordable to consumers. Because the United States does not have a regulatory process for pharmaceutical costs, there are no guidelines, and it is left at the State level. As shown by Canada and other international countries, national-level governmental control of pharmaceutical costs is a practical way to ensure life-sustaining medications are feasible to its citizens. While this is not a current proposition in the United States, Americans can benefit from federal level oversight and implementation of strategies to keep pharmaceutical drugs affordable.

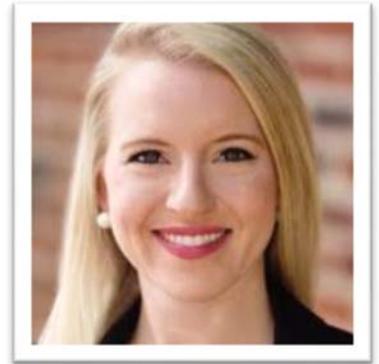
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Invited Commentary - Sue Ann Forrest, MPA

By Sue Ann Forrest, MPA, Director of Legislative Relations, North Carolina Medical Society



Legislative Commentary

Controlling the cost of health care has been a priority of Congress and the North Carolina General Assembly for much of the last decade. While legislators from different political ideologies may vary in their approach to solve this complex issue, most elected officials agree that healthcare costs are too high and health outcomes do not compare to other countries that spend much less than United States. While this white paper focuses specifically on the high costs of insulin, the authors raise important systemic issues that necessitate policy-level solutions. One area of focus for recent health policy reform in North Carolina has been around the role of pharmacy benefits managers (PBMs) being a costly middle man in the supply chain for prescription drugs. Many drug manufacturers assert that PBMs force these companies to raise their listed price of more expensive drugs to keep their business. PBMs also keep the rebates they receive from drug manufacturers and that information is not required to be publicly disclosed. In 2019, the NC House and NC Senate filed companion bills SB 632/HB 534 NC Pharmacy Benefits Manager Licensure Act to address the added costs that pharmacy benefit managers to the health care system which is ultimately passed on to patients.

While this legislation is not specific to insulin, it illustrates that there is legislative interest to find a bi-partisan solution to bring down the costs of prescription drugs. This language was added on to another bill, relating to birth centers, and is currently in the negotiation process by conferees of the House and Senate in the 2020 legislative session. This legislation would add consumer protections, restrict PBMs from taking certain actions, and establish rules for claim overpayments and PBM networks. Additionally, the bill would increase the NC Insurance Commissioner's ability to take enforcement action against PBMS. While this bill does not place a cap on the monthly cost of insulin as suggested in the white paper, it does help address providing more oversight around the middlemen cited in the paper as being a factor in increasing costs. It is clear that this complex problem will require a multifaceted policy approach in order to create impactful progress.

CHAPTER 5 – Provider Shortages

Primary Care Provider Shortages in Rural North Carolina: Rationale & Blueprint for Action

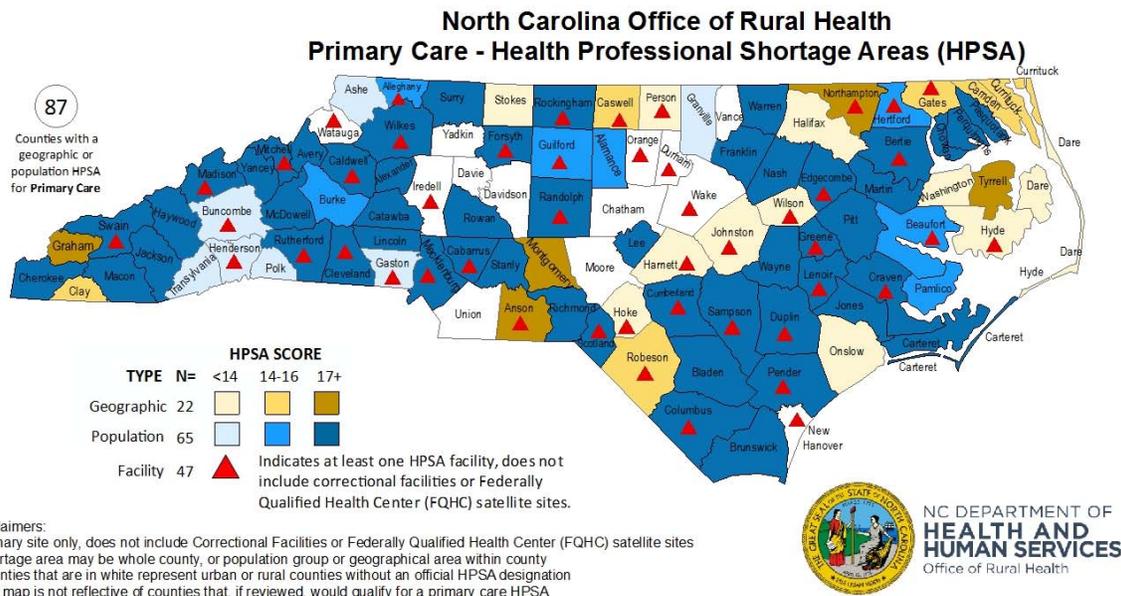
By Sydney Howard, Katriel Lee, Katelyn Linker, William McAllister, Angela McConnell, & Sarah Ryals



The Problem

Provider shortages occur when a population’s health care demands do not align with the supply. Recent estimates predict a national shortage of between 46,900-121,900 physicians by 2032 in both primary and specialty care (North Carolina Department of Health and Human Services [NC DHHS], 2019). The increasing demands are thought to be driven by the growing national population and our aging physician population. Although the provider shortage crisis can be felt everywhere, it is more acutely affecting our rural and historically underserved areas (Topchik, 2017).

Figure 1 – Health Professional Shortage Areas



Note. The 2019 profile, crafted by the North Carolina Office of Rural Health (ORH), reveals significant shortages in rural NC counties (NC DHHS, 2019). Reproduced with permission from the NC Department of Health and Human Services.

When we specifically explore the primary care shortages in North Carolina, much of the discrepancy lies in the rural counties. Primary care for our purposes will be defined by the Bureau of Health Workforce to include Family Medicine, Pediatrics, Obstetrics and Gynecology, and Internal Medicine. Rural counties are defined as having an average population density of 250 people per square mile or less and include 80 out of our 100 counties in North Carolina (North Carolina Rural Center, 2020). The 2019 profile of Health Professional Shortage Areas (HPSAs), crafted by the North Carolina Office of Rural Health (ORH), reveals significant shortages in rural counties of NC, as seen in the map in **Figure 1** (NC DHHS, 2019).

A higher HPSA score, represented in counties with the dark gold and dark blue colors, indicates a greater need for providers in a given county. These scores take into account provider service hours, census demographics, Medicaid paid claims data, access to services with a sliding fee, low birthweight and infant mortality, and the availability for overutilization of providers in surrounding areas. The shortage of primary care physicians is so large that 5 counties in 2018 had 1 or less primary care physicians per 10,000 people, 2 of which had 0 (Camden and Tyrrell Counties) (Cecil G. Sheps Center for Health Services Research, 2018).

Access to primary care stands as one of the most essential aspects of wellbeing. Primary care provides comprehensive health care and preventive management for patients. A 2008 report from the World Health Organization (WHO), stated that use of preventive measures could reduce the burden of global disease by 70% (Rakel & Rakel, 2015). Additionally, a 2007 analysis addressed this question: “Would increasing the number of primary care physicians improve health outcomes in the United States?” They found that predicted health outcomes with a one-unit increase in Primary Care Physicians per 10,000 people would improve all-cause, cancer, heart disease, stroke, and infant mortality; low birth weight; life expectancy; and self-rated health (Macinko et al., 2018). Although this study was performed with the impact of physician providers in mind, literature shows that Advanced Practice Providers (APPs) in a Primary Care setting perform quality care that should also be considered when analyzing population health benefits (Naylor & Kurtzman, 2010).

It is clear that North Carolina’s rural counties are facing a Primary Care provider shortage, and, if remedied, could significantly benefit the overall health of these populations. Our goal is to target improving the recruitment and retention of primary care providers practicing in rural North Carolina by fostering interest of future providers through clinical exposure to rural healthcare during their medical education.

Background & Significance

The provider shortage in rural primary care in North Carolina is multifaceted. First, recruitment of providers plays a critical role in the shortage. Only 3% of North Carolina medical school graduates of the class of 2010 were practicing rurally in Primary Care in 2015 as seen in **Figure 2** (Iglehard, 2018). This is due to a variety of influences. Rural areas may be perceived as having little opportunities for working spouses, lower resource schooling, and a lower income. Subtle biases towards specialization can also pervade training programs leading future providers to think less of family practice despite the unique and challenging nature of the field (Rabinowitz et al., 2001).

Clinician retention, a major factor affecting the number of clinicians available to practice in rural primary care, also affects the provider shortage in multiple ways. Older and more experienced clinicians are retiring earlier (Landon et al., 2006), and multiple studies have shown that older physicians have a high intention to leave their clinical duties. The retention issue is also prevalent in younger clinicians, who leave their first jobs at a higher rate than their older counterparts. Across the age groups, providers are increasingly likely to leave direct patient care for other medical opportunities such as telehealth, with intention to leave direct patient care rates being reported as high as 53.7%. Additionally, those with job offers outside the healthcare sector, such as medical consulting, informatics, and health insurance jobs, are more likely to leave direct patient care (Degen et al., 2015). Often, these prospects involve high compensation (Darves, 2019).

A variety of factors have been identified that have been correlated with increased provider recruitment to rural practice both reflecting characteristics of the provider as well as of the practice and community they will be serving (Evidence-Based Synthesis Program [ESP], 2015; Sharp et al., 2014). Provider characteristics include rural background, family practice specialty, rural training, having family in the rural area, and a rural oriented medical curriculum. Factors of the rural community and practice that improve recruitment include economic incentives and opportunities for family members (spousal employment and schools for children). Similarly to recruitment, rural curriculum and rural training opportunities have been associated with improved retention, but other studies have not found a strong association (ESP, 2015; Sharp et al., 2014). For retention of providers to rural areas, negatively impacting factors focus more on economic incentives and difficulties directly linked to administrative issues (ESP, 2015; Sharp et al., 2014).

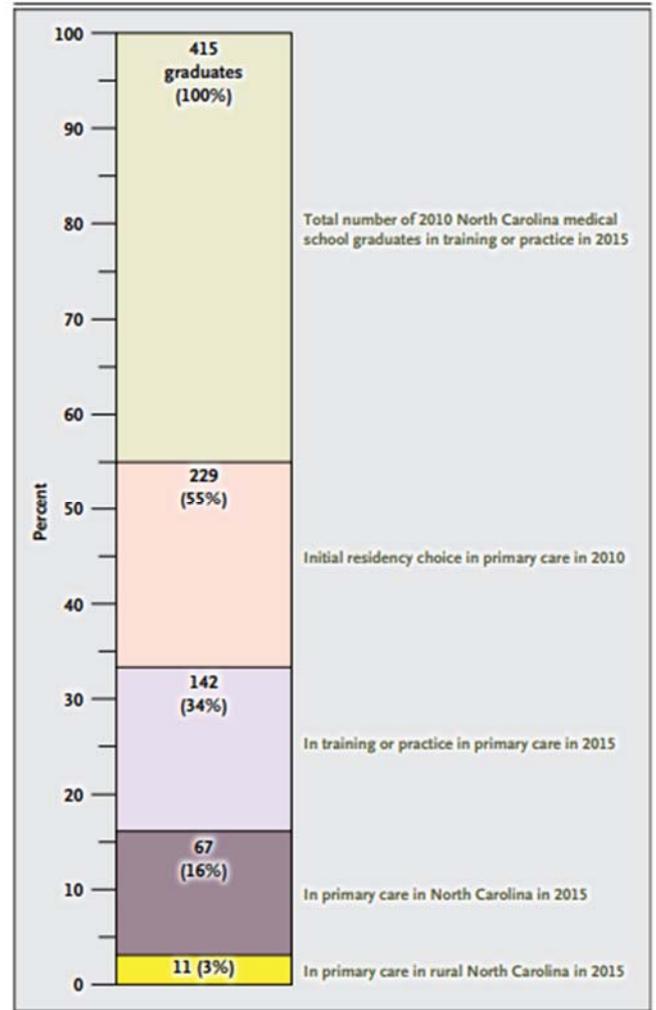
Medicare cuts have an effect on healthcare spending and primary care provider training in North Carolina. In 2013, 2% in Medicare cuts resulted in \$3.5 billion in lost Medicare reimbursement among rural hospitals, 153,000 jobs lost in rural hospitals and communities, and \$18.0 billion GDP loss (Topchik, 2017). In fact, since 2005, seven rural hospitals have closed in North Carolina, and those that are open are struggling (Knopf, 2017). About 40% of rural hospitals operate with negative profit margin (Knopf, 2017).

While Medicare cuts have hurt the rural healthcare community, there is also less emphasis and spending on primary care training itself. Among the 20 hospitals that trained the most primary care clinicians from 2006 to 2008, 41% were trained in primary care and received \$292.1 million in Medicare graduate medical education payments (Chen et al., 2013). However, among the 20 hospitals that trained the least number of primary care providers in the same years, only 6.3% of clinicians specialized in primary care, but these hospitals received \$842.4 million in Medicare payments (Chen et al., 2014). While Medicare cuts have damaged rural healthcare, Medicare spending overall is skewed towards specialty training.

While the aforementioned issues impact the provider availability in rural North Carolina, provider demand is increasing. Adults in rural areas are older, with the median age being 51 compared to 45 in non-rural areas (Topchik, 2017). The rural population of those ages 55 to 75 was estimated to grow 30% between 2010 and 2020 (National Conference of State Legislatures, n.d.). There is also a higher population of veterans in rural areas, and given that 41% of veterans struggle with service-related disabilities, this population also increases healthcare demand in these areas (Topchik, 2017).

As demand for primary care in rural North Carolina increases, the supply continues to dwindle. Clinician retention to primary care medicine, Medicare cuts and spending, and lack of focus on primary care training all play a role in the provider shortage. While supply suffers, demand rises, and the primary care provider shortage continues to increase.

Figure 2: North Carolina Primary Care Physicians in Rural Areas



Note. North Carolina medical school graduates who were practicing in rural areas (Iglehard, 2018). Reproduced with permission.⁷

Impact on North Carolina

Provider shortages have a significant impact on the health of the population of North Carolina. 92 out of 100 counties within North Carolina are suffering from health professional shortages (North Carolina Institute of Medicine [NC IOM], 2018). Currently, North Carolina has two counties without a primary care physician (Cecil G. Sheps Center for Health Services Research, 2018). Due to these staggering numbers, many individuals have further to travel to obtain basic access to care. Upon examination of healthcare providers among the state, Holmes (2018) found that the distribution of the providers seems to have an increased growth rate in providers practicing in metropolitan areas than in rural areas. Metropolitan areas have a supply of providers which is nearly three times that of rural countries (Holmes, 2018). Health disparities are directly impacted by the provider shortages within North Carolina. Within North Carolina, the health disparities within rural populations is significantly higher than urban areas. One in every five North Carolinians live within rural communities (NC IOM, 2018). There are higher rates of premature deaths, child poverty, child mortality, and diabetes (Topchik, 2017). Barriers to access to care result in patients' inability to receive preventative screening, care, stave off hospitalizations, and deaths (NC IOM, 2018).

The economic impact healthcare providers can bring to communities rurally is significant. One primary care physician within a rural community can create an average of four jobs within the providers office. Funded by referrals made by primary care physicians to the local hospital for different inpatient and outpatient services, an estimated 13.5 jobs can be created at that local hospital. The growth provided by economic stimulus through jobs and salaries, one physician within the community can impact the local economy by approximately \$2.2 million (NC IOM, 2018).

Proposed Solutions

Historically, rural provider shortages have been approached either from recruitment or retention strategies. Recruitment focuses more on bringing new providers into areas which is beneficial for improving the number of providers. Focusing on recruitment does not provide solutions to keep physicians in the community, thus affecting continuity of care. Retention strategies do focus on this aspect of the provider shortage but are limited due to the already low number of and the increasing age of these providers. As mentioned previously, exposure to rural healthcare in medical curriculum and training have been linked to improved recruitment and retention of rural providers. In order to impact both the recruitment and retention of rural providers, our team proposes the development of experiences through rural healthcare tracks to expose future providers to rural healthcare early in their education.

Rural track programs overall target rural provider recruitment and retention in a multifaceted manner. They first select students who are more likely to become rural healthcare providers. These are students who come from rural backgrounds and had an interest prior to their medical education to become rural providers (MacQueen et al., 2017), similar to the aforementioned characteristics associated with increased provider recruitment. Then, they provide a background of exposure for students to experience rural healthcare. Lastly, these programs foster a route of mentorship for the future provider would be able to utilize when they encounter difficulties in their own practice. The early training exposure and mentorship opportunities create experiences and a professional network to help the rural providers address future administrative problems that have been associated with reduced provider retention. These multiple aspects of the rural education tracks are what allows these programs to both target provider recruitment and retention.

Many programs across the country focus on increasing exposure to rural healthcare during education from which we draw inspiration. The APRN Rural and Underserved Roadmap to Advance Leadership (RURAL) Scholars Program at East Carolina University funds trainees to participate in two semesters of clinical placement in rural communities (East Carolina University, 2020). Though the program is new, it hopes to draw from the success of similar programs. One such program is the Physician Shortage Area Program (PSAP) at the Sidney Kimmel Medical College. Programs such as PSAP recruit students who already have an interest in rural medicine and provide them with rural healthcare focused experiences and mentorship during training. PSAP has seen great success in both recruitment and retention with program participants being eight times as likely to become rural providers and having a 79% retention rate after 11-16 years of practice (Thomas Jefferson University, 2019).

Rural healthcare tracks such as these above are generally small but have been found to have a large impact overall. Systematic review of multiple programs at medical schools across the country found that 26-92% of graduates practice medicine in rural settings. These rates are drastically greater than the approximately 9% of physicians practicing currently in rural healthcare (Rabinowitz et al., 2008). More widespread implementation of rural healthcare tracks in the North Carolina health profession programs has the potential then to make a large impact on provider shortages. Other educational tracks at multiple programs across the state have already seen success, which creates a framework to develop rural healthcare tracks. There is the potential to create 21 new Nurse Practitioners, 31 new Physician Assistants, and 13 new physicians each year if just 10 students participate at each North Carolina program with a minimum reported success rate of 26%.

The framework for the rural healthcare programs also allows further potential for growth to include changes in medical education and training already seen due to COVID-19. Telehealth services have seen further expansion in response to the pandemic, which will likely continue to further shape the delivery of healthcare moving forward. Medical education programs are further exploring ways to incorporate telehealth experiences into traditional training both for safety concerns and the likely continued increase use of telehealth. Telehealth has long been explored as an opportunity to improve healthcare access to unserved areas. This transition in medical practice and education to include telehealth would further allow for expansion of our plan into rural telehealth rotations. This exposure not only will help prepare the next generation of providers to a telehealth system, but might similarly impact recruitment of providers to serve rural communities, even if it is via a telehealth platform.

Overall, we believe targeting recruitment and retention of providers starting early in training can lead to a diminished gap in the rural primary care shortage of NC. Increased number of providers can significantly benefit the health and wellbeing in these communities.

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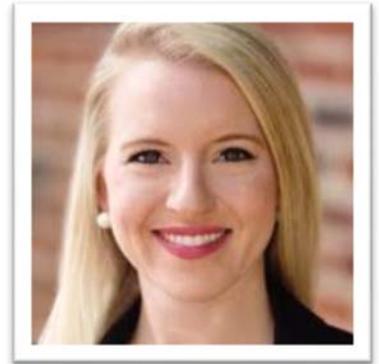
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Invited Commentary – Sue Ann Forrest, MPA

By Sue Ann Forrest, MPA, Director of Legislative Relations, North Carolina Medical Society



Legislative Commentary

The North Carolina General Assembly has worked to address increasing access to care in our rural communities through investment in residencies, rural loan repayment program funding, and increasing broadband in tier one and two counties through grants for telemedicine. As noted in the white paper, there are numerous challenges that relate to recruitment and retention of key health providers in rural areas. The proposed solution would create rural track programs for all health professions. This model could potentially be created as a legislatively funded program similar to the NC Teaching Fellows Program, which provides scholarship funding to undergraduate students who commit to teach in NC in STEM or Special Education fields. A Rural Health Fellows program could help as the white paper indicates, identify students with an interest in rural health and provide them financial and mentorship opportunities to retain those students in rural areas.

*Note: The NCMS Foundation's **Community Practitioner Program** partners with local communities and health care organizations to assist in recruiting talented primary care physicians, physician assistants, and family nurse practitioners by providing grants in return for service in underserved communities. By offering some relief for educational debts, the program encourages health professionals to serve in the areas that need them most*