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FOR HEALTH SERVICES RESEARCH

The Chiropractic Workforce In North Carolina and a Potential School of Chiropractic at Winston-Salem State University

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Introduction

The 2017 North Carolina Appropriations Act of 2017 (N.C.S.L. 2017-57) mandated that the Board of Governors (BoG) of the University of North Carolina (UNC) study the feasibility of establishing a chiropractic medicine program at Winston-Salem State University (WSSU). The Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research at the UNC-Chapel Hill was asked by the UNC General Administration to conduct a study to inform decision-making about the establishment of this program. This report summarizes findings about the current supply of chiropractors in NC including demographic and educational trends, practice locations, and demand for services. This study does not examine the costs and financing for a new school.

Background

Chiropractors are health care professionals that treat musculoskeletal and nervous system disorders, such as back pain, neck pain, and headaches.¹ Per NC law (N.C. Gen. Stat. § 90-143), “chiropractic” is defined as “the science of adjusting the cause of disease by realigning the spine, releasing pressure on nerves radiating from the spine to all parts of the body, and allowing the nerves to carry their full quota of health current (nerve energy) from the brain to all parts of the body.” Licensed chiropractors in NC may examine and diagnose patients, perform spinal manipulations (also known as chiropractic adjustments), and order x-rays and other imaging. Their scope of practice includes rehabilitative exercises, body work, massage, acupuncture, and nutritional management, including selling nutritional supplements.² Chiropractors can perform transcutaneous electrical nerve stimulation for pain relief and can dispense medical equipment to patients such as orthotics, cervical collars, temporomandibular joint

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(TMJ) nightguards, etc. In NC, chiropractors are recognized as initial contact physicians, meaning that patients can seek care from chiropractors directly and do not need a referral from a physician.

Chiropractic services are often considered a part of complementary and alternative medicine (CAM). This classification is due to the origins of the profession, which were based on the theory of vitalism, the body's ability to heal itself, as well as the theory of vertebral subluxation, the belief that improper alignment of the vertebrae in the spine would interfere with nerve functioning, leading to a variety of health issues.^{3,4,5} Since the 1970s, though still controversial, chiropractic has become more accepted by mainstream medicine, as some chiropractic practices, particularly spinal manipulation, have demonstrated effectiveness for low back pain.^{6,7} While some chiropractors adhere to the subluxation theory, a majority acknowledge the lack of evidence for the theory and the field has subsequently shifted toward favoring evidence-based chiropractic practices.^{8,9,10,11} Some chiropractors define themselves as CAM providers outside of traditional medicine, while others reject the CAM label and consider themselves allied health professionals with a focus on musculoskeletal issues.^{12,13} The internal disagreement about the direction of the field is not settled and continues to be a subject of debate in the literature.^{14,15}

Chiropractors must hold a four-year Doctor of Chiropractic (DC) degree from a school accredited by the Council on Chiropractic Education. NC does not have a chiropractic school and all chiropractors completed their DC degree out-of-state.

Winston-Salem State University (WSSU) is a historically Black university (HBCU) in Winston-Salem, North Carolina. WSSU has a school

of health sciences offering undergraduate, graduate, and professional degrees. Fields of study include: nursing, occupational therapy, physical therapy, rehabilitation counseling, clinical laboratory science, exercise physiology, and health management. WSSU is ranked first in NC and eighth nationally for graduating Black students in health professions, as well as first in NC and fifth nationally for graduating Black students in nursing.¹⁶

Methods

This analysis used a mixed methods approach, employing both quantitative and qualitative analyses to assess the demand for and supply of chiropractors in NC.

We analyzed chiropractor licensure data maintained by the NC Health Professions Data System (HPDS) at the Sheps Center. Descriptive statistics and cartographic analyses were used to analyze and display data on the chiropractor supply, distribution, and diversity. We created a map of the location of chiropractic schools in the United States.

Because data on the demand for chiropractic services is relatively lacking in the academic literature compared to other types of health services, we conducted interviews with nine key informants to gather more information. Interviewees included two licensed chiropractors active in the NC workforce, a public health professional with expertise in the Winston-Salem area, representatives of the NC Board of Chiropractic Examiners, the NC Chiropractic Association, and the Association of Chiropractic Colleges, and three researchers with national expertise in both chiropractic and physical

therapy treatment for back pain and related spine issues. Four interviewees were chiropractors.

Findings

Demographics

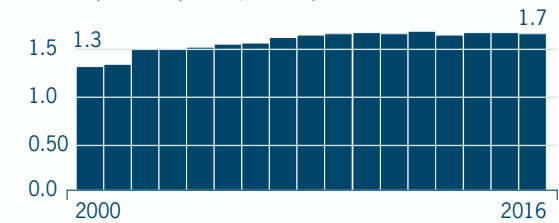
In 2016, there were 1,679 active, licensed chiropractors with a primary practice address in NC. While the total number of chiropractors in NC has steadily increased over the past 16 years, the rate of 1.7 chiropractors per 10,000 population in the state has remained steady since 2009 (**Figure 1**). According to the NC Board of Chiropractic Examiners, there are between 250 and 275 applicants to take the licensing exam in NC each year.

The chiropractic workforce is predominantly male (72% n=1,210) (**Figure 2**). The majority (89.5%, n=1,503) of NC's chiropractic workforce identified as white in 2016, compared to 63.5% of NC's population.¹⁷ Because 6.6% (n=111) of NC chiropractors did not provide information on their racial or ethnic background in 2016, the percent of the workforce who identify as non-white is not fully known, but well below that of NC's population and likely less than 10%. The national diversity gap in the chiropractic workforce has been documented^{18,19} and the NC data reflect these national trends.

Of those who reported their age (91.6%, n=1,539), 58.2% (n=1,055) were younger than 50 years old. The NC Board of Chiropractic Examiners reports that more chiropractors are retiring. Data show that 9.4% (n=145) of those who reported their age in 2016 were 61 or older, nearing retirement age (**Figure 3 & 4**).

Figure 1. Growth of the Chiropractor Workforce, North Carolina, 2000-2016

a. Chiropractors per 10,000 Population



b. Total Number of Chiropractors

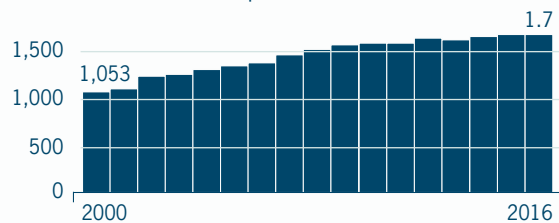


Figure 2. Percent of Chiropractors who were Female in North Carolina

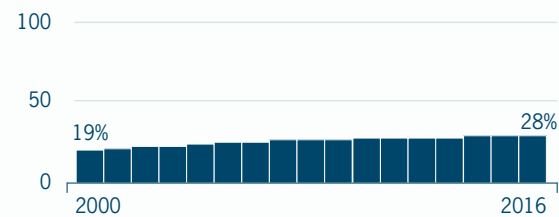


Figure 3. Percent of Chiropractors who were 65 or Older in North Carolina

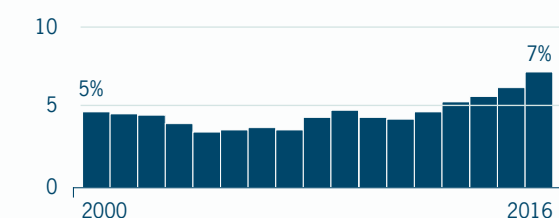
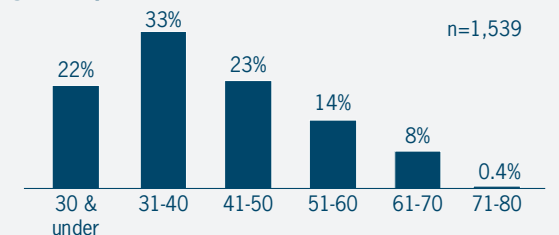


Figure 4. Active, Licensed Chiropractors by Age Group, NC, 2016



9% of chiropractors (n=140) did not report age data and are missing from this analysis.

Notes: Data include all active, in-state chiropractors licensed in North Carolina as of October 31 of the respective year. **Sources:** North Carolina Health Professions Data System, <https://nchealthworkforce.sirs.unc.edu>, with data derived from the North Carolina State Board of Chiropractic Examiners, 2016. Population data downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. **Produced by:** The Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Comparison with Physical Therapists

We have included data on physical therapists (PTs) in this report as a point of comparison. Chiropractors and PTs are distinct professions with differing educational pathways, scopes of practice, and regulatory requirements. However, as both professions focus on musculoskeletal issues, there is some overlap in both scope of practice and the types of services these professionals provide. Patients may choose to see either type of health professional for spine care. Both professions use non-pharmaceutical approaches for acute and chronic pain management, and both require a doctoral-level degree. For back pain, the academic literature^{20,21} indicates that when chiropractors and PTs follow evidence-based guidelines, patient outcomes are similar. Unlike chiropractors, PTs cannot order x-rays or other imaging.

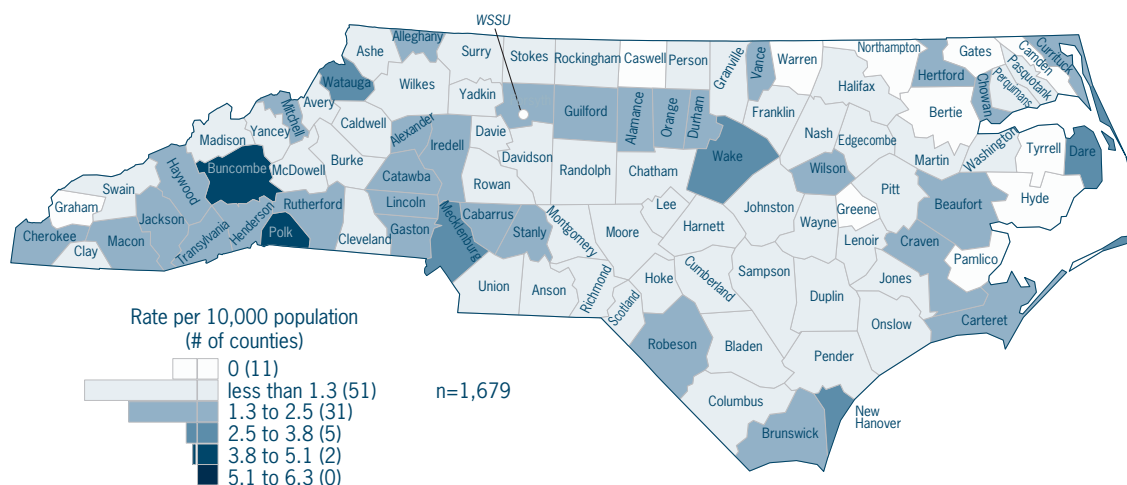
The PT workforce is much larger than the chiropractor workforce. There were 6,420 PTs in NC's workforce in 2016, a state rate of 6.3 PTs per 10,000 population. Unlike chiropractors, the PT workforce is majority female (71.7%, n=4,603).

Like chiropractors, PTs do not reflect the racial and ethnic diversity of NC's population, with both whites (82.0%, n=5,264) and Asians (6.2%, n=399) more represented in the PT workforce.

Four interviewees described chiropractic care as more “routine” than physical therapy. While chiropractors often treat patients for acute episodes, another model of chiropractic care involves regular visits and chiropractic adjustments with a focus on wellness and preventive care. Two interviewees noted that regular chiropractic treatments could become a part of a patient's routine care over the course of years or even decades. In contrast, interviewees described PT care as shorter in duration. After the patient meets treatment goals they no longer return for PT visits, unless problems reoccur or there is a new issue to address.

Three interviewees noted that in general, chiropractors earn higher salaries than do PTs. Data from the Bureau of Labor Statistics (BLS) show that in NC in 2016, the average salary for chiropractors was \$95,280 relative to \$82,320 for PTs.²²

Figure 5. Chiropractors per 10,000 Population, North Carolina, 2016



Notes: Data include all active, in-state chiropractors licensed in North Carolina as of October 31, 2016. **Sources:** North Carolina Health Professions Data System, <https://nchealthworkforce.sirs.unc.edu>, with data derived from the North Carolina State Board of Chiropractic Examiners, 2016. Population data downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. **Produced by:** The Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

There are eleven counties in NC that do not have a chiropractor with a primary practice location in that county (**Figure 5**). Nine of those counties have at least one PT with a primary practice location in the county. Two NC counties, Gates and Tyrell, do not have a chiropractor or a PT in the county.

Demand for Chiropractic Services

Data suggest that each year, roughly 12% of the US population visits a chiropractor at least once, most commonly for low back pain.^{23,24} Data from the National Board of Chiropractic Examiners indicate that the primary reasons patients seek chiropractic treatment have remained stable over time and include back pain (35%), neck pain (18%), arm or leg pain (17%), headaches (12%), and wellness (8%).²⁵

Low back pain is a common health condition. Data indicate that the prevalence of chronic low back pain in NC has increased over time, as has use of health care services for back pain.²⁶ Importantly, the data show that this increased use of services was the result of a greater number of patients with back pain, and was not due to more intense utilization of services by a small group of patients.²⁷

We were unable to identify a data source for chiropractic demand for NC. In general, it is difficult to estimate demand for chiropractic services because many of the health conditions they treat can be addressed by multiple clinical approaches, any of which may be clinically appropriate.²⁸ As Whedon and colleagues have noted, “For most of the conditions that chiropractors treat, such as non-specific low back pain, chiropractic spinal manipulation is not the only appropriate treatment choice.”²⁹ Whedon and colleague’s study demonstrated that for Medicare beneficiaries, the use of chiropractic care increased when the local

supply of chiropractors increased, independent of patient characteristics or diagnoses.³⁰

One study of 2008 Medical Expenditure Panel Survey (MEPS) data indicated that white, non-Hispanic patients are more likely to use chiropractic services than are minorities.³¹ While the reasons for the relative underuse of chiropractic services for minorities relative to whites was unknown, researchers hypothesized that the lack of non-white chiropractors may be a factor.³² The study demonstrated that the use of chiropractors did not differ between urban and rural areas in the Southern US.³³ Patient income was associated with increased chiropractic use, as odds of using chiropractic services were 67% higher for high-income patients than for low-income patients.³⁴

Payment for Chiropractic Services

A 2017 survey indicated that much of chiropractic care is paid for by insurance, with chiropractors receiving 39% of their income from private insurance, 16% from auto insurance,ⁱ 12% from Medicare, 5% from Medicaid, and 4% from workers compensation.³⁵ In NC, Medicaid covers chiropractic services for neuromusculoskeletal conditions, including x-rays.³⁶

A large portion of the costs of chiropractic care is paid directly by patients. The 2017 chiropractic salary and expense survey indicated that 39% of chiropractor income for patient treatment was paid in cash.³⁷ A separate analysis indicated that 30% of all chiropractic care is paid entirely out-of-pocket by patients.³⁸ While the high percentage

ⁱ A separate survey shows that 14% of patients seek chiropractic care after automobile accidents. See: Christensen MG, Hyland JK, Goertz CM, Kollasch MW. Practice Analysis of Chiropractic 2015. National Board of Chiropractic Examiners, 2015. Accessed January 6, 2017 at: <http://www.nbce.org/practiceanalysis/>

of self-pay chiropractic patients may indicate that patients value chiropractic services, self-pay patients also tend to see chiropractors for fewer visits and fewer services.³⁹

Two NC interviewees reported that insurance reimbursement has been reduced for chiropractic services, which has pushed some chiropractors to move toward a more cash-based business. One interviewee advised that co-payments are high for chiropractic services which results in higher costs for patients.

Chiropractic Education Programs in United States

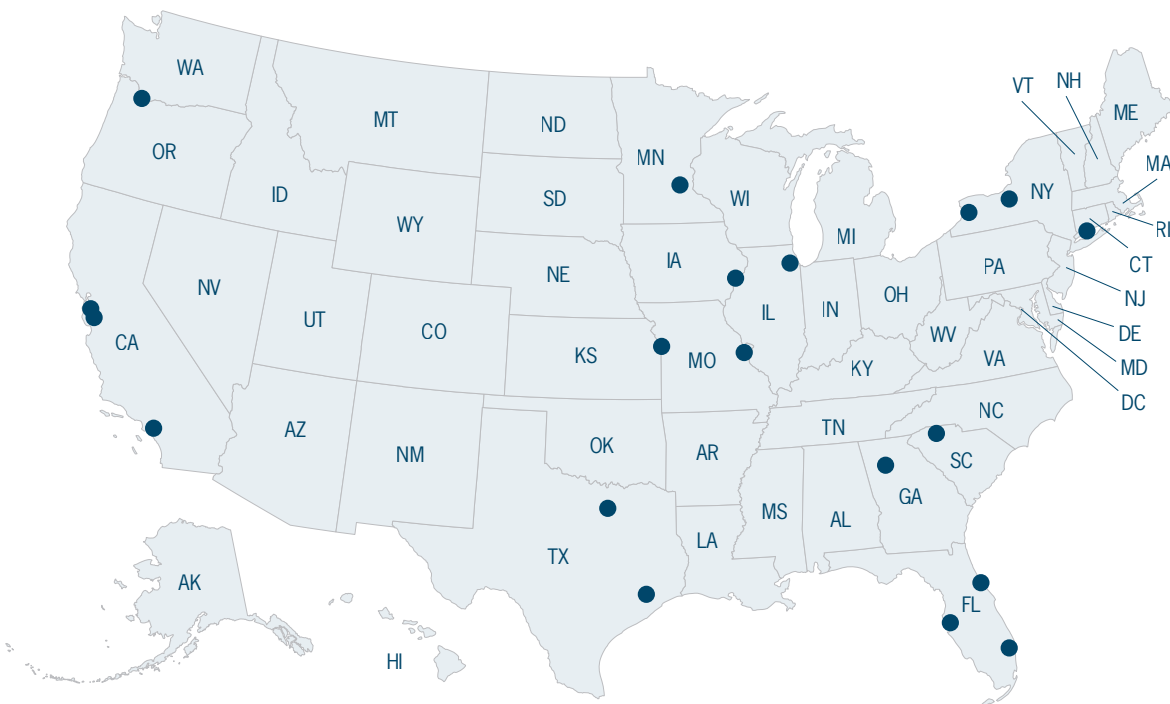
Sixteen chiropractic colleges are members of the Council on Chiropractic Education (CCE), the national accreditation agency for DC programs in the U.S. The map below shows

the locations of the 16 schools as well as three chiropractic programs in Florida not listed by CCE (**Figure 6**). Two of the FL programs are branch campuses of chiropractic schools in other states. The third, Keiser University in West Palm Beach, was not listed on the CCE website but enrolled its first class of DC students in 2016.

A representative of the Association of Chiropractic Colleges advised that there is no accreditation requirement specifying that a chiropractic school be located at a private institution, but thus far no public institution in the United States has opened a chiropractic school.

Historically, most chiropractic education occurred at stand-alone chiropractic schools that were not affiliated with universities. Palmer College of Chiropractic, which has campuses in three states, follows this model and only offers

Figure 6. Chiropractic School Locations, United States, 2017



Source: Council on Chiropractic Education, accessed January 3, 2017 from <http://www.cce-usa.org/Members.html>. **Produced by:** The Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

the DC degree. Life University in Georgia and Logan University in Missouri were originally founded as chiropractic schools but later expanded the degrees they offered. Most of the chiropractors in NC's workforce were educated in schools originally founded as stand-alone chiropractic programs. Half (51.5%, n=865) of the chiropractors in NC's workforce in 2016 reported graduating from one of three chiropractic schools: 21.2% (n=356) from Life University, 15.3% (n=256) from Logan University, and 15.1% (n=253) from Palmer College in Iowa.

Two of the more recently developed chiropractic programs, at the University of Bridgeport in Connecticut (founded in 1990) and D'Youville College in Buffalo (founded in 2003), have followed a different path, developing chiropractic schools within existing private universities. These are smaller programs with few graduates in the NC workforce. In 2016, fewer than 1% (0.8%, n=14) of NC chiropractors reported graduating from University of Bridgeport, and no chiropractors reported graduating from D'Youville College.

In 2016, Keiser University opened the first new chiropractic school in the US in over a decade, located at their West Palm Beach campus. Keiser University has 15 campuses and was a for-profit university that became a not-for-profit in 2011.⁴⁰

In the early 2000's, Florida State University began initial steps to develop the first chiropractic school based in a public research university in the US. The school was controversial and became a political issue for both the university and leadership in state government.⁴¹ In early 2005, the Board of Governors of the State University System of Florida voted to deny the school.

The University of Quebec at Three Rivers (UQTR) in Canada, which is a francophone institution, is the first public university in North America with a chiropractic program. If WSSU decided to pursue a public school of chiropractic, UQTR is the nearest model for a public university.

Chiropractic schools have not expanded as rapidly over the past decade as have other health professional programs, like physician assistants, nurse practitioner, or occupational therapy programs. During our interviews, we learned of two chiropractor schools that may be under development, one in Michigan, about which we learned no further details, and another at University of Pittsburgh (Pitt). Pitt is a "state-related" institution, a distinction unique to Pennsylvania that falls in-between private- and public-university status.⁴² While the development of a chiropractic school at Pitt has not been confirmed, if the school moves ahead it may provide an additional model for WSSU to explore that is closer to the UNC system.

Three interviewees, all of whom were DCs, noted a tension within the profession between schools training graduates in evidence-based practices versus schools that follow a less-evidenced-based, more philosophical approach. This disagreement within the profession has been documented in the literature, with many chiropractors advocating for increased use of randomized controlled trials and evidence-based approaches, while others in the field argue that such methods are not appropriate for evaluating chiropractic outcomes.^{43,44,45,46,47} Two interviewees noted examples of chiropractic schools that continue to follow the more philosophical chiropractic approach. Four interviewees, three of whom were

DCs, noted that a chiropractic school within a public university like WSSU would be well-suited to conduct research on chiropractic services and build the evidence base for best practices in the profession. All four expressed the opinion that this type of research institute is needed in the field. Three interviewees suggested that a chiropractic program at a public university with a research focus would be unique in the country and attractive to potential students.

Two interviewees noted the additional allied health programs offered at WSSU and suggested that a chiropractic program emphasizing interprofessional education would be beneficial for students across disciplines.

Preceptorship Training for Chiropractors

Chiropractor students train in clinical settings under the supervision of a preceptor who is a licensed chiropractor. Training can occur either on-site at a clinic affiliated with the chiropractic program or distributed at sites within the community. The 2017 NC appropriations act (N.C.S.L. 2017-57) authorized supervised training programs for chiropractic preceptorships in NC under the latter model, which are open to chiropractic student enrolled at accredited institutions. Because the authorization took effect 2017, there are likely many potential preceptorship sites available to chiropractic students in the state. This situation differs dramatically from other health professional fields, including medicine, physician assistant studies, and nursing, where the lack of available preceptorships has been a longstanding concern.⁴⁸ Chiropractor students are not permitted to perform spinal manipulations

as part of preceptorship training, but instead function in a role similar to an assistant.

Discussion

Although the growth in numbers of chiropractors in NC has remained steady, relative to population, the number of chiropractors has plateaued since 2009. The chiropractic workforce is aging, suggesting that retirements could be forthcoming.

Four interviewees speculated that the demand for chiropractic services in NC would increase due to the increased public attention about the opioid epidemic in the state, which may encourage patients to seek natural, non-pharmaceutical alternatives to pain management. We were unable to locate a data source to support or refute this assertion.

At present, it difficult to argue that NC does not have enough chiropractors to meet population health needs for musculoskeletal issues, given that patients can seek care from a variety of health professionals. Both the availability of services and patient preference determine the type of professional sought for musculoskeletal issues. Patients may choose to see a physician, physical therapist, chiropractor, massage therapist, or alternative medicine provider to address their concern. Over time, a patient who initially presents with low back pain may be treated with any combination of the following: over-the-counter pain medications, prescription opioid medications, massage therapy, acupuncture, chiropractic manipulations, physical therapy, osteopathic manipulative medicine, spinal injections, or surgery. With so many treatment options, it is difficult to determine the demand for chiropractic services and whether NC is under-supplied.

Given the finding that use of chiropractic services increases with the increased supply of chiropractors, it seems reasonable to assume that graduates of a new chiropractic school in NC would be able to attract enough patients locally to practice in state after graduation. The ability to attract patients will likely be related to patient preference and the capacity of chiropractors to market their services, since, as noted previously, many types of health professionals treat musculoskeletal issues. Whether there is a saturation point at which the supply of chiropractors meets local patient demand is not known.

National data indicate that chiropractic patients are more likely to be white. Data on the NC chiropractor workforce show that the state's chiropractors are overwhelmingly white and male. It is possible that locating a school at WSSU, a historically Black college, may increase awareness of the profession among potential students and patients. Whether this would have the effect of diversifying either the chiropractic

workforce or the chiropractic patient population is unknown. Because a chiropractic program based in a public university would be unique in the nation, a program at WSSU could potentially draw from a national applicant pool that may not reflect the diversity of its student body.

The longstanding debate within the chiropractic profession about whether to define itself as a field of complementary and alternative medicine or an evidence-based discipline has not been resolved. Given the few models of university-based chiropractic education, WSSU could leverage existing institutional resources to position itself with a focus on an evidence-based approach to the field. Innes and colleagues have argued that evidence-based education for chiropractors requires both funding and active academic engagement in research.⁴⁹ Such an institution could be primed for funding and research in evidence-based chiropractic care. At the same time, pioneering the first chiropractic school at a public institution in the US is likely to come with challenges, some of which may be unforeseen. ✖

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