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UNIVERSITY of NORTH CAROLINA
PEMBROKE

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June 27, 2018

Dr. Kimberly van Noort
Interim Senior Vice President for Academic Affairs
The University of North Carolina
910 Raleigh Road
P.O. Box 2688
Chapel Hill, NC 27514

Dear Dr. van Noort:

The University of North Carolina at Pembroke seeks to establish a College of Health Sciences (CHS) in 2018-2019. The attached proposal states the purpose, vision, and mission of the CHS, provides some background information and explanation for the proposal, and identifies the actions taken thus far and the steps we will take in the future.

The University has secured approval from our Board of Trustees to create the position of Dean of the CHS with the understanding that creation of the college is the logical next step. The genesis for the CHS came from a legislative mandate to the UNC Board of Governors to study the feasibility of creating such a college at UNCP. As you may recall, the completed study was presented to the BOG at its March meeting, at which time the Board voted unanimously to forward it to the General Assembly. (See Appendix A.)

The CHS will initially be comprised of four existing departments, with others added at later dates. Based on the studies contained herein, we believe the CHS will "help address the health issues in Robeson and surrounding counties, create innovative models for educating health professionals, and further the university's role as an economic driver in the region" (Sheps, v).

Please don't hesitate to contact me if you have any questions.

Sincerely,

Robin Gary Cummings, M.D.
Chancellor

Background

In 2017, the North Carolina General Assembly directed the UNC Board of Governors to

> study the feasibility of establishing a School of Health Sciences and Health Care at the University of North Carolina at Pembroke. In its study, the Board of Governors shall consider the health care needs of the region and what health science and health care programs would be serve the region and meet its health care needs. The Board of Governors shall also consider the costs and financial benefits of establishing a School of Health Sciences and Health Care. (N.C.S.L. 2017-57)

The Cecil G. Sheps Center for Health Services Research and Consulstart, Inc., led by Dr. John Ruffin, who was the founding Director of the National Institute on Minority Health and Health Disparities at the National Institutes of Health, were contracted to conduct the study. Furthermore, UNC Pembroke interviewed five focus groups made up of regional health care leaders to get input from local experts and practitioners about the feasibility and benefits of creating a College of Health Sciences.

The findings of the Sheps Center and Consulstart reports support the creation of a College of Health Sciences, stating that it "could make a potentially significant and lasting contribution toward improving the supply of health professionals in the region" (Sheps, 36). In addition, this could provide inter-professional training that allows the students, the university, and the community to develop community-based education models to respond to local health challenges.

Purpose:

To create a College of Health Sciences to serve the region and meet its health care needs.

Vision:

To create a clinical education and research program that could pull together local, state, and federal partners to coordinate studies in this unique rural, tri-racial population.

Mission:

To improve regional health outcomes, workforce capacity, and diversity challenges.

Process/Timeline

- CHS feasibility study directed by NC General Assembly (SL 2017-57) – July 1, 2017
- CHS feasibility study conducted (August 2017-December 2017)
    - Sheps Center report – December 2017
    - Consulstart Report – December 2017
    - Campus and Regional Focus Groups (5 sessions, 81 participants) – November and December 2017
        - UNCP Health Care Faculty – November 10, 2017
        - First Health of the Carolinas – November 16, 2017
        - Regional Behavioral Experts – December 1, 2017

        - Southeastern Health – December 6, 2017
        - Scotland Healthcare System – December 14, 2017
- CHS feasibility study completed – February 2018
- Provost updated Faculty Senate and sought input – February 7, 2018
- Chancellor updated Faculty Senate and sought input – April 5, 2018
- Associate Provost updated Faculty Institutional Affairs Committee and sought input – January 23, February 27, and March 27, 2018
- UNCP Faculty Health Career Summit – February 23, 2018
- Provost met with relevant departments – March 26 and June 25, 2018
- Chancellor presented CHS study to BOG Committee on Educational Planning, Policies, and Programs – March 22, 2018
    - BOG subsequently forwarded study to NC General Assembly
- BOT approved creation of CHS Dean position – June 14, 2018

Action Plan:

To form a new College of Health Sciences specific to the needs of our region, we propose to build on the existing infrastructure of health-related programs already at UNC Pembroke, and, in a managed, phased approach, create a continuum of care designed to address the clear, present, and persistent health factors and outcomes which have become a generational plague on southeastern North Carolina. The first step in moving this vision forward is the formal creation of a new College of Health Sciences. This is being done with existing resources by reorganizing four existing departments in two different colleges into the new College of Health Sciences. The new College of Health Sciences (CHS) will be phased in as follows:

Phase 1: 2018-2020

- Appoint CHS leadership team
- Create CHS
    - School of Nursing
    - Department of Social Work
    - Department of Counseling
    - Department of Health and Human Performance
- Expand BSN Nursing program
- Plan and start accelerated 5-year BS to OT program
- Plan School of Optometry
- Plan DNP program
- Implement DPT MOU with East Carolina University

Phase 2: 2021-24

- Start optometry program
- Start DNP program
- Start clinical research program
- Plan and start Doctor of Occupational Therapy program
- Construct CHS building

- Plan and start degree completion program for “part-way home” medical workforce professionals: B.S. Rural Health Equity
- Plan B.S. Public Health

Phase 3: 2024-2027

- Start B.S. Public Health
- Transition DPT program from East Carolina University
- Plan and start Master’s Degree in Health Administration (MHA)
- Plan M.S. Nutrition
- Conduct sweeping internal and external assessment to determine next steps, if any. Investigate partnership pathways with other universities to identify opportunities to make regional impact. Possible programs to consider include Physician Assistant and Speech Pathology.

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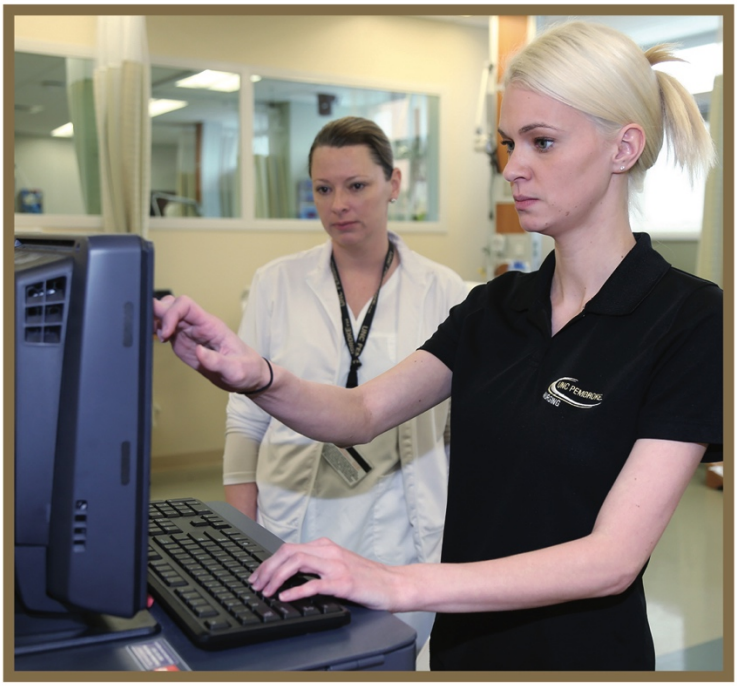

COLLEGE OF
HEALTH SCIENCES
STUDY

February 2018

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INTRODUCTION AND EXECUTIVE SUMMARY

The University of North Carolina at Pembroke (UNCP) respectfully submits the enclosed studies, documents, vision, and proposal in fulfillment of North Carolina appropriations act (N.C.S.L. 2017-57) which directed the Board of Governors to:

> *…study the feasibility of establishing a School of Health Sciences and Health Care at the University of North Carolina at Pembroke. In its study, the Board of Governors shall consider the health care needs of the region and what health science and health care programs would best serve the region and meet its health care needs. The board of Governors shall also consider the costs and financial benefits of establishing a School of Health Sciences and Health Care.*

In an effort to obtain a thorough assessment, UNC Pembroke contracted with two nationally recognized groups; The Cecil G. Sheps Center for Health Services Research and Consulstart Inc. led by Dr. John Ruffin the founding Director of the National Institute on Minority Health and Health Disparities at the National Institutes of Health. Their reports are included. The overall findings are perhaps best summarized by the authors of the Sheps study as follows:

- "The findings from this report suggest that new health sciences programs at UNC-P could make a potentially significant and lasting contribution toward improving the supply of health professionals in the region, increasing the racial and ethnic diversity of the health workforce, and providing access to well-paying health care jobs." (Sheps, 36)
- "The development of a health sciences school could provide UNC-P an opportunity to build new health sciences programs from the ground up around inter-professional training. Similar concepts have been developed around the country and show benefits not only to the learners-in-training but also to patients in the community. These teams sometimes take on community-based research projects that develop the capacity of the student, university and community to respond to local health challenges. Inter-professional models of community-based education improve clinical care processes and increase the research capacity of the institution which could, in future years, draw in research dollars." (Sheps, viii)
- "A significant body of research shows that the best way to address these shortages is for rural communities to adopt a "grow your own" approach that draws students into health professions training programs from the local catchment area." (Sheps, 36)

These conclusions are further supported by the Consulstart report:

- "It is clear that many of these disparities and challenges have existed for some time and are likely to continue if not worsen unless something transformative is done. UNC Pembroke could make a significant impact in terms of access to care and expertise with new and expanded training of the next generation of health care work force. This could include direct care and behavioral health care." (Consulstart, 5-6)
- "Without some sort of change which creates a larger and more diverse work force prepared to work in a rural setting, it seems unlikely that improvements will be made in regional health outcomes." (Consulstart, 13)

Based on the detailed information contained in both reports, plus feedback from five focus groups of regional health care leaders, the University of North Carolina at Pembroke strongly supports the formation of a new College of Health Sciences. Given the university's already vibrant economic contribution, it is reasonable to conclude that targeted investments in academic and community health care programming would bring even more robust benefits across Southeast North Carolina, while simultaneously improving health outcomes, work force capacity and documented diversity challenges. As noted in the Shep's Study, adding academic health programming capacity in targeted and specific areas with abiding health disparities provides a better chance at a positive impact on outcomes.

An especially exciting opportunity for the new College is the creation of a uniquely positioned Clinical Research Program. UNC Pembroke is located in a distinctive tri-racial, rural county impacted by persistently chronic poverty. As noted, the health outcomes are severe and have not responded to interventions to date. A clinical research program could pull together local, state and federal partners, with associated funding, along with institutions, academic and otherwise, public and private, to coordinate studies in this unique population and region. Indeed, major pharmaceutical firms would have great interest in such studies. As the executive director of a leading NC health society noted, nowhere else could we match the clinical research possibilities in Robeson county and southeast North Carolina.

To form a new College of Health Sciences specific to the needs of our region, we propose to build on the existing infrastructure of health-related programs already at UNC Pembroke, and, in a managed, phased approach, create a continuum of care designed to address the clear, present, and persistent health factors and outcomes which have become a generational plague on southeastern North Carolina. The new College of Health Sciences will be phased in as follows:

PHASE ONE, 2018-2020

- Create College of Health Sciences
    - School of Nursing
    - Department of Social Work
    - Department of Counseling
    - Department of Athletic Training
    - Department of Exercise Science and Health Promotion
- Expand BSN Nursing program.
- Plan and start accelerated 5 year BS to OT program.
- Plan School of Optometry
- Plan DNP program
- Implement DPT MOU with East Carolina University
- Hire College of Health Sciences Leadership team

PHASE TWO, 2021-2024

- Start Optometry Program
- Start DNP Program
- Start Clinical Research Program
- Plan and start Doctor of Occupational therapy Program
- Construct College of Health Sciences Building
- Plan and start degree completion program for "part-way home" medical work force professionals: B.S. Rural Health Equity
- Plan B.S. Public Health

PHASE THREE, 2024-2027

- Start B.S. Public Health
- Transition DPT program from East Carolina University
- Plan and start Health Informatics and Analytics Certificate.
- Plan and start Master's Degree in Health Administration (MHA).
- Plan M.S. Nutrition
- Conduct sweeping internal and external assessment to determine next steps, if any. Investigate partnership pathways with other universities to identify opportunities to make regional impact. Possible programs to consider include Physician Assistant and Speech Pathology.

The University of North Carolina at Pembroke is in the rare and enviable position to be able to transform an entire region of North Carolina, much as East Carolina has done in the eastern part of our state. With visionary legislation such as NC Promise as a tool for strategic growth, the foundation is in place to strategically and methodically change the futures of generations to come in southeast North Carolina. This study clearly demonstrates the need and equally the potential for meaningful long term economic and social impact. Importantly, this proposal is in keeping with the priorities expressed in the University of North Carolina System's strategic plan: Access, Student Success, Affordability and Efficiency, Economic Impact and Excellent and Diverse Institutions.

Sincerely,

Robin Gary Cummings, M.D.
Chancellor

UNC PEMBROKE VISION

LEGISLATIVE CALL TO ACTION

The Board of Governors of the University of North Carolina shall study the feasibility of establishing a School of Health Sciences and Health Care at The University of North Carolina at Pembroke. In its study, the Board of Governors shall consider the health care needs of the region and what health science and health care programs would best serve the region and meet its health care needs. The Board of Governors shall also consider the costs and financial benefits of establishing a School of Health Sciences and Health Care.[1]

PREAMBLE OF THIS REPORT

Because southeastern North Carolina—the primary service region of The University of North Carolina at Pembroke—features clear, present, and persistent health factors and health outcomes which place its citizens in dire jeopardy; because UNC Pembroke's mostly rural service area features a demonstrated paucity of health care professionals; because the health care work force falls significantly short of mirroring the diversity apparent in southeastern North Carolina; and because UNC Pembroke is committed to becoming a solution source in the region it serves, a College of Health Sciences should be created. Such an academic unit is in keeping with the priorities expressed in the University of North Carolina strategic plan.

- Access
- Student Success
- Affordability and Efficiency
- Economic Impact and Community Engagement
- Excellent and Diverse Institutions[2]

In approaching this study, UNC Pembroke adopted a conceptual strategy predicated on the following three primary components:

1. *What is the state of health care in the primary service area of the university?* How persistent or durable have the health outcomes and related challenges been? What are the work force training and development needs, particularly in the context of the rural nature of UNC Pembroke's service area? How diverse is the professional work force? What are the barriers to entry into professional training for students who present with socioeconomic challenges? What are the best practices for training a health care work force to practice in a rural setting?
2. *What current UNC Pembroke academic and community programs could be expanded to improve the primary health outcomes of the service area*?

[1] N.C. Sess. Laws 2017 – 57, § 10.14 (a)

[2] "Higher Expectations: The University of North Carolina Strategic Plan, 2017-2022," https://www.northcarolina.edu/sites/default/files/unc_strategic_plan.pdf

3. *What flagship programs could be created to improve the health factors and health outcomes of the UNC Pembroke primary service area?* **For purpose of this study, a flagship program is defined as one likely to make an impact in the immediate or near term on a) health outcomes b) health factors c) diversity of work force d) work force capacity in the rural UNC Pembroke service area.** What complementary programs can be planned for immediate or later implementation that could serve the needs of the UNC Pembroke service area?

METHODOLOGY OF UNC PEMBROKE STUDY

- Contract with the Cecil G. Sheps Center for Health Services Research **(See II. Sheps Center Report)** to provide a data driven assessment of:
    - Health Care needs in UNCP service region
    - Regional health care work force needs and distribution
    - Short, medium, and long range plan/matrix for:
        - Expanding current health programs
        - Adding "flagship" programs that make an immediate impact in health outcomes of service area
- Contract with Consulstart **(See appendix)** to make a quantitative and qualitative investigation focusing on the rural and underrepresented minority access issues pursuant to:
    - Analysis of the health factors, health outcomes, and critical social determinants of health that characterize the following North Carolina counties: Robeson, Cumberland, Scotland, Richmond, Columbus, Moore, Hoke, Bladen, Brunswick, Harnett, Sampson, Anson, and Lee. Also of potential note are the following border belt counties in nearby South Carolina: Dillon, Florence, Marion, Marlboro, Horry, Chesterfield, and Darlington.
    - Prepare a specific list of 1) expanded and 2) new academic degree programs that UNC Pembroke should include in its College of Health Sciences that are targeted to making improvement in health factors, outcomes, disparities, and social determinants of health.
- Conduct through various community partners and area practitioners and providers, a series of focus groups **(See appendix)** designed to provide first-hand, local, service area information about health factors, health outcomes, current and future work force needs, and population and community health practices likely to shape the next five years of patient care in primary and behavioral health settings.

STATED OBJECTIVES OF THE COLLEGE OF HEALTH SCIENCES

- UNC Pembroke will develop and execute integrated, inter-professional rural-based training designed to prep all levels of the health workforce for the exigent challenges of outcome-based health disparities in Southeastern North Carolina. UNC Pembroke will

develop and implement educational programs that directly contribute to a four-part continuum of primary care, therapeutic care, wellness and prevention, and community health and leadership. These four elements of a continuum of care will include new and expanded academic and community programs designed to provide patient and client access in the primary service region of the university.

- UNC Pembroke will honor its historic mission of championing diversity *in all its forms* while providing access and affordability to students who seek to change the lives, health outcomes, health factors, and communities of southeastern North Carolina. As a public university and one of the most diverse in the South, UNC Pembroke can introduce underrepresented minorities into the health care work force and do so in a manner that creates substantially less student debt than private institutions located along the perimeter of southeastern North Carolina.
- UNC Pembroke will develop a clinical research arm of the College of Health Sciences in order to assist the scientific community in developing greater knowledge and understanding of the complex health factors associated with this unique multi-racial region of North Carolina, impacted by chronic, persistent poverty. As such, UNC Pembroke will be a vital and willing collaborator with other researchers across the private and public spectrum.

CAMPUS AND REGIONAL PROFILE

UNC Pembroke is a regional public university and a member institution of the University of North Carolina. The university's roots date to 1887 when it was founded as an Indian Normal School. Even as the university's proud heritage is honored each and every day, in the years since, UNC Pembroke has become a fully functioning and energized campus with a range of programs including the Ester G. Maynor Honors College which attracts high performing students and features a 92% retention rate. 96% of all UNCP students hail from within North Carolina, many from a 10-12 county primary service area, though the student body—62% female—includes those that come to campus from over 20 different states and over 20 different countries. Because of the rich tapestry of races, ethnicities, and formative experiences of our students, faculty, and staff, UNC Pembroke is among the most diverse universities in the South. While many students are active or retired military (UNCP is designated a Military Friendly University), first generation college, displaced workers seeking new skills, or single parents on part-time schedules, the majority of students live on campus or within a mile of it and appreciate the athletic, extra-curricular, social, and cultural activities of a traditional college experience.

UNC Pembroke offers 41 undergraduate degree pathways and 17 graduate programs in a variety of fields. The university's annual economic impact on the surrounding region is nearly $400 million and every dollar invested in UNC Pembroke, according to one study, nets a ten-fold return. With STEM and health programs, degrees, and initiatives, a broad College of Arts and Sciences, and Schools of Business and Education, UNC Pembroke services the intellectual

needs and academic goals of many different students. In a quest to be innovative and efficient with resources, UNC Pembroke has established partnership pathways with select other universities for veterinary medicine, engineering, and other academic programs. Additional partnerships, provided they impact rural workforce development, health outcomes, and the social determinants of health can and will be pursued. Because service learning and regional engagement are hallmarks of the university, faculty, students, and staff regularly take their expertise into the community.[3]

UNC Pembroke features one of the most diverse student populations in the South and as a minority serving institution includes Caucasian, African-American (35%), American Indian (15%), Hispanic (5%), and international students. "Diversity in the health professions and scientific workforce," Dr. John Ruffin, founding Director of the National Institutes on Minority Health and Health Disparities (NIH) notes, "(is) pivotal in addressing health disparities borne by a rapidly increasing population of racial and ethnic minorities and individuals from low socio-economic backgrounds who experience persistent poor health outcomes." With 73.6% of prospective freshmen applicants accepted, UNC Pembroke fills a need as an access university in an economically underperforming region of the state. The immediate impact of the university's faculty, students, graduates, and programs tends to be received by the region or service area in closest proximity to campus.[4]

UNC Pembroke's affordability, diversity, and access brand are consistent with the system strategic plan. On average, a UNC Pembroke graduate walks across the stage with less student debt than state or national averages. Access and affordability are institutional markers and would be a critical component of any new academic programs created for bachelor, master, professional, or doctoral rank.[5]

Building on the strategic imperative of access and affordability and beginning in August, 2018, UNC Pembroke will initiate NC Promise, a reduced tuition opportunity for in-state and out-of-state undergraduate students. Thanks to the forward thinking of the General Assembly and their insight into the role UNC Pembroke could play, in-state students will pay a max semester amount of $500 for in-state tuition, not including housing, meal plan, student fees, and textbooks. Even so, the increased affordability will result in an annual savings of several thousand dollars for the student, their parents, or household. Similarly, out-of-state students will pay a max semester amount of $2,500 for tuition, a significant increase in affordability. One expected outcome is increased demand from students from neighboring South Carolina, many of whom are little more than twenty miles from UNC Pembroke's campus. Another outcome is increased total number of student applications and admissions, boosting overall student

[3] Demonstrating the Collective Economic Value of the University of North Carolina System," EMSI, UNC-GA sponsored research, 2015.

[4] "Fast Facts, Fall 2016," UNC Pembroke Office of Institutional Research, November 30, 2016; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

[5] https://ticas.org/posd/state-state-data-2015#; https://ncpromise.com/

enrollment. Finally, though UNC Pembroke's access brand and American Indian heritage will always be hallmarks of our past, present, and future, it is expected that the increased number of applications might lead to a slightly increased academic profile for incoming students. A time of expected growth dovetails appropriately with an increased footprint in regionally critical academic programs in healthcare.

AREA ECONOMIC SNAPSHOT

According to data compiled and published by ACCESSNC, an entity of the North Carolina Department of Commerce Labor and Economic Analysis Division, Robeson County—home of the university—is 62.6% rural, has a $29,128 projected median household income, an annual unemployment rate in excess of state and national averages, and a median value of owner-occupied housing of $67,600. Census Bureau data suggests Robeson County, the largest geographic county in the state with the second highest number of rural citizens in the country, is among the poorest in the state and nation. A University of North Carolina "Documenting Poverty in North Carolina" report indicates that significant numbers of Robeson County residents live in poverty with 44% of children between the ages of 0-17 living in impoverished conditions. Of Robeson County K-12 school children, 83.8% qualify for free or reduced school lunch. The total food insecurity rate is 22.8% with a 34.4% rate for children. The combination of health and poverty data creates an indication of how challenging conditions remain in southeastern North Carolina. Among North Carolina counties, Robeson contributes among the lowest amounts of local funding to K-12 school districts. Adjacent counties in the UNC Pembroke service area face similar economic conditions. Data from the Lumber River Council of Government region indicates that 28.6 percent of people lived below the poverty line in 2017; by way of comparison, the same Triangle region metric is less than half at 13.6.[6]

Table 1: Service Area Poverty Snapshot

COUNTY NAME	PERCENT POPULATION WITH INCOME BELOW THE POVERTY LEVEL
BLADEN	27.4
COLUMBUS	23.5
HOKE	22.2
RICHMOND	25.7
ROBESON	31.6
SCOTLAND	31.2

Source: Access NC County Profile, November 2017

[6] *USA Today* (January 10, 2015) identified adjacent Scotland County at the poorest in North Carolina. Other indices tend to note Robeson County, Hyde County, or Bertie County. University of North Carolina, "Documenting Poverty in North Carolina," March 2016, p. 5-7, 18.; Robert Wood Johnson Foundation Study, http://www.countyhealthrankings.org/app/north-carolina/2017/rankings/robeson/county/outcomes/overall/snapshot; Consulstart, "Report on UNC Pembroke College of Health Sciences Study;" BEST NC, "Facts and Figures, Education in North Carolina, 2017," http://best-nc.org/wp-content/uploads/2015/01/BEST-NCs-2017-Facts-Figures-vPDF-Optimized-0313.pdf; Access NC, Regional Profiles, November 2017, http://accessnc.nccommerce.com/DemographicsReports/.

Going further, many Robeson County and adjacent area minorities face even higher rates of generational, situational, and place-based poverty. Seven counties in UNC Pembroke's primary service area have Tier One status. One study placed the poverty rate for African-Americans at 30%, American Indians at 28% and Hispanics at 32%.[7]

A major factor in the deep and abiding poverty of the region has been its failure to make an effective economic transition. Originally an area dependent on tobacco, cotton, soy beans, and sweet potatoes, the county and service region moved to a mixed economy of farming, industry, and textile manufacturing after World War II. By the end of the twentieth and start of the twenty-first centuries, most of those plants, mills, and factories relocated to other nations or closed. Today, only 6,554 industrial workers live in the area where the total population numbers approximately 137,224. Economic factors are creating a "brain drain" or net out-migration. Data from the North Carolina Association of County Commissioners predicts a -1.4% population effect in Robeson County between 2015 and 2022. The same report identifies a Robeson County maximum economic distress index of 86.1-100, the highest (or worst) possible rating. In addition, chronically poor health outcomes deter economic growth.[8]

The overall conditions are only slightly better when the view extends beyond Robeson County into the adjacent counties which comprise the primary service area of UNC Pembroke. In Robeson County, 12.4 % of residents have a bachelor's degree or higher. Expanding the area of analysis to include four adjacent counties (Scotland, Hoke, Richmond, Bladen) only improves the college graduate rate to 13.7%. Never before has the need for highly qualified and uniquely skilled professionals—the backbone of a revitalized and resilient economy—been so acute in the primary service area of UNC Pembroke.[9]

The most recent study of the economic impact of the university indicates very encouraging results. The study, authorized by UNC General Administration and published in 2015, indicates that UNC Pembroke provided nearly $390 million in additional state income or the rough equivalent of creating over 6,200 jobs. The majority of the impact was felt in the primary service area and each dollar invested in the university brought a total overall return of $10.20, making UNC Pembroke an excellent investment for North Carolina taxpayers.

Given the university's vibrant economic contribution, it seems reasonable to conclude that targeted investments in academic and community health care programming would bring even

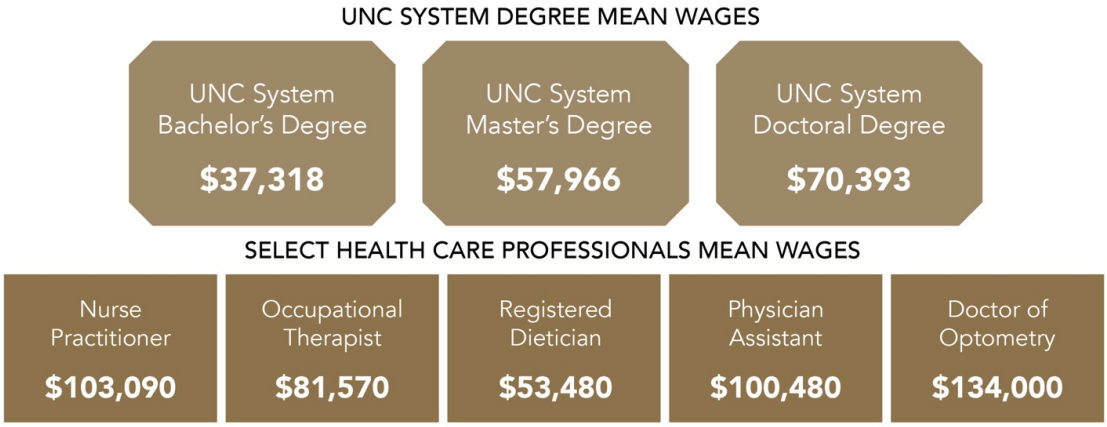
[7] Rural Health Task Force—North Carolina Institute of Health, "Rural Poverty in North Carolina," http://www.nciom.org/wp-content/uploads/2013/01/Rural-Poverty-in-North-Carolina.pdf, 1-12.
[8] North Carolina Association of County Commissioners Center for County Research data, submitted to Governor's Hurricane Matthew Recovery Committee, November 15, 2016.
[9] Notes of Jeff Frederick, Dean of the College of Arts and Sciences, Governor McCrory's Hurricane Matthew Recovery Committee, Meetings in Lumberton, Tarboro, Fayetteville, and Greenville, North Carolina, November and December 2016; UNC Pembroke, After-Action Report, p. 1-13.

more robust benefits while simultaneously improving health outcomes, work force capacity, and diversity problems.[10]

Macroeconomic data on income levels for UNC system grads paint a compelling case for individual, family, neighborhood, community, and regional uplift through the value of education. Adding more UNC system grads to the UNC Pembroke service region would inject a palpable jolt.

Data for specific health professions indicates the probability of an even more dynamic improvement to the regional economic profile if additional professional work force is added to the UNC Pembroke service area.

Figure 1: Mean Wages: UNC System Degrees and Select Health Care Professions



SOURCE: BEST NC, "Facts and Figures, Education in North Carolina, 2017," http://best-nc.org/wp-content/uploads/2015/01/BEST-NCs-2017-Facts-Figures-vPDF-Optimized-0313.pdf. SOURCE: Julie Spero, Tom Bacon, Evan Galloway, Tom Ricketts, Jordan Massey, Zahabiya Petiwala, "UNC Pembroke Report: Program on Health Workforce Research and Policy," December, 2017.

SERVICE REGION HEALTH CARE SNAPSHOT

Recent Robert Wood Johnson Foundation health factors and health outcomes analyses place Robeson and nearby counties at the bottom of nearly every statewide health index. Of the counties which funnel the majority of the institution's students, several are ranked in the bottom ten percent: Robeson (100/100), Scotland (99/100), Columbus (97/100), Bladen (91/100), and Richmond (87/100). These health factors and outcomes rankings have been present for many years and can be evinced in staggering challenges in diabetes, food insecurity, child poverty, substance abuse and addiction, child mortality, asthma, obesity, and

[10] For more information on economic impact see Economic Modeling Specialists International, "Demonstrating the Economic Value of The University of North Carolina at Pembroke to the UNCP Service Area and the state of North Carolina," "Demonstrating the Economic Value of The University of North Carolina at Pembroke to Robeson County and the state of North Carolina," and "Demonstrating the Economic Value of The University of North Carolina at Pembroke to the state of North Carolina." Each published February, 2017.

heart disease. Clearly, economic, local school, and historic factors are at play as well, making this area a holistic challenge encompassing all the social determinants of health. Put more starkly, a person born and raised in Robeson County has a life expectancy of approximately 73 years; North Carolinians in Wake County live to an average of 81. These statistics are both troubling and persistent and show little sign of changing unless direct resources can be applied to train, equip, and install an excellent health force whose daily practice has them in the primary service region of UNC Pembroke.[11]

Table 2: Sample Health Metrics

HEALTH ISSUE	STATE AVERAGE	ROBESON COUNTY AVERAGE	NOTE
Adult obesity	30%	40%	
Diabetes death rate	22.8/100K	46.5/100K	
Infant mortality	7.2/1,000	11.5/1,000	
Death rate for minors	57.8/100K	97/100K	
Mothers who smoked during pregnancy	9.8%	18.6%	2012-2016 Data
% of birth mothers Medicaid	45.1	63.8	2011-2015 Data
% of birth mothers WIC	55.3	83.4	2011-2015 Data
Heart disease death rates	165.9.1/100K	198.1/100K	2010-2014 Data
Cancer death rates	171.8/100K	194.7/100K	2010-2014 Data
Citizens per physician	1,410	2,320	
Citizens per dentist	1,890	4,630	

SOURCE: Robeson County State of the County Health Report, Southern Regional AHEC; Robert Wood Johnson 2017 Report, http://www.countyhealthrankings.org.

It should be noted that these terrible health outcomes and health factors metrics have proven durable. Robeson County, for example, has been ranked in the following manner over the last seven years:

Table 3: Robeson County Annual Health Ranking

Year of Ranking	Robeson County Ranking out of 100
2011	98
2012	99
2013	97
2014	97
2015	95
2016	100
2017	100

SOURCE: Robert Wood Johnson County Health Rankings.

[11] Various reports and rankings of the Robert Wood Johnson Foundation; Thomas Goldsmith, "In Robeson County, Fighting Grim Statistics with Work and Hope," *North Carolina Health News*, November 28, 2016; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

The persistence of health-related suffering in southeastern North Carolina is all the more noteworthy given the proliferation of expensive health care programs based at private universities on the perimeter of the UNC Pembroke service area. The health outcomes in UNC Pembroke's service area have proven inelastic to private university or college (health) program growth, likely because of cost and student profile. As numerous studies have shown, rural North Carolina is facing a shortage of health care work force across virtually all professions and levels. Similarly, most of the health care work force is not diverse on a profession-by-profession level analysis. Statistically, the infusion of private school programs appears to have made little impact on health factors, health outcomes, the number of rural providers, or the number of under-represented minorities in the work force.

The durability of these health outcomes suggests that adding academic health programming capacity in the state is not a solution. Rather, adding academic health programming capacity *in targeted and specific areas with abiding health disparities* provides a better chance at a positive outcome.[12]

Cost is a major factor for professional health care education. Private universities in non-rural environments charge extraordinarily high tuition and fees and do not appear to make many inroads into placing graduates in rural areas. "As a state school," the Sheps Center notes, "UNC Pembroke would be more affordable for students to attend than those at private institutions." NC Promise "will likely increase the number of students from low income households who are able to access health professions training, consistent with the University of North Carolina system's goals of increasing access and affordability of university education in the state."[13]

[12] Cara V. James, Ramal Moonesinghe, Shondelle M. Wilson-Frederick, Jeffrey E. Hall, Ana Penman-Aguilar, Karen Bouye, "Racial/Ethnic Health Disparities Among Rural Adults—United States, 2012-2015," Morbidity and Mortality Weekly Report, Centers for Disease Control v. 66, n.23, November 17, 2017; Erin Fraher and Julie C. Spero, "The State of the Physician Workforce in North Carolina: Overall Physician Supply will likely be Sufficient but is Maldistributed by Specialty and Geography, UNC Cecil G. Sheps Center for Health Services Research, August 2015; Erin Fraher, "Workforce Planning in a Rapidly Changing Healthcare System," South Carolina Health Care Workforce Forum, February 13, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

[13] Spero JC, Bacon TJ, Galloway E, Ricketts TC, Massey J, Petiwala Z, Fraher EP. Evaluation of a Potential New Health Sciences School at The University of North Carolina at Pembroke to Meet the Needs of the Region and State. Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, The University of North Carolina at Chapel Hill. December 2017. HEREAFTER, Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.

Table 4: Sample Cost Comparisons of Private and Public Health Care Programs

School	Program	Cost	Comparable state university cost
Wingate	Pharmacy	$31,884 per year tuition only	$22,902 per year tuition and fees (UNC)
High Point	Pharmacy	$40,522 per year tuition and fees only	$22,902 per year tuition and fees (UNC)
Wingate	Physician Assistant	$78,062 for program tuition and fees only	$38,613 for program tuition and fees (ECU)
High Point	Physician Assistant	$114,462 for program tuition and fees only	$38,613 for program tuition and fees (ECU)
Methodist	Physician Assistant	$88,347 program tuition and fees only	$38,613 for program tuition and fees (ECU)
Wingate	Physical Therapy	$30,882 tuition per year	$17,951.16 tuition and fees per year (UNC)
Methodist	Physical Therapy	$94,872 program tuition and fees only	$39,504 TOTAL program tuition and fees (UNC)
Methodist	Occupational Therapy	$104,670 program tuition and fees only	$39,504 TOTAL program tuition and fees (UNC)

*SOURCE: **Estimates** based on unc.edu; ecu.edu; methodist.edu; wingate.edu.*

Lacking a teaching hospital on campus, UNC Pembroke has developed a range of over one hundred community partners which assist in clinical supervision, and internship elements of various existing academic programs. In many cases, UNC Pembroke graduates in nursing, social work, counseling, or athletic training begin their careers by working with these partners. As functioning institutions, providers of direct care and client services, and corporate, community, and municipal agencies, these entities play a critical role in engaging the community and addressing health factors and health outcomes in various ways. Within existing UNC Pembroke programs, nursing (70%) and social work (85%) graduates are highly likely to remain within the service region to work. Data in Counseling and Athletic Training is anecdotal, but appears to largely follow the precedent of UNC Pembroke graduates mostly working in the university's primary service region.[14]

A major factor in new academic health programming is preceptor availability. UNC Pembroke is poised to mitigate some of these matters by leveraging these existing relationships and has broached this need in focus group sessions and conversations with area institutions. Integrated

[14] UNCP Health Faculty Focus Group, November 10, 2017; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017.

care models in didactic or classroom learning must be augmented with clinical practice where coordinated care delivery can be executed, debriefed, and institutionalized.[15]

The tendency of UNC Pembroke health graduates to practice within the primary service area of the university is consistent with research about the health work force. Writing about physician training, Erin Fraher and Julie Spero concluded that "simply increasing the number of physicians enrolled in medical school is not likely to increase supply in underserved communities." Daniels, Vanleit, Skipper, Sanders, and Rhyne conducted a national study finding that "size of childhood town, rural practice completion, discipline, and age at graduation were associated with rural practice choice." Assuming local practice and national research is accurate, a UNC Pembroke College of Health Sciences could, as the Sheps Center's report concludes, "grow its own health workforce . . . they can train local residents to fill the health needs of the community."[16]

UNC Pembroke can also make a significant improvement in diversity of health care professionals. Despite a total population of over ten million people of which almost 37 percent are non-Caucasian, the state does not have a healthcare workforce which corresponds to this demography. Physicians, dentists, nurses, nurse practitioner, pharmacists, physical therapists, occupational therapists, and optometrists are all disproportionately white within, on average, a work force that is approximately half as diverse as the general population of the state. According to Dr. John Ruffin, founding Director of the National Institute on Minority Health and Health Disparities at the National Institutes of Health (NIH) "a diverse workforce helps to ensure that the health care needs of the population can be adequately met when health professionals are culturally proficient and competent to care for patients who share a similar culture, language, or background . . . Given the university's diversity profile, the possibility of training a more diverse health care workforce in this rural area seems promising."[17]

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[15] Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.

[16] Erin Fraher and Julie Spero, "The State of the Physician Workforce in North Carolina: Overall Physician Supply will likely be Sufficient but is Maldistributed by Specialty and Geography," Cecil Sheps Center for Health Services Research, August, 2015; Zina M. Daniels, Betsy J. VanLeit, Betty J. Skipper, Margaret L. Sanders, and Robert L. Rhyne, "Factors in Recruiting and Retaining Health Professionals for Rural Practice, " *Journal of Rural Health*, January, 2007, 23 (1), 62-71; Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

[17] Erin Fraher, Julie Spero, Tom Ricketts, Evan Galloway and Erica Richman, "Key Issues and Challenges Facing the North Carolina Health Workforce, "Program on Health Workforce Research and Policy, May 24, 2017, Cecil G. Sheps Center for Health Services Research; Victoria McGee and Erin Fraher, "The Diversity of North Carolina's Health Care Work Force," Cecil G. Sheps Center for Health Services Research, August, 2012; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017; Consulstart, "Report on UNC Pembroke College of Health Sciences Study;" Discussions and Campus Visit, Dr. John Ruffin, Consulstart.

COURSE OF ACTION: COLLEGE OF HEALTH SCIENCES
CONTINUUM OF CARE

Given the charge from the legislature, the abject and persistent conditions pursuant to the social determinants of health, the socioeconomic conditions of southeastern North Carolina, the evidence that rural trained specialists tend to practice in rural settings, and the underrepresentation of minorities in the national, regional, and state work force, The University of North Carolina at Pembroke proposes to create and develop a College of Health Sciences.

Recent models and research on integrated, inter-professional care, and population health could help UNC Pembroke to design an innovative approach to meet the outcome, reimbursement, and care changes more effectively than some existing programs facing major curriculum and culture change. "Primary, preventive, and upstream care" as Barbara Brandt, Associate Vice President of the National Center for Interprofessional Practice and Education has argued, situates the next decade of health care in a context where primary care, home care, project teams, and system and community approaches are merged together for "more comprehensive, accessible, coordinated, and high quality care at lower costs." Rather than build another collection of silos operating independently and outside of an integrated care model, UNC Pembroke's new College of Health Sciences will optimize education and practice so that rural resources can be stretched for maximum impact and efficiency. At a November 10, 2017 focus group of UNCP health care faculty, an overwhelming sentiment was expressed to develop a singular academic unit where collaboration, integrated care, and inter-professional training would be a divisional mission. And the Sheps Center reached similar conclusions about the potential impact of a well-designed College of Health Sciences that could "help address the health issues in Robeson and surrounding counties, create innovative models for educating health professionals, and further the university's role as an economic driver in the region." Dr. John Ruffin also found UNC Pembroke to be a potential change agent: "Expanded academic and community programming from UNC Pembroke could be an important catalyst as the university is a positive economic force in the region . . . UNC Pembroke could make a significant impact in terms of access to care and expertise with new and expanded training of the next generation of health care work force." Existing community partners responded favorably in focus group sessions to the idea of an expanded UNC Pembroke healthcare footprint.[18]

[18] Barbara F. Brandt, "How many Doctors, Nurses, and Other Health Professionals do you Need?: The Impact of New Delivery System Models on your State's Workforce Needs," National Governors Association Meeting, April 2015; UNCP Health Care Faculty Focus Group, November 10, 2017; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017; Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; Discussions and campus visit, Dr. John Ruffin, Consulstart; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

The College of Health Sciences will have two main components:

1. Academic programming along a four-part Continuum of Care
    i. Primary Care
    ii. Therapeutic Care
    iii. Wellness and Prevention
    iv. Community Health and Leadership
2. Regional service and expertise through a clinical research arm

Table 5: UNC Pembroke Continuum of Care Plan

PRIMARY CARE	THERAPEUTIC CARE	WELLNESS AND PREVENTION	COMMUNITY HEALTH AND LEADERSHIP
Nursing BSN	Social Work BSW	Athletic Training	Degree Completion: CC Vocational Programs (EMS)
Nursing MSN	Social Work MSW	Nutrition	Health Informatics and Analytics (Certificate)
Nursing NP	Clinical Mental Health Counseling (Masters)	Exercise and Sport Science; Health Promotion	Health Administration MHA
Nursing DNP	Doctor of Occupational Therapy	BS Public Health	
Doctor of Optometry		School Counseling (Masters)	

Existing UNC Pembroke Programs New UNC Pembroke Programs to be added

A DEEPER LOOK AT THE FOUR-PART CONTINUUM OF CARE

PART ONE: PRIMARY CARE

Leveraging existing resources, programs, and equipment in its Department of Nursing, UNC Pembroke will add Nurse Practitioner and Optometry programs which will provide critical integrated and inter-professional care trained primary care assets into the rural health marketplace of southeastern North Carolina while developing a more diverse work force. The Department of Nursing will move from the College of Arts and Sciences to a more natural and inter-professional home in the College of Health Sciences. The majority of the Nurse Practitioners trained at UNC Pembroke seem statistically likely to practice in the primary service region of the university. Graduates working as Nurse Practitioners would make an immediate contribution to alleviating primary care challenges. Optometry graduates would be intentionally prepared to practice in rural settings.

Access to quality primary care is an important consideration for residents of the UNC Pembroke service area. All areas of the health care work force have grown rapidly. From 2000 to 2016, total health care employment in North Carolina rose some 70%. Even so, demand for more trained professionals remains robust, particularly in rural areas. Focus group sessions with three different area hospitals (First Health, Southeastern Health, Scotland Health Care System)

indicated they are unable to fill open positions for staff and specialist nurses. Research by the Sheps Center indicates that despite the overall job growth "there is a widening gap between Nurse Practitioner supply in rural and urban counties."[19]

Figure 2: Existing Program: UNCP Nursing

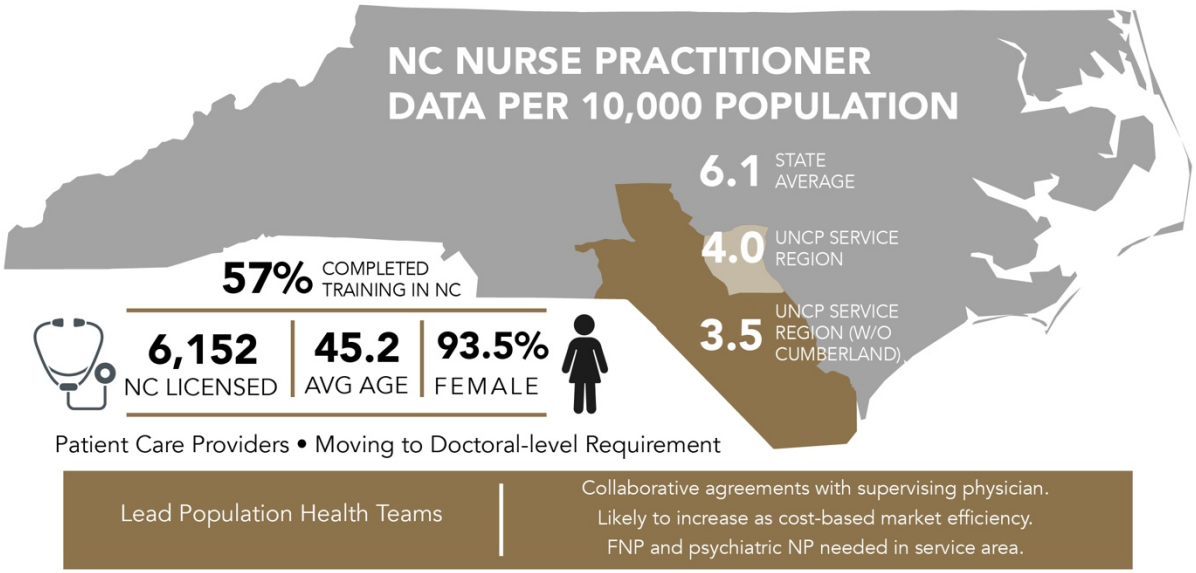
EXPAND PRE-LICENSURE NURSING FACULTY TO ACCOMMODATE MORE NURSING STUDENTS. Research by the Sheps Center indicates that "where RNs complete their education affects their practice location." With nurses forming an essential backbone of institutional, practice, community, and population health platforms, UNC Pembroke should increase the number of BSN nurses it produces. UNC Pembroke could easily accommodate an additional fifty or more nursing students per entering class and still remain in full compliance with the State Board of Nursing. Currently, the pre-licensure curriculum has not undergone a significant modification since 2003. The department is apace at examining a more contemporary course flow as well as designing a four semester sequence instead of the current five. When completed, this will allow the Department of Nursing to develop two admits (August and January) per academic year, instead of the current practice of one. Two outcomes are likely from the curriculum redesign and additional cycle: the volume of pre-licensure students will increase and the specialization of faculty teaching similar courses each semester will lead to enhanced teaching and learning.

DEVELOP NURSE PRACTITIONER (NP) PROGRAM. Nurse practitioners provide a range of primary care functions and select a concentration of practice while in training. Given exigent service area needs, UNC Pembroke should produce NPs with Family Nurse Practitioner and Psychiatric (or Mental Health) Nurse Practitioner concentrations. Behavioral health practitioners and area hospitals all indicated in focus groups that cross-trained NP's with behavioral/psychiatric training would be highly valued. Currently no NP programs exist in the UNC Pembroke primary service region. As indicated by Dr. Ruffin, efficiency and managed growth comes when programs are implemented "by phases or linkages between programs where one program can serve as a feeder for the other when possible." With professional associations calling for NP education to migrate to a doctoral level (DNP), UNC Pembroke

[19] Erin Fraher, Julie Spero, Tom Ricketts, Evan Galloway and Erica Richman, "Key Issues and Challenges Facing the North Carolina Health Workforce, " Program on Health Workforce Research and Policy, May 24, 2017, Cecil G. Sheps Center for Health Services Research; Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017.

should design an NP program that can accommodate training for Master's Degree candidates who wish to practice immediately, as well as those that wish to acquire the DNP (doctorate). Based on research conducted by the Sheps Center, Nurse Practitioner is not a diverse profession in North Carolina. In addition, the total number of NPs working in the UNC Pembroke service area is significantly less than the state average.[20]

Figure 3: NC Nurse Practitioner Data



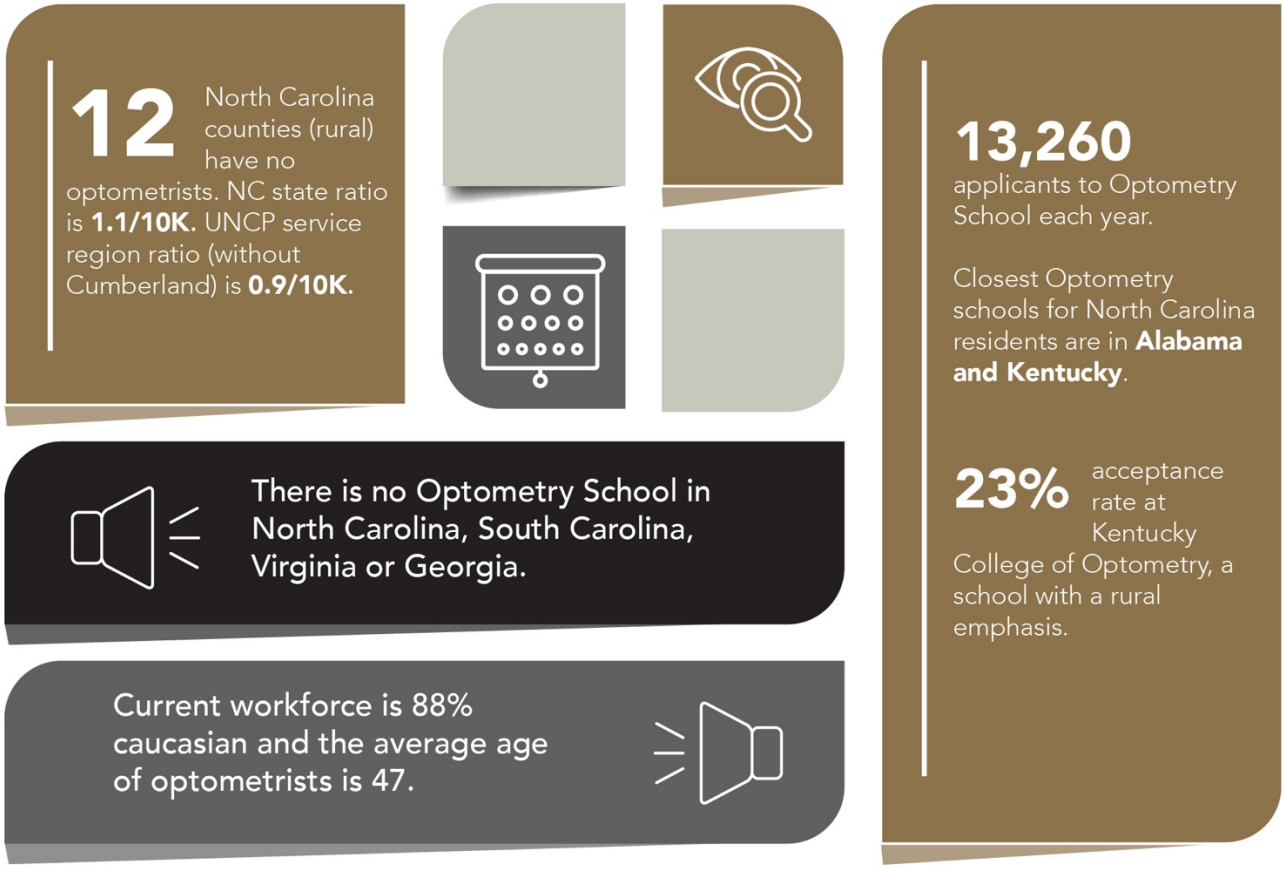
SOURCE: Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.
SOURCE: Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.

CREATE DOCTOR OF OPTOMETRY PROGRAM. North Carolina has 1,159 optometrists and none received their training in North Carolina. In fact, not only does North Carolina not have a public or private school of optometry, Georgia, South Carolina, and Virginia do not either. Across the country, only twenty-three such schools exist. On average, about thirty North Carolina residents enter optometry school each year, with the closest available schools in Alabama, Kentucky, and Pennsylvania. While other potential College of Health Science program additions would be primarily designed to attract a diverse group of rural North Carolinians to train at UNC Pembroke and then practice in the primary service area of the university, optometry would gather students from North Carolina, across the South, and potentially from other regions of the country. Located at a veritable crossroads of Interstates 95 and 74 and uniquely centered among the states of North Carolina, South Carolina, Georgia,

[20]UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Behavioral Health Focus Group, December 1, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017; Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

and Virginia, UNC Pembroke could not be more ideally located to attract students from these four states that lack optometry schools. Each of these four states feature significant rural populations, health care access issues in rural areas, and diverse populations which are not fully represented in the health care work force. The emphasis of an optometry school at UNC Pembroke would be on providing affordable training for diverse professionals to practice in rural locations, the areas of greatest optometric need.[21]

Figure 4: Optometry Facts and Figures



SOURCE: Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.

Quality vision care is increasing in importance given pediatric advancements and the graying of America. More to the point, optometrists are increasingly diagnosing other medical issues because of symptoms relating to vision and eye health. In 2014, one study concluded, optometrists diagnosed some 240,000 cases of previously undetected diabetes. An "Optometry School in Robeson County," the Sheps Center concludes, "would provide services to the medically underserved, rural community with high rates of diabetes, overweight and obesity." On average, optometric visits occur every twenty-five months. The American Optometric Association advocates a best practice of visits every eighteen months. With

[21] Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; Discussions and Visit of Dr. John Ruffin, Consulstart.

heightened patient education, achieving that standard would create need for an additional 34 million visits per year on top of the current standard of approximately 98 million current visits (2012 data).[22]

A rural and community based optometry program would be well positioned to provide graduates able and interested in practicing in rural areas. With Wingate, High Point, and other private universities considering an optometry school, it is worth considering whether a public university is a much better fit for a profession where diversity, access, and cost are critical factors. "The U.S. population is increasingly racially, ethnically, religiously, linguistically and culturally diverse," notes the Association of Schools and Colleges of Optometry. "When health professionals aren't prepared to care for patients in the context of their individual cultural norms and beliefs, access to quality care for entire groups of people is compromised." Given the available data on diversity and cost at North Carolina private schools, it seems unlikely that a North Carolina based private optometry education would make many inroads in rural providers or professional diversity. **Going further, an optometry program at UNC Pembroke appears to match perfectly the system strategic plan imperatives of access, affordability and efficiency, and excellent and diverse institutions.[23]**

Optometry students require an externship experience (supervised and intentional clinical field training) during their fourth year of matriculation. Given UNC Pembroke's ideal location within the four state desert of optometric education, creating these opportunities seems manageable. "It seems likely," the Sheps Center concluded about a potential UNC Pembroke Optometry School, "that a new optometry school would be able to develop relationships with optometry training sites within the state with relative ease." More to the point, an optometry care community clinic on campus would create opportunities to directly serve the indigent and uninsured population while also pursuing research opportunities in a unique tri-racial patient population. This would situate the UNC Pembroke College of Health Sciences as a solution center. **The Sheps Center has noted that "eye care is a priority of HRSA (Health Resources and Service Administration) and for federally funded community health centers," giving significant indication that federal and other research and grant programs would find a UNC Pembroke School of Optometry to be an institution of great interest.[24]**

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[22] American Optometric Association, "With Diabetes on the rise among the Young, Doctors of Optometry have an Opportunity to Educate Patients," https://www.aoa.org/news/clinical-eye-care/diabetes-on-the-rise-among-the-young?refer=rss; Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; Jobson Medical Information, "An Action-Oriented Analysis of the State of the Optometric profession: 2013," p.4, http://reviewob.com/data/sites/1/soop_070120134.pdf.

[23] Association of Schools and Colleges of Optometry, "Diversity Awareness and Cultural Competence in Optometry," June 5, 2014, http://blog.opted.org/diversity-awareness-and-cultural-competence-in-optometry; Higher Expectations: The University of North Carolina Strategic Plan, 2017-2022," https://www.northcarolina.edu/sites/default/files/unc_strategic_plan.pdf.

[24] The Sheps Center, "Report: Evaluation of Potential New Health Sciences School at University of North Carolina Pembroke to meet the needs of the Region and State," December, 2017, p. 12-18; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

A DEEPER LOOK AT THE FOUR-PART CONTINUUM OF CARE
PART TWO: THERAPEUTIC CARE

Building on primary care, therapeutic care situates UNC Pembroke more deeply in confronting the physical and behavioral health challenges of its primary service region. With a strong foundation of Social Work (BSW, MSW) and Mental Health Counseling (MA. ED) which meet accrediting, regional, professional, state, and national standards, therapeutic care programs can provide a baseline of integrated care for primary care students, as well as expand the number of mental and behavioral health professionals ready to tackle the exigent conditions of the UNC Pembroke service area. The Department of Social Work will move from the College of Arts and Sciences to a more natural and inter-professional home in the College of Health Sciences. The Department of Educational Leadership and Counseling will move from the School of Education to a more natural and inter-professional home in the College of Health Sciences. A Department of Occupational Therapy should be created. [25]

Figure 5: Existing Program: UNCP Social Work

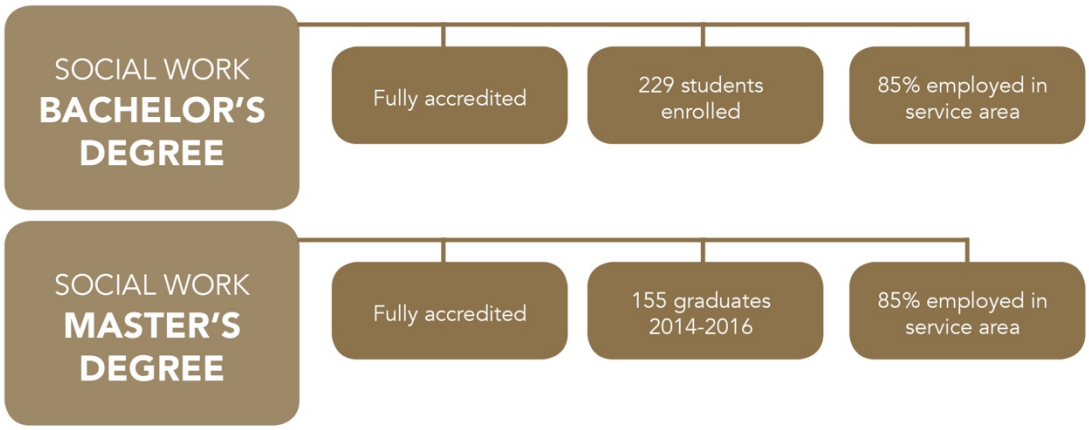
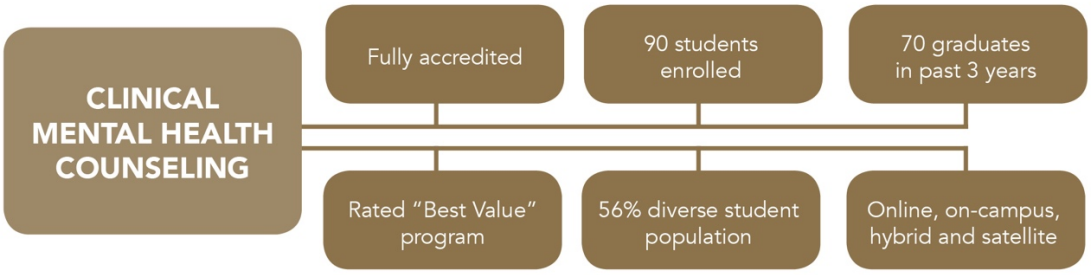


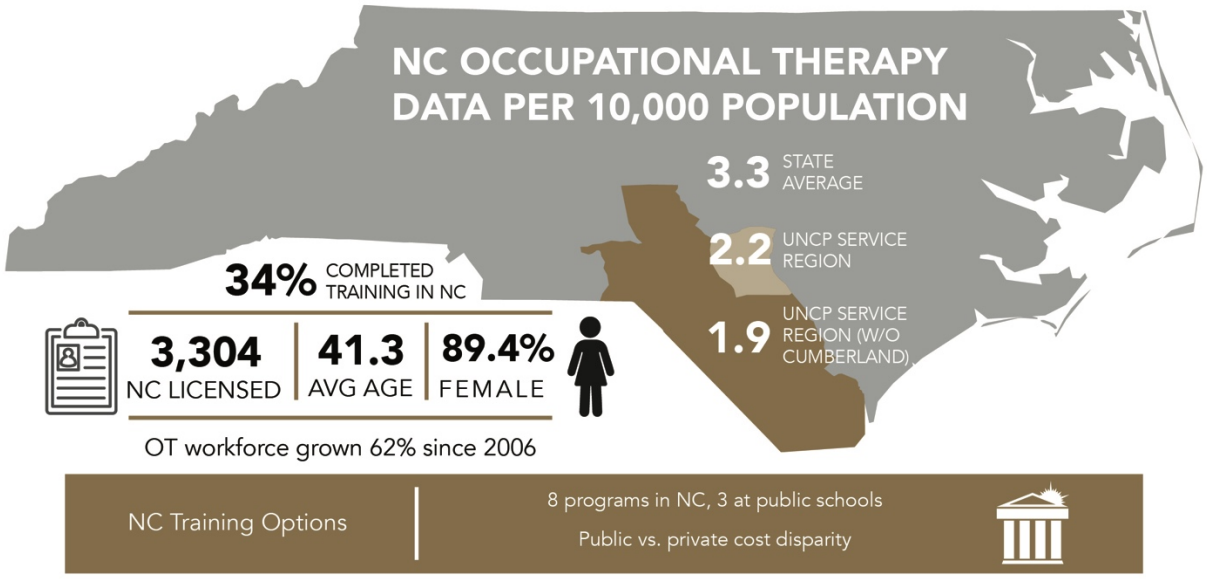
Figure 6: Existing Program: UNCP Mental Health Counseling



[25] UNCP Health Care Faculty Focus Group, November 10, 2017.

DEVELOP OCCUPATIONAL THERAPY PROGRAM. According to the American Occupational Therapy Association, "in its simplest terms, occupational therapists and occupational therapy assistants help people across the lifespan participate in the things they want and need to do through the therapeutic use of everyday activities (occupations). Common occupational therapy interventions include helping children with disabilities to participate fully in school and social situations, helping people recovering from injury to regain skills, and providing support for older adults experiencing physical and cognitive changes." Occupational therapists, then, help create and return function and activity to a range of pediatric to geriatric patients and clients who present with any number of physical or mental challenges. The Occupational Therapy degree is transitioning from a master's degree to a doctorate, and innovative programs can be constructed that provide a transition access point for bachelor's students (five year accelerated or Fast Track OT program) and allowing off-ramps for Master's trained graduates to practice while working on doctoral degrees. The professional transition to a doctoral degree will make cost of attendance a critical factor in meeting state demand.[26]

Figure 7: NC Occupational Therapy Data



Disparities exist in rural vs. urban and current workforce not diverse.

SOURCE: Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.
SOURCE: Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.

UNC Pembroke's access and affordability would provide a significant competitive advantage for training the next generation of occupational therapists. Highlighting mental health cross training in conjunction with existing social work and counseling programs would provide an

[26] https://www.aota.org/; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017; Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.

additional competitive advantage, as would an emphasis on rural practice conditions. "Training OT students alongside students from social work and nursing," the Sheps Center writes, "would provide an opportunity for students to learn how to work in cross-disciplinary teams and to learn about the unique knowledge base in each profession. A team comprised of a nurse, OT, and social worker may be particularly applicable for elderly patients who seek to age in place." In focus group settings, three area institutions indicated a need for additional occupational therapists and also noted a desire to hire more physical therapists as well—a program that UNC Pembroke could implement through existing partnerships, or as an eventual standalone.[27]

Given that the professional standard of occupational therapy is moving toward doctoral level education, UNC Pembroke would have an excellent opportunity to create some shapeable pathways to transition BS to DOT with an already-existing pre OT/PT program housed in the Biology department. In this way, a seamless program that merges mental and behavioral health components into an integrated "team" and population health approach could separate UNC Pembroke from other programs from its inception while training a more diverse work force preparing to practice in rural North Carolina.[28]

A DEEPER LOOK AT THE FOUR-PART CONTINUUM OF CARE
PART THREE: WELLNESS AND PREVENTION

Building on existing programs in athletic training, exercise science and health promotion, and school counseling, UNC Pembroke's continuum of care should add new programs in Public Health (bachelor's degree) and plan for a new program in Nutrition and Dietetics. The Departments of Athletic Training and the School Counseling program will move from the School of Education to the College of Health Sciences. The Exercise and Sport Science major and Health Promotion track will move to the College of Health Sciences as well. A critical aspect of a healthy community is equipping the populace with the tools and skills necessary to make effective choices. According to the National Wellness Institute, the many practices and benefits of wellness include "regular physical activity, healthy eating habits, strength and vitality as well as personal responsibility, self-care . . . self-esteem, self-control . . . a sense of direction, creative and stimulating mental activities, and sharing your gifts with others." Along with primary care and therapeutic care, academic and community wellness and prevention programming will play a critical role in the College of Health Sciences.[29]

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[27] Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017.

[28] UNCP Health Care Faculty Focus Group, November 10, 2017.

[29] Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; http://www.nationalwellness.org/?page=six_dimensions.

Figure 8: Existing Program: UNCP Athletic Training

Figure 9: Existing Program: UNCP School Counseling

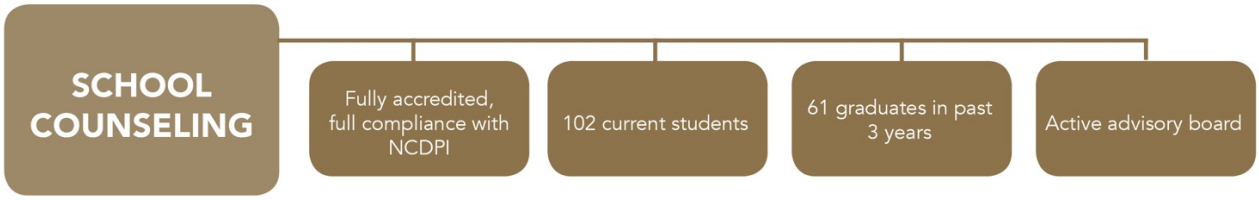


Table 6: Existing Program: Exercise Sport Science/ Health Promotion

While a varied major, graduates are working in the following fields that contribute to a healthier society:

Strength and Conditioning	Parks and Recreation	Corporate Wellness	Health Advocacy And Promotion
Community Health Work	Personal Trainer	International Health Efforts	Public Health Work
Exercise Physiology	Sports Marketing	Youth Recreation Services	Physical Therapy Preparation
Therapeutic Recreation	Sports Administration	Coaching	Cardiac Rehabilitation

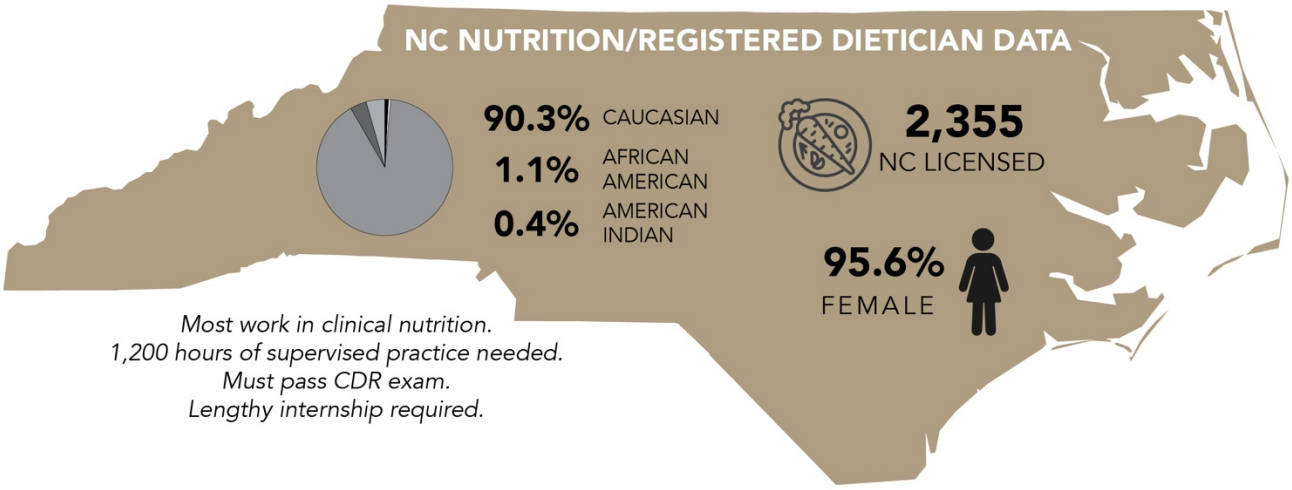
PLAN NEW PROGRAM: BACHELOR'S DEGREE, (B.S.) PUBLIC HEALTH. As the Sheps Center concludes, "there is a growing demand in the market place among entering students for stronger preparation in population health and public health." Graduates with educational experiences in basic biological sciences, statistical and logic based reasoning, and internships in public health settings make a significant contribution in areas outside of patient or client care. Given the increasing demands at all levels of the health care work force, UNC Pembroke's diverse student population could be trained in Public Health to either enter the work force or prepare for graduate work in Public Health, Health Administration, or Information Technology in a healthcare setting. K-12 and community college pipelines can be created to funnel students directly into a public health program.[30]

PLAN NEW PROGRAM: MASTER'S DEGREE, (M.S.) NUTRITION. Registered dieticians make an important if developing contribution to health professional teams. They shape practical policy and actions in schools and school systems, and at assisted living and

[30] Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

convalescent facilities. At present, the field is migrating from bachelor's level preparation to master's level, so, as part of the planning process, UNC Pembroke should plan to begin at the advanced level so to not duplicate actions. Existing programs in nursing, and exercise science and health promotion could assist in creating an integrated and inter-professional training and team approach. The best course of action with a nutrition program is to *prioritize other programs that have potential to make an immediate impact* in the health outcomes of the UNC Pembroke service area, but prepare to launch once higher impact programs leave their infancy.[31]

Figure 10: NC Nutrition/Registered Dietician Data



A DEEPER LOOK AT THE FOUR-PART CONTINUUM OF CARE

PART FOUR: COMMUNITY HEALTH AND LEADERSHIP

Building on primary care, therapeutic care, and wellness and prevention, the fourth part of the UNC Pembroke College of Health Sciences Continuum of Care is Community Health and Leadership. Whereas the first three elements of the continuum of care were largely focused on preparing work force to impact patients and clients through direct contact in one form or another, this element, Community Health and Leadership, will largely equip leaders, policy makers, information technology experts, and care providers who aspire to become future supervisors with the skills and degrees necessary to advance and excel in a rapidly changing health market. Merging degree completion, a Master's Degree in Health Administration, and certificate concepts, Community Health and Leadership is the fourth element of the UNC Pembroke continuum of care. Similar to an RN-to-BSN program, a degree completion concept will be created to provide online access to a bachelor's degree for emergency medical services

[31] Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017.

professionals, respiratory therapists, occupational therapy assistants, and other health care workers whose two-year degree allows them to assist patients, but not supervise units or otherwise advance in the ranks. This would allow many "part-way home" students to find a platform for completing a bachelor's degree. A Health Informatics and Analytics certificate will be studied for health care information technology experts who require access to ongoing professional development.

PLAN NEW PROGRAM CONCEPT: RURAL HEALTH EQUITY. This online degree completion concept would assist two-year (associate level) trained and working health care workers with obtaining a bachelor's degree (B.S. Rural Health Equity) useful for transitioning from a patient care support role to a team leader. By partnering with service area community colleges who can provide online general education courses, UNC Pembroke can foster dual admission statuses and help expedite the transition time to degree completion. Since most candidates would be working full time, courses could be created using innovative course construction, potentially including:

- Competency Based education/ shorter terms such as 7-8 weeks.
- Annual two-day clinical symposiums featuring team building and project-based learning.
- Integrated care and inter-professional elective courses from experts in Nursing, Optometry, Occupational therapy, Social Work, Counseling, Nutrition, Athletic Training, and Public Health.

Potential Two-year Degree Holders That Would Value a B.S. Rural Health Equity

EMS	Pharmacy Tech	OT Assistant
Radiology Tech	PT Assistant	Medical Assistant
Dental Assistant	Respiratory Therapist	

CREATE HEALTH INFORMATICS AND ANALYTICS CERTIFICATE. Hospitals and other health care institutions are increasingly tasked with tracking outcomes at every stage of the care delivery process. Improving outcomes and reducing cost redundancies is a factor in reimbursement. Going further, discharge planning, avoiding recurrence, and other prevention strategies increasingly include various integrated health teams who may depend on each other and who communicate in part or in whole electronically. Medical teams do not always understand the concepts inherent to software design, coding, and hardware capabilities; data professionals do not always understand standard medical terminology. A certificate program involving faculty and curriculum from Health Administration, Computer Science, the Entrepreneurship Incubator, and other key areas could be an asset to local health care and planning agencies and their key personnel. [32]

[32] Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Health Care Focus Group, First Health of the Carolinas, November 16, 2017; UNCP Behavioral Health Focus Group, December 1, 2017; UNCP Health Care Focus

PLAN MASTERS OF HEALTH ADMINISTRATION DEGREE. MHA programs equip administrators with the skills necessary to lead divisions and institutions in the rapidly changing health care environment. A UNCP MHA would build on existing core competencies in Public Administration and Business Administration, and expand through new capacity created with new programs in previously mentioned fields. Current graduate level course work includes:

- HAD 5710 Health Administration and Organization
- HAD 5720 Health Policy
- HAD 5730 Legal and Ethical Issues in Health Care
- HAD 5740 Health Economics
- HAD 5750 Comparative Health Systems

COURSE OF ACTION: COLLEGE OF HEALTH SCIENCES
CLINICAL RESEARCH PROGRAM

Why develop a clinical research program?

Robeson, the rural, home county of UNC Pembroke, is a unique tri-racial, rural area impacted by chronic, persistent poverty, confronting a severe and distinct range of health outcomes. These conditions provide a series of unique research opportunities featuring a diverse array of ethnicities, presenting problems, and social determinants of health. By creating a Clinical Research Program, UNC Pembroke can advance the state of medical science via clinical trials, patient and outcome tracking, screening research, quality-of-life investigations for patients with chronic conditions, family and genetic studies, and other forms of academic and medical research. These studies could focus on issues and epidemiological matters along the continuum of primary, therapeutic, behavioral, and prevention studies. Given current facilities, UNC Pembroke should primarily pursue out-patient research.

As an anchor of the region with roots to 1887, the university can play an important role in bringing together partners to coordinate research trials. A clinical and observational research program could increase the possibility of economic development in the area from funding and possible location of durable medical equipment or pharmaceutical enterprises of varying sizes. Behavioral health studies or investigations which rely on inter-professional analysis might be particularly fruitful given the relationship between mental and physical health outcomes in high poverty areas. In addition, research is a valuable student experience. "The development of a health sciences school," the Sheps Center concludes, "could provide UNCP an opportunity to build new health sciences programs from the ground up around interprofessional training. Similar concepts have been developed around the country and show benefits not only to the learners-in-training but also to patients in the community. These teams sometimes take on community-based research projects that develop the capacity of the student, university and

Group, Southeastern Health, December 6, 2017; UNCP Health Care Focus Group, Scotland Health Care System, December 14, 2017.

community to respond to local health challenges. Interprofessional models of community-based education improve clinical care processes and increase the research capacity of the institution which could, in future years, draw in research dollars."[33]

Research can provide resources, funding, and clinical opportunities to make a UNC Pembroke health care education more meaningful. Research conducted at UNC Pembroke could also make a valuable contribution to improving health factors and outcomes in the primary service area of the university. A clinical and observational research program will provide value for student and faculty recruitment as university faculty are excellent candidates to be principal investigators. Though national funding from some agencies like the National Institutes of Health is down, UNC Pembroke would be a willing partner with other universities including UNC Chapel Hill and East Carolina University, various funding foundations and non-profits, as well as private sector firms and primary care facilities. Clinical trials and observational studies can assist in UNC Pembroke's creation and maintenance of partner relationships across its primary service region. "Clinical trial programming, research initiatives into rural and minority health matters, and a campus clinic," John Ruffin notes, " could be the type of concepts critical to integrating the community more fully into a College of Health Sciences. Addressing community issues while educating both work force and citizens should be the goal of the College of Health Sciences."[34]

As UNC Pembroke develops programs in Optometry, Nurse Practitioner, and Occupational Therapy, discipline-specific research opportunities involving the unique patient profile of the region will become clear. UNC Pembroke's division of sponsored research can assist in grant writing and research study, intervention, observational, and clinical trial identification.

A DEEPER LOOK: IMPLEMENTATION AND BUDGET

Key question one: how will the College of Health Sciences be created?

At present, UNC Pembroke has approximately 1,400 students currently engaged in existing undergraduate or graduate health programs. If organized today as a College of Health Sciences, this would make it second in size only to the College of Arts and Sciences, and larger than either the School of Business or School of Education. Yet the scale of building the continuum of care necessary to make significant inroads into the abject conditions of the primary service area, necessitates a managed or phased approach to planning, creating, implementing, and growing the combination of existing and new programs that form the continuum of care.

[33] Consulstart, "Report on UNC Pembroke College of Health Sciences Study;" Sheps Center Report on UNC Pembroke College of Health Sciences, December, 2017.
[34] Consulstart, "Report on UNC Pembroke College of Health Sciences Study."

PHASE ONE, 2018-2020

- Create College of Health Sciences
  - School of Nursing
  - Department of Social Work
  - Department of Counseling
  - Department of Athletic Training
  - Department of Exercise Science and Health Promotion
- Expand Bachelor of Science in Nursing program.
- Plan and start accelerated 5-year Bachelor of Science to Doctor of Occupational Therapy program.
- Plan School of Optometry
- Plan Doctor of Nursing Practice program
- Hire College of Health Sciences leadership team
- Implement Memorandum of Understanding with East Carolina Doctor of Physical Therapy Program (DPT)

PHASE TWO, 2021-2024

- Start Optometry program
- Start Doctor of Nursing Practice program
- Start Clinical Research program
- Plan and start Doctor of Occupational Therapy program
- Construct College of Health Sciences building
- Plan and start degree completion program for "part-way home" medical work force professionals: Bachelor of Science in Rural Health Equity
- Plan Bachelor of Science in Public Health

PHASE THREE, 2024-2027

- Start Bachelor of Science in Public Health
- Plan and start Health Informatics and Analytics Certificate.
- Plan and start Master of Health Administration (MHA)
- Plan Master of Science in Nutrition
- Conduct sweeping internal and external assessment to determine next steps, if any. Investigate partnership pathways with other universities to identify opportunities to make regional impact. Possible programs to consider include Physician Assistant Speech Pathology.
- Transition DPT program from East Carolina

Key question two: how much will this cost?

In order to create and operate a College of Health Sciences consistent with the Continuum of Care, four categories of expenses were factored. The table below presents the estimated costs for Phase One and Two of a new College of Health Sciences.

Table 7: Estimated Costs for College of Health Science at UNCP—Phase 1 and Phase 2

	Phase 1		Phase 2			
	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Creation of College of Health Sciences						
Deans Office						
Salaries	$ 185,000	$ 357,000	$ 357,000	$ 357,000	$ 357,000	$ 357,000
Benefits	$ 51,712	$ 106,072	$ 106,072	$ 106,072	$ 106,072	$ 106,072
Total Labor	**$ 236,712**	**$ 463,072**	**$ 463,072**	**$ 463,072**	**$ 463,072**	**$ 463,072**
Operating Costs	$ 10,000	$ 40,000	$ 70,000	$ 70,000	$ 70,000	$ 70,000
Total Deans Office	**$ 246,712**	**$ 503,072**	**$ 533,072**	**$ 533,072**	**$ 533,072**	**$ 533,072**
Nursing Expansion (BSN Growth & New DNP)						
Salaries	$ 530,000	$ 760,000	$ 990,000	$ 1,220,000	$ 1,450,000	$ 1,450,000
Benefits	$ 166,548	$ 235,280	$ 304,012	$ 372,744	$ 441,476	$ 441,476
Total Labor	**$ 696,548**	**$ 995,280**	**$ 1,294,012**	**$ 1,592,744**	**$ 1,891,476**	**$ 1,891,476**
Operating Costs	$ 10,000	$ 19,000	$ 23,000	$ 27,000	$ 31,000	$ 31,000
Total Nursing Expansion	**$ 706,548**	**$ 1,014,280**	**$ 1,317,012**	**$ 1,619,744**	**$ 1,922,476**	**$ 1,922,476**
Occupational Therapy						
Salaries	$ 85,000	$ 170,000	$ 372,000	$ 407,000	$ 577,000	$ 662,000
Benefits	$ 26,932	$ 53,864	$ 121,527	$ 136,069	$ 189,933	$ 216,865
Total Labor	**$ 111,932**	**$ 223,864**	**$ 493,527**	**$ 543,069**	**$ 766,933**	**$ 878,865**
Operating Costs	$ 3,500	$ 5,000	$ 12,000	$ 27,000	$ 43,000	$ 43,500
Total Occupational Therapy	**$ 115,432**	**$ 228,864**	**$ 505,527**	**$ 570,069**	**$ 809,933**	**$ 922,365**
Doctor of Optometry						
Salaries	$ -	$ -	$ 507,000	$ 1,017,000	$ 1,492,000	$ 1,967,000
Benefits	$ -	$ -	$ 160,849	$ 322,441	$ 469,491	$ 616,541
Total Labor	**$ -**	**$ -**	**$ 667,849**	**$ 1,339,441**	**$ 1,961,491**	**$ 2,583,541**
Operating Costs	$ -	$ 100,000	$ 40,500	$ 70,000	$ 87,500	$ 100,000
Total Doctor of Optometry	**$ -**	**$ 100,000**	**$ 708,349**	**$ 1,409,441**	**$ 2,048,991**	**$ 2,683,541**
Total College of Health Sciences	**$ 1,068,692**	**$ 1,846,216**	**$ 3,063,959**	**$ 4,132,325**	**$ 5,314,471**	**$ 6,061,453**

The operating costs outlined above include the following specific costs and assumptions.

- Deans Office – Founding Dean hired in year one followed by an Associate Dean and an Executive Assistant in year two. Ongoing operating expenses includes funding for travel, professional program memberships and accreditations as well as general office operations.

- Nursing Expansion – To enable the BSN program to grow by 50 additional students per year and to develop and implement the DNP, the budget calls for a total growth of 12 faculty. The labor funds represent 4 new faculty in year one with expansion to 12 over year next four years. In addition to faculty lines, we anticipate the need for 2 Student Support Associates beginning year one of the BSN expansion. These specialists work directly with nursing students to ensure progression, retention and graduation. Operating funds include faculty travel ($500 per faculty member per year), travel for clinical rotations, and additional clinical supplies based on the growth of students.

- Occupational Therapy – Using data from other OT in North Carolina programs we estimated the total faculty need at 7. These faculty lines are phased in with 1 faculty line in year 1 to begin planning and implementing a pre-OT undergraduate track followed by an additional faculty line in year 2. Four faculty are needed through year 4 with the final three faculty added in year 5. The proposed budget also includes an administrative assistant in year 4 and a Student Success Associate in year 5. Operating funds include faculty travel ($500 per faculty member per year), travel for clinical rotations beginning in year 4 clinical supplies based on the growth of students and professional memberships and dues.

- Doctor of Optometry – Planning for the Doctor of Optometry will begin in Year 2 with a planning consultant ($100,000) being brought on to ensure a successful launch and begin the process for accreditation. Using both salary and staffing data from the Association of Schools and Colleges of Optometry, we estimate the total faculty need at 20. These faculty lines are phased in evenly with 5 faculty lines in year 3 and 5 additional lines added in each of the next three years. The proposed budget also includes an administrative assistant in year 3 and a Student Success Associate in year 4. Operating funds include faculty travel ($500 per faculty member per year), travel for clinical rotations beginning in year 3, clinical supplies based on the growth of students and professional memberships and dues. (Please note, initial equipment for this program is included in the capital cost estimation for a new building included below.)

In addition to the ongoing operational costs outlined above, the proposed program expansions and new programs would require construction of a companion building to team with the existing 87,000 square foot Weinstein Health Sciences building. This new building is estimated at 50,000 square feet and a cost of $41,631,875 as detailed below.

Design, Planning, and Construction ($650 per square foot)	$32,500,000
Equipment	$ 6,975,000
Infrastructure/ IT	$ 986,875
Land	$ 0
Contingency and Escalation	$ 1,170,000
TOTAL	***$41,631,875***

SHEPS CENTER REPORT

Evaluation of a Potential New Health Sciences School at The University of North Carolina at Pembroke to Meet the Needs of the Region and State

December 2017

This work was supported by the
The University of North Carolina at Pembroke and The University of North Carolina General Administration

UNC
THE CECIL G. SHEPS CENTER
FOR HEALTH SERVICES RESEARCH

PROGRAM ON HEALTH WORKFORCE
RESEARCH AND POLICY

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Evaluation of a Potential New Health Sciences School at The University of North Carolina at Pembroke to Meet the Needs of the Region and State

Executive Summary

Background

The 2017 North Carolina (NC) appropriations act (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 School of Health Sciences and Health Care at the University of North Carolina at Pembroke (UNC-P). The language specified that the study should consider the health care needs of the region and what health science programs would best serve those needs.

UNC-P is in Robeson County, a majority-minority county with high rates of poverty that has been ranked #100 out of 100 (worst) for health outcomes in NC according to the Robert Wood Johnson Foundation. A new health sciences school at UNC-P could help address the health issues in Robeson and surrounding counties, create innovative models for educating health professionals, and further the university's role as an economic driver in the region.

Methods

This analysis used a mixed methods approach, employing both quantitative and qualitative analyses to assess the demand and supply of health workers and which new health science programs might best fit with UNC-P's capabilities and the needs in the UNC-P region. Data on licensed health professionals in North Carolina were used to assess the demographic, practice and geographic characteristics of the health workforce in the Pembroke region and the state. Key informants were interviewed to assess priority health needs of the region and to gather information on potential health professional programs that would meet these needs. A summary matrix was developed to facilitate comparison of potential health professions programs across criteria including health professional supply per population, total number of existing programs in NC, average salaries, level of student and market demand, preceptor availability and other criteria relevant to evaluating potential programs at UNC-P.

Key Findings

We conducted an analysis of five potential programs for UNC-P's consideration.

A. Optometrists

Pros

- Strong support for the development of an optometry school within the state
- Little difficulty in finding clinical rotation sites in-state for students
- State optometrist workforce lacks diversity, UNC-P well-positioned to address workforce diversity
- An optometry school in Robeson County would provide services to a medically underserved, rural community with high rates of diabetes, overweight, and obesity

Cons

- Data are unclear on job market for new graduates
- Relatively few NC students enroll annually in optometry programs
- Two other private universities in NC have publicly expressed interest in an optometry school, providing competition for applicants if the schools are developed
- Historically, NC has been able to recruit optometrists from out-of-state with relative ease, although there are qualitative indications this may have changed in the past three years
- UNC-P would not be able to leverage an existing medical school or other training program for first-year interprofessional training

B. Occupational Therapy

Pros

- Value-based payment and care delivery models may increase the demand for occupational therapists (OTs) and the role they play in helping seniors age in place and avoid expensive hospital admissions/readmissions[1]
- Although small at present, the market for OTs with mental health training may increase in the future
- There is unmet need for OT services in rural areas
- The OT workforce in NC is not diverse and would benefit from an educational program focused on diversifying the workforce
- UNC-P has the potential to leverage interprofessional training opportunities with its schools of nursing zand social work
- Move to doctoral degree as minimum entry requirement may increase demand for OT education (as it has in other fields that have moved toward doctoral training, including the Doctor of Nursing Practice, Doctor of Physical Therapy and Doctor of Pharmacy)
- Growing evidence[2,3] that providing OT and PT services on an outpatient basis improves health outcomes could increase demand for OTs

Cons

- Eight existing or newly accredited schools in NC may increase competition for students, faculty, and internships, particularly with Methodist University in Fayetteville
- Move to doctoral degree minimum for OT practice may increase pressure for faculty recruitment challenges

C. Nutrition and Dietetics

Pros

- Key informants cite a need for more dietitians in the region, particularly given the prevalence of heart disease, diabetes, hypertension, and obesity
- Fewer private schools are expanding into dietetics (likely because registered dietitian (RD) salaries, in the mid-$50k range, are not high enough to justify private school tuition), making the program a good fit for a public university
- There are no nutrition/dietetic programs offered in the Charlotte region, providing a potential applicant pool

- The program would be able to leverage faculty from nursing and exercise and sport science
- A bachelor's level nutrition degree could be structured to fulfill pre-medicine, pre-dental, and other graduate health sciences requirements, building a pipeline of UNC-P graduates into health fields

Cons

- Lack of available dietetic internships suggest exploration of coordinated program, otherwise graduates will have difficulty meeting eligibility requirements to take national registration exam and become licensed to practice
- Accreditation agency will no longer accredit bachelor's level nutrition and dietetics programs, making a master's degree the only option for RD careers

D. Physician Assistant Studies

Pros

- Strong current job market for physician assistants (PAs) in NC
- Strong student demand
- UNC-P potentially able to recruit a diverse student body to the state's PA workforce
- Most PA programs in NC are at private universities with high tuitions; UNC-P could provide a more affordable option

Cons

- Large number of PA programs already in NC; market could become saturated in the future[4]
- Lack of preceptorships for PAs, nurse practitioners (NPs), and physicians in NC
- Schools rely on alumni connections for preceptorships, and UNC-P may be at a disadvantage without a pre-existing alumni network

E. Nurse Practitioner Studies

Pros

- There is a growing focus on addressing mental health shortages in the state; a psychiatric NP program could address these needs locally and at state level
- Changing care delivery models that emphasize primary and preventive health care may increase demand for family NPs; there is increasing evidence that NPs can provide range of primary care services at lower cost and equal quality as physicians[5]
- Doctor of Nursing Practice (DNP) would be doctoral level health professions education program at UNC-P
- An NP program would be an extension of the existing nursing school, rather than building a new program
- Opportunities to leverage existing resources in schools of nursing and social work schools

Cons

- DNP degree is relatively new, and employers are not sure how to deploy DNPs in practice[6]
- Rapid expansion of physician, NP, and PA education has made identifying training sites for students a limiting factor
- Existing nurse faculty shortage will likely make faculty recruitment difficult

Additional programs to consider, either woven through the curriculum of all health programs, as separate degrees or as certificate programs, include healthcare management, health informatics, and public health/population health.

A brief evaluation framework is provided that can be expanded upon to track the outcomes of training programs and the return on investment as it relates to health workforce professional supply and health outcomes in the region.

Conclusions

The findings from this report suggest that new health sciences programs at UNC-P could make a potentially significant and lasting contribution toward improving the supply of health professionals in the region, increasing the racial and ethnic diversity of the health workforce, and providing access to well-paying health care jobs. As a state school, health science programs at UNC-P would be more affordable for students to attend than those at private institutions. UNC-P is one of the three campuses in the UNC system chosen for the pilot program offering low tuition to in-state students ($500 per year). This program will likely increase the number of students from low income households who are able to access health professions training, consistent with the University of North Carolina system's goals of increasing access to and affordability of university education in the state.

Health care delivery and payment models are changing quickly, evolving toward integrated care delivery models that require health professions programs to train a workforce capable of working on teams to address a patient's physical and behavioral health needs. In NC and nationally, educators are revising health professions training to incorporate more interprofessional learning opportunities in education and practice; yet, their efforts are often thwarted by scheduling conflicts and existing models of education and training that are silo-based by profession. The development of a health sciences school could provide UNC-P an opportunity to build new health sciences programs from the ground up around interprofessional training. Similar concepts have been developed around the country and show benefits not only to the learners-in-training but also to patients in the community. These teams sometimes take on community-based research projects that develop the capacity of the student, university and community to respond to local health challenges. Interprofessional models of community-based education improve clinical care processes and increase the research capacity of the institution which could, in future years, draw in research dollars.

Evaluation of a Potential New Health Sciences School at The University of North Carolina at Pembroke to Meet the Needs of the Region and State

Introduction

The 2017 North Carolina (NC) appropriations act (N.C.S.L. 2017-57) mandated the Board of Governors (BOG) of the University of North Carolina (UNC) to study the feasibility of establishing a School of Health Sciences and Health Care at the University of North Carolina at Pembroke (UNC-P). The language specified that the study should consider the health care needs of the region and which health science programs would best serve those needs.

UNC-P approached the Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research at UNC-Chapel Hill (hereafter referred to as "Sheps") and requested assistance with the study. Sheps was asked to produce a report evaluating regional health workforce supply, regional health care needs, and options for a potential health professions school at UNC-P.

The first section of this report provides background information on the UNC-P region and the university. The methods section describes the methodology used to gather information on health professional demand and supply in the region and the process used to identify possible health professions programs at UNC-P. The findings section summarizes key findings and provides analyses of five potential programs. The conclusions section summarizes the implications of these findings. The appendix includes a matrix of a range of health professional programs assessed on a variety of criteria that could be used by UNC-P to assess the feasibility of other programs not analyzed in detail in this report.

Background

UNC-P is in Robeson County in southeastern NC on the border with South Carolina. Reflecting the historic concentration of Lumbee Indians in the area, 41.0% of the population in Robeson County identify as American Indian.[a] An additional 31.3% identify as white and 24.2% identify as Black.[7] The relatively even split between these three races is unique both regionally and nationally, making Robeson County one of only 10% of counties in the US that is majority-minority.

Like many majority-minority counties, Robeson County suffers from a high rate of poverty.[8] At 30.6%, the poverty rate in Robeson County is more than double the national rate.[9,10] Moreover, the median household income is $30,608, which is less than 60% of the median household income for NC.[11,12] The current unemployment rate of 5.8% in Robeson County is much lower than it was during the recent recession, but it is still higher than NC as a whole, where the rate has recently hovered around 4.0%.[13]

Robeson ranks as the worst county in NC in terms of health outcomes according to the Robert Wood Johnson Foundation.[14] The poor health outcomes in the county are not a new phenomenon, but have persisted over time. In 2011, Robeson was ranked #98 out of 100 for health outcomes, and was ranked worst in NC on measures related to length of life, health factors, and health

a The Lumbee Tribe are officially recognized as an American Indian tribe by the State of NC but do not have full official recognition by the U.S. government, and therefore do not receive federal benefits provided to other federally recognized tribes.

behaviors.[15] Obesity and associated health problems contribute to this poor ranking. The adult obesity rate in Robeson County is 40% (compared to 30% for NC),[16] and the diabetes death rate at 46.5 per 100,000 residents is double the rate of 22.8 per 10,000 for NC.[17] Child and young adult mortality are a challenge for the community. The death rate per 100,000 minors is 97.0 in Robeson County, compared to 57.8 for NC and the infant mortality rate per 1,000 live births is 11.5 in Robeson County compared to 7.2 for NC.[18]

The community is aware of the problems facing Robeson County. When asked "What does your community need to improve the health of your family, friends, and neighbors?", the top response was "job opportunities," reflecting the pervasive economic challenges in the county. "Job opportunities" was also the top response in 2003 and 2007 community health assessments, demonstrating that the economic issues have remained a constant challenge in the region.[19] In the most recent assessment in 2014, the second, fourth, fifth, and sixth most common responses were healthier food choices, wellness services, recreation facilities, and safe places to walk/play, which all relate to the burden of obesity and related chronic diseases in the community.[20]

Many of these same economic and health concerns are common to the other counties in the UNC-P region (NC: Anson, Bladen, Brunswick, Columbus, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Sampson, Scotland; SC: Chesterfield, Darlington, Dillon, Florence, Horry, Marlboro, Marion (**Figure 1**)). Scotland, Bladen, and Columbus counties are all in the bottom 10% of the county health rankings among NC counties,[21] and Marlboro, Dillon, and Marion counties make up the bottom three in the county health rankings for South Carolina.[22]

A new health sciences school at UNC-P could play a role in addressing the health challenges facing Robeson and surrounding counties while furthering the university's role as an economic driver in the region. A new health sciences school would be

Figure 1. UNC Pembroke Service Area

aligned with the UNC system strategic plan that calls for UNC system schools to increase access to education for low income and rural students, provide educational opportunities that provide "real value in the marketplace", improve diversity, and have an economic impact on the regional community.[23] UNC-P has historically emphasized rural and regional engagement and the school is committed to addressing community health needs. The school offers an affordable education for students and emphasizes the development of practical skills for employment after graduation.

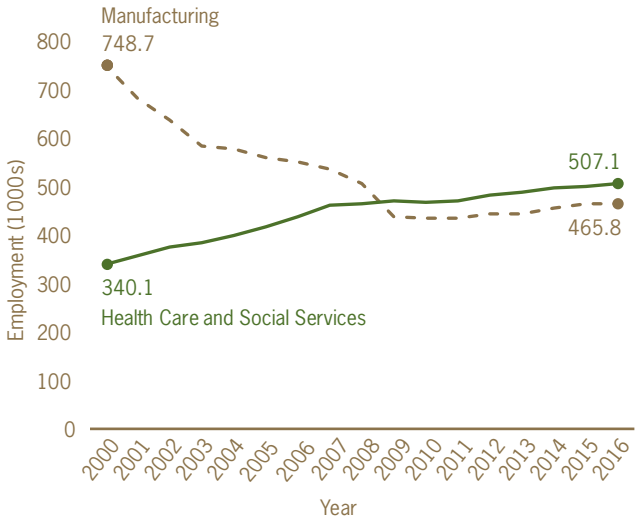
Most UNC-P students are from the surrounding area and many of those students stay in the area after graduating. The university draws 56% of its enrollment from the 13 NC counties in the UNC-P service area, with 21.2% coming from Robeson County alone.[24] Nearly 17,000 alumni have stayed within in the UNC-P service area in NC with at least 6,740 of those alumni staying within Robeson County.[25] Given this pattern of regional recruitment and alumni retention, UNC-P has a demonstrated ability to grow its own workforce by educating local residents to fill the needs of the community.

Like other rural and medically underserved communities in NC, the region has difficulty attracting and retaining health professionals in the community. Research on physician practice location has demonstrated that growing up in a rural area and feeling integrated with the community is an important predictor of the decision to practice in a rural community.[26] The same pattern holds with other health professionals and supports the aim of a health sciences school at UNC-P which could recruit, train, and then place local citizens into health professional careers in the local community to address population health needs.

New UNC-P health programs also have the potential to enhance the diversity of NC's health professional workforce. Almost none of the health professions in NC represent the diversity of the State's overall population.[27] U.S. News and World Report has reported that UNC-P is tied for the highest level of diversity among regional universities in the South.[28] Because UNC-P's student body is unique in NC and UNC system schools in its level of diversity, with minorities representing 59% of the total enrollment,[29] new health sciences programs could make a significant contribution to increasing the diversity of the state's workforce.

Unsurprisingly, given the poverty of the surrounding area, many of UNC-P's students are economically disadvantaged. In fact, 62% of full-time students received Pell grants in 2015, which is significantly higher than the state rate of about 44% across all institutions.[30] While this represents a challenge to the university in terms of student retention, it also represents an opportunity to help students from disadvantaged backgrounds prepare for higher wage jobs in the healthcare sector. Even during a recession, health care jobs continue to expand and provide an opportunity for economic mobility in a region that has higher unemployment rates than the rest of the state (**Figure 2**).

Figure 2. Total Employment in Manufacturing and Health Care & Social Assistance in NC, 2000-2016



Source: North Carolina Health Professions Data System with data derived from the North Carolina Department of Commerce Labor and Economic Analysis Division, Current Employment Statistics (CES), 2000-2016. Data include unadjusted employment as of October of the given year. Downloaded on April 12, 2017 from: http://d4.nccommerce.com/CesSelection.aspx. Produced By: Program on Health Workforce Research & Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

UNC-P currently offers a few health-related degrees, most notably the bachelor's and master's degrees through the Department of Nursing and the Department of Social Work within the College of Arts and Sciences. The UNC-P School of Education also offers master's degrees in clinical and mental health counseling and professional school counseling through the Department of Educational Leadership and Counseling, as well as coursework in athletic training through its Department of Health and Human Performance.

Methods

This analysis used a mixed methods approach, employing both quantitative and qualitative analyses to assess the demand and supply of health workers and which new health science programs might fit with UNC-P's capabilities and the needs in the UNC-P region.[b] Background data on the region were derived from national and state databases on county-level health outcomes to provide context for the analysis.

To assess the demand for health professionals in the region, we conducted a search for job postings in indeed.com, monster.com, and the SouthEastern Health website. However, due to the short time frame for the searches, a lack of data on how long the positions were unfilled, differing job titles, vague job descriptions, and a lack of clarity about whether postings were unique or duplicate positions, we were not confident that the searches provided an accurate assessment of demand for health professionals in the region. Furthermore, in some cases there were few postings for positions that key informants advised were in high demand. Because of our concerns about the accuracy and validity of the data, they are not included in this report.

Instead, we relied on structured interviews with eight key informants to assess the health workforce needs of the UNC-P region, determine the capacity of UNC-P to develop new programs, evaluate competing public and private universities offering health science programs and their possible impact on UNC-P, and gather other information relevant to the feasibility of developing new health science programs in the region. Individuals interviewed included leadership from health care organizations and employers in the region, including Southeastern Health and the Robeson County Health Department, state foundations and health related organizations with expertise working in the region, and the chairs of the departments of nursing and social work at UNC-P.

We used perspectives gained from interviewees, guidance from conversations with UNC-P leadership and our own workforce expertise to select five health professional degree programs for in-depth examination: optometry, occupational therapy, physician assistant (PA) studies, nurse practitioner (NP) studies, and nutrition/dietetics. This in-depth analysis drew on licensure data maintained by the NC Health Professions Data System (HPDS). Since the HPDS does not include information on registered dietitians (RDs), we requested licensure data from the NC Board of Dietetics/Nutrition.[c] Descriptive statistics and cartographic analyses were used to analyze and display data on the supply, distribution, diversity and practice characteristic of each profession. We also created maps of the location of health professional schools in the state and the accreditation status of those schools. In the case of optometry, the map is national since NC does not have an optometry school.

To supplement these quantitative analyses, we conducted 16 additional interviews with representatives from health professional educational institutions, licensing boards, health professional

b Representatives from UNC-P provided the Sheps Center with a list of counties they use to define the UNC-P region. These include: NC: Anson, Bladen, Brunswick, Columbus, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Sampson, Scotland; SC: Chesterfield, Darlington, Dillon, Florence, Horry, Marlboro, Marion

c While we heard about some need for physical therapists in the region, we did not investigate a new physical therapist program at UNC-P because of the school's existing relationship with East Carolina University for physical therapist training.

associations, lobbyists, and national associations and accreditation agencies to gather further insight about whether a specific profession might be a good fit for a new program at UNC-P. Six of the interviews were specific to optometry, three to occupational therapy, three to dietetics, and four to NP and PA studies. Because NPs and PAs often fill similar roles, discussions of one profession tended to include information about the other.

When we initially outlined the analysis plan for this study, we proposed identifying a short-term, medium-term, and long-term plan for UNC-P to serve regional health needs through a flagship health professions program (e.g.,optometry), extensions from programs already at UNC-P (e.g., health care social worker), and alternative educational approaches including certification programs (e.g., care coordination and informatics). This approach proved difficult because we were unable to identify an obvious candidate for a flagship program. Therefore, we performed an in-depth analysis of the five programs identified above, and we evaluated both these and additional health professions programs according the following criteria: total supply in NC, supply per 10,000 population, supply per 10,000 population in the UNC-P region, percent of workforce that is from an underrepresented minority, degree required to enter the workforce, total number of existing programs in NC, number of existing private vs. public programs in NC, availability of preceptors/ preceptor sites, student demand for program, job availability, and average salaries. The matrix provides a structured way for UNC-P to compare the pros/cons of different programs across the same criteria, enabling decision makers to consider their current and future fit at the university.

If the NC General Assembly decides to invest in the development of health science programs at UNC-P, they may want to evaluate the return on investment for these funds. To help UNC-P respond to such a request, we developed a brief evaluation framework that would enable UNC-P to measure retention in the region, retention in NC, etc. UNC-P can use this framework to develop the data and mechanisms needed to track outcomes of graduates to assess the degree to which the new program has influenced regional health outcomes, workforce supply, and workforce diversity.

Study Findings

Key Informant Interview Perspectives

Environment/Background

Overall, interviewees were positive about the potential for UNC-P to create a new school of health sciences in fields not currently offered by the university. Several individuals mentioned the challenging health issues faced by people living in Robeson County and surrounding areas. There was a sense that expanding the health programs would allow the university to better address the health needs of the region, offer additional well-paying careers to students served by the university, and serve as a positive economic driver for the region. One interviewee noted that UNC-P is well-positioned to grow since it is one of the three campuses in the UNC system chosen for the pilot program offering low tuition to in-state students ($500 per year). This development appears likely to generate interest in the university from a larger pool of potential students, particularly those from low income households.

Although interviewees were generally positive about a new school of health sciences at UNC-P, they also noted the competition such programs would face, given the existence of other health programs in the region, particularly at Campbell University and East Carolina University (ECU), and potentially Methodist University in Fayetteville. The region already hosts many learners which makes identifying quality training sites challenging. The preexisting footprint of these programs could present an obstacle for UNC-P as it seeks clinical sites for students. Statewide,

health education programs report difficulties finding preceptorships for learners. This issue is a key priority for the NC Area Health Education Centers (AHEC) program which is working with the UNC of Board of Governors to address these challenges.[31]

Potential New Programs

Interviewees noted that the region could benefit from new programs in the following areas:

1) Optometry – In the absence of prompting, no interviewee mentioned vision care as a priority need for the region. When asked about a potential optometry school, three interviewees suggested there could be a need for more optometrists in the state, primarily based on assumptions about the aging of the population increasing the need for eye services and high rates of diabetes in the region and state generating the need for diabetic retinal screening. One interviewee noted that eye care is a priority of Health Resources and Services Administration (HRSA) and for federally funded community health centers.

2) Nutrition/Dietetics – Both the county health department director and the regional AHEC director noted the need for more dietitians in public schools, in public health, and in acute care settings. Private universities in NC have not added nutrition degree programs. Compared to other health professions, salaries in this field are relatively low.

3) Physical Therapy and Occupational Therapy – Interviewees mentioned occupational therapy and physical therapy as possibilities for a UNC-P program due to the needs of the aging population in the region. They also noted the difficulty in attracting OTs and PTs to rural communities, and UNC-P's historic commitment to recruiting students from its rural region would give it an advantage in addressing rural placement of graduates.

4) Family Nurse Practitioner (FNP)/Psychiatric Nurse Practitioner – The need for a nurse practitioner program was only mentioned by one interviewee who made a strong case for the utility of FNPs who also have training as psychiatric NPs. The interviewee suggested that such an NP is ideal for rural clinics, Federally-Qualified Health Centers (FQHCs) and primary care practices since they can deliver both primary care and behavioral health services. Since UNC-P already offers a master of science in nursing (MSN) through its nursing department, adding a primary care and/or behavioral health track may be relatively straightforward. Through the existing department of Social Work, UNC-P has faculty who could teach some or all of the behavioral health component of a psychiatric NP curriculum. In addition, the nursing department may wish to seek collaboration with the psychiatric NP program at UNC-Chapel Hill or East Carolina University (ECU).

5) Health Care/Practice Management – The need for more people trained in health care management, particularly for rural practices, was raised by several individuals interviewed, and it was expressed in various forms. One interviewee noted the need for a master of health administration (MHA) program with a focus on outpatient practices, FQHCs, and rural clinics. Another interviewee noted the high demand for people with health care financial management skills and the jobs that are going unfilled in this field.

6) Clinical Informatics/Health Information Technology (HIT) – Several of those interviewed noted the growing and vital role that clinical informatics is playing in health care field and the fact that it will be even more important in the future. UNC-P already offers a computer science degree, so an added emphasis in health could be possible in that department rather than adding a new separate department.

7) Public Health and Prevention – Several of those interviewed noted the importance of public health and prevention as a part of all health care, and that there are available jobs in health education, public health management and related fields. One interviewee noted an increasing interest among students in opportunities for dual degrees in social work and public health.

While it may not be feasible to start entirely separate programs in health care management, informatics and public health and prevention, UNC-P may want to consider incorporating these concepts and skills in all its health programs.

Overarching Issues

Several of those interviewed raised common themes that are not discipline-specific issues but cut across all programs. If addressed successfully, these opportunities for innovation could distinguish UNC-P from other health science schools in the state.

1) Interprofessional Education and Team-Based Care – Several of those interviewed spoke to the importance of creating new educational programs and adapting existing programs to use inter-professional education to prepare graduates to deliver team-based care. New models of care that place greater emphasis on integrated care, population health, and prevention, require care that is delivered by a health care team. Existing schools struggle to break the old siloed models of health professions education. UNC-P has the opportunity to create an inter-professional educational model from the ground up as it considers ways to structure didactic and clinical practice curriculum it will provide in new programs. The University of Minnesota's Center for Interprofessional Education and Practice offers resources, evidence and best practices for building inter-professional models of education (see https://nexusipe.org).

2) Collaboration with Community Colleges – UNC-P should maximize its collaboration with Robeson Community College and other similar colleges in the region to facilitate ease of entry into its health science programs. The Department of Nursing already offers a registered nurse to bachelor of science in nursing (RN to BSN) program, and other similar programs could be developed to maximize opportunities for community college students in the region to enter health careers. One interviewee mentioned a new program at the Medical University of South Carolina in Charleston that offers a bachelors in health sciences to students from community colleges as a bridge degree for students to enter health programs in allied health and other fields that require a graduate degree. Although this model may not be the one used by UNC-P, the new school should clearly designate pathways that make it easy for community college graduates to access its programs.

3) Diversity – UNC-P was founded to serve the American Indian population of Robeson County. It has a long history of commitment to increasing the diversity of college graduates, and in the case of its health programs, increasing the diversity of the health workforce. The creation of a school of health sciences would permit the university the opportunity to build on its historic mission to assure that its student body and its graduates are reflective of the rich diversity of the region it serves. For example, occupational therapy assistant programs at Robeson Community College might provide a pipeline of students if UNC-P develops an OT program. This pipeline could greatly increase the diversity of the health workforce as it has in other therapy professions. Data from the HPDS show that 2% of NC's respiratory therapists identify as American Indian, 58% of whom trained at Robeson Community College (**Figure 3**).

Despite strong competition in health professions education from other universities, both public and private, interviewees felt that there are unique opportunities for UNC-P to create programs that are distinct from those at other universities in the region and state.

Figure 3a. Race of Respiratory Therapists in North Carolina, 2016

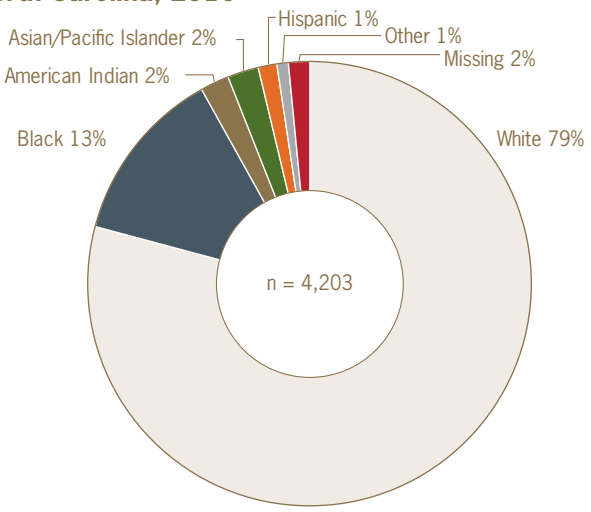
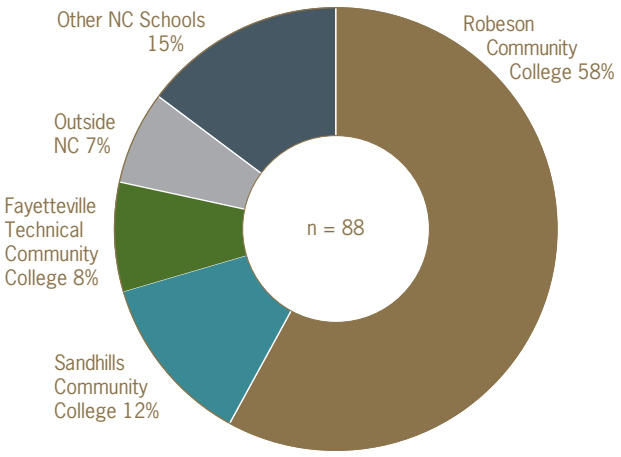


Figure 3b. American Indian Respiratory Therapists Practicing in North Carolina, 2016



Sources: North Carolina Health Professions Data System with data derived from North Carolina Respiratory Care Board, 2016. Figures include active, instate respiratory therapists licensed as of October 31, 2016. Produced by: Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

In-depth investigation of five potential programs for UNC-P

Sheps staff selected five programs for in-depth investigation. Optometry and occupational therapy were selected based on key informant interviews and conversations with UNC-P leadership. Optometry was selected based on keen interest in the state in developing a program as evidenced by the bills introduced (but not passed) during the 2017 legislative session that appropriated funds for an optometry school at UNC-P. Nutrition and dietetics and NP studies were selected based on key informant interviews. PA studies were selected based on conversations with interviewees, data that suggested strong current demand for PAs and the potential role UNC-P could play in diversifying the PA workforce.

We did not pursue in an in-depth investigation of healthcare/practice management, health informatics, or public health and prevention degrees in depth, as we read our charge to be focused on a health sciences school primarily engaged in producing direct care, clinical health professionals.

Optometry

NC Optometry Workforce Trends

Exhibit 1 shows a selection of information on the optometry profession, and the supply, distribution and demographic characteristics of optometrists practicing in North Carolina. Despite the lack of an optometry school in the state, NC has historically had a steady flow of new licensees moving into the state. HPDS data show that while the overall number of optometrists has increased by 42.2% over the past 16 years (**Figure 6**), the rate per capita has hovered steadily around 1.1 optometrists per 10,000 population (**Figure 7**). This rate is similar (1.0 optometrists per 10,000 population) in for the 10 NC counties in the UNC-P region. Omitting Cumberland County (where Fayetteville, a major population center, is located), the ratio of optometrists drops to 0.9 per 10,000 population. Data from the NC

Exhibit 1.

Optometrist Workforce and Education Programs, 2016

Profession Description: Optometrists examine eyes, diagnose and treat eye conditions, evaluate vision, and write prescriptions for glasses and contacts. Optometrists obtain a four-year doctor of optometry degree (O.D) following a bachelor's degree. Optometrists are referred to as "Doctor," but have a different scope of practice than ophthalmologists, the physicians who specialize in eye health and eye surgery. Many optometrists work in stand-alone clinics, chain stores that sell eyeglasses and contacts, or co-located ophthalmology and optometry practices. According to data from the Bureau of Labor Statistics, the mean wage for optometrists in NC was $134,000 in 2016.[32]

There were 1,159 licensed optometrists in active practice in NC in 2016.
There are 23 optometry schools in the United States. None are in NC.

Figure 4. Optometrists per 10,000 Population in 2016

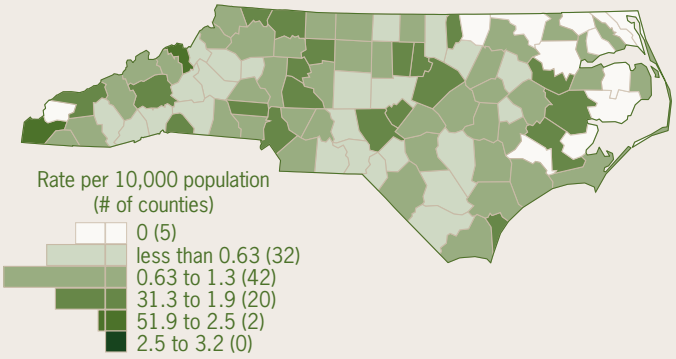


Figure 5. Optometry Programs, USA including Puerto Rico, 2017

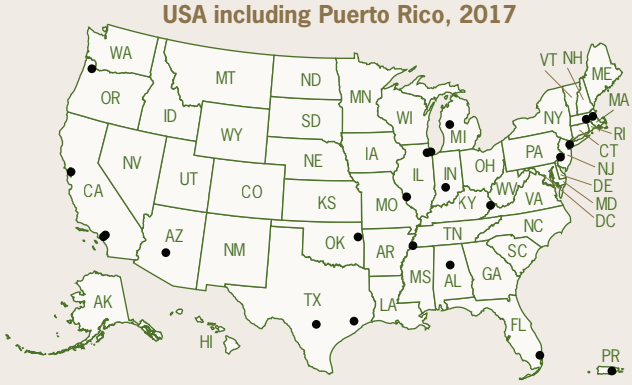


Figure 6. Optometrists per 10,000 Population in North Carolina from 2000 to 2016

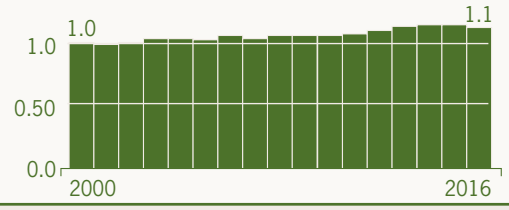


Figure 7. Total Number of Optometrists in North Carolina from 2000 to 2016

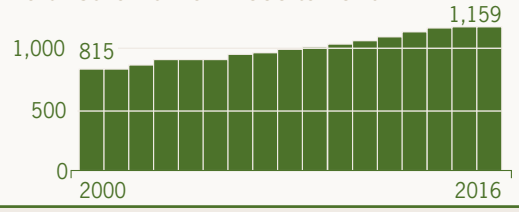


Figure 8. Active, Licensed Optometrists by Age Group, North Carolina, 2016

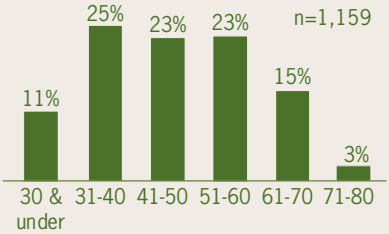
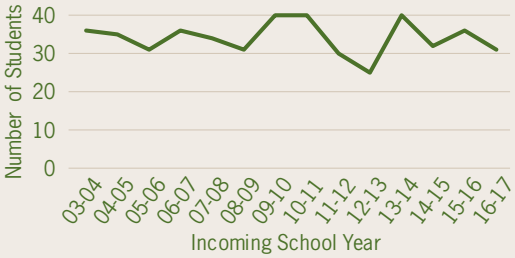


Table 1. Diversity of the NC Population and Optometrists, 2016

NC Population (n=10,146,788)	Optometrists (n=1,159)	
22%	3%	Black/African-American
9%	1%	Hispanic
3%	6%	Asian/Pacific Islander
2%	3%	American Indian/Alaskan Native
2%	0.3%	Other/Multiracial
36%	**12%**	**Nonwhite**
64%	**88%**	**White**

Figure 9. First Year North Carolina Resident Enrollment in Optometry School, 2003-2016



Notes: Data include active, licensed optometrists in practice in North Carolina as of October 31 of each year. Optometry enrollment data include all NC permanent residents entering their first year in optometry school, 2003–2016. **Sources:** Optometrist workforce data from the North Carolina Health Professions Data System, https://nchealthworkforce.sirs.unc.edu, with data derived from the North Carolina Board of Optometry. Population data downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. Optometrist program data from the Accreditation Council on Optometric Education, Accredited Professional Optometric Degree Programs, November 27, 2017, accessed November 30, 2017 from https://www.aoa.org/Documents/students/od_directory_2017_11_27.pdf. Optometry enrollment data derived from the Association of Schools and Colleges of Optometry, 2003 –2016, reports accessed November 30, 2017 at: https://optometriceducation.org/student-data-reports/. **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.

Board of Optometric Examiners indicate that, compared to prior years, there has been a decline in the application rate for new licensees from roughly 55 annually to roughly 30 annually since 2015.

In 2016, there were twelve counties in the state, mostly in the northeast, without an optometrist reporting a primary practice location. However, because we do not have data on multiple practice locations, we are unable to determine how much service coverage optometrists provide in those counties. For example, an optometrist who practiced three days a week in Cumberland County and two days a week in Bladen County would only be counted in HPDS data as a Cumberland County optometrist.

Data from 2016 indicate that the state's optometrist workforce is relatively young, with an average age of 47. Of those who reported their age, 60.6% (n=649/1,072) are younger than 50 (**Figure 8**).

The optometrist workforce in NC is majority white (88.1%, n=1,021 of 1,159). In 2016, 2.9% (n=33) of NC optometrists identified as Black, compared to 22.2% of the state's population (**Table 1**).

As noted earlier, one key informant noted that eye care is a priority of HRSA and for federally funded community health centers. HRSA data show that of the 1,771,333 visits to health centers in NC in 2016, there were 542 visits to optometrists in 2016 and 94 visits to ophthalmologists, which translates to 0.04% of all health center visits.[33] Vision care is not offered at most FQHCs in NC. Uniform Data System (UDS) data show that only three NC FQHC programs reported data for vision services; however, other health centers may contract with vision services providers or refer out for these services.[34] For example, Rural Health Group, in the northeastern part of the state, has a telehealth arrangement, capturing retinal photos at their clinic and sending them to a remote ophthalmologist who reads the images (ibid).[35]

Demand

There is little reliable data available about demand for eye care services. We were unable to locate data in the published literature on demand. Experts with whom we spoke advised that these data are unavailable beyond estimates from CDC on diabetic retinopathy, a possible complication of diabetes that can lead to retinal damage or blindness. The CDC cites 2008 BRFSS data showing that 18.5% of adults in NC aged 40 or older reported having diabetic retinopathy.[36] We did not find more recent or granular diabetic retinopathy data for NC on the CDC website. The American Diabetes Association recommends diabetic retinopathy screening annually for patients with diabetes and evidence of diabetic retinopathy, and every two years for patients with type 2 diabetes and no evidence of diabetic retinopathy.[37]

In 2014, the American Optometric Association commissioned a study about the eye care workforce from an outside consulting group,[38] but the methodology of the study received heavy criticism.[39] Experts with whom we spoke advised that the AOA study is not perceived as a reliable source of information due to methodological issues, but that additional sources of data on demand for the eye health workforce are unavailable.

We have not seen a similar call in the academic literature, white papers, or public media sources for better access to vision care in rural areas as with calls for better access to primary care, oral health care, and behavioral health care. It is not clear whether the absence of attention to eye care services is due to a lack of demand for these services or to vision care being an understudied area of healthcare demand.

In 2015, following a legislative mandate, the Sheps Center conducted a study on the establishment of a potential optometry school in NC.[40] That report included a summary of an optometry expert advisory group discussion that described the job

market in NC as competitive, noting that while there were jobs available, they were not always in the locations where optometrists preferred to work. As of November 2017, the NC Board of Optometric Examiners indicated that they are frequently approached by employers who wish to hire optometrists and seek job applicants. Outside of these qualitative indicators, we were unable to identify a data source to well assess the job market for optometrists. In 2015 and now, we heard a similar message from key informants: the optometry field is changing. In years past, most optometrists were self-employed and made most of their income selling glasses and contacts. Now, with chain stores and internet sellers moving into this market, optometry is moving more to a medical services model rather than relying on sales of glasses and contacts.

Scope of Practice

In our previous report we noted that NC has a reputation as a progressive state in which to practice optometry. During interviews for the UNC-P study, we learned that this was historically true, largely due to NC's status as the first state to allow optometrists to write therapeutic prescriptions during the 1970s. However, in recent years, other states have broadened the scope of practice of optometrists, and NC is no longer considered one of the most progressive states in which to practice. We are unable to determine a direct link between scope of practice and provider supply, or the extent to which scope of practice may influence where out-of-state trainees wish to practice. Bills seeking to expand optometrist scope of practice that would allow some types of surgeries (SB 342, HB 36) were introduced in the NC General Assembly in the 2017 legislative session but did not pass.

The University of Pikeville Kentucky College of Optometry (KYCO) is a potential model for an optometry school at UNC-Pembroke. KYCO is in a rural area with a mission to both train optometrists and serve the rural eye care needs of the Appalachian region. Much of the region's population is medically underserved and lives in poverty. To better facilitate care for this population, students take classes emphasizing cultural competence, social determinants of health, and the religious history of the region in addition to optometry courses. There are 60 students in each KYCO class year. One asset the University of Pikeville has that UNC-P does not is a school of osteopathic medicine. The optometry school has been able to leverage this asset for interprofessional training, where both osteopathic medical students and optometry students take introductory courses together.

Student Demand

In the 2015-2016 admissions cycle, 2,812 individuals applied to US optometry schools.[41] The data show that 1,871 first-year optometry students began school in the fall of 2016,[42] meaning that 66.5% of those who applied to optometry schools matriculated, a rate of 1.5 applicants for every seat.[43]

All optometry school applications are completed electronically through the Optometry Centralized Application Service, whereby one application is sent to multiple optometry schools. During the 2015-2016 cycle, the highest admissions rates were at Salus University Pennsylvania College of Optometry and New England College of Optometry in Massachusetts, both at 41% (477 out of 1155 applicants and 337 out of 815 applicants, respectively), while the University of the Incarnate Word Rosenberg School of Optometry in Texas had the lowest acceptance rate (11%, n=67 out of 585).[44] The University of Pikeville Kentucky College of Optometry which has a model focused on rural optometry accepted 23% of applicants (94 of 401). On average, students applied to 4.8 schools.

Data from the Association of Schools and Colleges of Optometry indicate that the number of NC residents enrolling in optometry schools outside the state has been relatively steady since 2003, with an average of 30 students enrolling each year (**Figure 9, page 9**). It is possible that an in-state

optometry school would increase the number of NC residents entering the profession, both due to an increase in the visibility of the profession, ease of attendance in a nearby location, and in-state tuition. Regardless, compared to the numbers of NC students currently applying to other health professional degree programs, such as physician assistant and nurse practitioner programs, NC student demand for optometry training appears to be much smaller.

Training Sites for Students

During the fourth year of optometry school, students complete supervised training in rotations at clinical sites called externships. Optometrists in NC offer externships for students in optometry programs outside the state. Because NC does not currently have an optometry school, it seems likely that a new optometry school would be able to develop relationships with optometry training sites within the state with relative ease.

Faculty Recruitment

Conversations with key informants indicated that there would be no concerns about recruiting faculty to a new school in NC if the school is in an urban area. Two interviewees suggested that faculty recruitment to UNC-P might be more difficult than to Wingate University, but still feasible.

Occupational Therapy

NC Occupational Therapist Workforce Trends

Exhibit 2 shows a selection of information on the occupational therapy (OT) profession, NC education programs, and the supply, distribution and demographic characteristics of OTs practicing in North Carolina. According to HPDS data, in 2016, there were 3,304 licensed, active OTs practicing in NC, with a state average of 3.3 per 10,000 population. The state's occupational therapist workforce has grown 62% since 2006, the first year the HPDS began tracking data on this profession. The UNC-P region has fewer OTs per capita than the state mean, with 2.2 OTs per 10,000 population (1.9 per 10,000 when Cumberland County is not included).

The OT workforce in NC is majority female (89.4%, n=2,955) and is relatively young, with an average age of 41.3 years old. Most OTs (78.8%, n=2,602) are younger than 50 years old (**Figure 14**).

Like most of NC's heath professional workforces, OTs in the NC workforce are not representative of NC's population. Seven percent (n=225) of OTs in NC self-identify as Black, compared to 22.2% of the state's population. Similarly, less than 1% of OTs identify as Hispanic or American Indian (n=30 and 3, respectively), compared to 9% and 3% of the state's population (**Table 2**).

Many of NC's OTs work in geriatrics (24.9%, n=822) or pediatrics (24.5%, n=808) (**Figure 15**).

Key informants advised that it is hard to recruit OTs to positions in rural areas. Occupational therapy assistants (OTAs) are easier to recruit because they are often trained at community colleges and prefer to stay local. Interviewees advised that retaining OTs in rural areas is also difficult, and there is a lot of "churn" in the workforce as OTs change jobs. One employer advised that new graduates who are hired to work in rural settings frequently leave their positions after roughly a year, usually after obtaining a position in an urban area. Jobs in urban areas often require more experience and have lower salaries than do jobs in rural areas, but are perceived as more desirable.

Occupational Therapist Education

Entry-degree requirements for occupational therapists are in a time of transition. Currently, the requirements specify either a master's degree or a doctoral degree, either a PhD or an Occupational Therapy Doctorate (OTD) to enter practice as an OT. However, in October 2017, the American

Exhibit 2.

Occupational Therapy Workforce and Education Programs, 2016

Profession Description: Occupational therapists (OTs) help patients participate in activities of daily life when functioning is impaired by physical or mental illness, injuries, aging, or developmental disabilities. OTs work in a wide variety of settings, including hospitals, clinics, nursing homes, day and rehabilitation centers, or in patient's homes. According to data from the Bureau of Labor Statistics, the average salary for OTs in NC in 2016 was $81,570.[45] Most enter the profession with a master's degree, although the field is transitioning to a doctoral degree.

There were 3,304 licensed OTs in active practice in NC in 2016.
There are five accredited OT programs in NC; three more have applied for accreditation.

Figure 10. Occupational Therapists per 10,000 Population in 2016

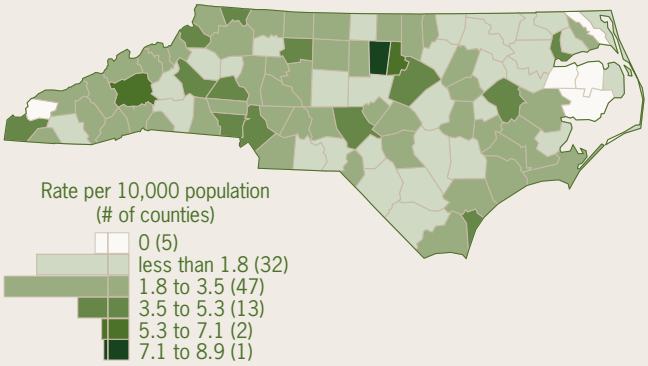


Figure 11. Occupational Therapy Programs, North Carolina, 2017

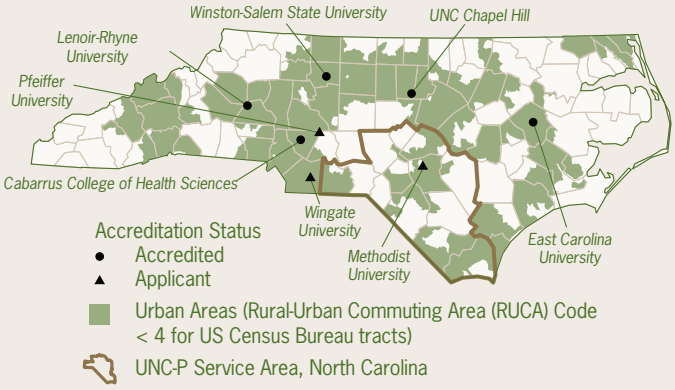


Figure 12. Occupational Therapists per 10,000 Population in North Carolina from 2006 to 2016

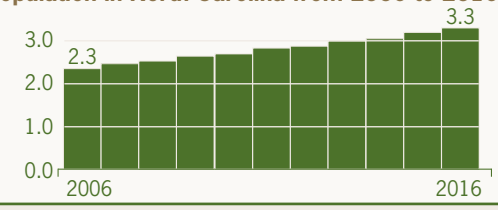


Figure 13. Total Number of Occupational Therapists in North Carolina from 2006 to 2016

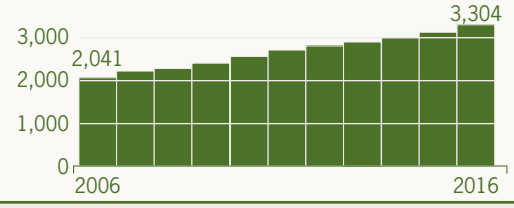


Figure 14. Active, Licensed Occupational Therapists by Age Group, NC, 2016

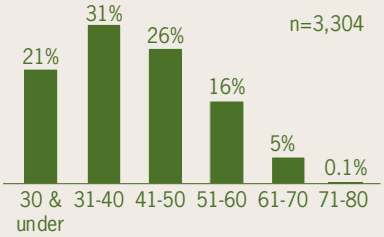
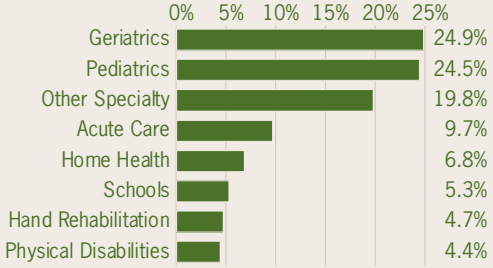


Table 2. Diversity of the NC Population and Occupational Therapists, 2016

NC Population (n=10,146,788)	Occupational Therapists (n=3,304)	
22%	7%	Black/African-American
9%	1%	Hispanic
3%	3%	Asian/Pacific Islander
2%	0.1%	American Indian/Alaskan Native
2%	2%	Other/Multiracial
36%	**12%**	**Nonwhite**
64%	**84%**	**White**

4% of OTs (n=133) were missing race data.

Figure 15. Specialty Practice Area for Active, Licensed Occupational Therapists, NC, 2016



Notes: Data include active, licensed occupational therapists in practice in North Carolina as of October 31 of each year. **Sources:** Occupational therapist workforce data from the North Carolina Health Professions Data System, https://nchealthworkforce.sirs.unc.edu, with data derived from the North Carolina Board of Occupational Therapy. Population data downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. Occupational therapy program data from the American Occupational Therapy Association, accessed November 30, 2017 from https://www.aota.org/Education-Careers/Find-School.aspx. RUCA data from the USDA Economic Research Service, https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx. **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.

Occupational Therapy Association's Accreditation Council for Occupational Therapy (ACOTE), which accredits US occupational therapist training programs, announced that beginning in 2027, the entry degree for occupational therapists will be a doctoral level degree.[46] The doctoral level minimum entry requirement for OTs will be enforced beginning in July 2027.[47] Because the OTD requires at least three years of academic work to complete the degree, the last cohorts entering master's level programs will begin training in fall 2025, but the expectation is that most OT training programs will transition to the doctoral level before then. If UNC-P plans to pursue a OT program, it seems prudent to plan for a doctoral level program.

As of the time of this report, NC has five fully accredited occupational therapy departments/programs. Three additional schools have applied for accreditation for occupational therapy: Methodist University, Pfeiffer University, and Wingate University. See **Figure 11** and **Table 3** for locations of OT programs in NC. High Point University has also expressed interest in developing a DOT program and will decide whether to move forward at their March 2018 Board of Trustees meeting.[48,49] Notably, only three of the eight OT schools in NC are located at public universities offering in-state tuition.

As of 2016, 36.8% (n=1,216) of NC's occupational therapists reported graduating from an NC school, with 10.2% (n=337) training in a state bordering NC (**Figure 16**).

Cost of attendance for an OT program at a private university in NC is greater than at a public university. For example, costs for five semesters to complete an OT master's degree at Winston-Salem State University are $24,965 for NC residents and $49,760 for out-of-state students, including fees and health insurance.[50] At Lenoir-Rhyne University, tuition for an OT master's degree is $57,750, which does not include university fees.[51]

Training Sites for Students

Interviewees noted difficulties placing students in OT internships. Historically, OT students were placed in internships at no cost to the program, but now some facilities are beginning to charge programs to host students. Internships in rural settings are particularly difficult because of a lack of housing for students.

Student Interest

National data show that OT student enrollment decreased in the mid-2000's, but began to increase again following a low in 2004 (**Figure 17, Table 4**).

Nationally, enrollment in master's level OT programs grew 49% between 2007 and 2014, while enrollment in doctoral level programs grew by 158%. With the move to the OTD degree as the entry degree for practice, rapid growth in doctoral OT program enrollment will likely to continue.

Data from the American Occupational Therapy Association show that despite the increase in the number of seats available in OT programs, admission to those programs became competitive over the five-year period between 2010 and 2014 because of the increase in overall applicants.

There were 1.8 applicants per seat in OT doctoral programs in 2010, compared to 5.8 applicants per seat in 2014. **Table 5** shows that, while 48% of applicants were admitted to doctoral OT programs in 2010, just 17% of applicants were admitted in 2014, even though the number of seats in doctoral programs doubled. Similarly, there were 3.0 applicants per seat in master's level OT programs in 2010, and 5.8 applicants per seat five years later. While 33% of applicants were admitted to master's level OT programs in 2010, 17% were admitted in 2014, despite an 19% increase in the number of available seats in those programs.

Exhibit 3.

Occupational Therapy Education Programs and Trends

In 2016, 37% (n=1,216) of occupational therapists practicing in North Carolina reported graduating from a North Carolina school, and 10% (n=337) trained in an adjacent state.

Figure 16. Active, Licensed NC Occupational Therapists by Occupational Therapy School State, 2016

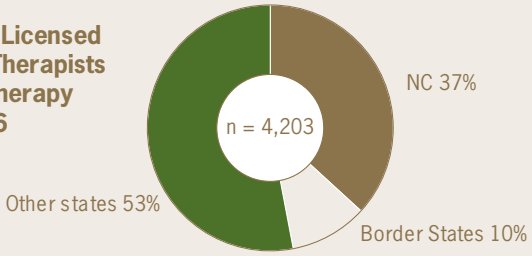


Table 3. First-Year Class Sizes of North Carolina Occupational Therapist Programs

University	OT Class Size	Program Level
Cabarrus College of Health Sciences	34	Master's-level
East Carolina University	25	Master's-level
Lenoir-Rhyne University	29	Master's-level
Methodist University	30	Doctoral-level
Pfeiffer University*	N/A	Master's-level
University of North Carolina - Chapel Hill	22-24	Master's-level
Wingate University	N/A**	Doctoral-level
Winston Salem State University	28	Master's-level

*As of Dec 18 2017, the American Occupational Therapy Association lists Pfeiffer University as an applicant for an entry level DOT program.
**Wingate University's program will start in 2019.

Figure 17. U.S. Trends in Occupational Therapist Enrollment, 2000-2014

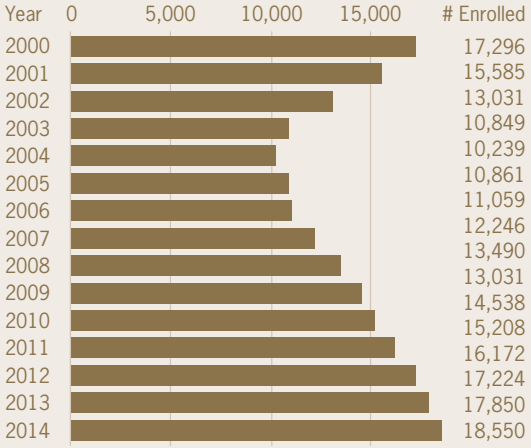


Table 4. U.S. Trends in Number of Students Preparing for Entry into Practice as an Occupational Therapist, 2007-2014

	2007	2008	2009	2010	2011	2012	2013	2014
Master's	11,970	13,187	14,160	14,825	15,767	16,799	17,342	17,837
Doctorate	276	303	378	383	405	425	508	713
Total	12,246	13,490	14,538	15,208	16,172	17,224	17,850	18,550

Table 5. U.S. Occupational Therapy Applications and Admissions, 2010-2014

	Doctoral-degree-level programs for occupational therapy students				Master's-degree-level programs for occupational therapy students			
Year	Admission Slots	Applications Submitted	# Students Admitted	% Students Admitted	Admission Slots	Applications Submitted	# Students Admitted	% Students Admitted
2010	127	226	108	48%	5,937	17,789	5,846	33%
2011	128	317	117	37%	6,193	23,044	6,155	27%
2012	122	514	120	23%	6,406	28,964	6,292	22%
2013	183	721	160	22%	6,726	34,699	6,611	19%
2014	255	1,481	248	17%	7,070	40,839	6,945	17%

Sources: Table 3: Program websites accessed October 30, 2017 at: https://www.carolinashealthcare.org/education/cabarrus-college-of-health-sciences/Academic-Programs/Occupational-Therapy-Assistant; http://www.ecu.edu/cs-dhs/ot/rates.cfm; http://www.lr.edu/ot; http://www.methodist.edu/otd-overview; https://www.med.unc.edu/ahs/ocsci/Prospective%20students/ms-program-description/faqs-about-the-ms-program; https://www.wingate.edu/wu-adding-ot-doctoral-program; https://www.wssu.edu/about/points-of-pride/index.html. Figure 15: Figure 16, Tables 4-5: Harvison N. 2011, 2015. Division of Scientific Affairs, American Occupational Therapy Association. Academic Programs Annual Data Reports, Academic Year 2010-2011 and 2014-2015. Accessed December 13, 2017 at: https://www.aota.org/-/media/Corporate/Files/EducationCareers/Accredit/47682/2010-2011-Annual-Data-Report.ashx and https://www.aota.org/~/media/Corporate/Files/EducationCareers/Educators/2014-2015-Annual-Data-Report.pdf.

Table 6. Faculty at U.S. Occupational Therapy Education Programs, 2014-15

	Doctoral Degree Programs				Master's Degree Programs			
	Positions	% of Total FTEs	Vacant	% of Total Vacant FTEs	Positions	% of Total FTEs	Vacant	% of Total Vacant FTEs
FTE - Full time	127	226	108	47.8%	5,937	17,789	5,846	32.9%
FTE - Part Time	122	514	120	23.3%	6,406	28,964	6,292	21.7%
FTE - Adjunct	255	1,481	248	16.7%	7,070	40,839	6,945	17.0%

Source: Harvison N. 2015. Division of Scientific Affairs, American Occupational Therapy Association. Academic Programs Annual Data Report, Academic Year 2014-2015. Accessed December 13, 2017 at: https://www.aota.org/~/media/Corporate/Files/EducationCareers/Educators/2014-2015-Annual-Data-Report.pdf.

Faculty Recruitment

As of December 2017, the AOTA website lists 17 accredited doctoral level OT programs nationwide, 22 with developing (pre-candidacy or candidate) accreditation status, and 42 with applicant accreditation status, including the three new OTD programs in NC. National data from the AOTA for the 2014-2015 school year, which are the most recent data available, show a vacancy rate of 4% (n=3) for full-time OTD faculty and a vacancy rate of 9% (n=107) for full-time master's degree faculty (**Table 6**). Given the rapid expansion of OTD programs, the low vacancy rate reported in 2014 of three full time faculty in OT doctoral programs is unlikely to still be accurate. Similarly, as of December 2017, there were 175 accredited OT master's level programs listed on the AOTA website, 11 with developing accreditation status, and 19 with applicant accreditation status. As many of these programs shift to the doctoral level degree, there may be more pressure on faculty recruitment for OT faculty trained at the doctoral level.

Two interviewees suggested that for practical purposes, it would not make sense to open a master's level OT school at UNC-P, given the profession's move to the doctoral degree. They noted that recruitment of faculty is already an issue in NC, and with the move to the doctoral degree, most schools expect faculty recruitment to become more challenging. At least 50% of faculty must have doctoral degrees to meet accreditation requirements for master's programs, and all faculty must hold doctorates for doctoral level OT programs.[52] Key informants advised that OT faculty at the PhD level are difficult to recruit, and established OT schools are reluctant to hire OTD faculty because they have less experience teaching. New programs may be more willing to hire OTD faculty out of necessity. One interviewee shared stories of generic mailings soliciting applications to faculty OT positions in NC, suggesting that faculty recruitment challenges may already exist in the state.

Nutrition and Dietetics

Exhibit 4 shows a selection of information on the nutritions and dietetics profession, and the supply, distribution and demographic characteristics of registered dietitians (RDs) practicing in North Carolina. According to data from the NC Board of Dietetics/Nutrition, there are 2,355 active, licensed RDs in NC with a business address in the state. At the state level, there are roughly 2.3 dietitians per 10,000 population. The RD workforce is majority female (95.6%, n=2,251) and is relatively young. Slightly fewer than half (44.6%, n=1,051) of the RD workforce is 40 years old or younger (**Figure 18**).

Like other health professions, RDs are less diverse than the state's population, with 4.2% (n=100) identifying as Black, 1.1% (n=25) identifying as Hispanic, and 0.4% (n=9) identifying as American Indian (**Table 7**).

Roughly half of NC's licensed RDs (44.2%, n=1,040) report a specialty in clinical nutrition, primarily working with patients. Private practice (15.2%, n=359) and community nutrition (14.4%, n=340), are the next most common specialties (**Figure 19**).

Exhibit 4.

Nutrition and Dietetics Workforce and Education Programs, 2017

Profession Description: Registered Dietitians (RD) are experts in food and nutrition who plan meals and nutrition programs to meet the health needs of patients and communities. An RD is a licensed health professional who has graduated from an accredited nutrition and food sciences program, completed an accredited dietetic internship under supervision, and has passed a national exam. RDs work in hospitals and clinics, long term care facilities, eating disorder treatment centers, school districts, government agencies, food companies, and private practice. They may work individually with patients to plan meals and nutrition programs, or in large organizations planning meals for dining services. The mean salary for dietitians and nutritionists in NC in 2016 was $53,480.[53]

There are 2,355 licensed RDs in active practice in NC in 2016, and roughly 2.3 dietitians per 10,000 population.

Figure 18. Active, Licensed Dietitians by Age Group, NC, 2016

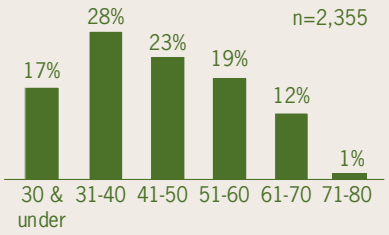


Table 7. Diversity of the NC Population and Dietitians, 2017

NC Population, 2016 (n=10,146,788)	Dietitians, 2017 (n=2,355)	
22%	4%	Black/African-American
9%	1%	Hispanic
3%	3%	Asian/Pacific Islander
2%	0.4%	American Indian/Alaskan Native
2%	1%	Other/Multiracial
36%	**9%**	**Nonwhite**
64%	**90%**	**White**

8 RDs (0.3%) were missing race data.

Figure 19. Specialty Practice Area for Active, Licensed Dietitians, NC, 2017

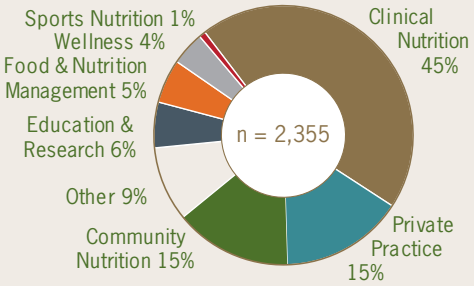


Figure 20. Dietitian Programs, North Carolina, 2017

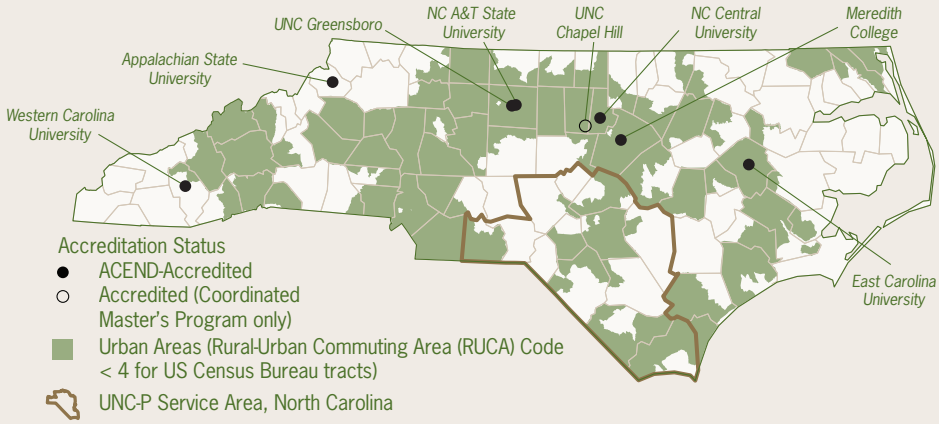
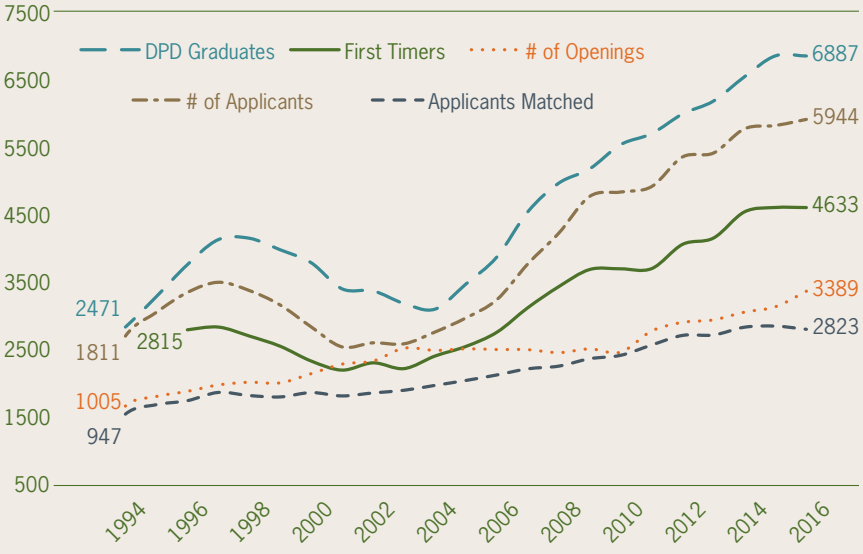


Figure 21. Supply and Demand for Dietetic Internships Since 1993



Sources: Figure18, 19; Table 7: North Carolina Health Professions Data System, https://nchealthworkforce.sirs.unc.edu, with data derived from the North Carolina Board of Dietetics/Nutrition. Data include active, licensed registered dietitians with a business address in North Carolina as of December 12, 2017. Population data downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. Figure 20: Academy of Nutrition and Dietetics, Accreditation Council for Education in Nutrition and Dietetics (ACEND), Accredited Programs page, accessed November 30, 2017 from http://www.eatrightpro.org/resources/acend/accredited-programs. RUCA data from the USDA Economic Research Service, https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx. Figure 21: Academy of Nutition and Dietetics, Accreditation Council for Education in Nutrition and Dietetics. Availability of Dietetic Internship Positions webpage, accessed December 10, 2017 at: http://www.eatrightpro.org/resource/acend/students-and-advancing-education/dietetic-internship-match-students/availability-of-dietetic-internship-positions.

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

Dietitian Education

At present, the minimum education for an RD license is a bachelor's degree from a program accredited by the Accreditation Council for Education in Nutrition and Dietetics (ACEND). However, completion of the degree alone does not fulfill the requirements to become an RD. RDs must also complete an accredited dietetic internship with at least 1,200 hours of supervised practice as well as pass the Commission on Dietetic Registration (CDR) exam. Beginning in 2024, ACEND will require completion of a master's degree before candidates are eligible to take the CDR exam.[54] In the meantime, ACEND has ceased accrediting new bachelor's level programs. Requirements for supervised practice are also being changed, and instead of a total number of hours completed the educational model is shifting to a competency-based assessment approach.

There are two types of dietetic education programs. Most dietitians complete training at the bachelor's or master's level in *didactic programs* in dietetics.[55] Of the NC universities who offer ACEND-accredited didactic programs in dietetics, five are public schools that offer a bachelor's degree (Appalachian State University, East Carolina University, North Carolina Central University, UNC-Greensboro, Western Carolina University). Meredith College, a private university in Raleigh, offers both bachelors and master's degrees in dietetics. NC State University and NC A&T State University offer both undergraduate and graduate degrees in nutrition but are not included on the ACEND website of accredited programs. Geographically, the southeastern quadrant of the state lacks an ACEND accredited program (**Figure 20**). After completion of their degree, graduates of didactic programs obtain a verification statement which is required for application to a dietetic internship.

Coordinated programs provide both academic coursework that leads to a degree and at least 1,200 hours of supervised practice. After graduates complete the program they are immediately eligible to take the CDR exam. The benefit of coordinated programs is that students who complete them do not have to apply for a separate dietetic internship. UNC-Chapel Hill has the only ACEND-accredited coordinated program in NC, which offers a masters of public health.[56] According to one interviewee, UNC is considered an "alternate entry program" since the school will admit students with any type of bachelor's degree as long as prerequisite requirements are filled. Annual tuition costs are $20,505 for NC residents and $38,151 for out-of-state students. UNC-CH plans to open an online nutrition and dietetics degree in the next few years. The tuition for the online program will be at the out-of-state rate regardless of the student residency status.

One key informant advised that there are no dietitian training programs in the Charlotte region, and that students interested in nutrition and dietetics who wish to stay nearby often train at Winthrop University in Rock Hill, SC. A program at UNC-P with in-state tuition, particularly at the graduate level, may appeal to students in that geographic area.

Training Sites for Students

Dietetic Internships must be accredited by ACEND. Securing an internship can be stressful for candidates as there are many fewer dietetic internships available than there are applicants. The Dietetic Internship Centralized Application System (DICAS) functions similarly National Residency Matching Program used to match medical school graduates to residency positions.[57] Candidates apply to programs, may have interviews at internship sites, and rank their top choices. Internships also rank their preferred candidates. On "match day," candidates are informed which internship they have been offered, and only have one option.

In 2016, 48% (n=2823/5944) of applicants successfully matched to a dietetic internship, meaning there are roughly 2.1 applicants for every seat (**Figure 21**).[58] Some internships that do not fill with matched candidates have the option of posting vacancies and communicating after match day with unmatched candidates to fill positions. However, a large portion of applicants remain unmatched.

According to the ACEND website,[59] most dietetic internships in NC are 10-11 months in length, except for Appalachian State University, which is 21 months long and offers an MS graduate degree upon completion. Other programs, like UNC-Greensboro, offer some graduate credit but no advanced degree, while others, like Duke University Hospital, offer no graduate credit. Because some internship programs offer graduate credit, one key informant advised that dietitians in those programs often pursue a master's degree along the way. Internships also vary in the cost to interns, ranging from $4,000 NC resident tuition at East Carolina University to $18,874 non-NC Resident tuition at NC Central University. Appalachian State University Tuition is $15,442 for NC residents and $41,780 for non-NC residents, but is structured as a combined Master of Science in Nutrition with the Dietetic Internship.

Unmatched candidates have the option of pursing ACEND-accredited Individualized Supervised Practice Pathways (ISPPs) under individual practitioners. In NC, Meredith College is the only university offering this option, which requires interns to set up their own sites at a distance greater than 150 miles away from Raleigh.

At the end of the dietetic internship, students obtain a verification statement that permits them to sit for the Commission on Dietetic Registration (CDR) exam. Passing the exam is a requirement for licensure in NC. If students are unable to match to an internship, they cannot progress in their career as an RD. The large number of unmatched students is concerning for the field.

One interviewee advised that, if UNC-P decides to move ahead with a program to train dietitians, they will need to build a network of preceptors and internships in the region. Dietetic internships already exist in the region, and one interviewee noted that the area is rich in community resources that provide a good experience for learners. The limiting factor is the number of RDs willing to serve as preceptors, since they are not compensated for doing so.

Student Interest

Historically, there have been roughly twice as many applicants to dietetic internships than available seats, indicating that there are many more learners interested in pursuing an RD career than are able to do so. We were unable to find a good source of data on student demand for nutrition degrees. The lack of clear information is due to the following reasons: A) the entry level degrees for RDs is a bachelor's degree, and the type of degree varies by school, and B) some schools do not restrict the number of students that can declare a major in this field.

Faculty Recruitment

We did not obtain reliable information on faculty recruitment for dietitian and nutrition degrees during the time frame for this study. To meet ACEND accreditation requirements, faculty must be trained at the master's level or higher.

Physician Assistant (PA) Studies

The PA and the nurse practitioner (NP) workforces have grown rapidly in recent years, both in NC (**Figure 21**) and in the US. NPs and PAs are often grouped together because even though they are trained under different models, they can fill similar positions and job duties. For example, job postings may advertise for a PA or an NP.

PAs train as generalists but may specialize after training (**Figure 22**). Some PAs and NPs switch specialties after they have practiced in the workforce.[61]

Figure 22. Cumulative Rate of Growth per 10,000 Population in North Carolina Since 2000: Physicians, Nurse Practitioners and Physician Assistants

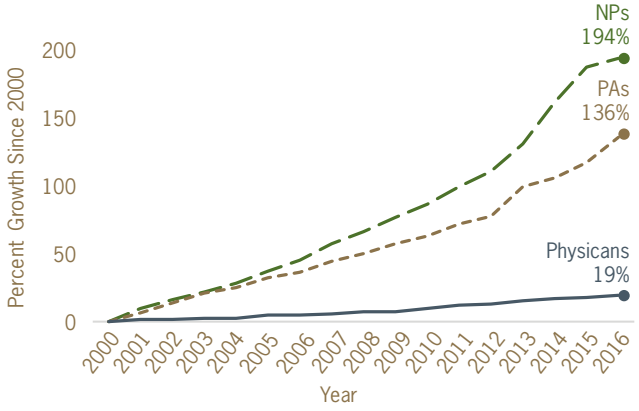
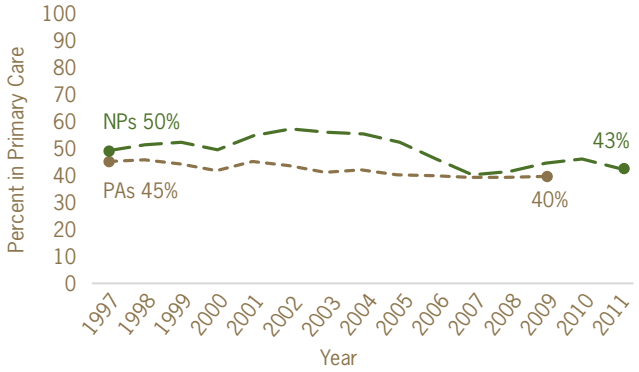


Figure 23. Percent of Nurse Practitioners and Physician Assistants Reporting a Primary Care Specialty, 1997-2011, North Carolina



Sources: North Carolina Health Professions Data System with data derived from the North Carolina Medical Board and North Carolina Board of Nursing, 2000 to 2016. Figures include all active, instate, non-federal, non-resident-in-training physicians, and all active, instate PAs and NPs licensed in North Carolina as of October 31 of the respective year. Specialty data were prepared in December 2012 and include a primary specialty of family practice, general practice, internal medicine, ob/gyn, or pediatrics for PAs, and a physician extender type of family nurse practitioner, adult nurse practitioner, ob/gyn nurse or pediatric nurse practitioner for NPs. PA data for 2010 and 2011 are excluded due to changes in the way specialty data were collected. 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.

NC PA Workforce Trends

Exhibits 5 shows a selection of information on the PA profession, and the supply, distribution and demographic characteristics of PAs practicing in North Carolina. In 2016, there were 5,602 active, licensed PAs practicing in NC, with a state ratio of 5.5 PAs per 10,000 population (**Figures 26, 27**). This rate is similar (5.6 PAs per 10,000 population) for the counties in the UNC-P region, but when Cumberland County data are omitted, the rate drops to 4.5 PAs per 10,000 population.

The PA workforce is majority female, (64.5%, n=3,615). The average age is 41.1 years old, with 77.3% (n=4,332) of the workforce younger than age 50 (**Figure 28**).

PAs are less diverse than the NC population, with 4.7% (n=263) identifying as Black, 2.9% (n=162) identifying as Hispanic, and 0.7% (n=43) identifying as American Indian (**Table 8**). Unlike NPs, PAs in NC have not broadly diversified over the past 16 years (**Figure 29**), and roughly the same percentage (8%) of PAs identified as an underrepresented minority in 2016 as did in 2000.

Despite rapid growth of PA programs in North Carolina, a unique advantage of a PA program at UNC-P would be that it might increase the diversity of the PA student body and PA workforce if graduates remained in-state. Winston-Salem State University, an historically black college and university (HBCU), is studying a potential PA program per language in the 2017 NC state appropriations act and may be similarly well-positioned to contribute to a more diverse PA workforce.

The job prospects for PAs in NC are currently good. We have not heard reports of PAs having difficulty finding employment, although some jobs require years of experience in addition to the degree. Key informants advised that because there are so many open PA positions, PAs tend to "job hop." An analysis of job postings for PAs only (not including jobs posted for either a PA or an NP) conducted by Perri Morgan and colleagues showed that there were 1,096 job postings for PAs in 2014 (**Table 9**), which equates roughly to one job opening for every five PAs in the NC workforce in that year.[62] These analyses use a novel methodology and it is unclear how accurately they reflect actual vacancies—for example, a health system might decide to leave a posting open after it is filled to have the ability to hire

Exhibit 5.

Physician Assistant Workforce and Education Programs, 2016

Profession Description: Physician assistants (PAs) are licensed by the NC Medical Board to practice medicine under the supervision of a physician, which may include examining patients, reviewing lab findings, diagnosing patients, developing a treatment plan, prescribing medication, or assisting in surgery. In 2016, the mean salary for PAs in NC was $100,480.[60] PAs are trained at the master's degree level and usually complete their degree in roughly two years. Some PAs choose to complete a residency before entering practice, but residency training is not required. There are 2,355 licensed RDs in active practice in NC in 2016, and roughly 2.3 dietitians per 10,000 population.

There were 5,602 active, licensed PAs practicing in NC in 2016.

Figure 24. Physician Assistants per 10,000 Population in 2016

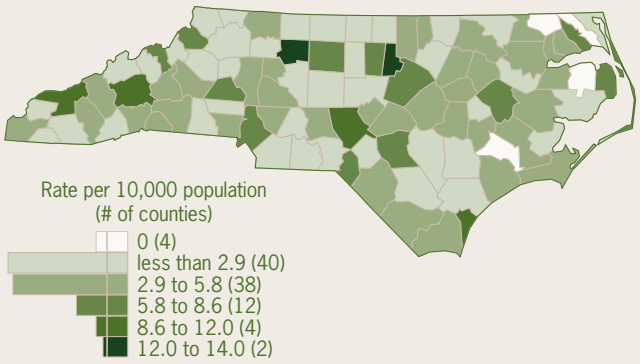


Figure 25. Physician Assistant Programs, North Carolina, 2017

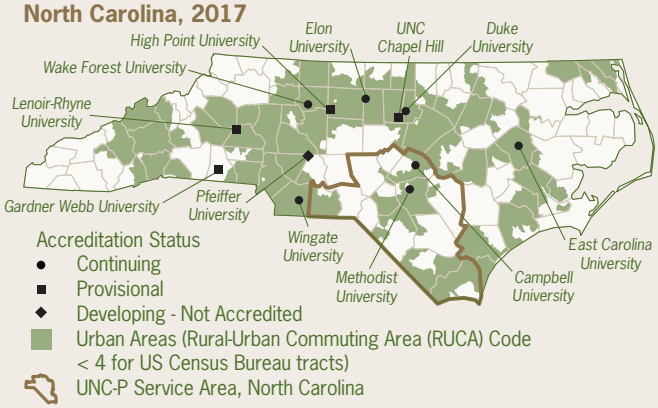


Figure 26. Physician Assistants per 10,000 Population in North Carolina from 2000 to 2016

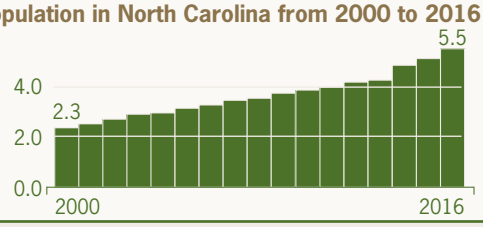


Figure 27. Total Number of Physician Assistants in North Carolina from 2000 to 2016

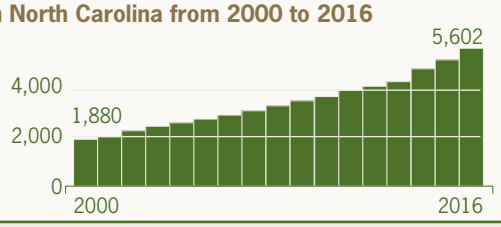


Figure 28. Active, Licensed Physician Assistants by Age Group, NC, 2016

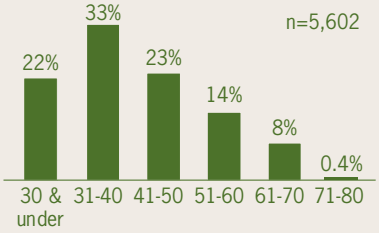
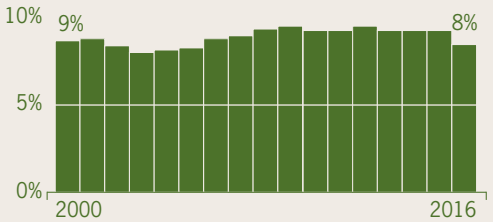


Table 8. Diversity of the NC Population and Physician Assistants, 2016

NC Population (n=10,146,788)	Physician Assistants (n=5,602)	
22%	5%	Black/African-American
9%	3%	Hispanic
3%	2%	Asian/Pacific Islander
2%	0.7%	American Indian/Alaskan Native
2%	1%	Other/Multiracial
36%	**12%**	**Nonwhite**
64%	**81%**	**White**

7% of PA s (n=133) were missing race data.

Figure 29. Percent of PAs who were Underrepresented Minorities in North Carolina, 2000 to 2016



Notes: Data include active, licensed physician assistants in practice in North Carolina as of October 31 of each year. Underrepresented minorities include PAs who self-identify as African-American, Hispanic, or American Indian/Alaska Native. **Sources:** Physician assistant workforce data from the North Carolina Health Professions Data System, https://nchealthworkforce.sirs.unc.edu, with data derived from the North Carolina Medical Board. Population data downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. Physician assistant program data from the Physician Assistant Education Association Program Directory, accessed November 30, 2017 from http://directory.paeaonline.org/programs. RUCA data from the USDA Economic Research Service, https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx. **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.

additional personnel later. However, signs point to a strong current demand for PAs in the state.

Although at present, the demand for PAs exceeds the supply, it is not known how long this demand will persist. Discussion in the academic literature suggest that the US may be oversupplied with PAs in the future, but due to the paucity of data around PA and NP practice patterns, it is unknown when or whether the market will be saturated with these professionals.[63]

PA Education Trends

PA training programs in NC have expanded rapidly to meet the demand from the employer side and the high level of demand from the students. The Accreditation Review Commission on Education for the Physician Assistant (ARC-PA) accredits PA educational programs. Seven NC programs are fully accredited and four are provisionally accredited. The PA program at Pfeiffer University is under development and is not yet accredited. (**Figure 25**)

Exhibit 6 shows a selection of information about PA education trends. Since 2011, the state has added six new PA schools enrolling a combined 175 students annually.[65] This count does not include the program under development at Pfeiffer University, scheduled to open in 2020 with an inaugural class of 24 students that will eventually grow to 45.[66] In addition to the new programs, existing PA schools have increased enrollment. Projected enrollment for the PA schools in NC in 2017-2018 was 520 students, a 16% increase over enrollments in the 2015-2016 school year. (**Table 10**)

Cost of attendance varies depending on whether the program is located at a public or a private school. For example, estimated total costs to obtain a PA degree at East Carolina University are $43,395 for NC residents and $89,417 for non-residents,[67] while costs for a PA degree at Elon University are $134,455.[68]

Unlike other programs we investigated, estimates of the cost to develop a PA program in the Southeastern US are documented in the academic literature. A study of a new PA program at the University of Tennessee Health Science Center (UTHSC) in Memphis with a class of 25 applicants cost $10.5 million in 2015 dollars for the first ten years of operation.[69] There are differences between the two campuses, (e.g. UTHSC has a medical school, health professions school, and teaching hospitals while UNC-P does not), but this estimate may provide some guidance on the potential expected cost to develop a new program.

Student Interest

Students apply to PA programs online via the Central Application Service for Physician Assistants (CASPA). CASPA data demonstrate that between 2002 and 2011, despite the rapid expansion of PA programs throughout the US, the total number of applicants to PA programs increased compared to the number of seats available (**Figure 30**).[70] The most recent data from CASPA indicate that in the 2015-2016 admissions cycle, there were 3.0 PA school applicants per seat.[71]

Key informants advised that attracting qualified applicants to PA programs was not a concern, as programs tend to have more well-qualified applicants than open seats.

Faculty Recruitment

National data from the 2016 Physician Assistant Education Association program report, which surveyed all 209 PA member programs in 2016, indicate that faculty recruitment for PA programs is challenging.[72] The report shows that 77% (n=161) of PA programs hired new faculty in the prior academic year. Of those that hired new faculty, 85% (n=137) cited the lack of qualified candidates as a significant barrier to hiring new faculty, and 82% (n=132) cited lack of teaching experience as a barrier (**Figure 31**).

Survey data from 2015 show that the majority (80.4%, n=863) of PA faculty were PAs, but one in

Exhibit 6.
Physician Assistant Education Trends, 2016

Table 9. North Carolina Physician Assistant Job Postings, 2014

Job Type	Number	Percent
For PAs only	1,096	65.5%
For PAs or NPs	577	34.5%
Total	**1,673**	**100%**

Figure 30. Number of Applicants per Seat, Physician Assistant Programs, U.S., 2002-2011

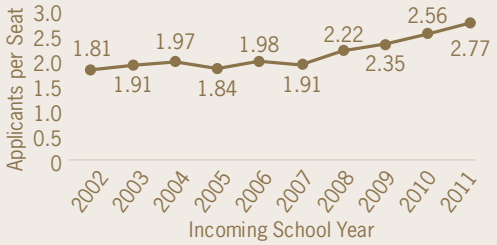


Table 10. Enrollments in North Carolina Physician Assistant Programs, 2015-2017

University	2015-16	2016-17 projected	2017-18 projected	Projected % Increase
Campbell University	44	44	50	14%
Duke University	90	90	90	0%
East Carolina University	34	36	36	6%
Elon University	38	38	38	0%
Gardner-Webb University	22	29	31	41%
High Point University	19	21	35	84%
Lenoir-Rhyne University	0	32	40	25%
Methodist University	40	40	40	0%
UNC Chapel Hill*	20	20	20	0%
Wake Forest University	90	90	90	0%
Wingate University	50	50	50	0%
PA Totals	447	510	520	16%

*Data for UNC have been updated to reflect actual numbers per https://www.med.unc.edu/ahs/unc-pa/admissions-information-2/frequently-asked-questions.

Figure 31. Barriers to Hiring New PA Faculty, PAEA, 2015

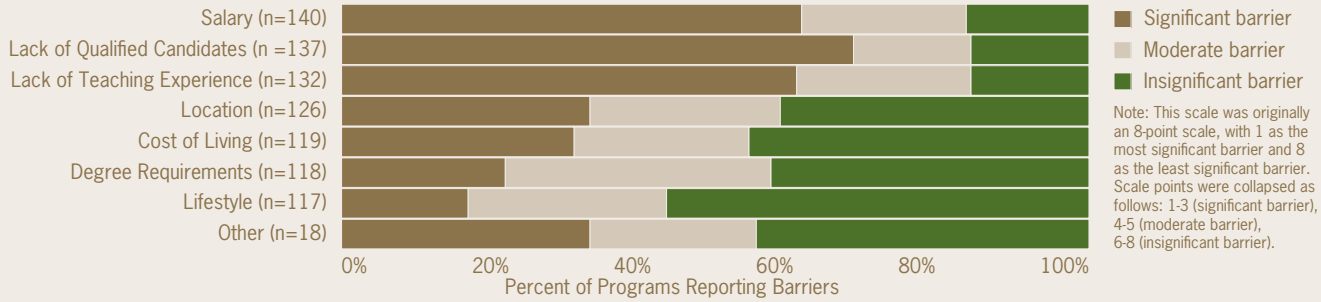


Table 11. Past Employment of New Physician Assistant Faculty Hired in the 2014-15 Academic Year
(N=193, 18% of all respondents)

Immediate Past Employment	Number	Percent
Clinical practice (including precepting)	88	45.6%
Clinical practice (no precepting)	40	20.7%
PA education	31	16.1%
Other educational program (non-PA)	16	8.3%
Previously worked part-time at the current institution/program	5	2.5%
Other	13	6.8%
Total	**193**	**100%**

Sources: Table 9: Personal Communication, Perri Morgan, Director of Research Physician Assistant Division, Duke University Medical School, October 23, 2017. Table 10: Newton WP, Brown A. Community-Based Health Professions Education: Who Will Teach Our Students? A Report by the NC AHEC Program. 11 July 2016. NC AHEC Program, Chapel Hill, NC 27599. Figure 30: McDaniel MJ, Hildebrant CA, Russell GB. Central application service for physician assistants ten-year data report, 2002 to 2011. *J PA Educ* 2016; 27(1), 17-23. Figure 31 and Table 11: Source: Physician Assistant Education Association, Physician Assistant Program Faculty and Directors Survey Report, 2015, Washington, DC: PAEA, 2015, accessed November 30, 2017 from http://paeaonline.org/wp-content/uploads/2017/05/faculty-directors-report20160218.pdf.

five were not. Most commonly, non-PA faculty held PhDs (33.7%, n=66) or were physicians (30.0%, n=51).

Survey results suggested that most PA faculty have not held their positions for a long length of time.[73] Of those surveyed, the majority of faculty (81.6%, n=621) had only been employed at one program. Close to half (46.2%, n=495) had held their current faculty position for fewer than four years. The majority of the 193 faculty that were hired in the prior academic year came from clinical practice; 45.6% (n=88) were in clinical practice and precepted students, and 20.7% (n=40) were in clinical practice and did not precept students (**Table 11**).

Training Sites for Students

The primary concern regarding PA (as well as physician and NP) education in the state is the lack of available preceptorships. As part of training, students must complete rotations at clinical sites. The rapid expansion of PA school enrollment, along with medical school and NP school enrollment, has put pressure on the state to find qualified preceptors for learners. While NP students are typically (although not always) precepted by other NPs, medical students and PA students sometimes compete for the same preceptorships.[74] The NC AHEC program has declared the situation a "crisis" and has made the issue one of its key priorities.[75] According to a study conducted by AHEC in 2016, 93% (27 of 29) of the NC schools that train physicians, PAs, NPs, and pharmacists provide financial incentives to preceptors, which typically go to the practice, rather than the individual.[76] Two healthcare systems in the state have set explicit limits on the number of students they will precept and the number of schools from which they will accept students due to the indirect costs associated with precepting,[77] which include supervising practitioner time, background checks for students, onboarding to electronic health record systems (EHRs), administrative costs, etc.

The AHEC report noted that two key influences related to preceptorships are accreditation requirements and alumni ties.[78] Without a pre-existing alumni network of graduates, UNC-P may be at a disadvantage in recruiting preceptors for a new PA or NP program.

An additional concern is preceptor payment. Given the choice between precepting students from two different schools, a preceptor may be more likely to accept students from schools that provide larger incentive payments. Private schools can opt to charge higher tuition to cover these incentive payments and are then at an advantage when competing for preceptors with publicly funded institutions. AHEC has led a task force around these issues and is evaluating options to level the playing field. Georgia, Maryland, and Colorado have recently passed legislation providing tax credits to physicians who precept medical students.[79] It remains to be seen whether NC will pursue a similar model.

Given Pembroke's proximity (roughly a one hour drive) to medical centers in Florence, SC, we contacted the SC AHEC Program to determine whether UNC-P might reasonably seek preceptorships in South Carolina. We were advised that SC, like NC, has rapidly expanded health professional education and is similarly constrained by a lack of quality preceptorship sites. Therefore, SC preceptorships are unlikely to be available to programs from outside of the state.

Nurse Practitioner Studies

Much of the data related to NPs echoes the above section on PAs. Many positions are posted for either an NP or a PA and both fill similar roles. However, while PAs train as generalists, NPs train in a specific area in which they later become certified, such as adult-gerontology primary care nurse practitioner, family nurse practitioner, psychiatric-mental health nurse practitioner, etc.

As mentioned earlier, one interviewee noted that UNC-P may be well-served developing programs to train family nurse practitioner and psychiatric-mental

Exhibit 7.

Nurse Practitioner Workforce and Education Programs, 2016

Profession Description: Nurse practitioners (NPs) are a type of advanced practiced registered nurse (APRN) licensed by the NC Board of Nursing. NPs provide care, diagnoses, and treat patients. In some states, NPs can perform these services, including prescribing medications, without physician oversight, but in NC NPs are legally required to practice under a collaborative practice agreement with a supervising physician. In 2016, the mean salary for NPs in NC was $103,090.[80] NPs are trained at the master's or doctoral level. Like PAs, a small portion of NPs choose to complete residencies, but they are not required.

There were 6,152 active, licensed NPs practicing in NC in 2016.

Figure 32. Nurse Practitioners per 10,000 Population in 2016

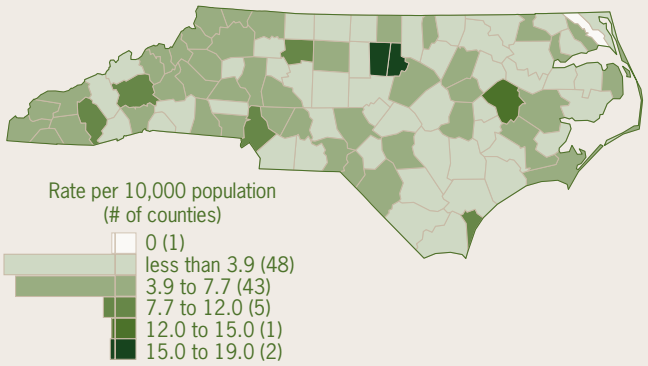


Figure 33. Nurse Practitioner Programs, North Carolina, 2017

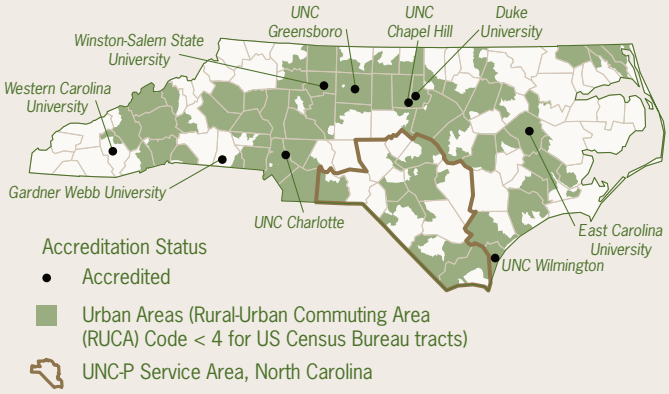


Figure 34. Nurse Practitioners per 10,000 Population in North Carolina from 2000 to 2016

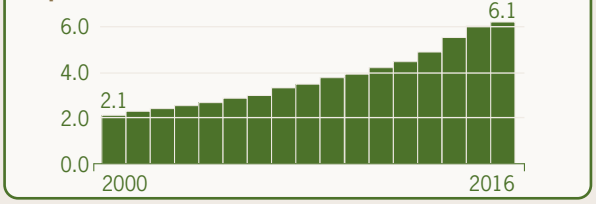


Figure 35. Total Number of Nurse Practitioners in North Carolina from 2006 to 2010

Figure 36. Active, Licensed Nurse Practitioners by Age Group, NC, 2016

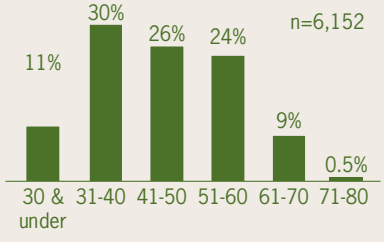
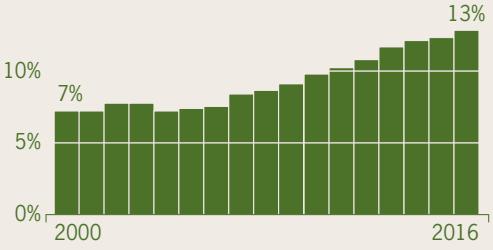


Table 12. Diversity of the NC Population and Nurse Practitioners, 2016

NC Population (n=10,146,788)	Nurse Practitioners (n=6,152)	
22%	10%	Black/African-American
9%	1%	Hispanic
3%	3%	Asian/Pacific Islander
2%	1%	American Indian/Alaskan Native
2%	1%	Other/Multiracial
36%	**16%**	**Nonwhite**
64%	**83%**	**White**

0.6% of NP s (n=35) were missing race data.

Figure 37. Percent of NPs who were Underrepresented Minorities in North Carolina, 2000 to 2016



Notes: Data include active, licensed nurse practitioners in practice in North Carolina as of October 31 of each year. Underrepresented minorities include NPs who self-identify as African-American, Hispanic, or American Indian/Alaska Native. **Sources:** Nurse practitioner workforce data from the North Carolina Health Professions Data System, https://nchealthworkforce.sirs.unc.edu, with data derived from the North Carolina Board of Nursing. Population data downloaded from the North Carolina Office of State Budget and Management via NC LINC and are based on US Census data. Nurse practitioner program data from the American Association of Nurse Practitioners NP Program Search webiste, accessed November 30, 2017 from https://npprogramsearch.aanp.org. RUCA data from the USDA Economic Research Service, https://www.ers.usda.gov/data-products/rural-urban-commuting-area-codes.aspx. **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.

health nurse practitioners. The growing emphasis on integrated behavioral health and primary care delivery models may be opportunities to collaborate with the department of social work to jointly train social workers with health care competencies and nurse practitioners with mental health competencies. UNC-CH has such a program. ECU will offer an online Psychiatric-Mental Health Nurse Practitioner Program this year with the goal of building the mental health workforce for NC.[81] There may be the potential to partner or collaborate with one of these universities if UNC-P considers a similar program.

NC NP Workforce Trends

Exhibit 7 shows a selection of information on the NP profession, and the supply, distribution and demographic characteristics of NPs practicing in North Carolina. In 2016, there were 6,152 active, licensed NPs practicing in NC, with a state ratio of 6.1 NPs per 10,000 population (**Figures 34, 35**). The UNC-P region has 4.0 NPs per 10,000 population, and when Cumberland County is omitted, the rate drops to 3.5 per 10,000.

The NP workforce is 93.5% female (n=5,755). The average age is 45.2 years old, with 66.6% (n=4,096) younger than 50 years old (**Figure 36**).

Like most health professional workforces in NC, NPs do not represent the diversity of the state. 10.0% (n=612) identify as Black, 1.5% (n=88) identify as Hispanic, and 1.2% (n=76) identify as American Indian (**Table 12**).

While the percent of underrepresented minorities did not change much for PAs, the NP workforce diversified over the past 16 years. The portion who self-identified as underrepresented minorities grew from 7% of the workforce in 2000 to 13% in 2016 (**Figure 37**).

NP Education Trends

In 2004, the American Association of Colleges of Nursing put forward a position statement calling for the basic education for NP programs to be the Doctorate of Nursing Practice (DNP) rather than a master's degree by 2015.[82] Although the 2015 has deadline passed and DNP programs have proliferated across the country,[83] no state licensing board has yet mandated the DNP as the entry degree for NP licensure. The expectation is that universities will transition their master's level specialty NP programs to DNP programs over time, but there is no firm timeline for this change.[84]

Nine universities in NC currently offer master's and/or doctoral NP degrees (**Figure 33, Table 13**). Currently, there is no NP program in the UNC-P region, although there are programs at UNC-Charlotte and UNC-Wilmington. Like PAs, NP education programs have expanded rapidly in NC, and statewide enrollments in these programs were projected to increase 14% between 2015 and 2017 (**Table 13**).[85]

As with other health professional degrees, cost of attendance varies by school. Estimated costs of pursuing a DNP at UNC-CH's BSN-to-DNP program were $65,400 for NC residents and $119,629 for out-of-state students.[87] Of the two private universities offering DNP programs, Gardner-Webb University only offers a MSN-to-DNP degree at present,[88] and tuition costs for full time BSN-to-DNP students were listed as N/A on the Duke website.[89]

More than half of NC's NP workforce (57.4%, n=3,532) completed NP training in-state, and 14.9% (n=915) trained in a state bordering NC (**Figure 38**). In other words, nearly three-quarters of NC's NP workforce trained in NC or a bordering state, indicating that this workforce tends to practice near where they trained.

Student Interest

We were not able to find a data source on applicants vs. admitted students for NP programs. Experts advised that the limiting factors for nursing education are primarily a lack of faculty and a lack of precepting sites, not a lack of qualified applicants.

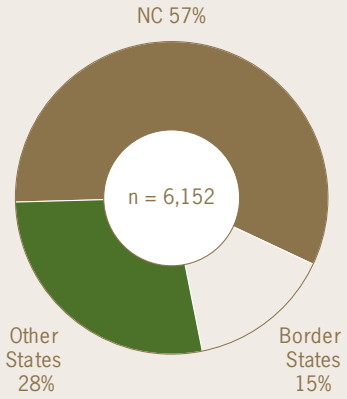
Exhibit 8.

Nurse Practitioner Education Trends, 2016

Table 13. Enrollments in North Carolina Nurse Practitioner Programs, 2015-2017

University	2015-16	2016-17 projected	2017-18 projected	Projected % Increase
Duke	125	125	125	0%
East Carolina	79	93	97	23%
Gardner-Webb	58	58	58	0%
UNC-CH	91	98	97	7%
UNC-Charlotte	46	52	54	17%
UNC-Greensboro	26	26	26	0%
UNC-Wilmington	0	8	15	88%
Western Carolina	30	31	33	10%
Winston Salem State University	16	20	30	88%
NP/DNP Totals	**471**	**511**	**535**	**14%**

Figure 38. Active, Licensed NC Nurse Practitioners by Nurse Practitioner Program State, 2016



Sources: Table 13: Newton WP, Brown A. Community-Based Health Professions Education: Who Will Teach Our Students? A Report by the NC AHEC Program. 11 July 2016. NC AHEC Program, Chapel Hill, NC 27599. Figure 38: The North Carolina Health Professions Data System, https://nchealthworkforce.sirs.unc.edu, with data derived from the North Carolina Board of Nursing. Data include active, licensed nurse practitioners in practice in North Carolina as of October 31, 2016.

Faculty Recruitment

Faculty recruitment is a long-standing concern in nursing education. A report by the American Association of Colleges of Nursing cites faculty shortages as one of the two main reasons qualified applicants are not accepted to graduate programs in nursing (the other is a lack of clinical training sites for learners).[90] In addition to difficulties recruiting faculty, data also show that, nationally, there is a growing concern about near term retirement of many nursing faculty.[91] All of these issues are pressing concerns for nursing education in the state. For example, one of the limiting factors for ECU's Psychiatric-Mental Health Nurse Practitioner Program is a shortage of faculty to teach these courses.[92] The chair of UNC-P's nursing department noted that the university has hired faculty at the master's level and supported them to work on their doctorates as a way of "growing their own" and this approach may be part of a solution for faculty hiring challenges.

Training Sites for Students

As with PAs, the lack of available, quality clinical training sites for NP students is the major limiting factor in program expansion. A 2013 survey of NP programs nationwide indicated that 96% of respondents were concerned about the number of clinical sites for NP learners.[93] In the academic literature, a discussion is underway about alternative training models for NPs to increase training capacity, but solutions are not straightforward.[94] All caveats reported in the "training sites for students" section relevant to PA learners are equally relevant to NP learners. The lack of preceptors is a cross-disciplinary and statewide issue that is not specific to the UNC-P region.

Conclusions

Optometry

We are aware of discussions within the profession and at the state legislature suggesting that NC will have an optometry school soon. In the 2017 legislative session, bills were introduced in both the NC House and Senate appropriating funds to start an optometry school at UNC-P in the amounts of $3.9 million (HB 919) and $2.1 million (SB 278) but both bills died in committee. In addition, three interviewees confirmed that since the Sheps Center study was published in 2015, four private NC universities have conducted their own feasibility analyses to determine the feasibility of opening an optometry school. In October 2017, Wingate University publicly announced that it will pursue an optometry school,[95] but to our knowledge, no formal movement forward has occurred. In December 2017, High Point University also announced that it is considering an optometry school, which may open as soon as 2020 if approved by the University's Board of Trustees in March 2018.[96, 97]

A new optometry school at UNC-P would likely attract applicants from across the state and nation, not just the UNC-P region. Unlike the other potential health professional training programs explored in this document, because there are no other optometry schools in NC or in the bordering states of Georgia, South Carolina, and Virginia, an optometry school at UNC-P would likely have a mission broader than the immediate UNC-P region. Demand for an optometry degree from NC students is relatively low compared to other professions, and it is not clear if or how much that will change with an in-state school.

The optometry workforce has grown steadily over the years despite the lack of an in-state school. There are qualitative indications that there may be more demand for optometrists on the job market in the future and that the number of optometrists imported into the state has declined over the last three years, but we did not find strong evidence suggesting there will be an increasing demand for optometrists in NC in future years. Based on the available data, which are sparse, and conversations with key informants, we are skeptical that there will be a large job market for optometrists in urban centers like Raleigh and Charlotte. If UNC-P moves ahead with an optometry school, it seems prudent to begin with a small initial class size with room to expand if students are successful on the current job market.

If a private university opens a school, there may not be sufficient student demand from within NC for multiple schools. While we have not communicated with either Wingate or High Point, our assumption is that the mission of a private school of optometry in an urban location in NC would differ from that of a school at UNC-P. Should a private optometry school open, the state could decide to support a second public optometry school if the school were primarily aimed at retaining graduates in NC and placing graduates in rural areas. Because of UNC-P's location and the demographics and health concerns of the population in the surrounding area, an optometry school in the region would likely have access to a patient population that is often understudied in medical research. While the opportunity to conduct clinical research on this population may provide benefits to the local population and researchers at UNC-P, to be successful the university would need to develop a research infrastructure or partner with another university.

Assuming an optometry school in NC is a given, UNC-P could be well-suited to train an optometrist workforce with a focus on serving the underserved in rural communities, following the KYCO model. Similarly, the state's current optometrist workforce is strikingly lacking in diversity, particularly for Black optometrists. Special attention to a diverse student body would help boost the diversification of the overall optometrist workforce.

Optometry Pros

- Strong support for the development of an optometry school within the state
- Little difficulty in finding clinical rotation sites in-state for students
- State optometrist workforce lacks diversity, UNC-P well-positioned to address workforce diversity
- Optometry school in Robeson County would provide services to medically underserved, rural community with high rates of diabetes, overweight, and obesity

Optometry Cons

- Data are unclear on job market for new graduates
- Relatively few NC students enroll annually in optometry programs
- Two other private universities in NC have publicly expressed interest in an optometry school, providing competition for applicants if the schools are developed
- Historically, NC has been able to recruit optometrists from out-of-state with relative ease, although there are qualitative indications this may have changed in the past three years
- UNC-P would not be able to leverage an existing medical school or other training program for first-year interprofessional training

Occupational Therapy

Given the rapid increase nationally in student applications for OT schools relative to seats and the comparatively small class sizes in NC (averaging around 28 student seats per class year), a new OT program may be worth UNC-P pursuing as a potential new program. One advantage UNC-P would have compared to the private OT schools is lower tuition costs, particularly for in-state residents. Other considerations include competition with other schools for internship placements, particularly with Methodist University nearby in Fayetteville opening a program. Faculty recruitment already appears to be a concern in NC, and the move to a doctorate entry level degree suggests that recruitment challenges may intensify. Challenges around faculty recruitment and securing internship sites are applicable to all OT education programs, and are not specific to UNC-P.

Key informants perceived demand for OTs in the UNC-P region. While OT jobs are available in rural areas, it is unclear whether a program at UNC-P will be able to help rural areas meet their OT needs or not. Key informants advised that it is difficult to recruit and retain OTs in rural areas, and that OTs are willing to make a lower salary if a job opens in a urban area.

Should UNC-P decide to pursue an OT program, positioning the program as rurally focused and intentionally seeking applicants with a desire to work in a rural area may be worth considering. Special attention to recruiting a diverse student body would help boost the diversification of the OT workforce. We asked key informants about new roles for OTs in mental health. In 2016, few OTs (0.7%, n=23) in NC reported a primary specialty in mental health. Nevertheless, nationally we are beginning to hear reports of the role OTs can fill on mental health teams, including examples from the Veteran's Health Administration in Durham, NC. If UNC-P decides to develop an OT program with a focus on mental health, there may be opportunities for collaboration and interprofessional education with UNC-P's schools of social work and nursing. Training OT students alongside students from social work and nursing would provide an opportunity for students to learn how to work in cross-disciplinary teams and to learn about the unique knowledge base in each profession. A team comprised of a nurse, OT, and social worker may be particularly applicable for elderly patients who seek to age in place.

Occupational Therapy Pros

- Value-based payment and care delivery models may increase the demand for occupational therapists and the role they play in helping seniors age in place and avoid expensive hospital admissions/readmissions[98]
- Although small at present, the market for OTs with mental health training may increase in the future
- There is unmet need for OT services in rural areas
- The OT workforce in NC is not diverse and would benefit from an educational program focused on diversifying the workforce
- UNC-P has the potential to leverage interprofessional training opportunities with the schools of nursing and social work
- Move to doctoral degree as minimum entry requirement may increase demand for OT education (as it has in other fields that have moved toward doctoral training, including the Doctor of Nursing Practice, Doctor of Physical Therapy and Doctor of Pharmacy)[99]
- Growing evidence that providing OT and PT services on an outpatient basis improves health outcomes[100] could increase demand for OTs.

Occupational Therapy Cons

- Eight existing or newly accredited schools in NC may increase competition for students, faculty, and internships, particularly with Methodist University in Fayetteville
- Move to doctoral degree minimum for OT practice may increase pressure for faculty recruitment challenges

Nutrition and Dietetics

The prevalence of heart disease, diabetes, hypertension, and obesity in the region combined with reports of a growing demand for dietitians in public schools, public health settings, and acute care settings, suggests that a degree program in nutrition may be a good fit for UNC-P. As the prevalence of chronic diseases and obesity rise in the region and the state, the role of dietitians seems well-positioned as a key member on health professional teams. New payment models that reward hospitals and health care systems for preventive, "upstream" care may incentivize the employment of dietitians on health care teams to help manage patients with obesity and chronic diseases such as diabetes and hypertension.

East Carolina University's Department of Nutrition offers two undergraduate degree training tracks: one intended to prepare students for careers as RDs, and another in nutrition science that serves as a pre-professional major for students interested in medicine and allied health careers.[101] UNC-Greensboro offers three undergraduate degrees in nutrition; one targeted at students who wish to become RDs, a second targeted at students who plan to go on in medicine, dentistry, optometry, or PA studies and enables them to fulfill pre-requisites for those degrees, and a third focused on health and wellness. The model of a nutrition major that serves as a pre-health professional degree may be useful as UNC-P seeks to expand its footprint in health professional education. No new undergraduate programs in nutrition will be accredited by ACEND going forward, so students graduating with an undergraduate degree in nutrition would need to earn a master's degree to be eligible to enter the match for a dietetic internship. A department of nutrition would also be able to leverage resources and provide opportunities for cross-collaboration with UNC-P's schools of nursing and social work, as well as the exercise and sport science and athletic training program.

Given the move to a master's degree as a requirement to take the national certifying exam in 2024, the clearest path forward for UNC-P would be to offer a master's degree in nutrition. A coordinated program modeled after UNC-CH's, rather than a didactic program, may be appealing to students seeking RD careers as applicants from a wider range of undergraduate degrees would be eligible to enter the program and they would not need to go through the matching process for a dietetic internship. Currently, UNC-CH offers the only coordinated program in the state (although the didactic internship at Appalachian State University (ASU) also offers a master's degree and may be a different model for UNC-P). Per the ACEND website, UNC-CH, Meredith College, and ASU's dietetic internship are the only universities in NC that offer ACEND-accredited nutrition degrees at the master's level, although that will likely change soon given the new requirements to obtain a master's degree prior to taking the national certifying exam.

One difficulty for all RD training programs is to find internship placements for students. One key informant advised that the UNC-P region has rich community resources and that several sites already provide good dietetic internships to students. If UNC-P decides to open a RD training program, it will be critical to develop training sites for students in the region, as students must complete an internship in order to take the certifying exam and become licensed practitioners. Should UNC-P move ahead with this program, careful consideration will be needed to ensure availability of dietetic internships for graduates, as the university otherwise risks training graduates who are not able to fulfill all the requirements for licensure as RDs.

Key informants advised that because RD salaries are relatively low compared to other health professions, private universities in the state are not rapidly expanding into this field because the costs/benefits relative to tuition are difficult to justify, making these programs a better fit with a public university model.

Nutrition and Dietetics Pros

- Key informants cite a need for more dietitians in the region, particularly given the prevalence of heart disease, diabetes, hypertension and obesity
- Fewer private schools are expanding into dietetics (likely because RD salaries, in the mid-$50k range, are not high enough to justify private school tuition), making the program a good fit for a public university
- There are no nutrition/dietetic programs offered in the Charlotte region, providing a potential applicant pool
- The program would be able to leverage faculty from nursing and exercise and sport science
- A bachelor's level nutrition degree could be structured to fulfill pre-med, pre-dental, and other graduate health sciences requirements, building a pipeline of UNC-P grads into health fields

Nutrition and Dietetics Cons

- Lack of available dietetic internships suggest exploration of coordinated program, otherwise graduates will have difficulty meeting eligibility requirements to take CDR exam
- ACEND will no longer accredit bachelor's level nutrition and dietetics programs, making a master's degree the only option for RD careers

Physician Assistant Studies

A PA program may be an option for UNC-P, but the case for a new program is unclear. On one hand, the demand for PAs on the employer side is strong, and the demand for students is such that despite the growth in seats at training programs, the number of applicants per seat has grown. At the same time, PA programs have expanded rapidly in the state and in the country over the past six years. While the current job market appears strong, there are concerns among PA workforce researchers that the market will reach saturation in the future.

Evidence to support PA workforce saturation is lacking, but largely because information on PA practice patterns are unavailable. Generally, PAs tend to practice in similar settings to physicians, so any program seeking to address rural health needs should weigh likelihood of practicing in a rural area in the admissions process.

A key difficulty of a new PA program is the lack of available preceptors in the state to train learners. The lack of preceptorships is a significant barrier already faced by existing PA programs. While this challenge would not be unique to UNC-P, the university would need to navigate an already crowded field. PAs and medical students sometimes compete for the same preceptorships. With the PA program at Methodist University and the PA and osteopathic medical school program at Campbell University located so close to UNC-P, it may be that nearby preceptorship options are already committed to those institutions. Furthermore, most of the PA schools in NC are in private universities, meaning they may be able to pay preceptors more by increasing tuition costs, which would not be an option for UNC-P that seeks to keep tuition affordable.

At present, there are only two PA programs at public universities in NC, one at ECU and one at UNC-CH. In total, only 10.7% (n=56/520) of PA students in the state enroll in public universities where tuition costs are much lower than at private universities. ECU reports on its website that between 600 and 700 applicants apply annually for the PA program, which enrolls 36 students in each class.[102] The cost of a PA degree at ECU for an in-state student is roughly one-third the cost of the same degree from Elon University. The lack of PA programs at public institutions in the state may present a barrier for potential students who wish to pursue the degree but cannot afford private university tuition. A PA program at UNC-P would provide a more affordable path forward for those students.

A PA program that trains with an interdisciplinary team leveraging the schools of social work and nursing could provide a valuable experience for trainees, particularly if the focus is on rural and underserved populations.

Physician Assistant Studies Pros

- Strong current job market for PAs in NC
- Strong student demand
- UNC-P potentially able to recruit a diverse student body to the state's PA workforce
- Most PA programs in NC are at private universities with high tuitions, UNC-P could provide a more affordable option

Physician Assistant Studies Cons

- Large number of PA programs already in NC; market could become saturated in the future[103]
- Lack of preceptorships for PAs, NPs, and physicians in NC
- Schools rely on alumni connections for preceptorships, and UNC-P may be at a disadvantage without a pre-existing alumni network

Nurse Practitioner Studies

NPs, like PAs, are high in demand in the current job market and students are interested in pursuing these careers. Both professions are well suited to work as part of a multi-disciplinary care team. Family nurse practitioners as well as psychiatric-mental health nurse practitioners may be well-suited to take on care for patients in the UNC-P region.

Unlike PAs, NPs in NC have attempted, but not succeeded, to change the legal requirements that define their scope of practice in the state to practice independently, without a supervising physician (see NC HB88/ SB73 from the 2017 NC legislative session). The intent of this legislation was to make it easier for NPs to practice in rural settings.[104] In 23 states, NPs can practice independently, but NC is not one of those states.[105]

Given that UNC-P already has several MSN degree tracks, if the school decides to pursue an NP track, it may be more straightforward to begin at the master's level with a plan to build toward a DNP program in the future. This decision would need to be made by UNC-P, likely looking at whether a master's program, which has the benefits of a shorter training period required before the NP can practice and earn a salary, is more appealing to applicants than a DNP program, which requires more years of education but is where the profession is moving. Thus far, there are little data available on practice patterns of DNPs and how they differ from master's trained NPs, and employers do not appear to deploy them differently. At present, the DNP vs. master's level NP distinction pertains more to education obtained and the role of DNPs in the workplace is difficult to differentiate.[106, 107]

Any new NP program opening in NC will face two significant barriers. First, difficulties recruiting nursing faculty, due to the national shortage. Second, as with PAs, NP programs in the state struggle to find quality preceptors to teach learners, and all aforementioned concerns about the lack of clinical training sites apply.

Nurse Practitioner Studies Pros

- Growing focus on addressing mental health shortages in the state, a psychiatric NP program could address these needs locally and at state level
- Changing care delivery models that emphasize primary and preventive health care may increase demand for family NPs. There is increasing evidence that NPs can provide range of primary care services at lower cost and equal quality as physicians[108]
- DNP would be doctoral level health professions education program at UNC-P
- An extension of the existing nursing school, rather than building a new program
- Opportunities to leverage existing resources in schools of nursing and social work schools

Nurse Practitioner Studies Cons

- DNP degree is relatively new, and employers are not sure how to deploy DNPs in practice[109]
- Rapid expansion of physician, NP, and PA education has made identifying training sites for students will a limiting factor
- Existing nurse faculty shortage will likely make faculty recruitment difficult

Additional Health Professional Tracks

Additional programs to consider, either woven through the curriculum of all health programs, as separate degrees or as certificate programs, include healthcare management, health informatics, and public health/ population health.

Management Education

Several of the key informants we interviewed noted the need for health professionals with management education which would prepare them to take on leadership roles in outpatient clinics, community health centers, rural health centers and other settings. At least one person noted that most MHA degree programs focus on hospital management issues, but that there is a growing need for people with a focus on managing outpatient entities. Since UNC-P already has a School of Business, a new school of health sciences could leverage those resources to incorporate management training in the curriculum of all the departments of the new school, or as an integral part of an inter-professional education track. In addition, if some individuals wanted to have a stronger management focus, a series of courses could be added that lead to a certificate in health services leadership and management.

Health Informatics

Health informatics capability is increasingly necessary for health care organizations to deliver quality care, to manage the health of the populations they serve, and to deliver care in a cost-effective manner. Staff must not only have the capability to use electronic health records and link those records to other providers, but also must be able to extract data from those systems and use data analytics to manage care of populations, give greater attention to preventive care, and use resources more efficiently. UNC-P already has a program in computer science in its Department of Mathematics, which might form the core for developing stronger capability in health informatics. There may not be enough demand at this point for a separate degree program, but giving students in new and existing health degree programs opportunities to develop their skills in data analysis and predictive analytics would strengthen the value of graduates in the market place.

Public Health/Population Health

There is a growing demand in the market place and among entering students for stronger preparation in population health and public health. Given the increasing emphasis placed on social determinants of health and the need to better manage the health of populations, access to some core courses in public health are valuable for students across the professions. In the near term, UNC-P could address this need by offering a set of public health courses for students in all health sciences departments. Longer term it could lead to the development of an MPH program that would offer students an opportunity to enroll in a dual degree program with their clinical major. On many campuses dual degree options with public health have become popular.

Evaluating New Health Professions Programs

The process of developing new health professions programs and a structure to coordinate their operations at UNC-Pembroke involves multiple policy decisions. The degree to which those decisions achieve results can be assessed both during and after their implementation. We suggest that UNC-Pembroke implement a "process" evaluation approach to assess the degree to which short and long term goals are achieved. This would be a continuous evaluation process that parallels the implementation of any individual program and the overall expansion itself. A process evaluation monitors progress at each step and allows the leaders and managers to adjust activities when there are unanticipated problems that emerge, or to adapt processes and structures to meet the day-to-day needs of the overall programs. This type of evaluation overlaps with management practice, but also allows for the development of cumulative metrics of progress and provides a context to understand longer term output and impacts.

As part of the contemporary process of planning and selection of programs and strategies, UNC-P should develop a “Formative Evaluation” approach that examines the structure process and outcomes of decision making following the classic guidance of A. Donabedian.[110] Under the “structure” portion, UNC-P or a selected agency or contractor should be able to explore the following questions:

1) Structure:
    a. Are the necessary stakeholders engaged in the process of selecting the programs that are to be developed and/or expanded?
    b. Are data and evidence used to support the process of assessment and selection?
    c. Are the criteria for selection clear and transparent to stakeholders?

d. Is a “program logic” in place to help guide the strategic process and will it be used to help modify the process as needed, in turn modifying the program logic?

2) Process:

a. Is the process for selection clear to all participants and stakeholders?

b. Are the results of the selection process broadcast widely to maximize future cooperation and engagement?

c. Are funds and resources available for the implementation of the planned expansion and is there a feasible and highly likely chance of receiving future funding for the programs?

d. Will the program expansions have a functional and applicable business plan to help guide day-to-day decisions?

e. Is there a cooperative plan for engagement with regional health care providers and employers?

3) Outcomes

a. Are programs established according to plan or after appropriate modifications of the planning process?

b. Are faculty in place to offer sufficient courses and provide support to students?

c. Do enrollment numbers meet expectations?

d. Are the needs of accreditors and supervising educational agencies met within the time frame of a provisional accreditation process?

e. Is an effective placement and outreach process in place in UNC-Pembroke?

4) Impacts

a. Are ongoing evaluation mechanisms in place to track student performance, job placement in the region, and retention in professions and locations?

b. Are there tangible examples of recognition and approval of the programs in the form of client-driven expansions, increased donations and support, and regional, state or national awards or ratings of programs?

c. Does Robeson County rise in the County Heath Rankings?

This is an outline for a continuous, formative evaluation of the process of expansion of the health professions programs offered by UNC-P. Implementing the evaluation may not necessarily require specific numerical markers but may be accomplished by a continuous process of documentation of activities in the context of a "Program Logic" and a set of broadly stated goals and objectives. This can be done using a “project diary” approach or the use of “realist” evaluation methods such as those used to assess the effectiveness of community-focused programs by academic health units.[111, 112] Additional assessments of the effectiveness of the programs using more quantitative methods may be developed as the programs progress.[113]

Summary of Findings and Discussion

This report provides an analysis of the supply and demand for different types of health professionals in the UNC-Pembroke region and in state. The goal of the analysis was to provide information that the University of North Carolina General Administration and Board of Governors could use to determine which health science programs might best serve the needs of the region. Like other rural parts of North Carolina, the counties surround UNC-P have faced a persistent shortage of health care professionals. Robeson County, where UNC-P is located, ranks as the worst county in NC in terms of health outcomes with a high incidence of diabetes, obesity, and child and infant mortality. High rates of unemployment and poverty have persisted in this region over decades.

The findings from this report suggest that new health sciences programs at UNC-P could make a potentially significant and lasting contribution toward improving the supply of health professionals in the region, increasing the racial and ethnic diversity of the health workforce, and providing access to well-paying health care jobs. As a state school, health science programs at UNC-P would be more affordable for students to attend than those at private institutions. UNC-P is one of the three campuses in the UNC system chosen for the pilot program offering low tuition to in-state students ($500 per year). This program will likely increase the number of students from low income households who are able to access health professions training, consistent with the University of North Carolina system's goals of increasing access and affordability of university education in the state.

North Carolina has seen a steady increase in the per capita supply of health care professionals but this increasing supply has not equally affected rural areas. Despite important initiatives undertaken by the NC Area Health Education Centers Program, the Office of Rural Health in the NC DHHS, state and federal loan repayment programs, and other programs aimed at recruiting and retaining health professionals in rural communities, underserved areas like those in the UNC-P region face a shortage of professionals from physicians, to nurses, therapists, behavioral health providers, oral health providers and direct care workers. A significant body of research shows that the best way to address these shortages is for rural communities to adopt a "grow your own" approach that draws students into health professions training programs from the local catchment area. Currently, UNC-P draws 56% of its enrollment from NC counties in the UNC-P service area,[d] with 21.2% coming from Robeson County alone.[114]

Health care delivery and payment models are changing quickly, evolving toward integrated care delivery models that require health professions programs to train a workforce capable of working on teams to address a patient's physical and behavioral health needs. Hospitals are penalized for unnecessary readmissions and seek ways to train and deploy an interprofessional workforce able to address the "upstream" factors that affect patient use of expensive health care services. In NC and nationally, educators are revising health professions training to incorporate more interprofessional learning opportunities in education and practice; yet, their efforts are often thwarted by scheduling conflicts and existing models of education and training that are silo-based by profession.

The development of a new health sciences school would provide UNC-P an opportunity to build health sciences programs from the ground up around interprofessional training. For example, UNC-P could develop a program that place Nurse Practitioners, Occupational Therapists and Social Workers on teams that could address the physical and behavioral health needs of patients with multiple comorbidities in the community. Similar concepts have been developed around the country and show benefits to both the learners-in-training and to patients in the community. These teams sometimes take on community-based research projects that develop the capacity of the student, university, and community to respond to local health challenges. Interprofessional models of community-based education improve clinical care processes and increase the research capacity of the institution which could, in future years, draw in research dollars.

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Appendix 1: Matrix of UNC-Pembroke Health Professional Program Options

	Total Supply	**Rate per 10,000 Population**			**% Under-Represented Minority**	**Entry Degree**				
Profession	*NC*	*NC*	*UNC-P Region*	*UNC-P Region excl. Cumberland*		*Bachelors*	*Masters*	*Doctorate*	*Multiple Entry Points*	**Changes to entry degree?**
Nurse Practitioner	6,152 [1]	6.1	4	3.5	13%		MSN	DNP		Move to DNP? (target date 2015, didn't happen)
Occupational Therapist	3,304 [1]	3.3	2.2	1.9	8%		MOT	OTD PhD		Entry level doctorate only (2027)
Optometrist	1,159 [1]	1.1	1	0.9	5%			OD		No
Physician Assistant	5,602 [1]	5.5	5.6	4.5	8%		X			No
Registered Dietician	2,355 [2]	2.3	NA	NA	NA	X	X			Masters required to take CDR exam (2024)
Audiologist	400 [3]	0.4	NA	NA	NA			AudD		
Health Information Administrator	NA	NA	NA	NA	NA				X	
Healthcare Administration - Ambulatory Setting	NA	NA	NA	NA	NA				X	
Physical Therapist	6,420 [1]	6.3	4.8	4.2	5%			DPT		No
Psychologist	2,185 [1]		0.9	0.5	7%			PhD PsyD		No
Radiologist Assistant	NA	NA	NA	NA	NA		X			
Rehabilitation Counselor	2,640 [3]	2.6		NA	NA		X			
Speech Language Pathologist	4,040 [3]	4	NA	NA	NA		X			

[1] HPDS, 2016; [2] NC Board of Dietetics and Nutrition, 2017; [3] Bureau of Labor Statistics, 2016

Appendix 1: Matrix of UNC-Pembroke Health Professional Program Options *(Continued)*

Profession	# Education Programs in NC: Total	Public	Private	Preceptorship Availability	Additional Requirements	Student Interest	Job Availability/ Demand	Average NC Salary [3]
Nurse Practitioner	9	7	2	Lack of qualified sites for learners in NC		NA		$103,090
Occupational Therapist	8	3	5	Some difficulties finding placements		High. Nationally 5.8 applicants per seat in 2014 and trending more competitive	Moderate demand in UNC-P region. Qualitative reports that OTs do not stay long in rural jobs	$81,570
Optometrist	0	0	0	Available		Comparatively low. 30 NC students enroll in US optometry schools annually, nationally 1.5 applicants per seat in 2016 cycle	No data indicating unmet need for vision services, but may be understudied	$134,000
Physician Assistant	12	2	10	Lack of qualified sites for learners in NC		High. Nationally 3.0 applicants per seat in 2016 and trending more competitive	High vacancy rate. PAs able to job hop due to open positions. But will NC reach saturation with new programs?	$100,480
Registered Dietician	8	7	1	Limited. National dietetic internship matching program via DICAS	Must complete dietetic internship and take CDR exam	Unclear. Student seats not limited but 2.1 applicants per internship position in 2016	Qualitative data indicate high demand for RDs in UNC-P region	$53,480
Audiologist	3	3	0				Unclear; population aging may increase demand	$79,860
Health Information Administrator								
Healthcare Administration - Ambulatory Setting								
Physical Therapist	8	4	4				Unclear; population aging may increase demand	$82,320
Psychologist	6	5	1					$73,150
Radiologist Assistant	1	1	0		Bachelor's in radiologic technology to enter master's program		Unclear; may increase due to MACRA	$60,000 to $100,000 [4]
Rehabilitation Counselor	4	4	0				Unclear; population aging may increase demand	$38,020
Speech Language Pathologist	6	6	0				Unclear; aging population may increase demand	$71,850

[3] Bureau of Labor Statistics, 2016; [4] Range based on various websites accessed November and December 2018

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APPENDICES

Consulstart Report and Data
UNC Pembroke Focus Group Report
Letters from select community partners

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Dr. John Ruffin, CEO
UNC Pembroke College of Health Sciences Study

Mission of Study: UNC Pembroke, a minority serving institution located in a rural area of southeastern North Carolina, will expand its health care footprint in order to be a critical agent of change in addressing the acute health disparities, health factors, and health outcomes in its primary service region.

Expected Outcome of Study: UNC Pembroke will launch a College of Health Sciences, blending current programs with new flagship programs, and layering in new initiatives which prepare students including underrepresented minorities for careers in critical health care fields.

The UNC Pembroke College of Health Science Design:

- Existing programs that should be expanded by increased faculty line or resource in order to improve factors and outcomes in UNC Pembroke's service area.
- Existing programs that should expand into a terminal degree to improve factors and outcomes in UNC Pembroke's service area.
- New Flagship programs at doctorate, professional, or master's level that can provide key personnel and improve factors and outcomes in UNC Pembroke's service area. By definition, *a flagship program* is defined by UNC Pembroke leadership to be one that is capable of making an impact on health outcomes in the short term.

- New programs at bachelors or entry level to create a larger pool of health care work force and improve factors and outcomes in UNC Pembroke's service area.

Current UNC Pembroke Health Programs

- **Nursing**: BSN; RN-to-BSN, MSN, RIBN (Accredited)
    - 519 majors
    - 47 grads last AY: 45 Undergrad; 2 grad
    - Admission to program highly competitive
    - Slotted for 180 Nursing students at one time
        - Generally closer to 120: faculty line needs
    - RN-BSN online: 30 students
    - RN-MSN online/hybrid
    - MSN online: 32 students
- **Social Work**: BSW,MSW (Accredited)
    - 229 undergrad majors
    - 70 grad students
    - 109 grads last AY: 49 undergrad; 60 grad
- **Counseling**: (Accredited) 3* year program
    - Clinical Mental Health Counseling; MA ED hybrid program-online and in-class
        - 91 students
        - 35 grads last AY
    - School Counseling MA ED hybrid program-online and in-class

        - 101 students
        - 14 grads last AY
- **Athletic Training**:
- BS AT (Accredited)
- MS AT in planning stage with UNC General Administration.
    - Students
    - 5 grads last AY

<u>Item 1</u>: **Overview of Health Disparities in Counties Surrounding Pembroke University**

The health of the community is a major area of concern for UNC Pembroke. Ensuring the health of the people means there is greater potential for the community to prosper. UNC Pembroke is surrounded by several counties which share a similar demographic profile in terms of being predominantly comprised of racial and ethnic minorities, impoverished, rural, and people with poor health outcomes. Services provided by UNC Pembroke extend to nearby counties including Cumberland, Scotland, Richmond, Columbus, Moore, Hoke, Bladen, Brunswick, Harnett, Sampson, Anson, and Lee. Robeson has been identified as the poorest county in North Carolina, and as the 100th worst county for health outcomes according to the Robert Wood Johnson Foundation's County Health Rankings. The emphasis of this report will be on Robeson County where the university resides, which will serve as a proxy for the state of health, social and economic conditions in the other counties such as Columbus, Scotland, and Bladen which were ranked among the bottom five counties by Robert Wood Johnson.

The U.S. Department of Health and Human Services, *Healthy People 2020,* defines a health disparity as "a particular type of health difference that is closely linked with social,

economic, and/or environmental disadvantage." There are multiple factors that influence an individual's health status or health outcome including race and ethnicity, geographic locale, sexual orientation, gender, age, physical disability, discrimination, and social determinants. Disparities in health exist across populations when a disease, condition, or health outcome presents itself to a greater or lesser degree in one population compared to another. Health care disparities are differences in access to and availability of health care facilities to different population groups. Access to medical care is important in preventing, diagnosing, managing and treating diseases and health conditions effectively and timely through quality care. Factors that impact access to care include having a regular physician or usual source of care, having health insurance, or ease of obtaining care when desired. Access to and number of care providers in Robeson and other nearby counties is problematic.

Robeson County is comprised of 68 percent racial and ethnic minorities, with 39 percent American Indians, 26 percent Whites, 24 percent African Americans, and 9 percent Hispanics, along with a 5 percent foreign born population. The unemployment rate of 5.8 percent in Robeson County exceeds that of North Carolina at 4.1 percent and the national average which is also approximately 4.1 percent. The main sectors for employment in Robeson County are manufacturing, health care, agriculture, social assistance, and retail. Thirty-three percent of Robeson residents live in poverty, primarily American Indians and African Americans, with 45 percent of children living in poverty, more than three times the national average of 12 percent. Robeson leads the state of North Carolina for crime with a rate that is four times the national average. Young people in Robeson are twice as likely as teens in other parts of the state to die from violent crime before age 18.These significant and varied conditions are highly unlikely to improve without major change in education, the economy, and work force. Expanded academic

and community programming from UNC Pembroke could be an important catalyst as the university is a positive economic force in the region.

Health disparities in Robeson County are prominent. Residents of Robeson and surrounding counties in North Carolina, primarily from racial and ethnic backgrounds, exhibit a disproportionate burden of disease when compared to their White counterparts. The leading causes of death in Robeson County are cancer, heart disease, unintentional injuries or accidents, diabetes, and chronic lower respiratory diseases. Robeson residents experience a higher rate of smoking, obesity, physical inactivity, sexually transmitted infections, and teen birth compared to the state of North Carolina and the nation. For example, there is a 40 percent obesity rate in Robeson in comparison to 30 percent and 26 percent for the state and nation. Only 41 percent of residents in Robeson have access to opportunities to exercise compared to 75 percent and 91 percent for the state and the nation respectively.

North Carolina is among the states that did not adopt the Medicaid expansion option provided by the Affordable Care Act that would increase access to health insurance, and medical care including free preventative care for many people. The uninsured rate in North Carolina is 15 percent, compared to the national rate of 8 percent, and the high rate of 22 percent in Robeson County. Access to health insurance determines whether, when, how often and the quality of health care that a person receives which ultimately influences health status and health outcomes. It is clear that many of these disparities and challenges have existed for some time and are likely to continue if not worsen unless something transformative is done. UNC Pembroke could make a significant impact in terms of access to care and expertise with new and expanded training of the

next generation of health care work force. This could include direct care and behavioral health care.

According to the World Health Organization, social determinants of health are "*the conditions in which people are born, grow, live, work, and age, including the health-care system."* Health status and health outcomes are shaped not only by biology and genetics, but social, economic, psychosocial, behavioral, and environmental factors also play a central role in a person's ability to access quality medical care and to lead a healthy life. The complex interplay of these factors at the individual, societal, community, or systems level often contribute to health disparities. At the individual level, behavior may be related to alcohol use and misuse, substance use and abuse, diet and nutrition, physical activity, unprotected sex, cultural or religious beliefs, or smoking. Issues related to discrimination, income, gender, education, geographic location, immigration status, transportation, employment status, housing and food security, and psychosocial stressors, are key components of the social environment. The physical environment which is closely linked to the social environment, is often overlooked in considering strategies to address health or health disparities, which includes: air and water quality, exposure to environmental toxins such as radiation, dust mites, lead, mold or pollution; access to walkable communities; stress, unhealthy housing units and neighborhood violence.

The quality of health services, health insurance status, mistrust of the medical system, patient-clinician communication, screening, diagnosing, and treating a disease or condition, limited treatment options, trained experts, quality of training offered to health care professionals, are essential factors at the health care system level that can determine the outcome of a person's

life. Given UNC Pembroke's cultural status and the fact that students often come from nearby rural areas, a College of Health Sciences could assist progress in alleviating area conditions.

Diversity in the health professions and scientific workforce are pivotal in addressing health disparities borne by a rapidly increasing population of racial and ethnic minorities, and individuals from low socio-economic backgrounds who experience persistent poor health outcomes. The U.S. health professions workforce is comprised of 80 percent Whites. African Americans, American Indians, and Hispanics are particularly underrepresented among physicians, registered nurses, dentists, pharmacists, and allied health professionals. In North Carolina, racial and ethnic minorities make up less than 17 percent of the health professions workforce, although they represent 33 percent of the state's population. In Robeson County, the mental health provider to patient ratio is 660:1, for physicians it is 2,320:1, and for dentists it is 4630:1. During 2015-2016, Robeson had 57 percent of kindergarten students who had filled, missing or decayed teeth, and 25 percent with untreated dental decay. A diverse workforce helps to ensure that the health care needs of the population can be adequately met when health professionals are culturally proficient and competent to care for patients who share a similar culture, language, or background. Diversity of the workforce is important in improving access to care in bringing health care issues of concern to policy leaders, researchers, and others with influence. Given the university's diversity profile, the possibility of training a more diverse health care workforce in this rural area seems promising.

Academic achievement is another key indicator of socio-economic and health status. Racial and ethnic minorities and low-income students are sometimes not as successful in academics because they often experience high rates of attrition, lack of role models and mentors,

and limited knowledge about opportunities in health-related careers. Recruitment and retention of racial and ethnic minority, and socio-economically disadvantaged individuals into college is a major challenge in pursuing health and science-related careers often because students lack the resources to pay for college as the cost of tuition continues to skyrocket. As a result, public universities may be a better fit for serving low income or rural students than private schools based on pure affordability. UNC Pembroke is among the more affordable universities in North Carolina.

UNC Pembroke can play a crucial role in improving the health of residents in Robeson and surrounding counties through development of new and expansion of existing programs which target key social and environmental factors that contribute to the health disparities experienced by residents in its service area. Unemployment, poverty, access to care, and diversity of the health care workforce are some of the leading health disparity-related factors that must be addressed. Engaging the community in identifying the priorities and solutions to the factors that underlie the poor health outcomes of residents is integral to the success of any effort aimed at improving community health. There is no single cause for health disparities which necessitates a multi-faceted approach that depends on strong collaborations and partnerships in tackling the intractable challenge of health disparities. Integrated care seems crucial given the varied nature of the social, economic, and environmental factors at play.

Item Two: Recommendations for UNCP Programs

Programs that UNC Pembroke should consider for its College of Health Sciences, must focus on strengthening areas where it is already excelling that can contribute to improving overall community health. In addition, UNCP should identify the gap areas and seek out

collaborations at the local, state, regional and national level that can complement existing efforts, or foster the creation of new programs and opportunities. Programs have to be considered within the context of building blocks that allows for the sustainability of effective efforts. As programs are developed, they should be contemplated in terms of implementation by phases or linkages between programs where one program can serve as a feeder for the other when possible. A Nurse Practitioner program, as one example, would build on existing Department of Nursing resources while adding to the direct care work force. This would allow UNC Pembroke to create an internal pipeline for ongoing training for multiple levels of the work force.

It should also be recognized that programs must also be considered that extend beyond the walls of the university and offer opportunities within the community, local, state and federal government agencies, and non-governmental organizations for students and faculty. Programs that promote collaborations and partnerships with Tribal Colleges and Universities which predominantly serve American Indians could be essential in identifying best practice models, similarly models from other minority serving institutions such as Historically Black Colleges and Universities. Community engagement and active participation in developing academic and community programs are necessary at every stage. Clinical trial programming, research initiatives into rural and minority health matters, and a campus clinic could be the type of concepts critical to integrating the community more fully into a College of Health Sciences. Addressing community issues while educating both work force and citizens should be the goal of the College of Health Sciences.

An emphasis on mentoring and career development are important programmatic areas to help promote diversification of the health care workforce, and to attract students and faculty to

UNCP. Programs that offer exchange opportunities for other students and faculty to come to UNCP, and that allow UNCP students and faculty to gain experience at other sites during the summer or semester can be an incentive for students and faculty to come to UNCP. Programs that match students with health professionals and faculty at other sites can offer social support and academic guidance to facilitate the successful pursuit of a health-related career.

Collaborations with the Department of Health and other UNC system components that have existing programs to address community health can provide models for UNCP and potential sites for community health and research experience. Membership in professional organizations and attendance at meetings for faculty and students can also provide exposure and networking opportunities for UNCP faculty and students. Pipeline programs that offer educational opportunities for students from K-12 should be explored with the school system as these students can potentially become prospective UNCP students in health programs. Global health can be an area of focus for Pembroke with the increase in immigrant populations to counties surrounding Pembroke. Cultural context is important to consider in developing programs at UNCP given the diversity of the student body but more importantly Robeson and nearby counties. UNCP's historic presence in the community situates it well for developing health programming that will be well received by people in nearby counties. Training and retaining work force are equally important.

The creation of programs within the College of Health Sciences can begin by launching a major health sciences initiative that fosters collaboration across departments and brings existing departments and programs together. Integrated care curriculum and inter-professional training could equip UNC Pembroke's students with the necessary skills for population health practices

including team-based practice. Integrated care programs can also be rewarding for faculty. Such practices can establish the foundation or infrastructure for the College of Health Sciences that can then lead to the creation of a specialized Center in an area such as rural health, rural health disparities, or social determinants of health with funding from state, federal, or foundation entities. This approach will allow the institution to show its commitment and investment in addressing some of the health issues impacting tribal and rural communities, and its ability to build off of that foundation. Issues of access and rural disparities are well chronicled and UNCP would have an opportunity to design an innovative College of Health Sciences shaped by recent research studies.

UNCP should explore funding opportunities through federal entities such as the National Institutes of Health particularly the National Institute on Minority Health and Health Disparities (NIMHD), the National Institute of Environmental Health Sciences (NIEHS -based in Research Triangle Park, NC), the National Institute of Diabetes, Digestive and Kidney Diseases (NIDDK), the National Institute of Dental, Craniofacial Research (NIDCR), the National Cancer Institute (NCI), the National Heart, Lung, and Blood Institute (NHLBI), the National Institute of Drug Abuse (NIDA), the Eunice Kennedy Shriver National Institute on Child and Human Development (NICHD), and the National Institute of Mental Health (NIMH). Other federal agencies to consider are the Centers for Disease Control and Prevention (CDC), the Health Resources Services Administration (HRSA), and the Agency for Healthcare Research and Quality (AHRQ). Foundation support should also be explored from the Robert Wood Johnson Foundation, and the Kellogg Foundation. State agencies, UNC system and community entities should also be options.

Given the data on Robeson and nearby counties, UNC Pembroke should be well positioned to compete favorably for funding from these and other sources. It will be incumbent on UNCP to develop a College of Health Sciences that emphasizes research on social determinants of health, training a diverse work force, and improving access to care for rural communities. These are important regional and national issues and a varied approach should make the university competitive for funds.

Some of the programs (alphabetical order) that UNCP might consider for the College of Health Sciences which should be prioritized based on input from the community, faculty, students, and stakeholders include:

- Community Health / Health disparities research/ Public Health/
- Dental Hygiene
- Environmental Sciences Health
- Global Health –internship/training opportunities at international sites
- Health care Economics (collaboration with Department of Economics)
- Health Care Delivery Systems
- Nursing (existing) Nurse Practitioner
- Nutrition
- Occupational Therapy (could combine with PT and Athletic Training)
- Optometry
- Physical Therapy (Athletic Training is existing may be where this reside)
- Physician Assistant or Nurse Practitioner
- Social Work (existing)/ Counseling (existing)

Not all of these programs could be pursued at the outset, but each would have a realistic chance to attract students and faculty to a new College of Health Sciences. In addition, each would produce valuable work force. There is a reasonable chance to design the curriculum so that some courses can be shared. This could be cost effective and create an integrated care model which would be attractive to students, faculty, funders, and employers, as well as beneficial to the community in that recruitment efforts will also focus on community members who are committed to the community and may be more dedicated to remaining in the community as professionals. Without some sort of change which creates a larger and more diverse work force prepared to work in a rural setting, it seems unlikely that improvements will be made in regional health outcomes.

Community Based Participatory Research

"A collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings.

CBPR begins with a research topic of importance to the community and has the aim of combining knowledge with action and achieving social change..."

What UNC-Pembroke Needs

--Institutional support

--Community support

--Capacity/infrastructure

--Programs to attract, retain, and continually develop good faculty and students including mentoring programs

--Sustainable Funding: requires diverse funding sources

--A strategic vision plan for a health sciences school

Types of Programs to Consider for Pembroke Health Sciences School?

Consider priorities, can start with most important and expand accordingly

- Community Health
- Social Work
- Nursing
- Public Health
- Dental Hygiene
- Physical Therapy (Athletic Training may be where this reside)
- Occupational Therapy
- Physician Assistant
- Global Health –internship/training opportunities at international sites
- Health care Economics (collaboration with Dept of Economics)
- Health care Delivery System
- Health disparities research
- Environmental Sciences/Health

Opportunities to Support Programs

- Federal Funding (NIH, CDC, HRSA and other
- State support
- UNC system

Health Disparities

...particular type of health difference that is closely linked to social, economic, and/or environmental disadvantage

...Differences in the incidence, prevalence, mortality and burden of diseases and other adverse health conditions that exist among specific populations in the U.S.

Key Strategies to Address Health Disparities

- Good Leadership
- Collaborations & Partnerships
- Community involvement
- Focus on social, economic, and environmental issues
- Improvement in health systems and health services delivery
- Enhance efforts to track, measure, understand and address the causes, drivers, and solutions to health disparities
- Highly trained, diverse work-force
- Sustainable interventions
- Integration of health into all policies and activities

Social Determinants of Health

...the conditions in which people are BORN, GROW, LIVE, WORK, and AGE

Social factors, including education, racial segregation, social supports, and poverty are major contributors to health outcomes and health status.

In the US, lower education levels are directly correlated with lower income, higher likelihood of smoking, and shorter life expectancy.

Research shows children born to parents who have not completed high school are more likely to live in an environment that poses barriers to health.

> More likely to live in areas that are unsafe, have exposed garbage or litter, and have poor or dilapidated housing and vandalism
>
> Less likely to live in areas that have sidewalks, parks or playgrounds, recreation centers, or a library

- Foundations (RWJ, etc)
- Community (businesses, non-profits, etc)

Models for Starting a Health Sciences School at Pembroke

- Bringing existing departments and programs together
- Establishing the foundation/infrastructure by securing funding for a specialized Center e.g. on health disparities, social determinants of health, etc. Allows institution to show its commitment and investment in addressing some of the health issues impacting tribal and rural communities, and its ability to build off of that foundation
- Launch of major health sciences initiative that fosters collaboration across departments

Pembroke, NC

- 60% poverty rate
- Median age is 24
- Diverse area –including surrounding cities
- Predominantly American Indian, followed by African Americans and high rate of immigrants from Mexico, Guatemala and Germany
- In nearby Lumberton City, high rate of residents from St. Kitts-Nevis (45 people).
- High rates of immigrants in the area is an opportunity to consider cultural context in approaches to address the health of the surrounding community; presents an opportunity for Pembroke to focus on global health

Education

- **Racial/Ethnic Breakdown of Graduates:** higher rate of Whites followed by African American and American Indian –where are the students from geographically who are graduating from UNC Pembroke and Robeson Community College?
- Most studied fields for graduates in Lumberton City area:
  --Criminal Justice-Safety;
  --General Business Administration
  --General Health and Physical Education
  --Social Work

Income

- Average income in Pembroke is $15,934 compared to $30,608 in Robeson County and $47,830 in North Carolina
- American Indian's most likely group in Pembroke to be poor

Robeson County

- Robeson County is the poorest county in North Carolina
- Robeson is bordered by South Carolina, and the North Carolina counties of Bladen, Columbus, Cumberland, Hoke, and Scotland.
- 68% minorities –American Indians, African Americans, and Hispanic; 26% White
- Lumbee Tribe is state-recognized and makes up 38% of the American Indian population
- The Lumbee reside primarily in Robeson, Hoke, Cumberland, and Scotland counties.
- Lumbee Tribe is the ninth largest non-federally recognized tribe in the United States.

Demographics of Robeson:

- 36.3% average age
- 39% American Indians, 26% Whites, 24% African Americans, 9% Hispanics
- 78% high school or higher education
- 5% foreign born population, 80% from Latin America, 12% Asia
- Unemployment rate is 6.1% compared to a rate of 4.1% for the state of North Carolina
- Robeson leads state of North Carolina for crime. The crime rate is four times the national average. Young people are twice as likely as teens in other parts of the state to die before they're old enough to vote.
- **Opportunity:** UNC Chapel Hill University of North Carolina at Chapel Hill has the nation's first rurally focused youth violence prevention research center with CDC funding
- Robeson County's youth death rate – 124 per 100,000 – was nearly twice the state average between 2004 and 2008, according to the N.C. Department of Juvenile Justice and Delinquency Prevention http://ncace.web.unc.edu/media/robeson-county-is-one-of-most-violent-in-state/

Health, Social & Economic Situation in Robeson

- Robeson ranked 100th out of 100 counties for health outcomes and health factor (clinical care, and health behaviors) by RWJ County Health rankings
- 22% residents without health insurance
- 40% obesity rate
- Sexually transmitted infections and teen births are a major problem far exceeding the national and state rates
- Primary care physicians =2,230:1
- Dentists: 4,630:1
- Mental health providers: 660:1

- Mammography screening –only 57% of women compliant
- 31% residents in poverty
- 20% residents facing housing problems
- Drinking water violations
- Air pollution above the North Carolina state rate
- County health rankings for counties surrounding Robeson:
    Hoke #60
    Cumberland #79
    Bladen #91
    Colombus #97
    Scotland #99

Department of Health

- Robeson County Health Report priorities obesity, and substance abuse and misuse
- Leading causes of death in Robeson County: **heart disease, cancer, diabetes** http://publichealth.southernregionalahec.org/robeson/docs/Robeson%20County%202015%20SOTCH.pdf

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COLLEGE OF HEALTH SCIENCES STUDY
NOTES ON UNC PEMBROKE FOCUS GROUPS

Five focus groups were held in November and December of 2017 to gauge interest and gather ideas concerning an expanded UNC Pembroke health care footprint. The five sessions featured the same basic questions with room for follow up on items unique to those that were assembled in each group. A total of 81 people attended. Each session lasted just over 90 minutes. Each attendee was provided a baseline presentation documenting the health care study legislation, the study design, basic demographic data about the university and its student body, the general state of health factors and outcomes in the UNC Pembroke service area, and statistical data about current UNC Pembroke health care programs.

BASELINE QUESTIONS

- WHAT ARE YOUR CURRENT WORK FORCE NEEDS? WHAT IS THE FUTURE LANDSCAPE?
- WHAT ARE THE KEY POPULATION AND COMMUNITY HEALTH TRENDS IN YOUR INSTITUTION?
- WHAT SPECIALISTS ARE NEEDED OR ARE OTHERWISE CHALLENGING FOR YOU TO RECRUIT?
- IF UNC PEMBROKE WERE TO SIGNIFICANTLY EXPAND ITS HEALTH CARE PROGRAMS AND CREATE NEW OFFERINGS, HOW COULD THAT HELP YOUR INSTITUTION?
- WHAT ARE THE BIGGEST HEALTH CARE CHALLENGES IN YOUR PRIMARY SERVICE AREA?

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- AS WE DESIGN AND IMPLEMENT A COLLEGE OF HEALTH SCIENCES, WHAT ADVICE AND SUGGESTIONS DO YOU HAVE?

FOCUS GROUP EVENTS

November 10, 2017 UNCP Health Care Faculty, UNCP Campus

- Natalya Locklear, Director Health Careers Access Program
- Jennifer Twaddell, Chair, Department of Nursing
- Cherry Beasley Department of Nursing
- Julie Harrison-Swartz Department of Nursing
- Deborah Hummer Department of Nursing
- Debbie Locklear Department of Nursing
- Kathy Locklear Department of Nursing
- Kate McAllister Department of Nursing
- Amy Medina Department of Nursing
- Kelly Moran Department of Nursing
- Pamela Morgan Department of Nursing
- Astrid Oviedo Department of Nursing
- Rosemarie Pilarczyk Department of Nursing
- William Puentes Department of Nursing
- Cynthia Woodrup Department of Nursing
- James Crouch Department of Nursing
- Velinda Woriax, Chair, Biology Department

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- Siva Mandjiny, Chair Chemistry Department
- Susan Edkins, Chair Athletic Training
- Beverly Justice, Athletic Training
- Caroline Taylor Athletic Training
- Sherry Edwards Department of Social Work
- Cindy Locklear Department of Social Work
- Veronica Hardy Department of Social Work
- Martica Bacallao Department of Social Work
- Summer Woodside Department of Social Work
- Alice Kay Locklear Department of Social Work
- Tamara Savage Department of Social Work
- Yale Kodwo Nyameazea Chair, Department of Social Work
- Dennis Swanson, Dean of the Library
- Shenika Jones Department of Educational Counseling and Leadership
- Angela McDonald Associate Dean, School of Education
- Nicole Stargell Department of Educational Counseling and Leadership
- Dana Unger Department of Educational Counseling and Leadership
- Jeff Warren, Chair Department of Educational Counseling and Leadership
- David Ward, Provost
- Jeff Frederick, Dean College of Arts and Sciences

- Richard Gay, Associate Dean College of Arts and Sciences
- John Ruffin, Consulstart

NOTED COMMENTS:

An integrated care College of Health Sciences model would be tremendously exciting for students and faculty; working with other faculty in different disciplines would be energizing; we are currently in different buildings but if we were in the same building collaboration would become second-nature

A good range of new health care programs would make an immediate impact in many communities with our graduates

We should be in an academic unit that specializes in health care issues, social determinants of health, and can focus solely on these issues

Grants would be attractive as we apply an inter-professional, integrated care focus

Some faculty might become 12 month employees in order to meet the demand of graduate and professional school

Preceptor and clinical sites might be hard with expansion of programs

Access is such an issue for patients

Community college pathways could provide links to advanced degrees at UNCP

We are student focused and our current faculty is very supportive; we should make sure we stay that way if we add new programs

Can we meet as health faculty every semester for collective brainstorming and professional development?

Cost is such an issue for our students seeking grad and professional programs; it would be great if UNCP had some new programs here.

Helping the aging population is much needed

We need to grow our graduates in order to meet health demand needs

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November 16, 2017, First Health of the Carolinas, Pinehurst, North Carolina

- Amy Graham: Vice President - Strategy and Innovation
- Karen Robeano: Chief Nursing Officer
- Cindy McDonald: Vice President – Quality
- Dan Barnes, DO: President – First Health Physicians Group
- Drusi Smith: Project Director, EPIC Implementation
- Teresa Sessoms: Manager, Recruitment
- Chris Miller: Administrative Director, Community Health Services
- Jeff, Frederick, Dean of the College of Arts and Sciences

NOTED COMMENTS:
UNCP should blend nurse, counseling, and social work training for better integrated care background

We need to hire more nurses. Can you expand number of graduates? Are you considering a DNP program? You should. We could do more nurse shadowing for younger students if it would help them in nursing school.

Have concerns about members of health care work force retiring earlier than usual

Dietician/Nutrition grads needed increasingly

UNCP getting deeper into health care is exciting

Communication skills are very important; make sure grads at all levels have excellent oral and written communication skills

Community health focus is already here. Project teams are key. Customer service mentality is part of health care moving forward.

Social workers with greater discharge planning experience would be useful

Medical lab techs needed; Chemistry grad need some specific coursework in order to be employed right away.

PT/OT needed

Executives and supervisors need health finance, health IT training and ongoing access to professional development, IT doesn't always understand patient care; patient care folks don't understand IT limits and practices

December 1, 2017 Behavioral Health Experts, UNCP Campus

- Tina Hall, Delta Behavioral Health
- Jane St. John, Delta Behavioral Health
- Briana Perkins Alliance Behavioral Healthcare
- Angela McDonald, UNCP Counseling/ School of Education
- Ki Chee, UNCP Counseling
- Kathryn Kelly, UNCP CAPS
- Leonard Covington, Sandhill's Center LME
- Melinda Frederick, Community Innovations
- Diane Henry, First Health Behavioral
- Lisa Atkins, First Health Behavioral
- George Grossman, UNCP CAPS
- David Ward, Provost
- Jeff Frederick, Dean of the College of Arts and Sciences

NOTED COMMENTS:

Should create a core of courses for all health related majors. This will make sure the approach at UNBCP is always integrated and inter-professional.

Such an acute need to make sure everyone at all levels of health care delivery understands something about substance abuse and the scope of the opioid problem.

A wider range of training for primary care folks is needed so that they have a greater working knowledge of mental and behavioral health.

We don't have enough work force trained to help adolescents

DD (developmentally disabled) population has own set of needs and requires work force who understands this.

Whole person and client centered training critical given the changing Medicaid model. Transition care and case managers who have multiple skills are needed. Evidenced based outcomes demand clinicians ready to know how to proceed.

Excited that UNCP could be a great source from which to recruit multiple specialists. Need PA's or NP's trained in Psychiatric/Clinical Mental Health.

Make sure the leadership is open and flexible

A range of Master's programs—Social Work, Psychology, Public Health, Health Admin—would allow people to specialize in areas of need.

December 6, 2017 Southeastern Health, Lumberton, North Carolina

- Renee Taylor, Chief Nursing Officer
- Jason Cox, COO of SRMC
- Lori Dove, VP-Post Acute
- Steve Milton, CIO
- Cynthia MacArthur-Kearney- Education
- Henry Edwards – PT

- Anthony Grimalkin- Behavioral Health
- Joe Roberts, MD – CMO
- Joann Anderson –CEO
- Ross Masters, UNCP student; med school applicant
- Jeff Frederick, Dean of the College of Arts and Sciences

NOTED COMMENTS:

Our staff needs diversity awareness and knowledge of this community. This helps when people need to "think on their feet." We want people who want to work in this community.

We are all moving in a population health direction. PA's NP's needed. Folks must understand the interrelated nature of the social determinants of health.

Major nursing needs. Need PT/OT bad. Needs likely to only grow for these positions in the future. We need local students in PT/OT and other programs. Dieticians and nutritionists would be important.

A Public Health program would be useful for prepping many kinds of work force.

With so many institutions working on health outcomes, we need to make sure we don't supplicate services unnecessarily. We need a partnering and team approach

Work force needs critical thinking and differentiation skills plus soft skills of interacting with people and effectively communicating.

Predictive analytics and health informatics critical. EPIC hospital. How could ongoing training be provided?

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December 14, 2017 Scotland Health Care System, Laurinburg, North Carolina

- Greg Wood, President & CEO
- Ann Locklear, VP Human Resources
- Paula McKinney, VP Patient Care Services/CNO
- Gary Hatchell, Senior Director of Rehab Services
- Karen Carlisle, Director Emergency Services
- Michelle Herberg, Director Women's Services
- Robin Crump, VP Operational Excellence
- Lisa Eaves, Director Medical/Surgical/Pediatrics
- Tracey Page, Sr. Director, Health Information & Resource Management.
- Jeff Frederick, Dean of the College of Arts and Sciences

NOTED COMMENTS:

Hire many UNCP grads already. Exciting to think of new programs that the hospital might take advantage of.

NC Promise could be great opportunity for RN-BSN. Would UNCP create a special cohort of classes for just Scotland nurses?

Need 20 additional nurses. Need PT/OT

Population health may mean more telemedicine. Always thinking about process improvement and patient flow. Efficiency and outcomes always at the forefront.

Analytics and informatics important. An EPIC hospital. IT needs to understand medical terminology and primary care needs to understand medical and health information coding. Communication can always be better.

A Public Health bachelors program could be a good match for prepping many kinds of workers.

Carolina Eye Associates
2170 Midland Road
Southern Pines, NC 28387

January 15, 2018

Dear Dean Frederick, UNC General Administration, UNC Board of Governors and NC General Assembly,

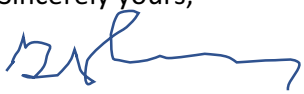
Over the last months Dr. Robin Cummings and I have had discussions about a school of optometry in NC and particularly a school at UNC Pembroke. Our group, Carolina Eye Associates, for four decades has provided tertiary medical and surgical care to North Carolinians as well as residents in our neighboring states. The relationship between ophthalmology and optometry in the rest of our country is largely based on the model of cooperation between the two professions began in NC in the late 1970's. Optometrists provide most of the primary eye care in NC and typically serve across the spectrum from urban to very rural locations.

UNC Pembroke is uniquely positioned to create a leading school of optometry capitalizing on the synergy within the UNC system. The best schools of optometry in the country are based in public universities. The opportunities for collaboration with the other schools of healthcare, the research opportunities with biomedical engineering, basic sciences, and the school of public health are unique to the UNC system. UNC Pembroke is geographically well suited for the school with nearby access to clinical training sites.

Carolina Eye is a leader in optometric education hosting lecture series throughout the year. Our surgeons serve as faculty at the Campbell School of Osteopathic Medicine, offering fourth year clerkships in ophthalmology. Our group currently has twelve locations throughout NC and two ambulatory surgery centers. We are willing and excited to offer our optometrists, surgeons and physical locations for clinical training sites for optometry students. We have a full time clinical research department and are active participants in clinical trials. We would welcome partnering with a UNCP optometry school in our clinical research endeavors.

A school of optometry at UNCP is a fine opportunity for eastern NC and the UNC system, and we are in full support.

Sincerely yours,



Gregory J. Mincey, MD, MBA, FACS
Senior Partner, Carolina Eye Associates

David J. Kilarski
Chief Executive Officer

January 15, 2018

Dr. Jeff Frederick, Ph.D.
Dean of College of Arts and Sciences
Professor of History
UNC at Pembroke
Hickory Hall/Box 1510
Pembroke, NC 28372-1510

Dear Dr. Frederick:

I understand that UNC General Administration, UNC Board of Governors, and the NC General Assembly are studying the healthcare workforce needs of southeast North Carolina. FirstHealth of the Carolinas has a long-standing relationship with UNC at Pembroke as a clinical training site for individuals in the healthcare field.

As you are aware, we serve many of the rural counties in central southeast North Carolina. FirstHealth continues to have shortages in many of the healthcare jobs in our health system. FirstHealth and UNC-Pembroke representatives met in November 2017 where concerns were identified including need for additional resources within rural North Carolina. I would strongly support the addition of healthcare programming to UNC-Pembroke campus. FirstHealth will continue to serve as a site for clinical education of these students since we believe this is one of the most effective ways to recruit young students into our vacant positions.

Please feel free to contact me if you need additional information. I continue to be impressed by the quality of programming and the students we see from UNC at Pembroke.

Sincerely,

David J. Kilarski
Chief Executive Officer

cc: Dr. Robin G. Cummings, Chancellor

SOUTHEASTERN HEALTH
Better Health—Starting With You

January 19, 2018

Dr. Robin Gary Cummings
Chancellor
University of North Carolina at Pembroke
P.O. Box 1510
Pembroke, NC 28372

Dear Dr. Cummings,

As President and CEO of Southeastern Health, I am writing this letter in support of the University of North Carolina at Pembrokes' establishment of a College of Health Sciences. This school would provide an opportunity to grow a stronger, highly educated, and qualified healthcare focused workforce in southeastern North Carolina. The ability to educate and train young people from Southeastern NC close to home will increase the likelihood they will remain in the area after completion of the program. This improved workforce would have an overall positive impact on the local economy.

Healthcare is one of the most fulfilling professions in the nation. Southeastern Health would be delighted to partner with this endeavor by providing clinical sites and staff to assist and train future students. Southeastern Health serves as a teaching site for numerous programs across the region. We have proven we can provide excellent clinical learning opportunities across inpatient, outpatient, and long-term settings.

I am excited about the possibilities a collaborative such as this can bring for Southeastern Health and the University of North Carolina at Pembroke. Both have had a long-standing and successful partnership for many projects. This could bring that relationship to another exciting level. If you should have any questions or concerns, please contact me directly, 910-671-5050.

Sincerely,

Joann Anderson

Joann Anderson, MSN, FACHE
President and CEO

SCOTLAND
HEALTH CARE SYSTEM

January 19, 2018

Dr. Jeff Frederick, Ph.D.
Dean of the College of Arts and Sciences
University of North Carolina at Pembroke
Hickory Hall/ Box 1510
Pembroke, NC 28372

Dear Dr. Frederick:

Scotland Health Care System is delighted to offer support for your plan to create a College of Health Sciences. As you heard from many of our leaders when you visited last month during our focus group session, the need for "locally grown" staff and leaders in the areas under consideration would be both a major and critical win for us. Recruiting and retaining quality health care professionals in a rural area like ours is quite challenging. Individuals who are from our region or want to work in rural environments greatly increases our long-term retention rates. You also heard that we have a long history of training students at all levels throughout our system and would welcome the opportunity to service as a clinical site.

As you work with UNCP Administration and Board leaders and others in the NC General Assembly, please let me know how else I or my staff can assist with this vital program.

Sincerely,

Gregory C. Wood
President & CEO

GCW/alt

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