# 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

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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.

#### <u>Methods</u>

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<sup>1</sup>
- 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<sup>2,3</sup> 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
- Occupational therapy, while a doctoral-level program, may not be enough of a "flagship" program to be attractive to UNC-P leadership

#### 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
- Dietitian program may not be enough of a "flagship" program to be attractive to UNC-P leadership

#### **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<sup>4</sup>
- 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<sup>5</sup>
- 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<sup>6</sup>
- 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.<sup>a</sup> An additional 31.3% identify as white and 24.2% identify as Black.<sup>7</sup> 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.<sup>8</sup> At 30.6%, the poverty rate in Robeson County is more than double the national rate.<sup>9,10</sup> Moreover, the median household income is \$30,608, which is less than 60% of the median household income for NC.<sup>11,12</sup> 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%.<sup>13</sup>

Robeson ranks as the worst county in NC in terms of health outcomes according to the Robert Wood Johnson Foundation.<sup>14</sup> 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.<sup>15</sup> Obesity and associated health problems contribute to this poor ranking. The adult obesity rate in Robeson County is 40% (compared to 30% for NC),<sup>16</sup> and the diabetes death rate at 46.5 per 100,000 residents is double the rate of 22.8 per 10,000 for NC.<sup>17</sup> 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.<sup>18</sup>

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.<sup>19</sup> 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.<sup>20</sup>

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,<sup>21</sup> and Marlboro, Dillon, and Marion counties make up the bottom three in the county health rankings for South Carolina.<sup>22</sup>

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.<sup>23</sup> 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.<sup>24</sup> 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.<sup>25</sup> 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.<sup>26</sup> 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.<sup>27</sup> 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.<sup>28</sup> 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,<sup>29</sup> 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.<sup>30</sup> 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.<sup>b</sup> 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.<sup>c</sup> 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.<sup>31</sup>

#### Potential New Programs

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

- <u>Optometry</u> 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) <u>Nutrition/Dietetics</u> 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) <u>Physical Therapy and Occupational Therapy</u> 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.

- Family Nurse Practitioner (FNP)/Psychiatric 4) 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) <u>Health Care/Practice Management</u> 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) <u>Clinical Informatics/Health Information</u> <u>Technology (HIT)</u> – 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) <u>Public Health and Prevention</u> – 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 interprofessional 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





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.<sup>32</sup>

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

2000

0.0



Table 1. Diversity of the NCPopulation and Optometrists, 2016

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 Chapel Hill.

Evaluation of a Potential New Health Sciences School at The University of North Carolina-Pembroke to Meet the Needs of the Region and State 9 Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research

#### Optometry

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.<sup>33</sup> 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.<sup>34</sup> 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).<sup>35</sup>

#### 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.<sup>36</sup> 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.<sup>37</sup>

In 2014, the American Optometric Association commissioned a study about the eye care workforce from an outside consulting group,<sup>38</sup> but the methodology of the study received heavy criticism.<sup>39</sup> 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.<sup>40</sup> 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 outof-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.<sup>41</sup> The data show that 1,871 first-year optometry students began school in the fall of 2016,<sup>42</sup> meaning that 66.5% of those who applied to optometry schools matriculated, a rate of 1.5 applicants for every seat.<sup>43</sup>

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).<sup>44</sup> 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.



1,000

0

2006



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



and Occupational Therapists, 2016



Table 2. Diversity of the NC Population Figure 15. Specialty Practice Area for Active, Licensed Occupational Therapists, NC, 2016

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

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.<sup>46</sup> The doctoral level minimum entry requirement for OTs will be enforced beginning in July 2027.<sup>47</sup> 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.<sup>48,49</sup> 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.<sup>50</sup> At Lenoir-Rhyne University, tuition for an OT master's degree is \$57,750, which does not include university fees.<sup>51</sup>

#### 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 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 OccupationalTherapist 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

	D	octoral-degree- occupational tl	level programs herapy students	for s	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/otdoverview; 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/2014-2015-Annual-Data-Report.pdf.

		Doctoral Degree	e Program	S		Master's Degre	e Programs	S
	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%

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

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.<sup>52</sup> 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.





28%

17%

under





### Figure 21. Supply and Demand for Dietetic Internships Since 1993



Sources: Figure 18, 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.eat.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 Draduaad by The Pro n on Hoalth Workfor Cooil C SI r for Hoalth So of N

Evaluation of a Potential New Health Sciences School at The University of North Carolina-Pembroke to Meet the Needs of the Region and State 17 Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research

#### **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.<sup>54</sup> 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.<sup>56</sup> 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.<sup>57</sup> 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**).<sup>58</sup> 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,<sup>59</sup> 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.<sup>61</sup>









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.<sup>62</sup> 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.<sup>60</sup> 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 28. Active, Licensed Physician Assistants by Age Group, NC, 2016



Table 8. Diversity of the NC Populationand Physician Assistants, 2016



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.

#### Physician Assistant Studies

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.<sup>63</sup>

#### 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.<sup>65</sup> 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.<sup>66</sup> 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,<sup>67</sup> while costs for a PA degree at Elon University are \$134,455.<sup>68</sup>

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.<sup>69</sup> 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**).<sup>70</sup> The most recent data from CASPA indicate that in the 2015-2016 admissions cycle, there were 3.0 PA school applicants per seat.<sup>71</sup>

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.<sup>72</sup> 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 PhysicianAssistant 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



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%						

40

20

90

50

510

40

20

90

50

520

0%

0%

0%

0%

16%

Table 10. Enrollments in North Carolina Physician Assistant

\*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.

40

20

90

50

447

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



Methodist University

Wake Forest University

**UNC Chapel Hill\*** 

Wingate University

PA Totals

## 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: <u>Table 9</u>: Personal Communication, Perri Morgan, Director of Research Physician Assistant Division, Duke University Medical School, October 23, 2017. <u>Table 10</u>: 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. <u>Figure 30</u>: 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. <u>Figure 31</u> and <u>Table 11</u>: 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.

Evaluation of a Potential New Health Sciences School at The University of North Carolina-Pembroke to Meet the Needs of the Region and State 23 Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research 23 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.<sup>73</sup> 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.<sup>76</sup> 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.<sup>78</sup> 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.<sup>79</sup> 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.<sup>80</sup> 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

9%

11%

under







Figure 33. Nurse Practitioner Programs, North Carolina, 2017

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 Economi 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.<sup>81</sup> 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.<sup>82</sup> Although the 2015 has deadline passed and DNP programs have proliferated across the country,<sup>83</sup> 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.<sup>84</sup>

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**).<sup>85</sup>

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 outof-state students.<sup>87</sup> Of the two private universities offering DNP programs, Gardner-Webb University only offers a MSN-to-DNP degree at present,<sup>88</sup> and tuition costs for full time BSN-to-DNP students were listed as N/A on the Duke website.<sup>89</sup>

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.

Table	13.	<b>Enrollments</b>	in North	Carolina	Nurse	Prac	titioner	Progr	ams	5,
2015-	201	7								
						-	001710			

Hada a state	0015 10	2016-17	2017-18	Projected
University	2015-16	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: <u>Table 13</u>: 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. <u>Figure 38</u>: 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).<sup>90</sup> In addition to difficulties recruiting faculty, data also show that, nationally, there is a growing concern about near term retirement of many nursing faculty.<sup>91</sup> 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.<sup>92</sup> 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.<sup>93</sup> In the academic literature, a discussion is underway about alternative training models for NPs to increase training capacity, but solutions are not straightforward.<sup>94</sup> 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,<sup>95</sup> 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<sup>98</sup>
- 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)<sup>99</sup>
- Growing evidence that providing OT and PT services on an outpatient basis improves health outcomes<sup>100</sup> 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
- Occupational therapy, while a doctoral-level program, may not be enough of a "flagship" program to be attractive to UNC-P leadership.

#### 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.<sup>101</sup> 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 prerequisites 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, predental, 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
- Dietitian program may not be enough of "flagship" program to be attractive to UNC-P leadership

### 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.<sup>102</sup> 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<sup>103</sup>
- 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 preexisting 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 psychiatricmental 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.<sup>104</sup> In 23 states, NPs can practice independently, but NC is not one of those states.<sup>105</sup> 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.<sup>106, 107</sup>

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<sup>108</sup>
- 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<sup>109</sup>
- 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 dayto-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.<sup>110</sup> 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?
- 3) 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.<sup>111, 112</sup> Additional assessments of the effectiveness of the programs using more quantitative methods may be developed as the programs progress.<sup>113</sup>

## 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,<sup>d</sup> 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 learnersin-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. 😹

d Anson, Bladen, Brunswick, Columbus, Cumberland, Harnett, Hoke, Lee, Montgomery, Moore, Richmond, Sampson, Scotland

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3,5 1,1 5,6 ian 2,5	152 <sup>1</sup> 304 <sup>1</sup> 502 <sup>1</sup> 355 <sup>2</sup> 10 <sup>3</sup>	NC 6.1 1.1 5.5 2.3 0.4	NNC-P UNC-P	NC-P Region Cumberland 3.5 1.9 1.9 4.5 NA	Represented Minority 8% 5% 8% NA NA	Bachelors X	Masters MSN MOT X X	Doctorate DNP OTD PhD OD	Multiple Entry Points	<b>Changes to entry</b> <b>degree?</b> Move to DNP? (target date 2015, didn't happen) Entry level doctorate only (2027) No No No Masters required to take CDR exam (2024)
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Appendix 1: Matrix of UNC-Pembroke Health Professional Program Options

Evaluation of a Potential New Health Sciences School at The University of North Carolina-Pembroke to Meet the Needs of the Region and State 41 Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research

Pactitioner         9         7         2         Lack of qualified sites in funding placements         MA           ational         8         3         5         Some difficulties in funding placements         MA           ational         8         3         5         Some difficulties in funding placements         MA           ational         8         3         5         Some difficulties in funding placements         MA           atrixt         0         0         0         A balable         MA         MA           atrixt         0         0         A balable         Mathematics and indicating unterstuding more compactive to monterstuding more and indicating more compactive to monterstuding more and indicating more and indicating more and indicating more and indicating more and indicating more and indicating more compactive and indicating more and indicating more compactive and indicating more and indicating more and indicating more compactive and indicating more and indicating more compactive and indicating more compactive and indicating more and indicating more compactive and indicating more and indicating more compactive and indicating more compactive and indicating more compactive and indicating more and indicating more compactive and indicating more and indicating more compactive and indicating more compactive and indicating more indicating more compactive and indicating more compactive and indicating more polidentin and indicating more colid and indicating more pol	sion	# Pro Total	Educat grams i Public	ion In NC Private	Preceptorship Availability	Additional Requirements	Student Interest	Job Availability/ Demand	Average NC Salary <sup>3</sup>
In     8     3     5 Some difficulties finding placements     Moderate demanding signal     Moderate demanding finding placements       0     0     0     0     Nariable     Non-attrations     Non-attrations       10     0     0     0     Nariable     Non-attrations     Non-attrations       11     12     2     10     Lack of qualified sites set in 2016 cycle     Nor students enrolin 105 need for vision service popularity services and in 05 need for vision service popularity serves in 2016 and tranding more via DLCAS     Nor attrations were able to poh due to the pode and indicating more set in 2016 and tranding more via DLCAS       12     12     12     10     Lack of qualified sites set in 2016 and tranding more via DLCAS     Nor attrations were able to poh due to the pode and indicates popularity and take mationally 13     Able to poh due to able to poh due to the positions. But were non- set internship internship materiation internship internship materiation internship internship materiation internship internship materiation internship materiation internship materiatinternship internship materiation internship materiatinternship mat	tioner	6	2	2	Lack of qualified sites for learners in NC		NA		\$103,090
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Issistant       12       2       10       Lack of qualified sites       High. Nationally 3.0       High. vacancy rate. PA applicants per seat in a bib to bib hop due to poen positions. But with we complete the difference in NC reach sturration. We may programs?         Dieticiant       8       7       1       Lumited. National dieter complete dieter completer completer complete dieter completer complete diet	ţ	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
Deticion         8         7         1         Limited. National deterior internship matching program         Must complete dietetic internship matching program         Unclear. Student seats not ber internship position in Unclear; population age internship bostion in Unclear; population age iton- v Setting         1         Limited but 2.1 apticants internship position in Unclear; population age internship iton- v Setting         Unclear; population age internship internship internship internship internship internship v Setting         Nuclear; population age internship in	Assistant	12		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
tion- rrmation for tor y Setting y Setting berapist be tion- y Setting berapist be y Setting berapist be y Setting be herapist be be be be be be be be be be be be be	l Dietician	00	~	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
Interation       Interation         intion :       intion :         y Setting       intion :         ist       intion :         t       1         intion :       intion :         t       1         ion       intion :         t       1         ion       intion :         t       1         ion       intion :         t       0         intion :       intion :         ion       intion :      <	t	Ω	ŝ	0				Unclear; population aging may increase demand	\$79,860
tion - y Setting berapist 8 4 4 herapist 8 4 4 ist 6 5 1 t 1 1 0 t 1 1 0 bechelor's in radiologic t 1 1 0 t 1 1 0 herease demand due to MACRA master's program ion 4 4 4 0 horlear; population ag due to MACRA may increase demand due to MACRA may increase demand due to MACRA may increase demand unclear; aging popula t may increase demand	rmation tor								
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cion 4 4 0 Unclear; population ag may increase demand inguage 6 6 0 Unclear; aging popula tt	t	1	1	0		Bachelor's in radiologic technology to enter master's program		Unclear; may increase due to MACRA	\$60,000 to \$100,000 <sup>4</sup>
nguage 6 6 0 Unclear; aging popula t	ion	4	4	0				Unclear; population aging may increase demand	\$38,020
	inguage t	9	9	0				Unclear; aging population may increase demand	\$71,850

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

42 Evaluation of a Potential New Health Sciences School at The University of North Carolina-Pembroke to Meet the Needs of the Region and State Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research

Evaluation of a Potential New Health Sciences School at The University of North Carolina-Pembroke to Meet the Needs of the Region and State43Program on Health Workforce Research and Policy at the Cecil G. Sheps Center for Health Services Research43

