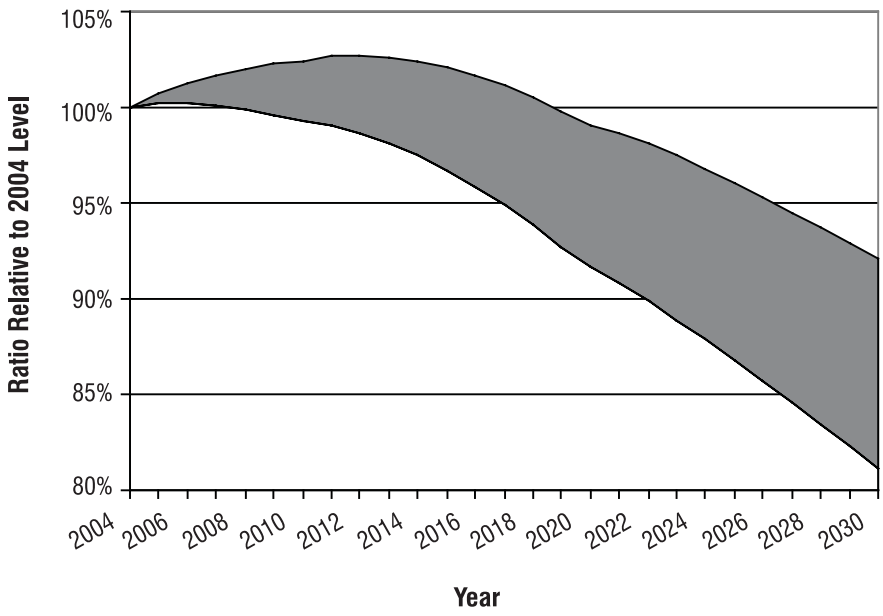
Chapter 2
Addressing Provider Shortage by Developing New and More Efficient Models of Care or Increasing Provider Supply

North Carolina is likely to experience a significant provider shortage over the next 15-25 years. Assuming the best case scenario, North Carolina will effectively lose 1% of the provider workforce by 2020 and 8% by 2030 (measured in provider-to-adjusted population demand ratio).[a] If growth in supply does not continue or estimates of the productivity of nonphysician clinicians is too optimistic, the state may effectively lose as much as 8% of the workforce by 2020 and 19% by 2030.[b] None of these projections factor into increased demand due to an increased number of people with chronic diseases. The increased prevalence of chronic diseases could result in an additional 3% increase in demand for services by 2020 and 5% by 2030.

North Carolina is better positioned than many states to examine impending provider shortages and develop workable strategies to expand the health professional workforce.

Chart 2.1
Range of Projected Provider-to-Population Ratios



Source: Details on the projection method are outlined in Appendix A.

North Carolina is better positioned than many states to examine impending provider shortages and develop workable strategies to expand the health professional workforce. North Carolina has a nationally recognized health professions data system that collects data on different types of healthcare professionals. North Carolina's

a The "best-case" projections are based on current growth of physicians and a higher rate of growth of nurse practitioners, physician assistants, and certified nurse midwives (based on average growth over the last five years). The projections also factor in the current rate of exodus from the professions (due to death, retirement, moving out of the state, or other factors). Nonphysician clinicians are weighted as 0.75 FTE of a physician; however, federal workforce projections factor nonphysician clinicians as 0.5 FTE of a physician.

b The "worst-case" projections are based on current growth of physicians and a lower rate of growth of nonphysician clinicians (based on the yearly increase in supply averaged over the last 25 years). Nonphysician clinicians are weighted as 0.5 FTE physician (as is used by federal workforce projections).

Health Professions Data System is the longest standing state health workforce data system in the country. North Carolina has also been a national leader in addressing health professional maldistribution problems and has a long history of supporting practice innovations. The state needs to use these data for ongoing oversight by stakeholders and policy makers to monitor the state's changing healthcare needs, as well as trends in provider supply, to ensure the emerging needs of the state are addressed. Therefore, the Task Force recommended:

Recommendation 2.1. (Priority Recommendation)

a) The NC General Assembly should appropriate $170,000 to support and expand the health professional workforce research center charged with examining current and future needs for health professionals, which is housed within the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill. Research should be conducted at the individual practitioner level as well as the practice level. The Center will expand its current research to include analyses that:

1) identify the need for physicians, nurse practitioners (NPs), physician assistants (PAs), and certified nurse midwives (CNMs) to meet the healthcare needs of the state 5, 10, and 20 years into the future;

2) identify new models of care that can improve the quality and efficiency of care offered by North Carolina providers;

3) examine the distribution of physicians, NPs, PAs, and CNMs across the state;

4) examine trends in the supply of minority health professionals in comparison to the general population and examine percentage of underrepresented minority students and residents who receive training in North Carolina but who leave the state for practice;

5) examine trends in the number of primary care and specialty providers by specialty area;

6) examine changes in health status and sociodemographic factors that might influence future healthcare needs so as to examine the mix of healthcare professionals necessary to address the state's healthcare needs; and

7) identify barriers that affect entry into the health professional workforce or continued practice, if any.

b) The NC General Assembly should create an ongoing Health Workforce Policy Board that is charged with developing strategies to address impending health professional workforce shortages.[c] The Board will include representation from the NC Office of the Secretary, NC Department of Health and Human Services, NC Office of Rural Health and Community Care, NC Area Health Education Centers Program, five North Carolina academic health centers, NC Community College system, relevant professional associations and licensing boards, NC Hospital Association, NC Medical Society Foundation, and nonmedical public members. The Board shall identify strategies to:

   1) develop new models of care that encourage quality and efficiency of healthcare services;

   2) increase the overall supply of physicians, NPs, PAs, and CNMs to meet the unmet health needs of the state's growing population;

   3) encourage more health professionals to practice in health professional shortage areas;

   4) establish priorities for which types of provider specialties are most needed to meet the healthcare needs of the state;

   5) increase the supply of underrepresented minorities in the profession;

   6) ensure the mix of health professionals is appropriate to meet the changing healthcare needs of the state; and

   7) address barriers that affect entry into the health professional workforce or continued practice, if any.

   The Health Workforce Policy Board should report its findings and proposed recommendations on an annual basis to the University of North Carolina Board of Governors, the NC State Board of Community Colleges, and the NC General Assembly.

One example of a study the Health Workforce Policy Board could do is an investigation of the amount of care providers of all types, not just geriatricians, provide to adults aged 65 and older and whether there are any current or future supply issues in the state. Current data constraints limit such analyses. The Board could also evaluate potential educational needs that should be considered as population longevity increases and more providers treat chronically ill patients.

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c Utah has established a similar workforce policy board. The legislation that created the Utah Medical Education Council (UMEC) authorized the UMEC to conduct ongoing healthcare workforce analyses and to assess Utah's training capacity and graduate medical education (GME) financing policies. The legislation requires the UMEC to report to the governor and the legislature on these issues and to provide policy recommendations for achieving state workforce objectives. UMEC is comprised of the Dean of the University of Utah Medical School; an educator member of the Board of Regents; the Assistant Dean of Curriculum and GEM at the University of Utah; a risk manager with a community hospital; the President and CEO of a health insurance company; the Director of Family Practice Residency at the Utah Healthcare Institute; and a nurse (RN) member of the Utah State Board of Education. Ha J. *Utah's Physician Workforce: A Study on the Supply and Distribution of Physicians in Utah*. Salt Lake City, UT: The Utah Medical Education Council; 2006.

New Models of Care

The US currently spends 16% of its Gross Domestic Product on healthcare, which is more than any other country.[1] Overall healthcare expenditures have risen between 6.3% and 8.8% between 2000 and 2004, creating an affordability crisis. Some people question whether the cost of training an expanded supply of providers is affordable. Using tuition costs as a proxy for the costs of training new providers, it costs approximately $35,000/year to train a new physician (or approximately $140,000 total for each medical school graduate),[d] $45,000 total to train a new physician assistant (PA),[e] and $35,000 total to train a new nurse practitioner (NP). These cost estimates use private university tuition as a proxy for cost because public universities receive state funding to subsidize program costs.[f] Yet, absent new delivery models that can improve quality and efficiency, the state may need to invest significant new resources into increasing the production of healthcare professionals.

Absent new delivery models that can improve quality and efficiency, the state may need to invest significant new resources into increasing the production of healthcare professionals.

North Carolina should restructure the healthcare delivery system and financing system to increase quality and efficiency, so providers, practices, and healthcare systems can appropriately manage a higher caseload. One way of increasing provider productivity involves reorganizing delivery of care. While conceptually this is a very attractive option, there have been few large-scale system redesigns that have led to major increases in productivity. However, several models have been tried and warrant further study.

Expand use of nonphysician clinicians:
One potential model would expand the use of and role of PAs, NPs, and certified nurse midwives (CNMs) in caring for patients with routine problems while physicians would manage the care of patients with more complex health conditions. These nonphysician clinicians provide direct patient care and can help ameliorate the impending physician shortages. A meta analysis of studies examining the role of NPs found there were no appreciable differences between doctors and NPs or advance practice nurses in health outcomes, process of care, resource utilization, or cost for primary care services.[2] Substituting NPs for physicians could potentially decrease physicians' workloads and direct healthcare costs, but there is no guarantee

d As a rough approximation of education costs per student, Duke University charged ~$34,800 in tuition costs (2005-2006) and ~$7,300 in other fees and books. Available at: http://medschool.duke.edu/modules/som_finaid/index.php?id=3. Accessed December 2006.

The University of North Carolina at Chapel Hill charged ~$9,340 in tuition for in-state students and $33,000 for out-of-state students, and ~$1,500 in required fees for both in-state and out-of-state. Available at: http://cashiers.unc.edu/tuition%20and%20fees%202005-06%20final%20revised%20102405.pdf. Accessed December 2006.

Wake Forest University charged ~$34,000 for tuition and $1,500 for books/supplies. Available at: http://www1.wfubmc.edu/FinancialAid/MD+Student+Cost.htm. Accessed December 2006.

The Brody School of Medicine at East Carolina University charged $7,676 for in-state student tuition and $1,153 for books/supplies. The Brody School of Medicine does not accept out-of-state students. Available at: http://www.ecu.edu/bsomstudentaffairs/FinancialAid/Cost.htm. Accessed December 2006.

Report 2 of the AMA Council on Medical Education (I-00) reports that the annual cost in 1996 dollars of educating a student ranged from $71,672 to $92,836 per year.

e The total tuition (over two years) for the Physician Assistant programs at Duke University, Methodist College, and Wake Forest University is approximately $52,000, $36,000, and $40,000, respectively.

f The total program cost for the Duke University nurse practitioner program is approximately $35,000.

substitutions will have this effect. Nurses tend to spend more time and consult more frequently with patients, which means fewer patients can be seen. While this attention may lead to higher patient satisfaction, as it did in some studies, reducing the number of patient visits in a day could offset any potential cost savings gained from using nurses. Further, nonphysician clinicians are not trained to provide all the same services as physicians—so while they can provide similar and complementary services, they are not a complete substitute for physicians.

Interdisciplinary team-based models can enhance productivity: Team-based approaches to healthcare can be efficient, cost-effective models of care delivery. There are a variety of models that are utilized depending on the specific patient population and setting. The NC Medicaid program, Community Care of North Carolina (CCNC), uses a team-based approach to provide care to people with chronic illnesses. CCNC is organized around a local network of care that includes, at a minimum, primary care providers, nurse or social work care managers, health departments, hospitals, and social services agencies. In many communities, the nurse or social work care managers are housed in providers' offices, and they help provide disease management education or case management services needed to help patients manage their health problems. In this way, licensed practical nurses, registered nurses, or social worker case managers can help provide more intensive patient education or patient follow-up, leaving physicians more time to see patients.

Team-based approaches to healthcare can be efficient, cost-effective models of care delivery.

Studies have shown that NP-physician collaborative practices are cost-effective and lead to enhanced quality of care in nursing homes, emergency rooms, and surgical inpatient settings.[3] These integrated delivery models enable practitioners to perform the tasks most appropriate for their training and specialization. For example, in a surgical setting the NP can take initial health history, provide both pre and postoperative patient education, and assist with discharge planning.[4] The physician would have more time to work with the patient to make surgical decisions and to perform surgeries. Both NP and physician would be involved in developing the overall plan of care with the patient. Working in a collaborative practice with NPs has been shown to have positive impacts on physicians, including improved job satisfaction, reduced workload, and a higher standard of care.[3] In addition, interdisciplinary teams including healthcare practitioners with different specialties, social workers, and other allied health professionals have been essential to improved quality of care for geriatric patients with multiple health problems and restricted activities of daily living.[5,6]

While teams have been shown to be effective in improving care to patients in certain settings and in leading to higher provider satisfaction, there are barriers to effective implementation of interdisciplinary team approaches. Practitioner groups (eg, physicians, NPs, PAs, CNMs) are generally trained separately and do not have experience working in a fully integrated team environment. More work is needed to ensure that medical students are trained in a collaborative team environment with nurses, PAs, NPs, and other healthcare professionals. Models could be developed around care of people with chronic illnesses. The Task Force made a number of recommendations to provide incentives to health professions training programs to increase interdisciplinary team training. (See Recommendations 2.4, 2.5, 2.7, 2.8,

and 3.4.) In addition, there has not been extensive research, to date, on the impact of interdisciplinary teams on provider efficiency or cost-effectiveness across different healthcare settings. Having more providers see the same patients does not necessarily improve efficiency or quality. More research is needed to understand how to best utilize healthcare teams and to determine the cost-effectiveness of these approaches.

Current payment systems also create barriers to effective use of teams. Public and private insurers and payers do not always pay for the services of certain health professionals in the community (ie, case managers in physician offices and/or nutritionists). Another barrier is that reimbursement policies are generally set up to reimburse individual practitioners separately rather than unified teams of practitioners. In addition, current payment methodologies do not encourage the use of communication through the Internet or other methods that could reduce unnecessary office visits.

Another new trend which may increase the number of patients providers can see in an ambulatory setting is use of hospitalists (discussed more fully in Chapter 3). Hospitalists are physicians who practice exclusively in hospitals. Hospitalists can help free up time that primary care providers would otherwise spend doing rounds caring for their hospitalized patients. Theoretically, hospitalists could enable primary care providers to treat more patients in an ambulatory setting. However, use of hospitalists is relatively new, so there are no data on the impact of hospitalists on primary care practice.

Recommendation 2.2. (Priority Recommendation)

In order to develop and implement new models of care:

a) **North Carolina foundations should help fund new models of care for improving quality and efficiency of primary and specialty care across North Carolina. New models should be evaluated to determine if they improve quality of care and/or efficiency.**

b) **Medical schools, other health professions schools, and residency programs should incorporate successful new models of care into training curricula and ensure that students and residents have the opportunity to practice using new models.**

c) **The State Health Plan, Division of Medical Assistance, and private insurers should modify reimbursement policies to support the long-term viability of new models that are shown to improve quality and/or efficiency.**

New models of care also should be focused on how they can better provide services in underserved areas to reduce the maldistrbution problem across the state. (See Recommendation 3.4.) Furthermore, new models of care should be developed to target psychiatric specialty shortages across the state, but particularly in underserved areas. (See Recommendations 4.6 and 4.7.)

Electronic health records (EHRs) and health information technology, when properly used, have the potential to help increase productivity of providers and

practices. EHRs, integrated with practice billing systems, can help reduce overhead and labor costs. This technology allows practices to successfully operate in sparsely populated communities that may not otherwise be able to support a provider.[g] EHRs can help improve access to accurate, timely patient data; increase the quality of care provided to patients; and improve workflow in physician practices. These improvements will become increasingly important as payers move to pay-for-performance and providers have increased accountability.

There are several burdens associated with implementing an EHR system. Nationally, only about 15% of physician practices had an EHR system in 2005, and the adoption rate was lower for smaller practices.[7] The cost of implementing an EHR system, as well as monthly maintenance costs, can be prohibitive, especially to smaller practices.[h] The time and resources needed to train staff to successfully operate an EHR system is also substantial. Lack of capital resources, loss of productivity during the transition period, lack of support from physicians and other clinical staff, and an inability to find systems that meet practitioner needs are all barriers to implementation. In addition, practices must have effective management systems to realize the benefit of an EHR system. In other words, EHR systems cannot solve underlying practice management problems.

Carolinas Center for Medical Excellence (CCME) has funding from the Centers for Medicare and Medicaid Services (CMS) to offer technical assistance to practitioners in selecting an EHR system.[8] The national initiative, called the Doctor's Office Quality-Information Technology (DOQ-IT), works with physician offices to help practices evaluate their EHR needs and capabilities, evaluate different EHR options, provide assistance with vendor selection, help create workload efficiencies, and improve patient care. The consulting is free to the physician practice and is targeted to smaller offices (with eight or fewer physicians). However, CCME can only work with primary care practices that serve a Medicare population, and CCME only has funding from CMS to work with up to 200 practices for the 2006-2008 time period. Thus, CCME is currently unable to help pediatric practices (which tend to have few Medicare beneficiaries) evaluate their EHR needs.

Recommendation 2.3.

The NC General Assembly should appropriate:

a) $2.5 million to The Carolinas Center for Medical Excellence to increase the number of practices that receive technical assistance under the Doctor's Office Quality-Information Technology project and to expand this assistance to include pediatric offices;[i] and

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g In certain communities, a provider's patient panel may not generate the revenues necessary to support a practice. Some of these providers may be able to maintain a financially viable practice if they can reduce overhead costs. The NC IOM Primary Care and Specialty Supply Steering Committee heard presentations from North Carolina physicians who operate low-overhead practices by increasing their use of technology EHRs.

h One study of 14 solo or small-group primary care practices reported that the initial costs of implementing an EHR averaged $44,000 per full-time equivalent provider, with ongoing costs of approximately $8,500/year. Practices generally were able to recoup their start-up and ongoing costs within two and one half years. Miller RH, West C, Brown TM, Sim I, Ganchoff C. The value of EHRs in solo or small-group practices. *Health Aff*. September/October 2005;24(5):1127-1137.

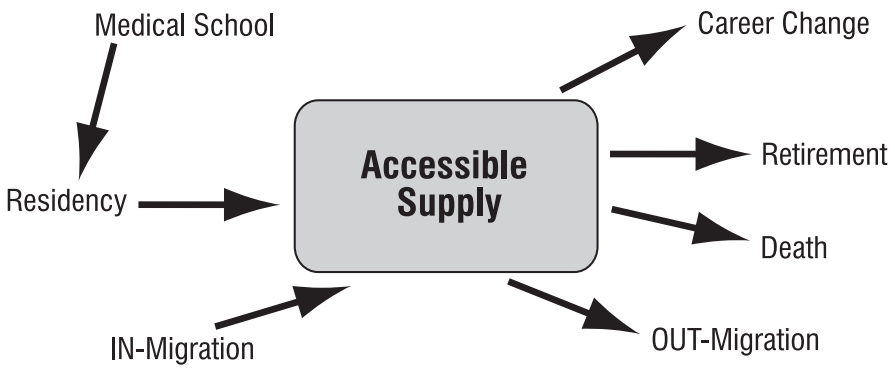
i The Carolinas Center for Medical Excellence estimates it would cost approximately $2.5 to $3 million to extend DOQ-IT technical assistance to between 100-125 non-Medicare practices.

b) $4.8 million to the NC Medical Society Foundation to provide grants to small or solo practitioners to purchase health information technologies to improve quality performance and practice efficiencies.[9]

Increasing Provider Supply

To increase the supply of providers practicing in North Carolina, the state must either increase the number of providers entering practice, decrease attrition, or both. (See Figure 2.1.) There are short-term and long-term strategies to address the provider workforce shortage. Over the short term, the state can put more effort into recruiting providers from other states to practice in North Carolina. North Carolina is a net importer of physicians. Most of the physicians practicing in North Carolina completed their undergraduate medical education and residency training out of state. However, most other states also will be in the midst of a physician shortage.[j,10] Thus, there will be increased competition for the limited number of physicians. Over the long term, there is a need to educate and train more physicians by increasing undergraduate medical education and residency positions. More PAs, NPs, and CNMs also need to be trained. Most practicing NPs and PAs in North Carolina were trained in state. Additionally, North Carolina can improve the

Figure 2.1
Factors in the Supply



practice environment by reducing the number of North Carolina-trained providers who leave the state, retire, or change professions. North Carolina also can make it easier for practitioners who have temporarily left the profession to reenter the workforce.

There are two primary ways to address supply issues related to the impending primary care and specialty provider shortage in North Carolina:

1) North Carolina can produce more practitioners who set up practice in state by increasing the number of medical students, NPs, PAs, CNMs, and/or physicians who complete their postgraduate training in state.

j The following states have issued reports highlighting physician workforce shortages: Texas (2002), California (2004), Mississippi (2004), Wisconsin (2004), Arizona (2005), Georgia (2005), Kentucky (2005), Massachusetts (2005), Michigan (2005), and Oregon (2005).

2) North Carolina can improve the practice environment to encourage more practitioners to move to North Carolina and to reduce the number of practitioners who leave practice in this state.

Both of these options are discussed more fully below.

Increasing production of providers practicing in North Carolina:
In order to practice medicine, physicians must attend an accredited allopathic[k] or osteopathic[l] medical school in the US or attend a foreign medical school and complete other licensure requirements.[m,n] In 2004, 81.7% of the physicians who entered practice in North Carolina graduated from allopathic schools, 8.7% were from osteopathic schools, and 9.6% were international medical graduates (IMGs).[o]

The growth in medical education in the US over the last 20 years has not kept pace with the growth in the overall population. Between 1982 and 2001, the US population increased 23%, but US medical school enrollment grew only 7%.[11] Medical student enrollment per 100,000 population actually decreased 13% during that same time period. Graduates from allopathic schools have stayed relatively constant over the last 25 years (approximately 15,700/year), but graduates from osteopathic schools have increased by more than 200% during the same time period. The number of students trained in international medical schools also has increased substantially.[p]

The growth in medical education in the US over the last 20 years has not kept pace with the growth in the overall population.

Despite the growth in osteopathic graduates and US-IMGs, the overall rate of growth in physician supply is not keeping pace with the growth in overall population or increased demand for services. The Association of American Medical Colleges (AAMC) recently recommended US medical schools increase the number of undergraduate medical students they enroll by 30% in order to meet the need for physicians in the future.[12] While there is a growing recognition of the need to

k Allopathic schools are accredited through the Liaison Committee on Medical Education (LCME).

l Osteopathic schools are accredited through the American Osteopathic Association (AOA). Information on the American Osteopathic Association (AOA) is available at: http://www.osteopathic.org/. Accessed April 3, 2006.

m There is not a standard accreditation process for foreign medical schools.

n All medical students are required to take three licensure exams, one after the second year of medical school, another during the fourth year, and the last during postgraduate education (typically at residency). Allopathic students trained in the US take their United States Medical Licensure Exam (USMLE) through the National Board of Medical Examiners. Osteopathic students take their Comprehensive Osteopathic Licensure Examination through the National Board of Osteopathic Medical Examiners, although osteopaths wishing to pursue postgraduate medical education through an allopathic residency placement must take their exam through the USMLE. Internationally-trained medical graduates (IMGs) take their first two exams through the Educational Commission for Foreign Medical Graduates. In addition to successfully passing the licensure exams, physicians also must complete at least one year of postgraduate education (internship or residency).

o In 2004, 64% of the medical students who entered US residency programs graduated from allopathic schools, 11% were from osteopathic schools, and 25% were international medical graduates (of whom 5% were US citizens trained in international schools, US-IMGs).

p There also has been a large increase in the number of medical students educated overseas. Between 1977 and 2004, there was a significant increase in the number of medical schools established in the Caribbean (from 1 in 1977 to 21 in 2004). US citizens educated overseas are eligible to be matched into US residency programs, but non-US citizens must first obtain a visa to enter the country in order to complete a residency in the US. In 2004, 22.6% of Educational Commission for Foreign Medical Graduates (ECFMG) Certificates were issued to US-born international medical graduates (US-IMGs) (1,360 out of 6,004). From 1980 to 2004, 13.9% of ECFMG certificates were issued to US-IMGs. Boulet JR, Norcini JJ, Whelan GP, Hallock JA, Seeling SS. The international medical graduate pipeline: Recent trends in certification and residency training. *Health Aff*. Web Exclusive. 2006;25(2):469-477. In 2004-2005, 7.5% of all residents in primary care programs were US-IMGs (3,358 of 44,668). Of all IMG primary care residents, 22.0% were US-IMGs (3,358 of 15,225). Brotherton SE, Rockey PH, Etzel SI. US graduate medical education, 2004-2005, trends in primary care specialties. JAMA 2005;294(9):1075-1082. Table 2.

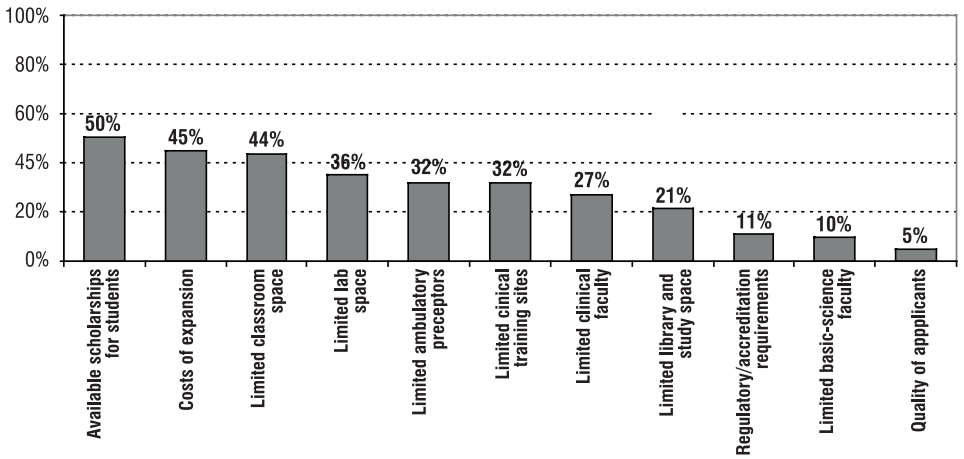
increase enrollment in medical schools, there are several barriers to expansion including financial support for students, costs of expansion, need for additional classroom and laboratory space, and need for additional faculty and preceptors. (See Chart 2.2.)[q]

North Carolina has four medical schools. They are located at Duke University, East Carolina University (ECU), University of North Carolina at Chapel Hill (UNC-CH), and Wake Forest University (WFU). The four schools graduate approximately 440 students per year. The number of students trained in North Carolina medical schools has not changed significantly since 1977 when the Brody School of Medicine at ECU began enrolling students. North Carolina does not have a school of osteopathy.

Even if all 440 of the medical students trained in North Carolina ended up practicing in state, there would still be a need to import physicians trained elsewhere just to replace the physicians who leave the profession.

North Carolina schools do not produce enough graduates each year to meet the state's need for additional physicians. Most physicians actively practicing in North Carolina received their undergraduate medical education out of state. A little more than one quarter (26.9%) of North Carolina physicians graduated from a North Carolina medical school. More than three fifths (62.4%) went to other US or Canadian medical schools, and 10.7% were international medical graduates. Between 2001 and 2004, approximately 1,240 physicians left practice each year due to death, retirement, changed professions, or other reasons. Thus, even if all 440 of the medical students trained in North Carolina ended up practicing in state,

Chart 2.2
Barriers to Enrollment Expansion:
Percentage of Schools Identifying Barriers as "Major" or "Very Significant," 2005



Source: Association of American Medical Colleges Center for Workforce Studies. *Medical School Expansion Plans: Results of the AAMC 2005 Survey of US Medical Schools.* Washington, DC: AAMC; April 2006. Figure 14. Available at: http://www.aamc.org/workforce/enroll.pdf. Accessed September 9, 2006.

q Respondents from allopathic medical schools reported that larger increases in enrollment would make it potentially more difficult to find qualified students. For example, only about 14% of respondents from the allopathic medical schools thought there would be a problem finding qualified applicants if there were a 10% increase in enrollment (with 1% being very concerned), but 71% of the respondents thought it would be a problem with a 30% increase in enrollment (with 27% very concerned). Association of American Medical Colleges Center for Workforce Studies. *Medical School Expansion Plans: Results of the AAMC 2005 Survey of US Medical Schools.* April 2006. Figure 15. Available at: http://www.aamc.org/workforce/enroll.pdf#search='AAMC%20Medical%20School%20Expansion%20Plans'. Accessed September 9, 2006.

there would still be a need to import physicians trained elsewhere just to replace the physicians who leave the profession.

Over the last 40 years, approximately 40% of the students trained in North Carolina medical schools ended up practicing in state.[13] Those who complete their training in a publicly funded medical school are more likely to practice in state. This may be

Table 2.1
North Carolina Medical School Enrollment and Graduates Practicing in the State

School	2004-2005 Academic Year			
	Total Enrollment	New Entering Students	% New Students In-State	% Graduates Practicing in NC
Brody School of Medicine, East Carolina University	290	72	100%	59%
Duke University School of Medicine	467	101	20%	24%
University of North Carolina School of Medicine	649	160	85%	49%
Wake Forest University School of Medicine	427	108	40%	39%

Source: American Medical Association. *Medical schools in the United States. JAMA.* Medical Education Issue. September 7, 2005;294(9):1119-1127; NC Health Professions Data System. September 2006.

partially explained by the fact that publicly-financed medical schools (UNC-CH and ECU) are more likely to admit North Carolina students. North Carolina medical students originally from the state are more likely to practice in North Carolina.

The state should target medical school expansions to North Carolina students in order to have the greatest chance of increasing the number of physicians who ultimately set up practice in state. The two state medical schools that admit a higher proportion of North Carolina students also have a much higher proportion of students who choose to practice in North Carolina after finishing their residency programs (eg, retention rates).

Recommendation 2.4 (Priority Recommendation)

North Carolina medical schools should increase enrollment by 30% (AAMC recommendation). Expansion can be accomplished through an increase in enrollment on existing campuses[r] or through satellite campuses.[s] In expanding programs, medical schools should consider

r More than one half of medical schools around the country planning to increase enrollment plan to incorporate innovations in medical curriculum to accommodate expansion. These innovations include: patient simulations and IT-based self-directed/independent learning; use of interdisciplinary courses; community-based services/hands-on learning; and telemedicine, distance learning, and video-conferences. Association of American Medical Colleges Center for Workforce Studies. *Medical School Expansion Plans: Results of the AAMC 2005 Survey of US Medical Schools.* April 2006. Available at http://www.aamc.org/workforce/enroll.pdf#search='AAMC%20Medical%20School%20Expansion%20Plans'. Accessed September 9, 2006.

s Satellite campuses often have basic science education for the first two years at the parent campus, with clinical education the last two years at the satellite location. In 2003, there were 20 medical schools with satellite campuses across the country. Mallon WT, Liu M, Jones RF, Whitcomb M. *Mini-Med: the Role of Regional Campuses in US Medical Education.* Washington, DC: Association of American Medical Colleges; 2003. Available online at: https://services.aamc.org/Publications/showfile.cfm?file=version47.pdf&prd_id=57&prv_id=161&pdf_id. Accessed September 9, 2006.

changing admissions criteria[t] or using other strategies to increase the overall supply of physicians practicing in the state, increase the number of physicians who set up practice in underserved areas, increase the number of physicians who specialize in shortage specialties, increase the number of underrepresented minority physicians practicing in the state, and enhance interdisciplinary team training.

Strategies to increase the number of underrepresented minorities in the profession are discussed more thoroughly in Chapter 5.

Recommendation 2.5

If current medical schools are unable to increase enrollment by 30%, the NC General Assembly should consider creation of a new public allopathic or osteopathic medical school or provide incentives to encourage development of a new private medical school. Specifically:

a) The NC General Assembly should appropriate funds to build a new state-supported allopathic or osteopathic medical school that will focus on increasing the supply of physicians who practice in North Carolina, particularly those willing to practice in medically underserved areas or in shortage specialties.[u,v] Special consideration should be given to creating a medical school that focuses on increasing the number of underrepresented minority physicians in the state, increasing the overall supply of physicians practicing in the state, increasing the number of physicians who set up practice in underserved areas, increasing the number of physicians who specialize in shortage specialties, and enhancing interdisciplinary team training.

b) Alternatively, as part of state efforts to increase economic development in communities across the state, the Department of Commerce should consider incentives to attract private osteopathic or allopathic medical schools into the state.

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t For example, one option medical schools could explore is giving higher preference in the admission criteria to individuals who were raised in medically underserved areas and who express an interest in returning to those areas.

u The exact cost of building a new medical school is unknown. The costs would vary depending on potential enrollment, curriculum design and other factors. One state that recently (1999) developed estimates for a new medical school was Florida. Florida State University developed a proposal for a new medical school that would focus on training physicians to meet the primary healthcare needs of the state, particularly the needs of the elderly, rural populations, and other underserved citizens. They designed a school that would enroll 120 students per class and provide most of the third and fourth year clinical training using a community-based model with a special focus on rural health. Their cost estimates were $50 million for the new school and $39 million annually for operational costs (some of which would be offset by tuition). MGT of America, Inc. Plan for a Four-Year Allopathic School of Medicine at Florida State University. Submitted to: Florida State University. Tallahassee, FL: MGT Management, Inc; November 15, 1999. Available at: http://med.fsu.edu/pdf/10_four_year_allopathic.pdf. Accessed September 13, 2006.

v The cost of building a new osteopathic school would depend on different factors. For example, building a new osteopathic school from the ground up could cost approximately $100 million. Developing an osteopathic medical school within a college or university with existing infrastructure would cost less. The American Osteopathic Association is requiring at least $50 million be held in earnest before creating a new Osteopathic school. Personal communication with M Murphy, Associate Dean, Clinical Sciences, Pikeville College School of Osteopathic Medicine, Pikeville, KY. September 18, 2006.

Despite the fact there is no osteopathic medical school in North Carolina, the population of osteopathic physicians is growing rapidly. Osteopathic physicians remain only a small proportion of the overall physician population in North Carolina (3% in 2005), but their potential to practice could be increased by providing financial assistance to students choosing osteopathic medical schools in other states with an obligation to return for practice in North Carolina and by developing joint accredited American Osteopathic Association (AOA) residencies. (See Recommendation 2.10.)

Recommendation 2.6.

The NC General Assembly should appropriate funds to pay for allocated seats for North Carolina students admitted to osteopathic schools in other states (eg, Alabama or Kentucky model) with an obligation that students return to practice in North Carolina.[w]

Expanding the number of PAs, NPs, and CNMs also can help reduce demand for physicians. NPs and PAs can provide many—but not all—of the same healthcare services provided by physicians. Under North Carolina state laws, NPs and PAs must operate under supervision of a physician and can only provide the services authorized in a practice agreement with the supervisory physician.[x] Within certain limitations, NPs and PAs can diagnose and prescribe medications, tests, and treatments.[y] NPs and PAs often serve as primary care providers, helping to manage the health of patients. They can provide services directly in a physician's office, clinic, hospital, nursing home, or other healthcare facility. While the physician need not be present at the same location, he or she must have a policy to review periodically the NP's or PA's prescribed medicines, tests, and treatments. NPs and PAs also can serve in specialty areas of medicine, and their job responsibilities vary by specialty and supervising physician. CNMs typically provide a range of health services to women and newborns including prenatal, intrapartum, postpartum, newborn, and family planning services.

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w For example, Kentucky provides a primary care scholarship that is the difference between in-state tuition and the tuition at Pikeville College School of Osteopathic Medicine. Students are required to pursue primary care residencies but must return to Kentucky and practice a year for each year the scholarship was received. If they choose not to do a primary care residency, they are required to pay the scholarship back at the normal loan rate. Kentucky has 200 students on the scholarship with 90% completing their obligation to practice primary care in Kentucky. The difference in tuition is currently $15,000 for each student, for a total of $3,000,000 dollars per year. M Murphy, Associate Dean, Clinical Sciences, Pikeville College School of Osteopathic Medicine, Pikeville, KY. September 18, 2006.

x Physicians work with PAs to establish a supervisory arrangement, a written statement that describes the medical acts, tasks, and functions delegated to the PA by the primary supervisory physician. NPs must have a collaborative practice agreement with a supervisory physician. A collaborative practice agreement is an agreement between a physician and NP that provides ongoing supervision, consultation, collaboration, referral and evaluation of care provided by the NP. The scope of services provided by a PA or NP must be consistent with their education, training, skill, and competence.

y PAs and NPs can perform medical acts under supervision of physicians [NCGS §90-18(c)(13)(PA) and NCGS §90-18(c)(14)(registered nurses)]. Both PAs and NPs can prescribe medicine, if they have been authorized by the NC Medical Board (and in the case of NPs, also authorized by the Board of Nursing), and if their supervising physicians provide written instructions about indications and counterindications for prescribing drugs and have a policy to periodically review the drugs prescribed [NCGS §90-18.1(a)(PA) and NCGS § 90-18.2(a) (NP)]. Similar rules apply when a PA or NP orders medications and tests and treatments in hospitals, clinics, nursing homes, and other facilities. [NCGS 90-18.1(d)(PA) and NCGS §90-18.2(d)(NP)].

Expanding the number of NPs and PAs is a less expensive option and yields more immediate results than increasing the number of physicians. Unlike medical schools, which typically require four years of training and three-year, postgraduate residency programs, NPs, PAs, and CNMs can complete their education and training within two to three years after completing their undergraduate degree. Upon graduation, NPs, PAs, and CNMs must pass national certification exams.[z] In North Carolina, there are currently seven NP schools,[aa] four PA schools,[bb] and one CNM program, which collectively graduate approximately the same number of practitioners as do medical schools.

One cost effective way to expand the array of primary care and specialty providers is to increase the supply of NPs, PAs, and CNMs. However, increasing the number of NPs who are trained in state may be particularly challenging as there is currently a severe shortage of nursing faculty needed to train NPs. Without addressing the underlying nursing faculty shortage, it will be difficult to significantly increase NP class size or begin new programs.[14]

Recommendation 2.7. (Priority Recommendation)

a) **North Carolina physician assistant (PA) programs should increase student enrollment by 30%. Expansion can be accomplished through an increase in enrollment on existing campuses or through satellite campuses. In expanding programs, PA schools should consider changing admissions criteria or using other strategies to increase the overall supply of PAs practicing in the state, increase the number of PAs who set up practice in underserved areas, increase the number of PAs who specialize in shortage specialties (including but not limited to geriatrics and behavioral health), increase the number of underrepresented minority PAs practicing in the state, and enhance interdisciplinary team training.**

b) **North Carolina nurse practitioner (NP) schools should increase student enrollment by 30%. In expanding programs, NP schools should consider changing admissions criteria or using other strategies to increase the overall supply of NPs practicing in the state, increase the number of NPs who set up practice in underserved areas, increase the number of NPs who specialize in shortage**

z In addition to passing the national exam, PAs must maintain certification by taking 100 hours of CME every two years and passing a recertification exam every six years.

aa There are seven NP programs in North Carolina: Duke University, East Carolina University, University of North Carolina at Chapel Hill, University of North Carolina at Charlotte, University of North Carolina at Greensboro, University of North Carolina at Wilmington, Winston-Salem State University, and Western Carolina University. Each year these programs graduate approximately 240 new NPs (2005-06 data) most of whom stay in North Carolina.

bb There are four PA programs in North Carolina: Duke University (45-49 graduates/year; 39% in primary care; 44% remain in North Carolina); Wake Forest University (44-48 graduates/year; 38% in primary care; 67% remain in North Carolina); East Carolina University (24-45 graduates/year; 40% in primary care; 88% remain in North Carolina) and Methodist College (25-30 graduates/year; 51% in primary care; 86% remain in North Carolina). Strand J. Chief, PA Division, Duke University Medical Center. Presented at: Primary Care and Specialty Supply Task Force Steering Committee Meeting, North Carolina Institute of Medicine; February 13, 2006; Cary, NC.

specialties (including but not limited to geriatrics and behavioral health), increase the number of underrepresented minority NPs practicing in the state, and enhance interdisciplinary team training.

c) The Nurse Midwifery program at East Carolina University should increase student enrollment by 30%.[cc]

The NC General Assembly should tie future financial incentives to existing medical schools and other health professions schools that increase production of healthcare providers who set up practice in North Carolina and that address the state's pressing workforce needs, including, but not limited to: maldistribution issues, underrepresentation among certain minority populations, and supply of specific provider specialty areas.

Recommendation 2.8. (Priority Recommendation)

a) The NC General Assembly should provide financial support to encourage or reward medical schools and other health professions schools that produce physicians, nurse practitioners (NPs), physician assistants (PAs), and certified nurse midwives (CNMs) who fill the unmet health needs of the state's population. Incentives should be provided to increase the overall supply of healthcare providers, appropriately distribute physicians, NPs, PAs, and CNMs practicing in the state, and promote interdisciplinary training. Enhanced funding should be tied to outcomes that result in:

   1) increased numbers of physicians, NPs, PAs, and CNMs who set up and maintain practices in underserved areas;

   2) increased numbers of physicians, NPs, PAs, and CNMs who obtain qualifications for and practice in primary care or other shortage specialties as identified by the Health Workforce Policy Board;

   3) increased numbers of practicing physicians, NPs, PAs, and CNMs who are members of underrepresented minorities; or

   4) greater interdisciplinary didactic and clinical team training among physicians, NPs, PAs, CNMs, nurses, and other health professionals (eg, pharmacists, social workers, allied health workers).[dd]

b) In order to determine the effectiveness of various training programs in meeting the healthcare workforce needs of North Carolina, the NC

cc The East Carolina University Nurse Midwifery School estimates it would cost $206,000 annually to increase enrollment by 30%. The program currently enrolls and trains 6-12 students a year from across the state via internet and other distance learning techniques.

dd Section 754 of Title VII of the Public Health Service Act provides federal funding to demonstrate and evaluate innovative interdisciplinary methods and models designed to provide access to cost-effective comprehensive healthcare. The Quentin N. Burdick Rural Program for Interdisciplinary Training program lost federal funding in FFY 2007; however, similar programs should be encouraged through state funding.

General Assembly should amend NCGS §143-613 to require medical schools, PA programs, NP programs, and CNM programs to report information on an annual basis to the Health Workforce Policy Board, the Board of Governors of the University of North Carolina, and the NC General Assembly. Medical schools and NP, PA, and CNM programs shall cooperate with the Health Workforce Policy Board to identify on an annual basis the following data and information:

1) **number and location of graduates in active patient care practice and number of graduates no longer in active patient care practice by year of graduation;**
2) **percentage of graduates who enter residencies in primary care specialties or other specialties that are deemed as shortage areas in North Carolina as defined by the Health Workforce Policy Board;**
3) **percentage of graduates who practice in federally-designated health professional shortage areas in North Carolina and in areas specified as shortage areas by the Health Workforce Policy Board;**
4) **number and percentage of underrepresented minorities who are enrolled in and who graduate from these schools and programs and where they practice; and**
5) **number of graduates who have been involved in formalized interdisciplinary didactic or clinical training programs that involve students from multiple disciplines working together as teams in patient care.**

Residency programs in North Carolina that qualify physicians in family medicine, general pediatrics, general internal medicine, and primary care obstetrics and gynecology shall cooperate with the Health Workforce Policy Board to identify on an annual basis the practice status and location of physicians completing those programs.

One precondition to expansion or creation of a new medical school or PA, NP, or CNM program is that the program has the capacity to provide needed clinical training. In the past, there have been attempts to move clinical rotations out of academic health centers and hospitals and into communities, particularly underserved communities, in an effort to enhance clinical training and to encourage providers to set up practice in those locations. However, developing community clinical training sites is challenging. Students need places to live during their temporary assignment to new communities. In addition, the time it takes for a community practitioner to serve as a preceptor reduces the time that practitioner can spend treating patients (thereby lowering revenues). AHEC currently helps support clinical rotations for health professions students; however, resources available to support additional clinical rotations are limited and need to be expanded. (See Recommendation 2.9.)

Increasing number of physicians who complete their residency in North Carolina: After graduating from medical school and successfully passing licensure exams, physicians must complete at least one year of postgraduate training (internship or residency).[ee] Foreign-trained medical students generally have longer postgraduate education requirements before beginning practice. Specialists have longer residency programs and also must take specialty board examinations offered by the American Board of Medical Specialties.

Most residency placements run between three and seven years, depending on the specialty.[ff] Physicians who complete their residencies in North Carolina are even more likely to remain in state than those who go to North Carolina medical schools. Over the last forty years, almost one-half (49%) of physicians who completed their residencies in North Carolina remained in the state to practice. More than two-thirds (67%) of physicians who completed their residencies at AHEC family practice residencies remained in state.

Over the last forty years, almost one-half of physicians who completed their residencies in North Carolina remained in the state to practice.

In 2004, there were 2,648 residents in 12 postgraduate programs across the state. (See Table 2.2.) Of these 2,648 residents, 16% were in internal medicine, 10% in

Table 2.2
Number of Residents by Location, 2004

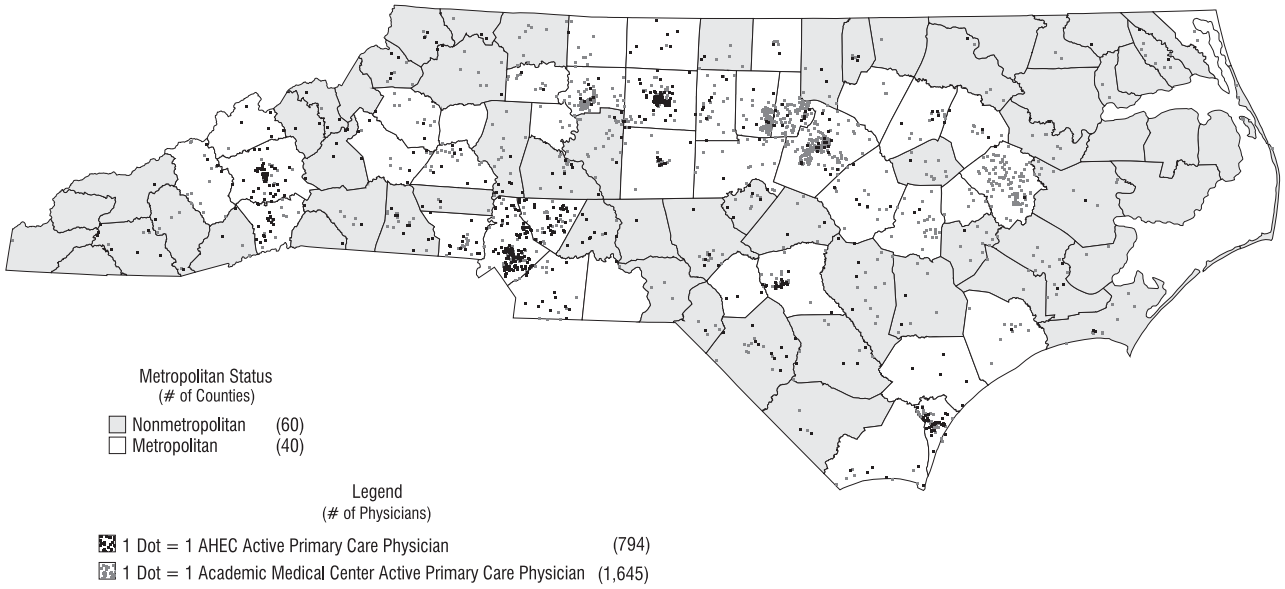
Location	Number of Residents
Duke University Medical Center	880
UNC/UNC Hospitals	648
Wake Forest/Baptist	583
East Carolina University/Pitt County Memorial Hospital	318
Charlotte/Carolinas Medical Center	200
Coastal AHEC/New Hanover Regional	61
Greensboro AHEC/Moses Cone	47
Mountain AHEC/Mission Hospitals	46
Cabarrus/Northeast Medical Center	23
Southern Regional AHEC/Cape Fear Valley	17
Monroe	6
Hendersonville	6
Total	**2,648**

Source: NC Health Professions 2004 Data Book.

ee Each state has its own rules for licensure and practice. In North Carolina, applicants who attend US medical schools must graduate from an accredited medical school, pass the US Medical Licensure Examinations or its equivalent, and complete at least one year of graduate training. If the applicant graduates from a foreign medical school, that individual must be individually certified by the Educational Commission for Foreign Medical Graduates and complete at least three years of postgraduate residency training. NC Medical Board. Available at: http://www.ncmedboard.org/. Accessed April 3, 2006.

ff Postgraduate education is accredited through the Accreditation Council for Graduate Medical Education (ACGME). ACGME includes 27 specialty Resident Review Committees (RRCs) that set standards for residency programs for 199 specialties and subspecialties. Nationally, these programs train approximately 100,000 residents annually. Accreditation Council for Graduate Medical Education. *History and Organization of the Accreditation Council for Graduate Medical Education*. Available at: http://www.acgme.org/acWebsite/25_anniv/25_history.asp. Accessed April 3, 2006.

Map 2.1*
Distribution of Active Primary Care Physicians Who Graduated from a North Carolina Residency Program AHEC and Academic Medical Center Program, North Carolina, 2003



Data are for active, in-state, non-federal, non-resident-in-training physicians indicating primary care specialties of FP, GP, IM, Ob/Gyn or Pediatrics, who were licensed as of October 2003 with residency graduation dates from 1972 and later. Internship data were used if residency data were missing.

Source: NC Health Professions Data System with data derived from the North Carolina Medical Board, 2005; NC Area Health Education Centers Program, 2003; US Census Bureau, 2004.

Core Based Statistical Areas are current as of the December 2003 update. Nonmetropolitan counties include micropolitan and counties outside of CBSAs.

* Color versions of all maps are available at http://www.nciom.org/projects/supply/primary_specialty.html.

family practice, 7% in pediatrics, 6% in OB/GYN, 7% in general surgery, and 47% in other specialty areas (eg, anesthesiology, dermatology, emergency medicine, pathology, surgical specialties, neurology, radiology).[15] North Carolina has a slightly lower than average number of residency spots: 3.1 per 10,000 population compared to 3.4 nationally.

Generally, North Carolina has been able to fill more than 90% of its approximately 630 first-year residency positions over the last ten years; however, the exact percentage of filled positions varies by specialty and location. Family practice has a 72% match rate[gg] whereas general surgery has a 100% match rate.[hh] Most physicians set up practice within 90 miles of where they completed their residency.[16]

gg Family medicine programs across the country are having difficulty filling their residency positions.

hh General surgery is different from preliminary surgery residencies, the latter of which has a 65.7% match rate. Preliminary surgery residents often are not counted in a longitudinal track of residents in general surgery since many subspecialize. Preliminary surgery residency positions (like those of preliminary medicine) are one-year positions tailored to residents who know they want to subspecialize. Residents spend one year in these positions and then move on to other programs elsewhere. As a result, residents are not usually counted in a longitudinal track of residents in that particular specialty because most are headed into a subspecialty area. Preliminary medicine residents are frequently headed to programs in radiology, anesthesiology, or other hospital-based residencies.

As with medical education, North Carolina has more physicians who completed their postgraduate medical education out of state than in state. (See Appendix A.) In 2005 approximately two-thirds (64.7%) of all physicians actively practicing in North Carolina completed their postgraduate education in other states or Canada (2003). One-third (35.3%) of the physicians practicing in state completed their postgraduate education in state. North Carolina does not currently offer enough postgraduate training programs to meet the need for new physicians.

One way to expand the number of physicians who practice in North Carolina is to expand the number of postgraduate education residency spots, since about one-half of all physicians who complete residencies in North Carolina stay in state-to-practice. Residency programs are underwritten through Medicare and Medicaid graduate medical education funds paid to teaching hospitals, clinical income, state funds, grants, and other sources. Estimates for residency training range from $250,000-$400,000 in gross costs per resident. Depending on the residency program, one-half to one-third of these costs can be covered through clinical revenues generated by faculty and residents (eg, surgical or specialty residency programs can generate more clinical revenues than family medicine).

North Carolina does not currently offer enough postgraduate training programs to meet the need for new physicians.

It also is important to track the impact of hospitalists in recruitment and retention of physicians in underserved areas (discussed more fully in Chapter 3). If increased use of hospitalists leads to higher provider retention in underserved areas or greater productivity in primary care settings, then the state should consider the feasibility of creating special tracks for hospitalists within internal medicine residencies and other primary care programs.

The state can increase the number of residency positions, although new Medicare graduate medical education (GME) funds are not available to help support this expansion.[ii] In 1974, the NC General Assembly appropriated $4.5 million to provide stipends of $15,000 per resident to help pay for primary care residency training.[jj] The goal was to expand the number of primary care residency positions. Since 1974, 730 new primary care residency positions have been established, but state funds have grown only to a level capable of supporting 324 positions for a current total of $4.86 million. Efforts also have been made over the years to increase the amount of the stipend, but it remains at the $15,000 level established in 1974.

The NC General Assembly should increase the funding for residency programs either through a direct appropriation or through an increase in Medicaid GME funds.[17] The annual cost of training a resident is approximately $100,000, which

ii The Balanced Budget Act of 1997 capped Medicare GME funds, limiting the number of slots that it would support. In 2005, the US Centers for Medicare and Medicaid Services (CMS) reallocated Medicare GME funded slots from training programs that were unable to fill all of their allocated slots to other programs. North Carolina received the second largest increase in Medicare GME funded slots (6.55%) as a result of this reallocation process. Nevertheless, all of these reallocated Medicare slots simply covered existing unfunded positions and did not result in a growth in residency positions.

jj Residencies in family practice, pediatrics, internal medicine, OB-GYN, and med-peds qualify as primary care residencies eligible for the state-supported stipend.

covers the resident's salary and benefits and pays for a small portion of faculty members' salaries and related costs.[kk]

North Carolina paid $75.7 million in Medicaid GME funds to support graduate medical education.[ll] This amount could be increased and targeted to produce types of physicians or other graduate health professionals needed to meet the state's future healthcare needs. North Carolina currently pays GME funds as part of the hospital's per diem rate. Funding is limited to support graduate *medical* education. However, 12 states also provide GME funding for graduate nursing education, and 13 states use GME funds to support graduate training of other health professionals.[mm] Eleven states specifically link Medicaid GME payments to achieve certain state policy goals such as training in certain shortage specialties (eg, primary care), training in certain settings (eg, rural or medically underserved communities), or increasing the supply of health professionals serving Medicaid beneficiaries.

Recommendation 2.9. (Priority Recommendation)

The NC General Assembly should appropriate $13 million in new funding and/or Medicaid GME funding to the NC Area Health Education Centers (AHEC) Program to support additional and expanded clinical rotations for health science students and expansion of primary care or other residency programs that meet specialty shortages.

a) **$3 million should be provided to develop new clinical training sites for students; to pay stipends to community preceptors who supervise and teach primary care students; and to provide housing, library, and other logistical support for students in community settings. Enhanced payments should be made to preceptors who practice in health professional shortage areas.**

b) **$10 million should be provided to fund 100 new residency positions across the state targeted toward the high priority specialty areas of primary care, general surgery, and psychiatry or targeted toward other specialty shortage areas identified by the Health Workforce Policy Board. This funding should be provided to AHEC, with AHEC then making grants to AHEC- and university-based residency programs that agree to expand residency slots and to create programs designed to graduate physicians likely to settle in rural and other underserved areas of the state.**

In addition to creating new residency positions, the state could more easily attract osteopathic doctors into North Carolina residency programs if North Carolina residency programs were accredited by both the Accreditation Council for Graduate Medical Education (ACGME), necessary for allopathic residencies, and the American

kk The state could support 100 new positions with an additional $10 million in funding. The number of new positions could be increased further if hospitals helped match some of the residency costs.

ll The North Carolina Division of Medical Assistance provides funding to reimburse for the costs of both direct graduate medical education and indirect medical education in hospitals and other settings. GME payments are included as part of the hospital's per diem rate.

mm For example, Minnesota uses its GME funding to support dental students and residents, doctors of pharmacy students and residents, PAs, and chiropractic students.

Osteopathic Association (AOA), necessary for osteopathic residencies. There are only two residency programs in North Carolina that have dual accreditation: Wilmington and Fayetteville. Osteopathic students can do their residencies in an ACGME accredited residency program, but they may not be able to continue some of the skills they learned in their undergraduate medical school (eg, manipulation).[nn] Many osteopathic students would prefer to do their residencies in jointly accredited residency programs so it is easier for them to take both sets of board examinations.[oo] By offering more jointly accredited programs, North Carolina may be able to attract more osteopathic trained medical students into North Carolina residency programs.

Recommendation 2.10.

NC residency programs should consider seeking joint accreditation by the American Osteopathic Association along with existing accreditation by the Accreditation Council for Graduate Medical Education.

Improving the practice environment to encourage more physicians to move to North Carolina and to keep existing North Carolina physicians in practice in the state: Other strategies to increase the number of providers in North Carolina include increasing the number of providers recruited to practice in North Carolina from out of state, decreasing attrition from the practice, or encouraging providers who left the practice to reenter the practice. North Carolina is a net importer of physicians: most North Carolina physicians either attended medical schools or completed their residencies out of state. Historically, the state has been able to attract physicians to relocate to North Carolina to set up practice; however, that may become more difficult in the future as more states actively recruit physicians to address their provider shortages.

Historically, the state has been able to attract physicians to relocate to North Carolina to set up practice; however, that may become more difficult in the future as more states actively recruit physicians to address their provider shortages.

One strategy is to encourage retired providers or those on inactive status to reenter practice. Between 2003 and 2004, 193 physicians who had retired or become inactive reentered the practice.[pp] Improving the practice environment for physicians may lead to less out-migration or fewer providers leaving the profession. Physician salary, the complexity of the healthcare system, the malpractice environment, hours of practice, and community factors all affect provider satisfaction and the desire to remain in the profession and/or practice location. Changing some of these underlying conditions could also increase the overall supply of physicians in the state. Similar strategies could be employed for nonphysician clinicians.

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nn Many of the ACGME primary care residency programs in North Carolina are trying to accommodate the interests of the osteopathic residents by offering short courses that focus on skills taught in osteopathic schools such as manipulation.

oo The American Osteopathy Association conducted a survey of graduates of osteopathy medical schools. More than 80% of DO graduates indicated that they would prefer to attend a jointly accredited AOA/ACGME residency program. Murphy M. Presented at: Primary Care and Specialty Supply Task Force Steering Committee Meeting, North Carolina Institute of Medicine; February 13, 2006; Cary, NC.

pp 138 of these physicians were inactive in 2003 and became active in 2004; 48 moved from retired status to active status; 52 physicians did not have business hours or an active practice listed in 2003 but listed one in 2004. (Note: there is overlap between some of these categories).

Physician salaries:
The average salary of North Carolina physicians is higher than the national average and generally ranks in the top 20 states.[qq] According to the 2006 Geographic Practice Cost Indices (GPCI), used to determine variations in costs for physician services for Medicare based on geographic location, North Carolina physicians' practice expenses (including office staff, renting office space, and supplies and equipment) were 8% below the national average.[18]

North Carolina's malpractice environment can affect a physician's willingness to set up practice:
One commonly cited factor contributing to a potential decline in the provider supply is the medical malpractice environment. Practitioners are concerned that supply is inhibited by high malpractice insurance premiums and/or especially litigious environments that discourage training in certain specialties (eg, OB/GYN), encourage relocation to other states with more provider-friendly medical liability environments, hasten retirement and/or transition to other professions, and lead to the cessation of specific medical services (eg, delivering babies).

The American Medical Association (AMA) lists North Carolina as one of the states "in crisis" with respect to medical malpractice liability, although it does not provide data on how this determination was made.[rr] Other evidence suggests that North Carolina does not have a more adverse malpractice environment than other states. For example, information from the National Practitioner Data Bank shows that North Carolina has average per capita malpractice awards and settlements.[ss] Further, the Medicare Geographic Practice Cost Indices (GPCI) noted that professional liability insurance for North Carolina physicians was 36% lower than the national average.[18] It should be noted, however, the "average" malpractice environment in North Carolina may be more positive than that experienced by specific providers practicing in certain specialties, located in certain geographic areas, or covered by certain carriers. In other words, certain subsets of providers may face more acute malpractice pressures than the above "average" data suggest. While evidence on the underlying malpractice environment is mixed, the perception that North Carolina has a worse malpractice environment than other states could potentially discourage practitioners from moving to this state to practice and may accelerate other practitioners to leave practice.[tt] The Task Force was not able to fully consider

qq Family practice physicians in North Carolina average $145,875 annually, compared to $138,235 nationally. North Carolina internists earn, on average, $165,045 annually compared to $157,495 nationally. Similarly, OB/GYNs earn $180,995 in North Carolina compared to $175,380 nationally. Occupational Employment Statistics, Bureau of Labor Statistics, US Department of Labor. May 2004 and November 2004 values averaged.

rr According to the AMA, "In crisis states, patients continue to lose access to care. In some states, obstetricians and rural family physicians no longer deliver babies. Meanwhile, high-risk specialists no longer provide trauma care or perform complicated surgical procedures." Available at: http://www.ama-assn.org/ ama/noindex/category/ 11871.html. Accessed December 2006.

ss For example, the average per capita award in 2002-2003 in North Carolina was $9.39 compared to $7.92 (TN), $8.68 (VA), $9.87 (SC), $13.45 (GA), and $12 (US). National Practitioner Data Bank Public Use Data File, Practitioner Data Banks Branch, Office of Workforce Analysis and Quality Assurance, Bureau of Health Professions, Health Resources and Services Administration, US Department of Health and Human Services. Accessed December 31, 2005.

tt Evidence on the extent to which medical malpractice affects provider supply is also mixed. US Government Accountability Office. Medical Malpractice: Implications of Rising Premiums on Access to Health Care. GAO-03-836 (August 2003).

all the different complexities of malpractice reform.[uu] However, until either the reality or the perception of the malpractice crisis is addressed, it will continue to be an issue that underlies some dissatisfaction with the practice environment.

North Carolina should mount an aggressive outreach and marketing campaign to extol the virtues of practicing in North Carolina. Salaries are comparable, but costs of practice are generally lower. Of the 89 geographic locations measured by the GPCI, only 29 locations had lower practice expenses and only 20 locations had lower liability insurance than North Carolina in 2006.[18]

Recommendation 2.11.

The NC Office of Rural Health and Community Care in collaboration with the Community Practitioner Program of the NC Medical Society, NC Area Health Education Centers Program, and professional medical societies should conduct marketing and outreach campaigns that emphasize positive aspects of healthcare practice in North Carolina.

The data listed above suggest that North Carolina currently offers physicians a positive work environment. North Carolina also provides a positive practice environment for PAs, NPs, and, to a slightly lesser extent, CNMs. In a national study of PAs, NPs, and CNMs, North Carolina was considered to have the most positive practice environment for PAs and the 10th most favorable practice environment for NPs, but only the 24th most favorable practice environment for CNMs.[19] Despite the overall positive work environment for physicians, NPs, PAs, and CNMs, North Carolina cannot afford to rest on past accomplishments. As health professional shortages become more acute across the country, other states are likely to increase their recruitment efforts as well as take steps to improve the regulatory and practice environment. North Carolina should remain vigilant in maintaining and improving the practice environment for physicians, NPs, PAs, and CNMs.

Recommendation 2.12.

The NC General Assembly should help maintain and improve the positive regulatory environment for all licensed health professionals including physicians, nurse practitioners, physician assistants, and certified nurse midwives.

Alterations to the regulatory environment should lead to:

a) more out-of-state licensed health professionals migrating to North Carolina;

b) fewer practicing licensed health professionals leaving North Carolina;

c) licensed health professionals retiring later in their careers;

uu When the NC Institute of Medicine studies an issue, it strives to have all relevant stakeholders participate in the study. The Task Force examining primary care and specialty supply was not properly constituted to fully study the issue of malpractice reform, as trial lawyers and other individuals representing patients injured by medical negligence were not part of this study.

d) more licensed health professionals treating underserved populations in underserved communities;

e) more licensed health professionals offering a full scope of services (within their scope of practice); and

f) greater quality and efficiency of healthcare offered to North Carolinians.

Possible options for the NC General Assembly to consider include, but are not limited to: ensuring adequate provider reimbursement, providing practice supports to help practitioners provide quality care in an increasingly complex healthcare environment, addressing rising malpractice costs, and addressing any other barriers that discourage physicians or other licensed health professionals from continuing to provide services in North Carolina.[vv]

Another strategy is to encourage retired physicians, NPs, PAs, or CNMs or those on inactive status to reenter practice. Between 2003-2004, 193 physicians who had retired or become inactive reentered practice.[ww] The North Carolina Medical Board currently has a process to validate the competence of physicians or PAs seeking licensure after two or more years out of active clinical practice.[20] Physicians and PAs who have applied for reentry have spent between 2-22 years out of practice. Applicants who are interested in resuming practice must develop reentry plans which the Board must approve. The reentry plan must include diagnostic, remedial education, and reassessment elements. However, it has been very difficult for applicants to develop appropriate reentry plans. Many applicants need to participate in a postgraduate training program or set up an alternative method of demonstrating clinical competence. However, there are limits on training slots available for mini-residency training. Reentry applicants also have difficulty obtaining liability coverage for the residency training or mentorship. Applicants who took a hiatus from practice directly out of a residency program face particular problems if they were never licensed.

The North Carolina Board of Nursing has a reentry process for NPs who have been inactive for five or more years.[xx] NPs who have been inactive for at least five years must complete a NP refresher course approved by the Board of Nursing. The refresher course must include didactic and clinical learning experiences and an evaluation of student competencies. The Midwifery Joint Committee does not have a similar process to validate the competence of CNMs who have been out of practice for any length of time. The American College of Nurse-Midwives (ACNM) developed a flexible, individualized pilot program for nurse midwives who would like to reenter practice, which includes continuing education and a clinical refresher depending on the length of time out of practice. Each nurse midwife is individually evaluated and a unique reentry plan is developed. The nurse midwife

vv The Task Force did not specifically address the issue of whether the NC General Assembly should remove the requirement for physician supervision from the practice acts governing PAs, NPs, or CNMs.

ww 138 of these physicians were inactive in 2003 and became active in 2004; 48 moved from retired status to active status; 52 physicians did not have business hours or an active practice listed in 2003, but listed one in 2004. (Note: there is overlap between some of these categories).

xx 21 NCAC 36.0808(d).

is responsible for identifying the site or clinical preceptor to assist with carrying out the plan.[21]

The North Carolina Medical Board should continue its efforts, in conjunction with other organizations, to facilitate reentry of PAs into practice. The Midwifery Joint Committee should develop its own rules to govern reentry of inactive CNMs into practice. Inactive practitioners from other states might be interested in moving to North Carolina if a streamlined process is created that facilitates reentry of competent practitioners into practice.

Recommendation 2.13.

The North Carolina Midwifery Joint Committee should follow licensure reentry procedures established by the American College of Nurse-Midwives to enable inactive practitioners otherwise in good standing to reenter practice.

The complexity of the healthcare billing system requires more highly trained practice managers to ensure that outstanding balances are collected. The managerial skill required to successfully operate a practice has increased rapidly over the past few decades. Most practices have patient populations with multiple insurers, requiring the practice to navigate a vast array of reimbursement forms and procedures to receive appropriate payment for services. Few residencies provide training on the business side of practice management, which discourages physicians from opening their own practices. In general, geographically underserved and rural areas are most dependent on solo practitioners; therefore, reluctance to open a solo practice affects the most at-risk communities. In addition, the rapidly changing business environment of medicine may disproportionately affect small practices that cannot afford to invest in staff training.

One key element in the success of a medical practice is a practice manager who has the skill set to manage the business side of the practice, such as ensuring appropriate reimbursement for medical services, whether from private payers, public programs, or individual patients. Practice managers increase the long-term financial viability of practices, especially in rural and underserved areas, and could increase provider supply in these at-risk communities.

Other organizations also can assist providers in understanding basic financial and clinical management systems needed to successfully manage a healthcare practice. Historically, the NC Office of Rural Health and Community Care (ORHCC) has worked with rural practices and federally qualified health centers to provide technical assistance to both new and current practices through improving billing and management systems, increasing financial performance, and maximizing the chance of long-term provider retention in the community. However, ORHCC funding is limited, and, as a result, their staff are able to reach only approximately 40 practices per year.

The NC Medical Society Foundation is developing a practice management program (PractEssentials) to provide technical assistance to physicians, NPs, and PAs who

receive support through the Community Practitioner Program.[yy] The goal of PractEssentials is to help providers in medically underserved areas develop and maintain financially viable practices.

Recommendation 2.14. (Priority Recommendation)

In order to improve practice management across the state:

a) **The University of North Carolina system, NC community colleges, and NC independent colleges and universities should offer courses that will increase the supply of practice managers across the state, particularly in underserved areas, and improve the skills of existing practice managers.**

b) **The NC Area Health Education Centers Program, NC Office of Rural Health and Community Care, Community Practitioner Program, NC community colleges, and NC independent colleges and universities should develop a continuing education curriculum for existing practitioners and staff to enhance the business skills needed to maintain a viable practice.**

c) **North Carolina foundations should consider funding start-up programs to community colleges and other organizations to enhance the skills of practice managers and providers and programs targeted to underserved areas.**

yy The Community Practitioner Program (CPP) provides financial assistance to physicians, PAs, and family NPs in return for healthcare service in an underserved community. It is run through the NC Medical Society Foundation. CPP funds help support approximately 50 providers per year. More information is available at: www.ncmsfoundation.org. Accessed April 28, 2006.

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