North Carolina's Healthcare Needs and Provider Supply Trends

Chapter 1

Growth in the provider supply has not kept pace with growth in the overall population or the increased demand for health services in North Carolina. The state is likely to face a severe shortage of physicians, nurse practitioners (NPs), physician assistants (PAs), and certified nurse midwives (CNMs) over the next 20 years, absent major changes in the healthcare delivery system or significant increases in the number of providers.

The North Carolina Institute of Medicine (NC IOM) convened a Task Force to analyze current and projected trends in provider supply and to examine whether the existing production of physicians, NPs, PAs, and CNMs will address the state's growing healthcare needs. The Task Force was a collaborative effort with the North Carolina Health Professions Data System and the Southeast Regional Center for Health Workforce Studies at the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill and the North Carolina Area Health Education Centers Program. The Task Force was chaired by E. Harvey Estes, Jr, MD, Chairman Emeritus of the NC IOM Board of Directors and Professor Emeritus, Department of Community and Family Medicine, Duke University. The 34 other Task Force and Steering Committee members were drawn from across the state and included representatives of professional associations (representing allopathic and osteopathic physicians, NPs, PAs, and CNMs), provider specialties, academic health centers, other health professions training programs, residency directors, hospitals, and the North Carolina Office of Rural Health and Community Care.

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The Task Force examined trends in provider supply including: (1) types of providers (by specialty) likely to be needed to address future healthcare needs; (2) areas of the state that experience persistent shortages; and (3) underrepresentation of certain ethnic and racial minorities in specified health professions. The goal of the Task Force's work was to develop public and private policy options to ensure North Carolinians have access to the providers they need. In short, the goal was to ensure that North Carolina has the right combination of providers in the right places.

The Task Force met for over a year and developed a set of preliminary recommendations that were presented to a larger group of stakeholders at a summit in December 2006. The summit included more than 100 invited guests, including a broader array of healthcare professionals, hospitals, state and local policy makers, and insurers. Recommendations of the summit participants were considered and incorporated into the report. The work of the Task Force was supported by a generous grant from the Kate B. Reynolds Charitable Trust.

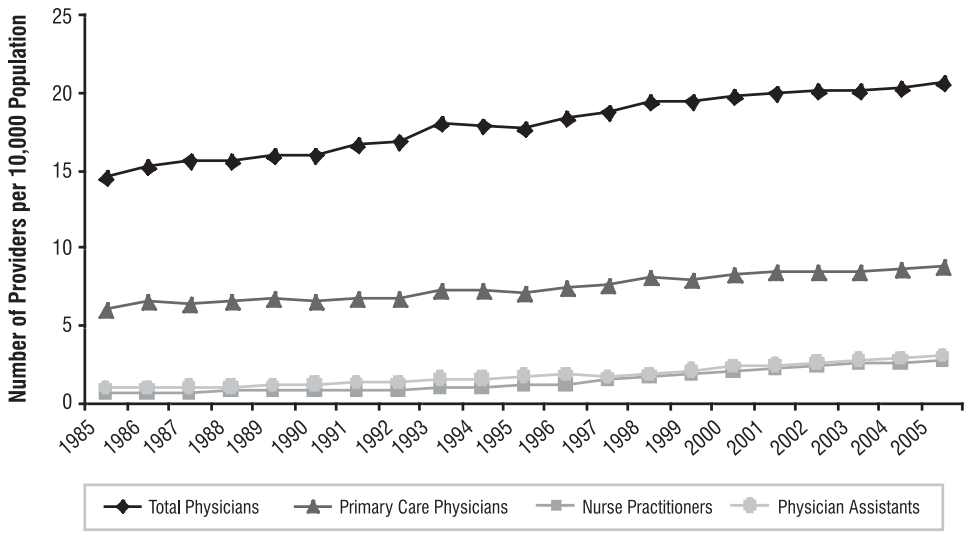
Provider Supply and Population Health

Physicians, NPs, PAs, and CNMs (referred to collectively as "providers") are indispensable practitioners in the state's healthcare system. Having access to these providers contributes to the overall well-being of the population. While the exact relationship of overall provider supply to population health measures is disputed,[1]

the specific contribution of physicians and other nonphysician clinicians to individual health is not in doubt. The consequences of not being able to see healthcare providers when needed are clear. Studies have shown people with less access to medical care live shorter lives with more disability and lower productivity.[2] Physicians, with their extensive education and training, provide the leadership and expertise to manage complex health conditions. NPs, PAs, and CNMs also help address the healthcare needs of North Carolinians.

For most of the last 20 years, North Carolina has seen a steady increase in the ratio of providers-to-population as the number of licensed providers has grown faster than the population. (See Chart 1.1.) Although there has been growth in the ratio of providers-to-population over the last 20 years, over the last five years the rate of growth has slowed. Between 1985 and 2000, the physician-to-population ratio increased by approximately 2.1% annually. However, starting in 2000, the annual growth rate slowed to 0.9%.

Chart 1.1
Providers per 10,000 Population, North Carolina, 1985-2005

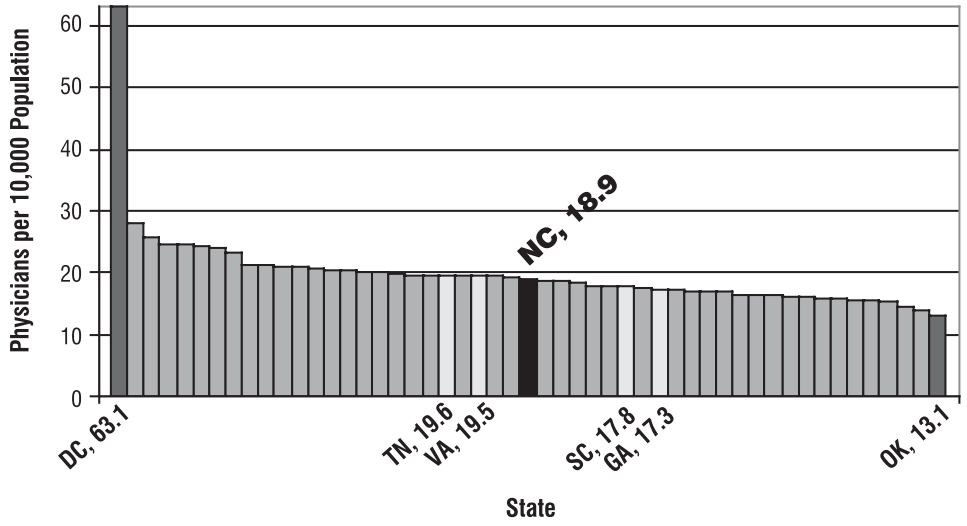


Note: Providers are active, in-state, non-Federal, non-resident-in-training providers licensed in North Carolina. Primary care physicians are those with a primary specialty of family practice, general practice, internal medicine, obstetrics /gynocology, or pediatrics.
Source: North Carolina Health Professions Data System and NC State Demographer.

While evidence suggests that more providers do not inevitably lead to better health outcomes,[3] other data suggest that too few providers, especially in underserved areas, can adversely affect health status.[4,5] No one currently knows the optimal number or type of providers needed to maximize population health. Yet, by most measures, North Carolina has neither too many nor too few physicians. Using data that allow state-to-state comparisons, North Carolina had 18.9 physicians to every 10,000 people in 2005, which is about average when compared to all states. (See Chart 1.2.) Note that these estimates come from American Medical Association (AMA) data. Caution should be used when comparing these data to data shown elsewhere in the report because of differences in the data collection efforts at the

AMA; the AMA master file relies on survey data and is updated throughout the year while the North Carolina data are collected in October of every year.

Chart 1.2
Physician Supply per 10,000 Population by State, 2005



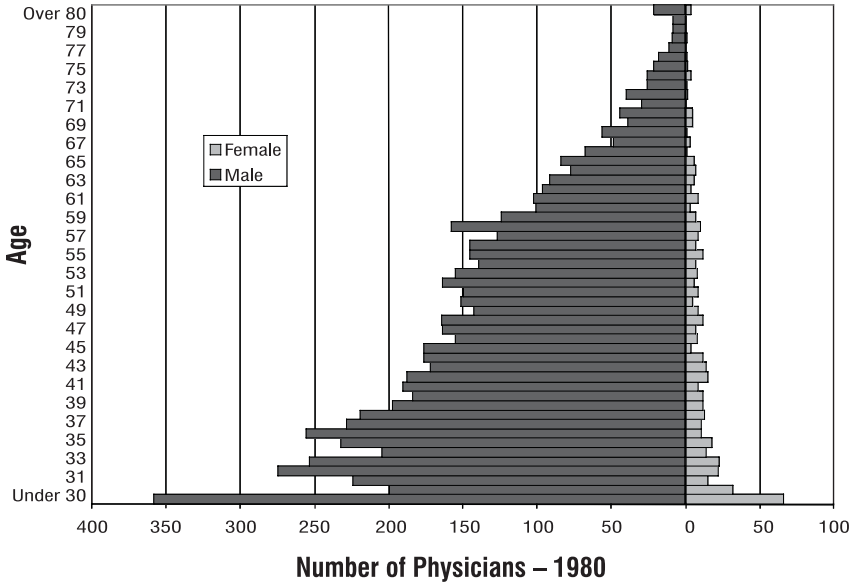
Source: American Medical Association Physician Masterfile. 2005.

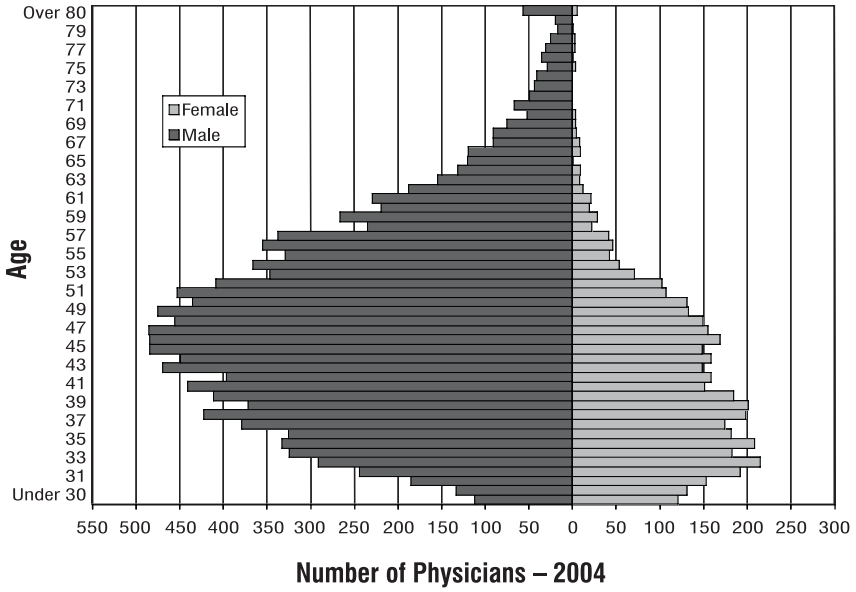
The Potential Provider Shortage

While North Carolina's current overall supply may be adequate, state population growth, aging of both population and providers, and increase in the prevalence of chronic diseases may lead to a future workforce shortage. The growing population and aging of the provider workforce are two of the factors that contribute to decline in the provider-to-population ratio. The population is expected to grow 25.4% in North Carolina between July 2004 and July 2020. At the same time, provider supply is expected to increase only 23%. The physician workforce is aging, and a sizable portion of physicians are approaching traditional retirement age. In 1980, a large proportion of the physician workforce was in their 30s. (See Chart 1.3.) This cohort of physicians has remained the largest age group among North Carolina's practicing physicians, and so nearly 25 years later, this group of physicians is in their late 40s to early 50s. In fact, in 2004, 68% of North Carolina physicians were age 40 or older compared to 58% in 1980. Assuming the average retirement age of physicians (66) does not change significantly in the future, a large percentage of the current physician workforce is likely to retire in the next 20 years. NPs are similar as a group: 68% of NPs are age 40 or older. PAs are somewhat younger: 51% of PAs are age 40 or older.

In addition to state population growth and aging of the provider workforce, other factors affect provider supply. There is some evidence to suggest newer providers want to work fewer hours. This preference may be an effort to balance home and professional careers. Likewise, gender plays a role in physician supply. Female physicians are somewhat more likely to temporarily exit the profession during child raising years. Of the 173 physicians who were active in 2004 but became inactive in

Chart 1.3
Age Distribution of Physicians, 1980 and 2004





Note: There were three physicains with missing age.

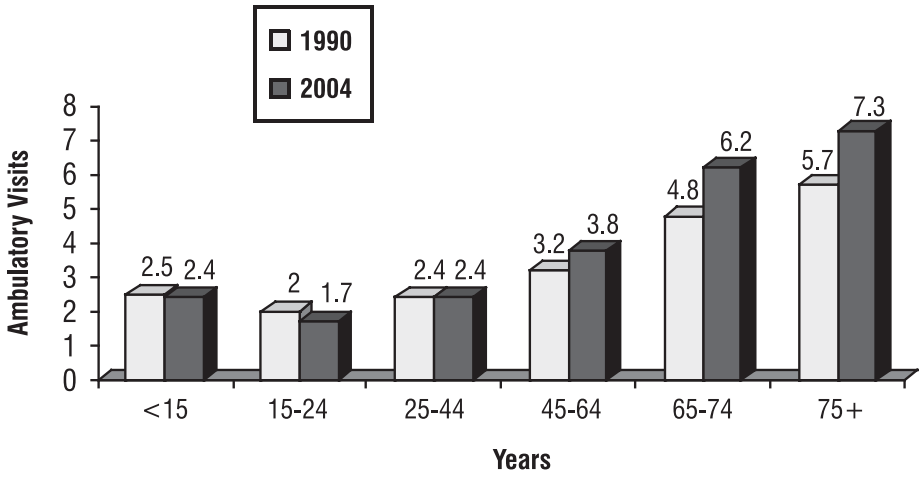
2005, 36 (21 percent) were women younger than 45.[6] This group constitutes 16% of all physicians, so women in this age group are slightly—1.3% versus 0.9%—more likely to become inactive than other physicians. Furthermore, on average women work slightly fewer hours per week than men.[a] As the percentage of physicians

a For example, in 2005 the average number of work hours per week reported by female physicians was about 91% of the average hours reported by males. NC Health Professions Data System. Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill. 2006. It is important to note this difference will have a larger effect in specialties that have more females.

who are female increases, these factors will combine to slightly reduce provider supply for a given number of trained physicians located in the state.

The need for healthcare services is likely to increase at the same time the supply of providers begins to slow. As people age, they use more health services. Between April 2000 and July 2003, North Carolina had the fourth largest growth in number of older adults of any state in the nation.[7] Further, the population of older adults (65 or older) is expected to grow 59% between July 2004 and July 2020.[8] Approximately 12% of North Carolinians were age 65 or over in 2004; this number is projected to increase to 15% by 2020. On average, people make approximately three visits per year to a physician's office or clinic. However, utilization varies by age: 25-34 year olds made 2.3 annual visits to a physician's office or clinic (2003), while 75-84 year olds had more than 7.3 visits. (See Chart 1.4.) Moreover, the average number of visits for people over age 45 has increased in the last 20 years.

Chart 1.4
Average Number of Ambulatory Visits by Age of Patient, 1990 and 2004



Source: National Center for Health Statistics. *National Ambulatory Medical Care Survey (NAMCS)*. Number, percent distribution, and annual rate of office visits with corresponding standard errors, by patient characteristics: United States, 2004. Hyattsville, MD: National Center for Health Statistics. Advance Data No. 374; Table 3. Available online at: http://www.cdc.gov/nchs/data/ad/ad374.pdf. Accessed August 24, 2006. National Center for Health Statistics. *National Ambulatory Medical Care Survey (NAMCS)*. Number, percent distribution, and annual rate of office visits by patient's age, sex, race and geographic region: United States. Hyattsville, MD: National Center for Health Statistics. Advance Data No. 213; Table 1. Available online at: http://www.cdc.gov/nchs/data/ad/ad213.pdf. Accessed September 15, 2006.

In addition to aging of the population, growth in the number of people with chronic illnesses also affects demand for services. As a general rule, healthier individuals use fewer health services, and less healthy individuals use more. Between 1987 and 2002, there was a significant increase in the treated disease prevalence of certain chronic diseases such as cerebrovascular diseases (161% increase) with strokes being most common; kidney problems (99% increase); pulmonary conditions (90% increase); diabetes (64% increase); presence of abnormal or elevated lipids (fatty molecules) in the blood (437% increase) with cholesterol being most common; and certain back problems (78%).[9] An increase in the prevalence of obesity explains part of the increase in demand for treatment. For example, in 2001, 24% of the adult population was considered obese, an

increase of 10 percentage points since 1987.[10] People who are obese use more health services, and this group accounted for 27% of the growth in real per capita spending on healthcare during this same time period.

There are other factors aside from aging and increased prevalence of chronic illnesses that can drive demand for health services. Growth in the economy has historically led to greater demand for services.[b,11] Advances in medicine have the potential to decrease the use of some health services but can lead to greater use of other health services. Efforts to weed out unnecessary or marginally beneficial services can help reduce the need for health services.

It is impossible to predict fully the demand for and supply of provider services 20 years into the future. There are a number of different factors that must be considered in projecting provider supply and increased demand for health services. Some of these factors include anticipated growth in the supply of new physicians, NPs, PAs, and CNMs; anticipated exodus from the profession (due to death, retirement, moving out of state, or other factors); growth in the overall state population; aging of the population (which affects demand for services); and overall prevalence of chronic illness. The combined effect of three primary drivers of demand—growth of the population, aging of the population, and increase in the prevalence of chronic illnesses—is expected to increase the demand for services in North Carolina (measured in annual visits) by 34% between 2004 and 2020.

The NC IOM Primary Care and Specialty Supply Task Force developed a set of different workforce projections based on different assumptions. These included "best case" and "worst case" scenarios. The "best case" scenarios are based on the current growth of physicians and the higher than average rate of growth of nonphysician clinicians experienced in the last five years. These projections weigh nonphysician clinicians at 0.75 full-time equivalent (FTE) of a physician.[12] The "worst case" scenarios are based on current growth of physicians and average rate of growth of nonphysician clinicians over the last 25 years. These projections weigh nonphysician clinicians at 0.50 FTE of a physician (as used by federal workforce projections). In addition, there are separate estimates for provider-to-population

Table 1.1
Projected Change in Provider-to-Population Ratios, North Carolina, 2020 and 2030

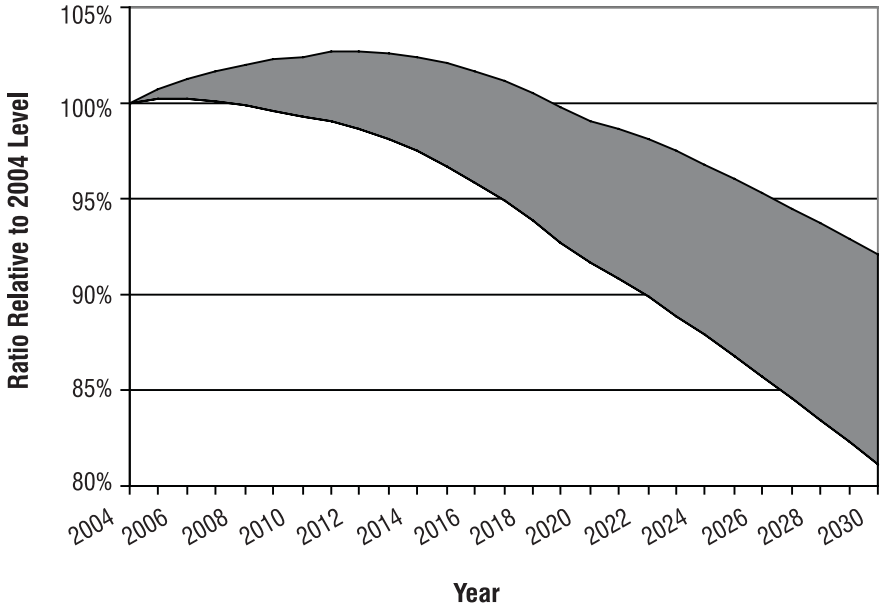
	Projected Change in Provider-to-Population Ratios		Projected Change in Provider-to-Adjusted Population Ratios	
	2020	2030	2020	2030
Physicians only	-8%	-21%	-12%	-26%
All providers				
Best Case	4%	-2%	-1%	-8%
Worst Case	-4%	-13%	-8%	-19%

Source: NC IOM and the NC Health Professions Data System. See Appendix A for details.

b There is a positive correlation between aggregate community wealth, measured by Gross Domestic Product (GDP) or personal income, and the demand for physician services. A longitudinal study of 14 Organisation for Economic Co-operation and Development (OECD) countries, including the US, found growth in physician supply corresponded to increases in GDP.

only and provider-to-adjusted population (based on increased demand due to aging of the population). These projections do not include the additional demand that would be anticipated from growth in the number of people with chronic illnesses. (See Table 1.1.) By 2030, under almost any realistic scenario, North Carolina is likely to experience significant provider shortages. Chart 1.5 presents the best and worst case projections for age-adjusted populations.

Chart 1.5
Range of Projected Provider-to-Population Ratios



Source: NC IOM and the NC Health Professions Data System. See Appendix A for details.

The state is likely to face a serious provider shortage over the next 20 years given growth in the population, aging of the population, and increase in chronic diseases. There are two fundamentally different approaches the state can take to address this problem: (1) restructure the healthcare delivery and finance system to create new and more efficient systems of care (particularly for people with chronic illnesses) or (2) increase provider supply. These options are not mutually exclusive. The state can redesign the healthcare delivery system and at the same time expand the overall supply of providers. North Carolina could maintain its current provider-to-population ratio (adjusted for demand changes) over the next 25 years by:

1) increasing yearly educational production of physicians by 20%, or
2) increasing production of nonphysician clinicians by over 30%, or
3) increasing in-migration of physicians by 15%, or
4) increasing the capacity of the health system to effectively manage the health of North Carolinians or improving the health of North Carolinians to reduce the need for health services by 15%.

Naturally, using multiple strategies would enable smaller percentage changes to satisfy the increasing demand. However, the longer the state waits to address

impending shortages, the greater percentage change that will be needed in future years. Options to expand the workforce or redesign the healthcare system to create new and more efficient models of care are discussed more fully in Chapter 2.

In addition to the projected overall provider supply shortage, the state is currently facing a significant maldistribution problem. North Carolina is a largely rural state and access to healthcare in rural areas has historically been a challenge. Some urban communities also face serious access barriers. North Carolina made significant headway in addressing provider maldistribution problems in the 1980s and 1990s; however, improvements have stagnated, and now maldistribution problems appear to be getting worse. There were 11 whole-county and 40 part-county health professional shortage areas in 2005.[c] Of these, 38 counties are considered persistent health professional shortage areas because they have failed to meet the minimum primary care provider-to-population ratio for six of the last seven years. Strategies to address the maldistribution issue are discussed more fully in Chapter 3.

In addition to an overall maldistribution problem, there are significant maldistribution issues among certain health professional specialties. Between 2000 and 2005:

- 27 counties experienced a decrease in primary care provider-to-population ratios;
- 53 counties experienced a loss in general surgeons relative to population, and five counties lost all general surgeons;
- 32 counties experienced a decline in the proportion of psychiatrists-to-population (six counties lost all psychiatrists), and 24 had no psychiatrists in either year; and
- 52 counties had either a decline in the ratio of physicians delivering babies to women of childbearing years or had no physicians providing deliveries.[d]

Shortages typically exist in rural areas, but there also are pockets of low provider supply in some low-income areas of larger cities. These shortages have varying impacts on affected communities. For example, despite the decrease in some areas of providers delivering babies, the average distance women across the state travel to deliver children has increased by only one third of a mile. By contrast, losing a general surgeon in a rural community can have a large impact on the financial sustainability of a rural hospital. Additionally, loss of psychiatrists working in the state's local management entities (LMEs) has been particularly acute in small population areas, where 44% of LME psychiatrists have stopped working with public patients.[13] Strategies to increase the number of providers, by type of specialty, are discussed in Chapter 4.

The state also faces a significant shortage of minority providers. In North Carolina, 69% of the state's 8.5 million residents are white, non-Hispanic; 21%

c The Bureau of Health Professions in the US Department of Health and Human Services has designated certain communities, population groups, or medical facilities as Health Professional Shortage Areas (HPSAs). Certain counties, or parts thereof, are considered HPSAs if they have fewer than one primary care provider to 3,500 people, or one primary care provider to 3,000 people in high-needs areas.

d 2004 are the most recent data available for physicians providing deliveries.

are African-American or black, non-Hispanic; 6% are Hispanic; 2% are Asian or Pacific Islander; and 1% are American Indian. By comparison, whites account for 82% of the physician population (17,090), Asians 7%, African-Americans 6%, and Hispanics 2%. Similarly, whites account for 90% and 88% of the NP and PA populations, respectively, while African-Americans account for only 5% and Hispanics account for 1-2% of each group. When given an option, individuals of all racial and ethnic groups are more likely to pick a provider who has a similar racial and ethnic background.[14,15] Studies suggest minority patients are generally more satisfied with care received from providers of similar race and/or ethnicity,[14,16,17] but the state is producing far too few providers from underrepresented minority populations to meet this need. Because minority providers are more likely to practice in underserved areas, increasing the number of minority providers also could lessen the maldistribution problem. Strategies to increase the number of underrepresented minorities in the profession are discussed in Chapter 5.

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