# First Biennial Report

## On Health Issues for the State of North Dakota

## 2011

School of Medicine & Health Sciences

Advisory Council

The University of North Dakota

School of Medicine & Health Sciences

# Foreword

This *First Biennial Report on Health Issues for the State of North Dakota* was prepared by the University of North Dakota School of Medicine and Health Sciences (SMHS) Advisory Council, a legislatively mandated group of 15 stakeholders in the North Dakota healthcare enterprise. It was produced with the cooperation of the senior leadership from the School. The primary stimulus for the preparation of the report was a revision in the North Dakota Century Code (NDCC) that was instituted by the 20009-2011 Legislative Assembly, in which the duties of the SMHS Advisory Council were modified. The modified duties included a requirement to submit a report biennially. The duties of the SMHS Advisory Council as specified in NDCC Section 15-52-04 are as follows:

*1. The advisory council, in consultation with the school of medicine and health sciences and the other agencies, associations, and institutions represented on the advisory council, shall study and make recommendations regarding the strategic plan, programs, and facilities of the school of medicine and health sciences.*

*2. Biennially, the advisory council shall submit a report, together with its recommendations, to the agencies, associations, and institutions represented on the advisory council, to the university of North Dakota, and to the legislative council.*

*3. a. The report must describe the advisory council's recommendations regarding the strategic plan, programs, and facilities of the school of medicine and health sciences as developed under subsection 1. The recommendations for implementing strategies through the school of medicine and health sciences or other agencies and institutions must:*

> *(1) Address the health care needs of the people of the state; and*
>
> *(2) Provide information regarding the state's health care workforce needs.*

*3. b. The recommendations required under subdivision a may address: (1) Medical education and training; (2) The recruitment and retention of physicians and other health care professionals; (3) Factors influencing the practice environment for physicians and other health care professionals; (4) Access to health care; (5) Patient safety; (6) The quality of health care and the efficiency of its delivery; and (7) Financial challenges in the delivery of health care.*

*4. The council may consult with any individual or entity in performing its duties under this section.*

This report fulfills the responsibility and duty of the SMHS Advisory Council to submit a report addressing the strategic imperatives for the SMHS and the State of North Dakota in addressing the health-

care needs of the state and the attendant workforce requirements. It is a comprehensive snapshot of the current state of health of North Dakota and its health care enterprise. But it also offers an analysis of what the future is likely to hold over the next few decades.

The report concludes with a multifaceted plan to address the current and future healthcare needs of North Dakota, emphasizing necessary steps to reduce disease burden, increase the healthcare workforce through enhanced retention of graduates as well as expansion of class size, and a call for a better functioning healthcare delivery system through more cooperation and coordination of the various health care delivery systems.

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# One

# Executive Summary and Key Findings

# Executive Summary and Key Findings

Rural depopulation, out-migration of the young, an increasingly elderly population, low population density and localized population growth will necessitate more physician and health science providers in North Dakota, and better health care delivery systems. North Dakota currently has a paradox regarding its healthcare workforce—shortages in the midst of plenty. The size of the physician workforce in North Dakota is at or better than national norms for most specialties, including all of the primary care disciplines. Despite this, there is a significant distribution problem, with the predominance of providers in the urban areas and a shortage (especially primary care providers) in the rural areas.

Some of the apparent adequacy of the workforce in North Dakota is, however, an illusion. There is a significant migration of Minnesotans living near the Red River to healthcare facilities in, and providers from, North Dakota. These additional patients tend to "dilute" the supply of physician for North Dakotans and will place further challenges on any provider shortages in North Dakota. The impact of these otherwise "hidden" patients is that estimates of North Dakota's physician workforce adequacy (which are based solely on North Dakota census numbers) are thereby underestimated, as are the resulting estimates of current and future workforce shortfalls.

The best available conservative estimate is that currently there are between 50 and 100 open physician positions in North Dakota, although the number may be as high as 150. About two-thirds of the openings are in the urban areas, with the remaining third in the rural regions. Both specialists and primary care physicians are in great demand.

The current shortage of physicians is only going to increase as the population ages and grows modestly in the future. Based on conservative estimates, North Dakota will need an additional 210 physicians at a minimum within the next 15 years.

The shortage of healthcare workers over the next 15 years will not be limited to physicians. An entire cadre of additional healthcare providers—from nurses to physician assistants to occupation and physical therapists to clinical laboratory specialists and others—will be needed to ensure that effective, efficient, and appropriate health care is available to all North Dakotans.

Addressing the imbalance between increasing demand for health services and inadequate supply of providers will require a coordinated approach to moderate demand (i.e., reduce the need for acute and chronic care services), increase supply of providers, and improve the efficiency of the healthcare delivery system within the state.

There are three principal options for increasing the size of the workforce—recruit from outside the state, retain more of our own graduates, and/or expand class size to produce more physicians and health sciences providers.

As far as external recruitment, North Dakota competes on the world market to recruit and retain healthcare professionals. As North Dakota faces deepening workforce shortages in the decades ahead, the nation as a whole will experience a shortfall of similar or greater magnitude. Increasing competition for a shrinking pool of available healthcare workers (with higher associated attrition of those recruited to North Dakota) makes it unlikely that North Dakota could successfully recruit a substantially higher proportion of its workforce from outside the state. Thus, the emphasis needs to be on expansion of the class sizes to "grow our own," and on retention.

Growing our own health professions workforce is not limited to simply increasing the class sizes. It also involves engaging young students to consider health careers and prepare for successful admission to health professions programs (see summary of pipeline activities in North Dakota in Appendix). Retention of more of our own graduates is an important component of ensuring the workforce for the future. And equally important will be getting the right kind of health professionals in the right locations to address the needs of that population. This will require additional change and investment. This includes changing the admission process for all health professions students to encourage selection of health professionals who will fill the needs of North Dakota, revising the curriculum to assure the competency of all graduates in primary care skills and to provide increase longitudinal clinical experience in rural communities, along with increasing the number of medical school and primary care residency positions.

While recruitment is the principal factor impacting rural health workforce, retention is also important. The SMHS can help with retention of rural health professionals by advocating for scholarships and/or loan repayment for students committed to rural practice and appropriate reimbursement and practice support, along with developing continuing education and training opportunities to enhance the professional experience and skills of rural health professionals. Additional opportunities revolve around creating collaborative relationships to share expertise and coverage.

At the highest level of analysis, the health status of North Dakotans is on par or slightly better than that of the nation as a whole, exhibiting lower-than-average age-adjusted death rates, high life expectancy, and low prevalence of disability. However, there are conditions in which North Dakotans fare worse than those in other states (such as alcohol abuse), worsening indications of health status by some important measures (such as increasing morbidity relating to obesity), and disparities in health status among various populations.

Beyond access to adequate health care services, one of the major opportunities for improvement of health status rests in our ability to positively influence health related behaviors, such as proper nutri-

tion, physical activity, elimination of tobacco and substance abuse, motor vehicle safety, and immunization.

There are some significant challenges for health delivery in North Dakota. Geographic factors hamper timely access to routine and emergency services by rural populations. Many people experience financial barriers for access to care. Also, aging infrastructure and financial challenges hinder appropriate investment in facilities and technology.

To address the widening gap between the need for healthcare and the supply of providers, the School of Medicine and Health Sciences Advisory Council, in conjunction with the SMHS, has developed a comprehensive healthcare plan for North Dakota. The plan has been reviewed, vetted, and approved by multiple stakeholders. The plan calls for reducing disease through the initiation of a master of public health program as a combined undertaking by UND and NDSU, and the institution of a geriatrics training program. The plan provides for an expanded workforce through greater retention of graduates and an expansion of the medical school, health sciences, and residency classes, and programs to help engage and prepare young students to become future health professionals (see summary of pipeline activities in North Dakota in Appendix).

To accommodate the attendant growth, a new building is also required. The specific components of the plan include the following six items:

| | |
|---|---|
| Master in Public Health Program | $1,215,219 |
| Geriatrics Training Program | $1,151,810 |
| 16 additional medical students | $857,600 |
| 30 additional health science students | $402,000 |
| 17 resident positions | $2,170,806 |
| **Total increase in operating base funding** | **$5,797,435** |
| ***New building (capital item)*** | ***$28,890,000*** |

A revised plan was subsequently developed that begins the class size expansion as planned, but at about half the size. The plan has three phases: the Initiate Phase; the Study Phase; and the Build Phase.

The Initiate Phase would begin the expansion of the class size, with the addition of 8 medical students, 15 health science students, and 9 residents. Admission of the additional medical students would be restricted to candidates likely to choose rural family medicine after graduation. The residency slots would be targeted at enhanced family medicine training. The requested additional biennial funding for 2011-2013 is $1,779,050 for the class size expansion, along with the $2,367,029 already in the proposed Executive Budget to fund the UND/NDSU joint M.P.H. program and the geriatrics training program.

The Study Phase would follow, and would delay the implementation of the full class size expansion for the two years required for an interim study to be completed,

with the findings reported back to the Interim Committee of the state Legislature.

The Build Phase would follow during the 2013-2015 legislative session. Assuming that the Interim Study is supportive, the Legislature would be expected to fund the full class size expansion as originally envisioned, along with the funds for a new Health Sciences building.

# Two

# Healthcare Workforce for North Dakota

# Key Workforce Drivers

There are several unique features of the demographics of North Dakota that pose particular challenges to the efficient and coordinated delivery of health care throughout the state. These include :

- Rural depopulation
- Out-migration of younger citizens (young adults and young families) to other states, especially from smaller towns and rural/frontier areas
- An aging population, with an increasing proportion of elderly citizens
- Low population density
- Rapid growth in the western portion of the state due to the Bakken oil patch

# Increasing Challenges for Providing Health Care for All North Dakotans

## Rural depopulation

Rural depopulation refers to the trend of rural and frontier dwellers to relocate to the urban centers. Decades of movement of these residents to the larger cities (along with out-migration of younger North Dakotans to other parts of the United States) has depopulated much of North Dakota. This trend of residential consolidation in North Dakota is similar to that occurring throughout the Great Plains. In the last decade, population growth has occurred largely in the metropolitan and Native American reservation counties of the state. In fact, only six of the state's 53 counties grew between 1990 and 2000 (20 percent in Cass, 15 percent in Burleigh, 8 percent in Sioux, 7 percent in Rolette, 7 percent in Morton, and 2 percent in Ward) (further details at http://www.ndsu.nodak.edu/sdc/data/populationtrends.htm).

## Out-migration

Out-migration of younger singles and families has been a trend for some time, with these individuals relocating to surrounding or distant states, often for perceived employment and quality of life issues. As reported by Dr. Rathge of the North Dakota State Data Center, the loss of residents in their twenties and early thirties has increased markedly over the past two decades. The loss of young adults means that there will be fewer parents of childbearing age and therefore fewer children. That trend is already evident, with the birth rate in North Dakota

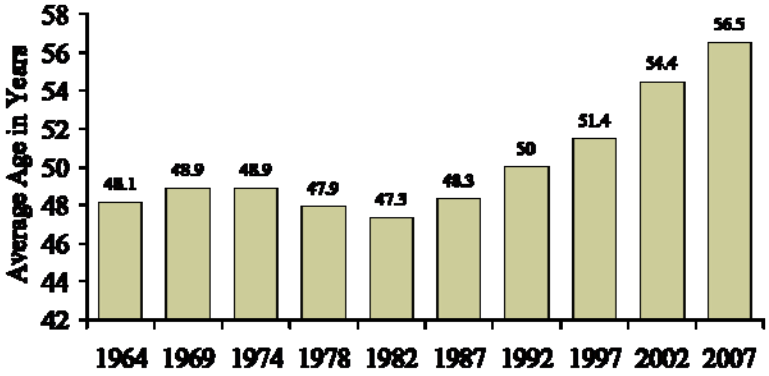



Figure 1. Average age of farmers in North Dakota
Source: *USDA, National Agricultural Statistics Service*

having declined steadily over the past few decades. As a result, the number of children will consistently decline for the majority of counties over the next 20 years. The long-term trend of net out-migration is expected to continue.

One net effect of the rural depopulation and out-migration of younger folks is that much of North Dakota is increasingly populated by older individuals. One measure of this is how much the remaining farm-based workforce has aged over time. As shown in Figure 1, there has been a nearly 20 percent increase in the age of the average North Dakotan farmer over the past four decades or so.

Thus, the majority of counties will continue to lose population. Currently, more than half of the 53 counties in the state have a population base below 5,000 residents. By 2020, nearly half of the counties will have a population base below 4,000 residents (further discussion at the North Dakota State Data Center website: http://www.ndsu.nodak.edu/sdc/data/populationtrends.htm).

This trend complicates health care delivery by simultaneously depleting the more rural/ frontier areas of healthcare professionals while at the same time isolating the remaining consumers of health care and making delivering care all the more complicated due to geographic considerations. Indeed, the distribution of family medicine physicians within North Dakota exactly mirrors the general population rural depopulation patterns with a resulting concentration of family medicine physicians in the four major cities.

## An aging population

Several issues regarding the population trends in North Dakota are particularly salient when considering the delivery of health care. Perhaps most important is the out-migration of people—especially the young—from the non-urban areas. Largely as a result of the out-migration of younger citizens, North Dakota faces a unique challenge for future health care delivery, as our non-urban population becomes even more elderly than the projections for the country as a whole. This trend will be particularly prominent in the non-urban rural and frontier areas.

The impact of the “baby boomer” generation on the demand for health care over the next several decades will be dramatic.

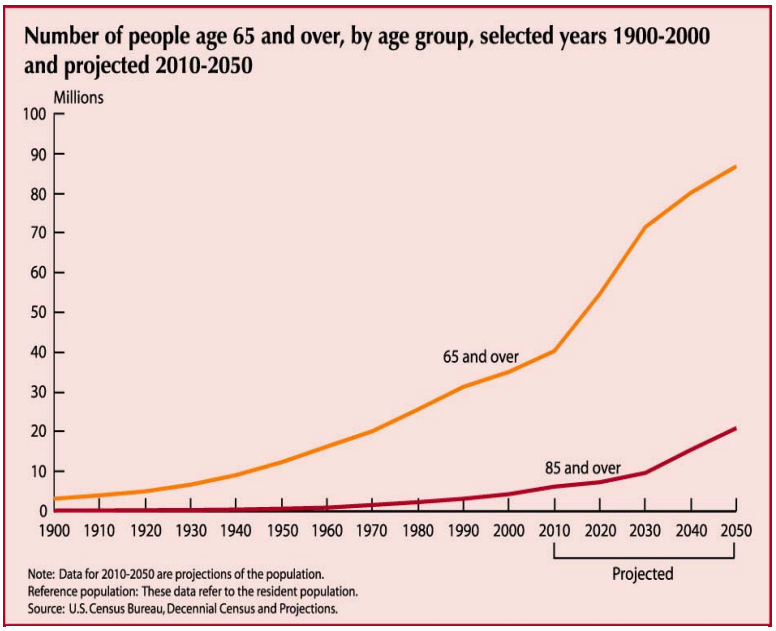



Figure 2. Percent of the U.S.'s population composed of seniors
Source: *National Atlas of the United States. U.S. Census Bureau, 2000*

The baby boomers are just beginning to enroll in Medicare, and their numbers will grow over the next twenty years.

Beginning in 2011, about 2.8 million boomers will join the Medicare age group annually, eventually growing to about 4 million in 2020, or about 5,000 new enrollees per day (on average). Coupled with a continued increase in life expectancy, the numbers of seniors thus will increase dramatically over the next twenty years (Figure 2).

While the graying of the population across the United States will be a significant determinate of health care needs (since the need for health care increases directly with age), the effect will be particularly pronounced in North Dakota. North Dakota has among the highest proportions of elderly citizens in the country. We have the fourth highest percentage of seniors aged 65 years or older in the country (after Florida, West Virginia, and Pennsylvania), and **we are second only to Florida in the percentage of folks aged 85 and over**. More than half of the state's 53 counties had more than 20 percent of their population classified as seniors (i.e., 65 years or older) (Figure 3). This is in contrast to the national average of only 12.4 percent. If current trends

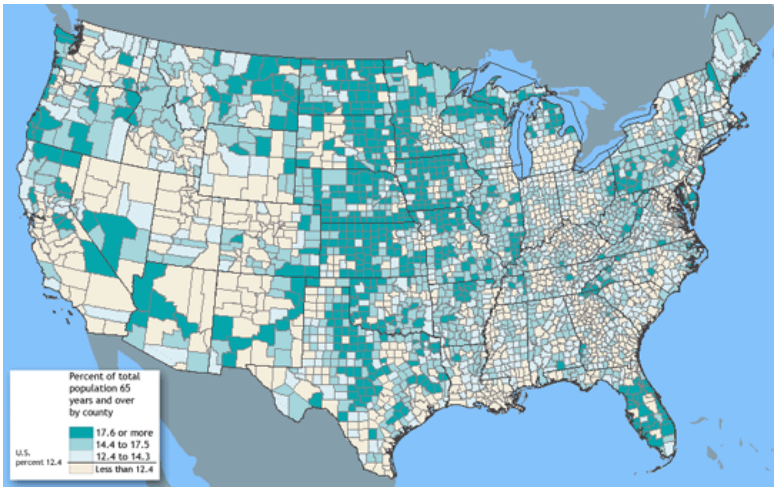



Figure 3. Growth of number of U.S. elderly over time
Source: *US Census Bureau, 2000*

continue, the number of elderly in the state will grow by 58 percent over the next 20 years and represent nearly a quarter of the state's population. In addition, the number of older seniors (i.e., 85 years of age and older) will grow by nearly two-thirds during that time frame (see further information at http://www.ndsu.nodak.edu/sdc/data/population-trends.htm).

## Population density

The distribution of our population is another challenging issue for efficient health care delivery. The state has a sparse population density overall, with a small population distributed over a large land mass. In fact, North Dakota ranks 49th in population density when compared nationally, with 9.7 people on average per square mile. This is roughly ten times the density compared with Alaska, the least dense state with 1.2 people per square mile. But it pales in comparison with the District of Columbia, with more than 1,000 times our population density at 9,859 people per square mile (http://2010Census.gov).

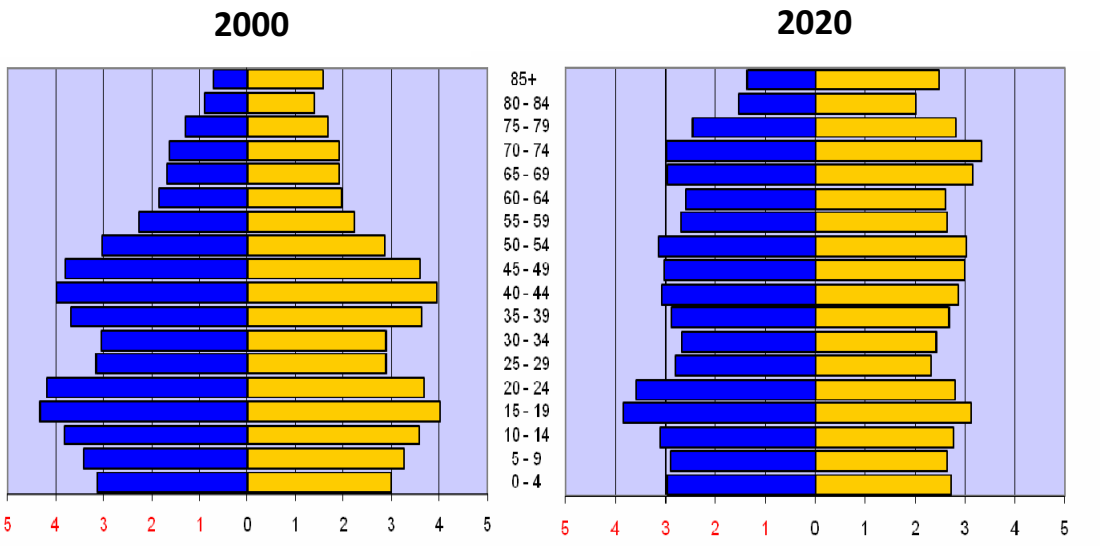



Figure 4. North Dakota population distribution in 2000 (left) and that predicted in 2010 (right) Males – blue; Females – yellow. Source: *US Census Bureau*

The impact of these demographic changes is shown graphically in Figure 4, which compares the age distribution of the North Dakota population in 2000 and the predicted distribution in 2020. The "normal" or expected distribution is a pyramid, with more young people than elderly, as is seen in the year 2000 above. However, note the change to a rectangular distribution by 2020, with a dramatic expansion of the proportion of the senior population.

## Western growth

The growth of the "oil patch" has health care delivery implications as well. In the most recent national census completed in

2010, North Dakota experienced a 4.7 percent population growth, after years of slow decline or trivial growth. North Dakota is unique in the nation in experiencing negative population growth for four of the last 10 decennial census determinations (http://2010.census.gov/2010census/data/apportionment-pop-text.php).

North Dakota's growth occurred in two locations—mainly the cities (Fargo, Grand Forks, and Bismarck), but also in the western counties (related to the Bakken oil patch). Figure 5 graphically demonstrates the population growth in the three cities and the western counties, with most of the other counties experiencing a loss in population. It has been estimated that the new jobs stemming directly from oil and gas production could boost population in the eight core oil and gas counties by 20,000 to 25,000 by 2030, not including additional spin-off jobs (http://www.Jamestownun.com/event/article/id/26442/). In recognition of the ongoing and predicted growth in the western part of the state, Gov. Jack Dalrymple's proposed 2011-13 budget includes nearly $1 billion in infrastructure investment in the oil patch region.

The healthcare delivery implications of this western growth are significant. None of the six major hospital systems is located in the western counties, and most of the health care is delivered through clinics and critical access hospitals. The region is already suffering from a disproportionate shortage of physicians and other health care workers.

## Demographic implications

The five major demographic factors at play in North Dakota—rural depopulation, out-migration of the young, an increasingly elderly population, low population density, and localized population growth (in the east, in the cities, and in the west, in the oil patch counties)—will have a significant impact on the state's health care needs. Taken together, they will have a predictable impact on the subsequent health care delivery enterprise of the state:

- Need for more health care providers to provide care for an increasing de-

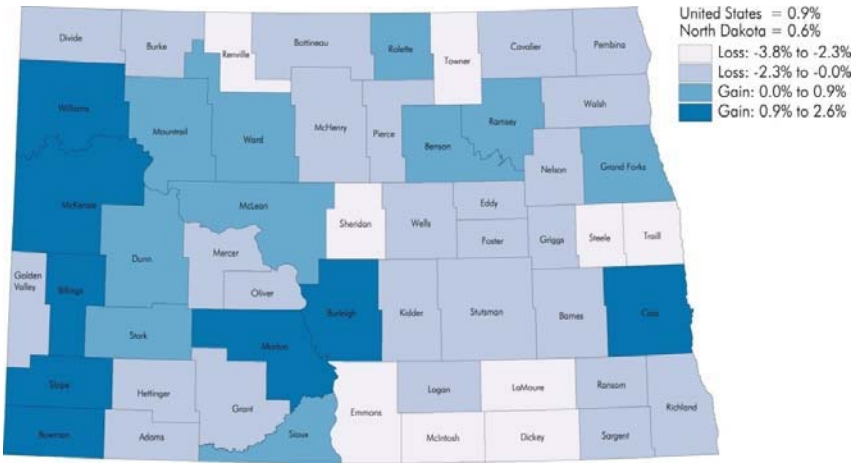



Figure 5. County population changes over time – Source: *North Dakota Stat Data Center*

mand for health care services. The two main drivers of increased health care demand are population growth and aging. North Dakota has both. While the population growth is likely to be more modest than in some other (especially "sunbelt") states, the pronounced aging of our population likely will place particular demands on the state for more health care delivery mechanisms and providers.

- Need for a balanced and appropriate supply of additional health care providers of various types, especially primary care providers for the growing oil patch counties and the elderly population, but also additional specialists for the six major urban hospital systems.
- Need for improved and novel methods of health care delivery systems to ensure adequate access to a wide variety of health care providers in the areas of the state that are geographically removed from the major hospital delivery systems. The two factors that will place special demands on our health care delivery systems are the low population density in many of our counties, and the western growth that is relatively distant from the "Big 6".

Rural depopulation, out-migration of the young, an increasingly elderly population, low population density and localized population growth will necessitate more physician and health science providers in North Dakota, and better health care delivery systems.

# North Dakota's Healthcare Workforce

*It was the best of times, it was the worst of times, it was the age of wisdom, it was the age of foolishness, it was the epoch of belief, it was the epoch of incredulity, it was the season of Light, it was the season of Darkness, it was the spring of hope, it was the winter of despair, we had everything before us, we had nothing before us, we were all going direct to heaven, we were all going direct the other way - in short, the period was so far like the present period, that some of its noisiest authorities insisted on its being received, for good or for evil, in the superlative degree of comparison only.*

*– Charles Dickens, A Tale of Two Cities*

## Overview of Workforce

### Physician workforce size and distribution

In many ways, North Dakota's physician healthcare workforce situation mirrors the Dickens dualism. In any number of key indicators, North Dakota ranks better than the national average, yet in other areas, there are pressing unmet needs. Not only do we have a higher percentage of physicians for our population than average (2.33 physicians per 1,000 people compared to 1.87 physicians/1,000 people nationally), but we have more primary care providers than average (0.55 family and general practitioners per 1,000 people compared to 0.32 nationally (North Dakota Medical Database)). At the same time, 48 of our 53 counties have less than the national average of physicians, and 25 counties in North Dakota have less than the national average of primary care providers (North Dakota Medical Database, 2010; US Census Bureau, 2009). Figure 6 shows that the three counties housing our three largest cities have physician density that substantially exceeds the national average. A similar distribution of family physicians is found as well, with more than two-thirds of all family physicians living and practicing in the four largest cities in North Dakota.

Thus, it is clear that the geographic, social, and demographic factors that result in rural depopulation and out-migration of the general population have an identical impact on the physician practitioner workforce. **North Dakota's physician workforce problem is not so much one of shortage, it is one of distribution.**

One of the complicating factors in calculating healthcare workforce adequacy, especially along the Red River corridor, is how porous North Dakota's state border is to patients. There is a significant movement of patients from the Minnesota side of the border to healthcare facilities in North Dakota, and some North Dakota physicians practice part- or full-time in Minnesota. The net effect of this is that it results in an overestimation of the adequacy of the current physician workforce and an underestimation of the magnitude of the current and future workforce shortages for North Dakota.

Precise quantitative data are not available to measure the true impact of these additional patients, but it is estimated that many – perhaps the majority – of the Minnesotans living along the Red River obtain their healthcare from North Dakota physicians. There are nearly 250,000 people living in the 13 Minnesota counties that lie within 120 miles of the North Dakota border (U.S. Census, 2009), so there easily could be 150,000 or more Minnesotans who obtain their care from our side of the river.

Adding these additional patients to those in North Dakota would tend to mitigate some of the apparent "surplus" supply of physicians noted earlier and would again serve to emphasize that our predictions of physician shortfall for North Dakota are extremely conservative. The true shortfall may turn out to be significantly worse than estimated.

There are 1,508 physicians in North Dakota; 1,452 are MDs, 54 are DOs, and 2 are MD/JDs. About 77% of North Dakota physicians are male (North Dakota Board Data), compared with 71% nationally (AMA, Physicians Professional Data, 2008, AAMC, 2009). Eighty-two percent of North Dakota physicians are non-Hispanic white, 9% are Asian, and 1% is American Indian. Our population of physicians is composed of more non-Hispanic whites than nationally, where 75% of physicians that indicated race are non-Hispanic white, 13% are Asian, and less than 1% are American Indian (AMA, 2008).The average age of North Dakota physicians as of 2005 was 51 years and 26% of them indicated an intention to retire within the subsequent 10 years (Amundson et al., 2005).

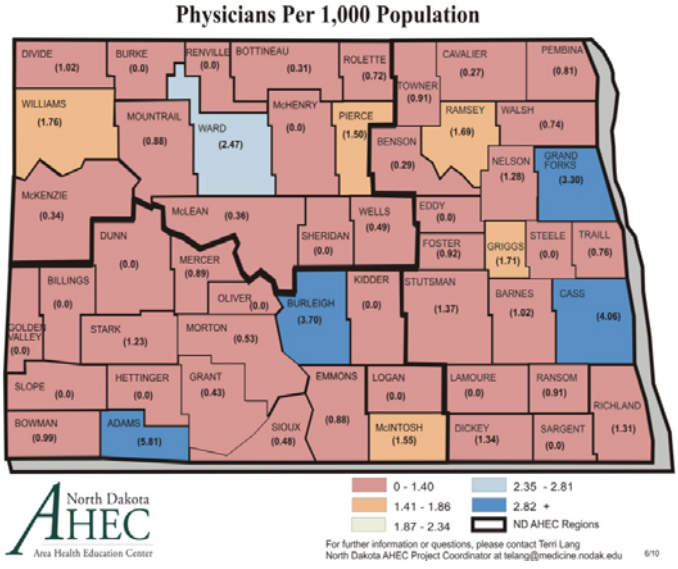



Figure 6. Physicians per 1,000 population
Source: *North Dakota AHEC*

Forty percent of current North Dakota physicians attended the University of North Dakota School of Medicine and Health Sciences, 8% attended the University of Minnesota, 2% attended the University of South Dakota and 2% attended the University of Iowa. The other 52% attended other medical schools (North Dakota Medical Database, 2010). The percentage of primary care physicians who attended medical school at the University of North Dakota is higher at 45 percent (North Dakota Medical Association).

As of 2005, 26% of North Dakota physicians worked in a free-standing clinic, 25% in a hospital-based clinic, 19% in a hospital, 18% in an office and 12% in other alternative arrangements (Amundson et al., 2005). Assessed in a different way, 83% of all physicians practice in an urban setting, as do 69% of primary care physicians. Similarly, 69% practice at one of the "Big 6" hospitals (North Dakota Medical Association).

Female physicians tend to be younger than their male counterparts. Overall, about 70% of female physicians in North Dakota are age fifty or younger while 46% of male physicians are age fifty or younger. Thus, a disproportionate percentage of those due to retire in the next few decades will be male physicians, resulting in a workforce that is increasingly female. This will have various health care delivery implications, but since female physicians on average work fewer hours and see fewer patients than their male counterparts, one result likely will be an exacerbation of any workforce shortages (HRSA).

Thirty-six percent of the physician workforce is in primary care, while the remaining 64% practice in the other specialties.

## Retirement of the physician workforce

The average age of North Dakota physicians is slightly less than the national average, with 22.5% of the workforce over the age of 60, compared with the national average of 23.4% (AAMC State Physician Workforce Data Book, Nov., 2009). Despite the slightly younger average age, retirement will play an important role in future workforce staffing. Assuming that the average age of retirement is 67 years, fully a third of currently active North Dakota physicians will retire by 2020 (ND Medical Database, 2010).

Figure 7 shows the predicted retirement rate of currently active physicians in the state. Half will have retired by 2026, and essentially all will be retired by 2048. It is clear, however, that workforce predictions, which are based on both the production as well as the retirement and loss of individuals in the workforce, are crude estimates at best. Multiple variables are involved, and they may change in unpredictable ways. For example, the current economic downturn and stock market losses may well influence the retirement plans of practitioners, with some deciding to delay retirement. Nevertheless, it is sobering to remember that the average age of the physician workforce is over 50 years, and that small changes in the anticipated retirement rate may have significant impact on the active workforce over as little as a ten or twenty year time horizon.

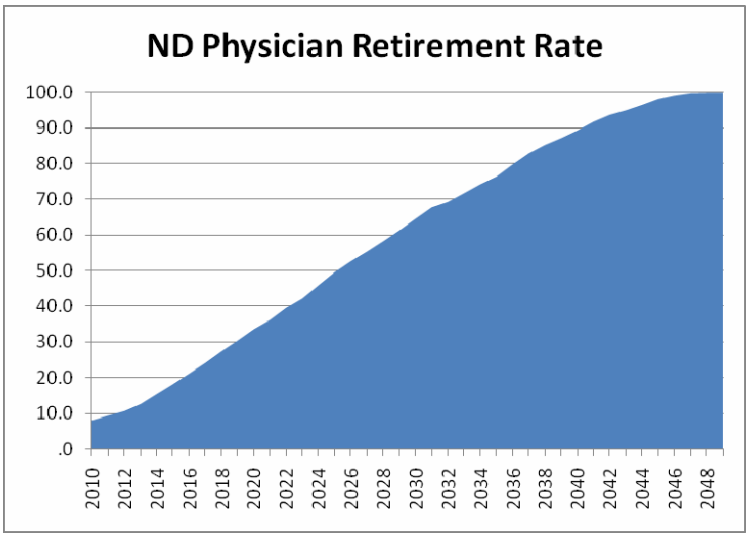



Figure 7. ND physician retirement rate of currently active physicians
Source: *North Dakota AHEC*

## Physician workforce composition

Table 1 analyzes the distribution of the professional workforce in greater detail. It shows, by specialty, the average age of various specialists, and contrasts their frequency in North Dakota compared with national norms. Almost all of the specialists average around 50 years of age, except for the surgeons, who tend to be somewhat older on average (54 vs. 51).

Those specialists present in North Dakota in less frequency than national norms are shown in red, while those present in greater frequency are shown in green. Perhaps contrary to the general perception, note that it is the specialists (anesthesiologists and "other") who are present in North Dakota less than expected compared with national averages; the primary care providers (family medicine, general internal medicine, pediatrics, and, in some designations, OB-GYN) are actually *more* preva-

**Table 1. Age and Frequency of Various Health Care Providers in North Dakota**

| Specialty | # in ND | Average age (years) | #/1,000 population (ND) | #/1,000 population (US) |
|---|---|---|---|---|
| Anesthesiology | 69 | 50 | 0.11 | 0.12 |
| Family Medicine | 354 | 50 | 0.55 | 0.32 |
| Internal Medicine | 129 | 49 | 0.20 | 0.16 |
| OB-GYN | 57 | 50 | 0.09 | 0.07 |
| Pediatrics | 102 | 51 | 0.16 | 0.10 |
| Psychiatry | 94 | 51 | 0.15 | 0.07 |
| Surgery | 201 | 54 | 0.31 | 0.15 |
| Other | 502 | 51 | 0.78 | 0.89 |
| Dentists | 392 | 50 | 0.61 | 0.76 |

Red designates specialties that are under-represented in North Dakota (ND) compared with national norms; green designates those specialties that are over-represented in North Dakota.
Source: *ND AHEC*

lent than national averages. This again reflects the paradox of North Dakota's professional workforce dilemma—more primary care providers than elsewhere (on average), yet with significant shortages in many areas. This highlights North Dakota's distribution problem, and emphasizes the need to not only get providers to the under-served areas, but also to address North Dakota's rural health care delivery system.

There is a clear need for innovative methods to extend the impact and efficiency of the providers that we do have. Note also that North Dakota is relatively under-represented by dentists. It should also be emphasized that Indian country is particularly in need of health care professionals of virtually all types.

## Retention of physician graduates

The University of North Dakota (UND) School of Medicine and Health Sciences retains its graduates as practitioners in the state at a rate that is slightly below but close to the national average. Like most medical schools, UND retains about one in three of its graduates to practice in the state. For students who complete medical school elsewhere and come to a North Dakota residency to complete their specialty training, the retention rate increases to somewhat less than one in two. But for those physicians who go to the UND School of Medicine and Health Sciences *and* complete their training in a North Dakota residency, the retention rate increases to two out of three. Both here in North Dakota and nationally, it is clear that the optimal retention of students occurs when they complete both medical school and residency in-state (see Figure 8).

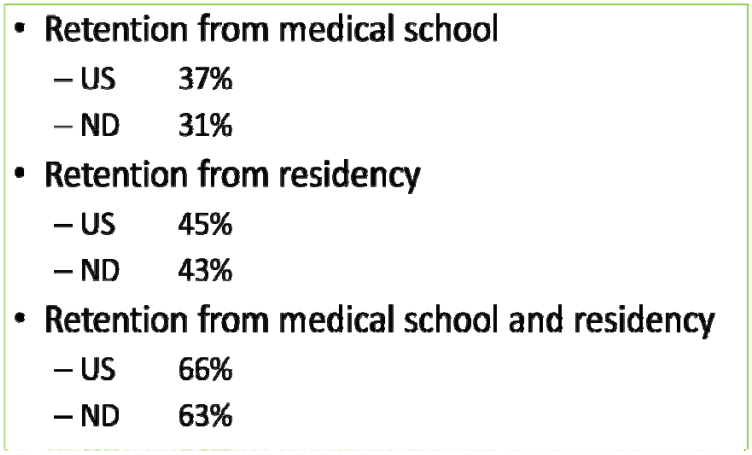



Figure 8. Retention of medical school graduates
Source: *AAMC*

## Family medicine and UND students

Since the early 1990s, the nationwide trend in medical student residency selection has been away from primary care (usually defined as family medicine, general internal medicine and pediatrics), and toward specialty training or training in the so-called EROAD residencies (Le., emergency medicine, radiology, ophthalmology, anesthesiology, dermatology) that are said to offer a more desirable lifestyle (with predictable hours, defined on-call responsibilities, etc.). A study recently published documents that over a 10-year

period there was a fall in the choice of a primary care residency by U.S. medical student graduates from 17.6 percent to 6.9 percent for family medicine, from 15.7 percent to 6.7 percent for general internal medicine, and from 10.2 percent to 6.6 percent for a pediatrics residency (Jeffe, 2010).

The UND School of Medicine and Health Sciences has not been immune to this trend, but its students are much more likely to choose primary care than the national average. In the most recent residency match, about 8 percent of U.S. graduates went into family medicine; UND had double that rate at 16 percent. In fact, for the past several years, our students had the highest rate of selection of family medicine training of any medical school in the country at about 20 percent.

**Comparison of UND with other medical schools.** UND students choose family medicine as a career at a rate that compares favorably with other community-based medical schools in the country that share UND's commitment to producing primary care providers. A useful comparison is with the medical school in Duluth, which is renowned for its primary care programs and initiatives. In the 2010 residency match, the SMHS had nine students (out of 55) choose family medicine, compared with 19 of 55 in Duluth, or about half as many. There are, however, two confounding issues to consider. First, the Duluth school is not a separate school, but a regional campus that is part of the University of Minnesota system. Thus, there is likely what is called selection bias in play, in that Minnesota students who are interested in primary care would likely go to Duluth rather than the Twin Cities campus. Indeed, only 13 out of the 154 Twin Cities campus students chose family medicine (8 percent, just about the national average). Second, the population of Minnesota is over eight times greater than that of North Dakota. If one calculates the number of family residents graduating from each state's medical school and normalizes that number for state population, one finds that Minnesota graduated 0.6 family medicine residents per 100,000 population, while UND graduated 1.4, or more than twice as many.

## Predictors of primary care choice of medical students

In an effort to learn what best predicts specialty choice after graduation, the Association of American Medical Colleges (AAMC) recently reported the preliminary results of a study in which they surveyed representative graduating fourth-year medical students from across the country. This topic obviously is of major importance to North Dakota, given the importance of primary care in our health care delivery system. The AAMC team used a sophisticated method to identify the determinants of the students' specialty choice. What was most remarkable about the study was the finding that the multivariate model they developed could explain only about a third of the choices—even though the model contained just about every factor previously identified for choosing primary care (including anticipated income, debt burden, rural background, and a positive primary care experience in college and in medical school). The fact that two-thirds of the decision remains unexplained suggests

that there are "unmeasured variables"—factors that are at play but weren't in the model. Further work clearly needs to be done to better understand our students' choices. At least two major factors that weren't considered have been identified—spousal occupation, and spousal preferences. Perhaps those factors help explain the students' choices.

Of the factors identified by the AAMC model, the ones that best predicted specialty choice were: 1) good "fit" with the interests of the student, 2) personality of future colleagues, 3) role model influence, and 4) work/life balance. What were the factors that were associated with becoming a primary care provider? Three stood out: 1) a favorable opinion of primary care during medical school, 2) positive experiences in primary care prior to medical school, and 3) role models. Interestingly, anticipated income level did *not* factor prominently in the model; in fact, a majority of students who were "on the fence" in their career choice of primary care versus another specialty said they would not be swayed toward primary care solely by the promise of income equity with other specialties. And higher level of debt did not predict a propensity to select a higher income specialty (AAMC Annual Meeting, Washington, D.C., 2010).

One AAMC official called these findings "myth-busters"—and so they were. In fact, debt level correlated positively with a primary care choice—that is, those with more debt were *more* likely to go into primary care. That counterintuitive finding is probably explained by the fact that those with more debt likely came from lower income families from rural areas. But what remains enigmatic and troubling is why a model that seemed to include all of the expected factors (like anticipated income level, cumulative debt burden, rural background, rural experience, gender, etc.) would be such a poor predictor of primary care choice by medical students. Another recent study critically evaluated the world's literature in regards to rural (not just primary care) practice choices, and the authors also found that much remains to be understood about the career choices of medical students. The study confirmed our belief that rural background, exposure of premed students to primary care and rural options, and rural exposure during medical school and residency training are among the more important determinants of a primary care and rural focus, although as in the AAMC study, these factors were only modestly predictive of eventual career choices.

The size of the physician workforce in North Dakota is at or better than national norms for most specialties, including all of the primary care disciplines. Despite this, there is a significant distribution problem, with the predominance of providers in the urban areas and a shortage (especially primary care providers) in the rural areas.

# Current Shortage of Physicians

## Methodological considerations

There is no single repository of timely data on physician shortages throughout North Dakota for several reasons. First of all, some healthcare systems consider the information proprietary. Secondly, while the Center for Rural Health (CRH) compiles data from rural areas, the CRH does not routinely acquire data from the urban centers (where the "Big 6" are located). Finally, the numbers change frequently, and there is a substantial lag until data are compiled.

Nevertheless, we have used several different sources of data to determine a reasonable estimate of the current shortage of physicians in the state. The sources of data include:

- Federal information
- Data from the Center for Rural Health (providing reasonable estimates of rural shortages)
- Recent survey of the "Big 6" hospital systems (providing reasonable estimates of urban shortages)

**Federal perspective.** Using federal designation methodology, 89% of North Dakota's counties are partially or fully designated as Primary Care Health Professional Shortage Areas (HPSA) (Figure 9). Included in HPSAs are shortages of family medicine, general internal medicine, general pediatrics, and general obstetrics/gynecology. Twenty three of North Dakota's 53 counties (43%) have been classified as persistent whole county primary care HPSAs that have retained the HPSA designation for at least seven years. Nationally, counties with this designation have the lowest primary care physician supply, the lowest percentage of rural adults with a regular primary care provider and are the most likely to forego needed health care due to cost (Doescher, 2009).

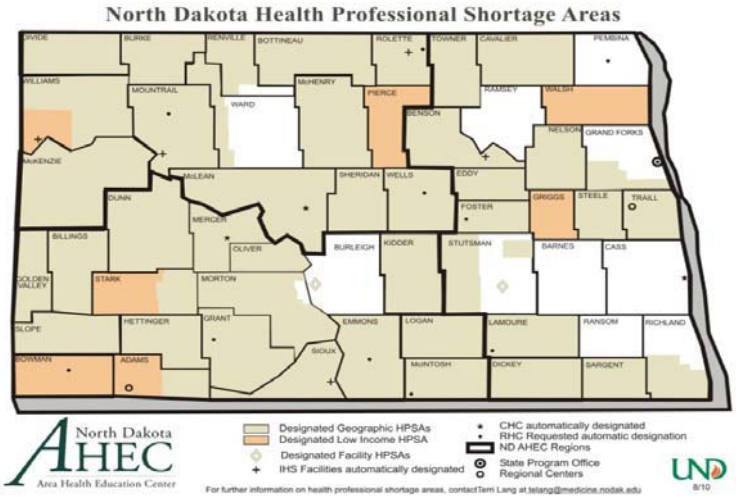



Figure 9. Health professional shortage areas (HPSA) are shown in tan
Source: *North Dakota AHEC*

**Center for Rural Health data.** Self-reported data from rural clinics and hospitals report 46 openings for primary care providers, the predominant specialist providing care in rural areas (31 family medicine physicians and 16 general internists) (North Dakota AHEC). Many of these vacancies have been present for some time, and have been difficult to fill. Even in urban areas, there may be difficulty in recruiting and retaining primary care providers. For example, the UND Centers for Family Medicine in both Minot and Bismarck have experienced great difficulty in filling open family medicine slots despite offering quite competitive compensation packages, using recruiting firms, and using advertisements.

**Health system survey data.** In an effort to identify current physician openings in the urban areas, a telephone/e-mail survey was conducted of each of the "Big 6" hospital systems. As of December 2010, there were more than 104 physician positions available at these institutions (Molmen, 2010). Some of the positions were for rural clinic locations and thus were likely also included in the Center for Rural Health dataset.

## Current estimate of physician shortages

Condensing the available data from the above three sources permits the establishment of a reasonable estimate of the current unmet physician needs in North Dakota. In combining the various data sources, allowances were made to avoid double counting certain vacancies (since, for example, a vacancy in a rural clinic operated by a "Big 6" hospital would be reported both in the CRH dataset as well as the health system survey dataset). Additionally, allowances were made for recruitment plans that resulted from planned expansion of services. Thus, our final estimate is of physician vacancies that are needed to meet current needs.

**Based on the available data and subject to the above considerations, our best estimate is that the current physician shortfall needed to meet current needs is between 50 and 100 physicians.** In our estimates of future workforce shortages, we have consistently modeled our estimates using the most conservative scenario available, recognizing that the actual numbers may well be more pessimistic than our "best case" estimates. Nevertheless, we have taken great pains to not overly dramatize the attendant workforce needs, and to present the data in as responsible and stringent manner as possible. Thus, it is important for the public to be aware that our estimates should be considered "rosy", in that they assume a "best case" situation.

The best available conservative estimate is that currently there are between 50 and 100 open physician positions in North Dakota, although the number may be as high as 150. About two-thirds of the openings are in the urban areas, with the remaining third in the rural regions. Both specialists and primary care physicians are in great demand.

# Future Workforce Requirements

The Association of American Medical Colleges (AAMC) has one of the most robust databases regarding physician staffing available anywhere. The organization is respected as a careful and reliable voice in health care work force issues. Using national data, the AAMC has estimated a shortfall of some 160,000 physicians by 2025 (see full discussion that follows). To meet the predicted shortfall, the AAMC has called on the 126 medical schools in the United States to increase overall class size by 30 percent. More than 80 percent of the medical schools in the U.S. have indicated that they have, are in the process of, or are planning to increase class size (although the current economic downturn has prevented some of these schools from proceeding with their planned expansions).

## Estimates of Workforce Shortfall

### Physician workforce needs by 2025

We have attempted to predict the physician workforce needs for North Dakota using a time horizon of the 15 years (i.e., what will be needed in 2025). Such an estimate is based on the current physician shortage plus any additional workforce needs that will be required over the next 15 years.

There are two principal drivers of physician workforce needs: population growth and aging of the current population. The direct relationship between population growth and the need for more physicians is obvious, as there are no "economies of scale" as the population grows. Since the ratio of physicians to the population is a constant (all other things being equal), as the population grows, there is a linear and analogous increase in the need for physicians (and other healthcare providers for that matter; see Estimates of Non-Physician Workforce Shortfall on page 26).

The other powerful determinate of workforce needs is the level of sickness of the population served. Perhaps the single best predictor we have as to the level of "sickness" of a population is its age. With aging, there is a dramatic increase in the need for, and consumption of, healthcare resources. For example, the per person expenditure on personal health care needs was $14,792 in 2004 for seniors aged 65 and above, which was 5.6 times the amount spent on each child ($2,650) and 3.3 times the amount spent on every working age person on average ($4,511) (Centers for Medicare and Medicaid data, accessed at https://www.cms.gov/NationalHealthExpenData/25_NHE_Fact_Sheet.asp).

Table 2 shows in greater detail the effect of aging on health care expenditures. As the population ages there is a dramatic increase in healthcare expenditures. In fact, the expenditures on the very elderly (85 years and older) is fully **ten times** the amount spent on every child ($25,691 vs. $2,650).

**Table 2. Total Personal Health Care Per Capita Spending (in dollars) (2004 data)**

| *Age Group* | *Per Person Spending* |
|---|---|
| 19-44 | 3,370 |
| 45-54 | 5,210 |
| 55-64 | 7,787 |
| 65-74 | 10,778 |
| 75-84 | 16,389 |
| 85+ | 25,691 |

Source: *Centers for Medicare and Medicaid https://www.cms.gov/NationalHealthExpendData/downloads/2004-age-tables.pdf*

Since the majority of healthcare spending is on workforce, healthcare spending is a reliable surrogate for workforce needs.

There are multiple other indicators that indicate that consumption of healthcare resources correlates directly with advancing age, and thus indicate that more healthcare providers will be required as the North Dakota population continues to age.

One example is shown in Figure 10, which illustrates the increased office visits that are seen as the age of the patient increases. Note two striking findings in the figure: first, that the patients aged 75 and older had **four times** the number of office visits as those 15-24 years; and second, note that over time (from 1990 to 2005) the number of office visits has increased for most age groups. There is no reason to assume that this trend will abate in the future.

Since the population of North Dakota is skewed toward the elderly (due in part to out-migration), the effect of aging on our healthcare enterprise is likely to be particularly challenging. It is reasonable to anticipate the current workforce shortages will only get worse as our population ages.

## Predicting the future needs

How then does one best estimate the workforce needs for the future? At its most elemental level, the healthcare workforce needs for the future are a combination of the current shortage plus any future shortages. Estimating future shortages requires a rigorous analysis of supply and demand.

On the supply side, we in North Dakota have a solid track record that we can use to estimate future supply of physicians. But, that assumes that everything else remains static, including the composition of the workforce, the retirement age, etc. But we know that the workforce is changing; among other things, there has been a significant increase in the number of female physicians.

One of the few negative aspects of this otherwise welcome change is that women tend to work fewer hours per year than male physicians, and see fewer patients. Thus, as the workforce becomes more

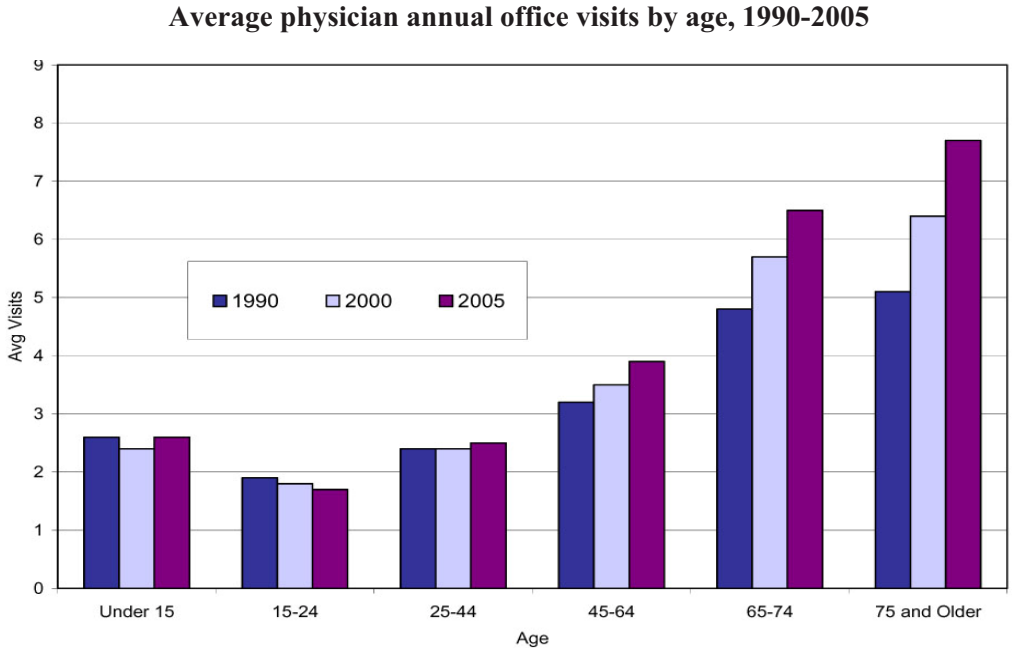



Figure 10. Average physician annual office visits by age, 1990-2005
Source: *Analysis of data from the National Ambulatory Medical Care Survey, National Hospital Ambulatory Medical Care Survey and the Nationwide Inpatient Sample*

balanced, the overall clinical "productivity" of it is likely to fall. Thus, one needs to estimate the effects of these various complicating factors, and then also estimate the increase in demand that will result from population growth and the aging of the population. Here in North Dakota, we can apply methodology that has been developed nationally.

The best estimates of physician workforce shortages come from the Association of American Medical Colleges, and as reviewed subsequently, the best estimate of the national shortfall is about 160,000 physicians by 2025. On the demand side, this estimate is based on the following simplified model—that two-thirds of the increased demand will come from population growth, and one third from aging of the population. So how do we apply these national models to North Dakota? We make simplifying assumptions.

First, we assume that the effect of population growth will be significantly less than in other parts of the country (but not zero, as our most recent census data show). Second, we assume that the aging effect will be somewhat more than in other parts of the country, due to our much older population. Putting these two factors together, we have estimated that we'll need about half the number of additional physicians as the rest of the country. This is a conservative estimate, to be sure, and the actual number of needed physicians may well be more. But, it is a reasonable starting point.

Based on our current population, the national data indicate that we'll be short 320 physicians by 2025. Using our simplifying assumptions, we'll decrease this by 50%, and thus we end up with 160.

Adding our current physician vacancies of at least 50, we arrive at a conservative shortage of 210 physicians over the next 15 years.

The current shortage of 50 or more physicians is only going to increase as the population ages and grows modestly in the future. Based on conservative estimates, North Dakota will need an additional 210 physicians at a minimum within the next 15 years.

# Estimates of Non-Physician Workforce Shortfall

## Non-physician workforce needs by 2025

There is every reason to assume that there will be analogous workforce shortages of non-physicians over the same time horizon. The UND School of Medicine and Health Sciences actually trains many more non-physicians than physicians.

As Figure 11 shows, the School trains about two and a half times as many health science students as it does medical students. Those health science students are made up of physical therapy, occupational therapy, clinical laboratory science, physician assistant trainees, cytotechnology, and athletic training students. All of these disciplines are expected to have similar increased demand going forward. Data from other sources, including the Department of Labor, anticipate an analogous 15 to 25% shortage of these health science professionals by the year 2025.

Table 3 demonstrates the breakdown by specialty field within the non-physician health science disciplines. Although not quite as dramatic as the predicted 30% shortfall in the supply of needed physicians by 2025, the predictions indicate the need for approaches to expand the number of health science specialists along with increasing the supply of physicians.

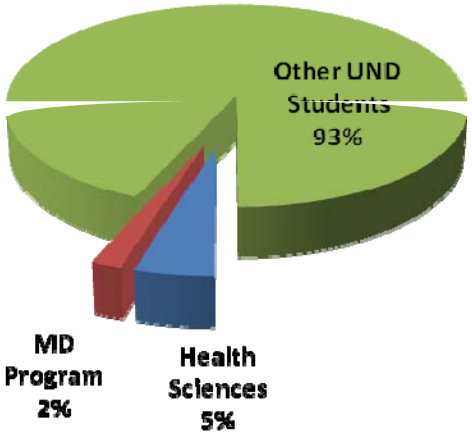



Figure 11. Education of various categories of students at UND SMHS

| Medical Field | U.S. Job Growth | ND Job Growth |
|---|---|---|
| Athletic Trainers | 37% | 13% |
| Clinical Laboratory Science (Medical Technologists, Medical Technicians) | 14% | 23% |
| Occupational Therapists | 26% | 15% |
| Physical Therapists | 30% | 18% |
| Physician Assistants | 39% | 19% |

Table 3. Predicted growth in need for health science specialists
Source: *Department of Physical Therapy, SMHS, and United States Bureau of Labor Statistics*

The shortage of healthcare workers over the next 15 years will not be limited to physicians. An entire cadre of additional healthcare providers—from nurses to physician assistants to occupation and physical therapists to clinical laboratory specialists and others—will be needed to ensure that effective, efficient, and appropriate health care is available to all North Dakotans.

# Options for Workforce Development

Any plan to match the supply of health care professionals with the emerging need for their services in North Dakota must take into account the long time horizons necessary to effect change. It must also realistically assess the likely net yield of each component strategy employed as considered in the context of healthcare workforce nationwide and worldwide.

This report evaluates three possible approaches to fill the future manpower gap: 1) recruit needed physicians and other health professionals form outside the State of North Dakota; 2) train greater numbers of health professionals in North Dakota; and 3) retain a greater proportion of the health professionals we currently train in North Dakota jobs. These strategies are considered singly and in combination to produce desired results.

## Option 1: Recruit from Outside North Dakota

One approach to meet workforce needs is to recruit physicians and other health professionals from training programs or employed positions outside the State of North Dakota. Indeed, this approach has always played a part in filling the State's workforce complement, and it is assumed to continue as an ongoing component of the effort necessary to replace normal turnover in the workforce.

Recruitment may come from physicians located in other states or other countries. Particularly important for filling a gap in rural primary care needs has been the recruitment of international medical graduates (IMGs). Currently, almost 1 in 4 (23%) physicians practicing in the U.S. are IMGs (Thompson et al., 2009). Studies provide some evidence that proportionally more IMGs that U.S. medical graduates (USMGs) practice in underserved settings. Recent studies have indicated that all graduates are trending away from practice in rural underserved areas. In a recent report, a state comparison of percent of generalist IMGs and USMGs shows that North Dakota has significantly fewer IMG physicians in urban areas, relatively more IMGs in small rural areas, and significantly more IMGs in isolated rural areas (Thompson et al., 2009).

IMGs have filled an important and essential role in providing primary care to North Dakota rural communities. Relying on an increased effort to recruit additional IMGs may be difficult for several reasons. First, there is no reason to assume that the trend for IMGs will be dis-

similar from USMGs, away from primary care and away from rural practice. Rules regarding J-1 visa waivers may change and have an impact on availability of IMGs. IMGs often come from developing nations and there is a continuing debate over the impact of retaining IMGs for service in the U.S., rather than encouraging service to their own countries of origin (Thompson et al., 2009).

When recruiting outside the state, North Dakota communities compete on the world market for professional talent. Intense competition for scarce human resources often requires that North Dakota healthcare facilities offer premium compensation to attract workers, which in turn raises costs to North Dakota patients. This is particularly true in the most rural of our communities, where the work is demanding, and professionals have access to fewer support mechanisms than larger communities.

Cost considerations aside, in order for a plan to meet additional future shortages through external recruitment, North Dakota would have to recruit more successfully against other competitors than it does at present.

## Future U.S. Demand for Health Workers

To understand the viability of a strategy to recruit greater numbers of health professionals from outside the state, we must understand the forces shaping the national healthcare marketplace.

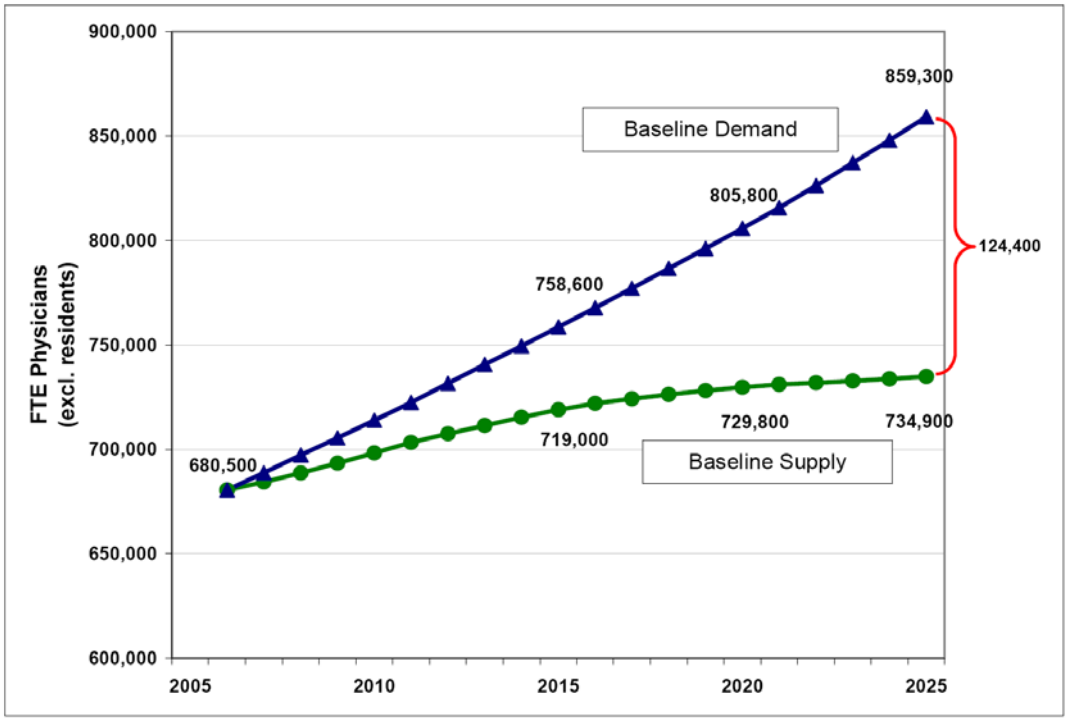



Figure 12. Baseline Projection of Physician Supply and Demand
Source: *AAMC, 2006*

In June 2006, the Association of American Medical Colleges issued a report concluding that under any set of plausible assumptions, the United States is likely to face a growing national shortage of physicians. Due to population growth, aging and other factors, demand will outpace supply through at least 2025.

Under its baseline scenario (AAMC, 2006), which assumes a continuation of current supply, use and demand patterns, the AAMC predicted that, taking into account factors such as population change, aging, and physician retirements, a shortage of 124,000 physicians would result by 2025 (Figure 12). Some key findings are:

- The US Census Bureau projects that the US population will grow by more than 50 million (to 350 million) between 2006 and 2025, leading to a considerable increase in the demand for physician services.
- Aging of the population may drive demand sharply upward for specialties that predominantly serve the elderly.
- Though the supply of physicians is projected to increase modestly between now and 2025, the demand for physicians is projected to increase even more sharply.

Recognizing that practice and utilization patterns in the future are very unlikely to be the same as today (as assumed in the baseline projection), the AAMC did a further analysis of additional scenarios that were likely to affect workforce requirements, such as likely continued increase

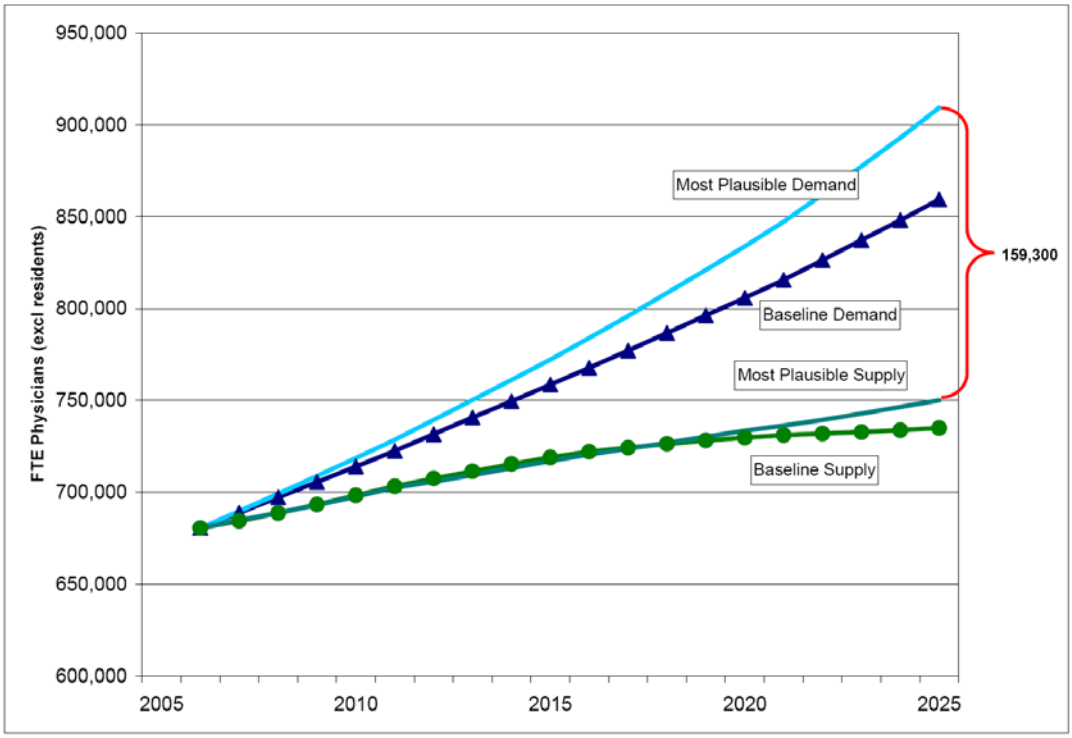



Figure 13. Plausible Scenarios of Physician Supply and Demand
Source: *AAMC, 2006*

in utilization rates, changes in work schedules with older physicians continuing to work more hours and younger physicians working fewer, a moderate expansion of GME capacity, and productivity improvements. Under this scenario there would be a projected shortage of 159,300 FTE physicians by 2025, or 35,000 more than the baseline shortage (Figure 13). Some key findings are as follows:

- Growth in future demand could double if visit rates by age continue to increase at the same pace they have in recent years – with the greatest growth in utilization among those 75+ years of age.
- Even a robust expansion of Graduate Medical Education capacity (from 25,000 new entrants per year to 32,000) would only reduce the projected shortage in 2025 by 54,000 physicians (43 percent).
- Any future shortages are likely to have an uneven effect, with some geographic areas, specialties and subpopulations hit harder than others, resulting in hardships for both poor urban and rural communities, where access to care continues to be problematic.

Based on the foregoing factors, the AAMC recommended a 30% increase in U.S. medical school enrollment and an expansion of Graduate Medical Education positions to accommodate anticipated needs (AAMC, 2006).

## Health Reform Impacts

Healthcare reform will likely increase the shortage of healthcare workers. In 2010, the AAMC released new physician shortage estimates based on projections by the Center for Workforce Studies that, beginning in 2015, are 50 percent worse than originally anticipated prior to health care reform. This report factors in the expansion of health care insurance as a result of reform, as well as new information on changes in physician retirements and specialty choice. This newer model illustrates the critical shortfall in the number of all physician specialties that care for older adults.

Between now and 2015, the year after health care reforms are scheduled to take effect, the shortage of doctors across all specialties will quadruple. While previous projections showed a baseline shortage of 39,600 doctors in 2015, current estimates bring that number closer to 63,000, with a worsening of shortages through 2025.

One resource for filling a gap in rural primary care needs includes the recruitment of international medical graduates (IMGs). Currently, almost 1 in 4 (23%) physicians practicing in the U.S. are IMGs. (Thompson et al. 2009) Studies provide some evidence that proportionally more IMGs than U.S. medical graduates (USMGs) practice in underserved settings. Recent studies have indicated that all graduates are trending away from practice in rural underserved areas. In a recent report, (Thompson et al., 2009) a state comparison of percent of generalist IMGs and USMGs shows that North Dakota has significantly fewer IMG physicians in urban areas, relatively more IMGs in small rural areas and significantly more IMGs in isolated rural areas. IMGs have filled an important and essential role in providing primary care to North Dakota rural communities. Relying on an increased effort

to recruit additional IMGs may be difficult for several reasons. If the trend with IMGs is similar to USMGs, away from primary care and away from rural practice, continues this will not be an effective approach. Rules regarding J-1 visa waivers may change and have an impact on availability of IMGs. IMGs often come from developing nations and there is a continuing debate over the impact of retaining IMGs for service in the U.S., rather than encouraging service to their own countries of origin.

## Implications for North Dakota

We conclude that the United States as a whole is experiencing proportionately the same workforce shortage as North Dakota faces. Although the nation's healthcare need is driven to a larger degree by population growth than North Dakota (which is impacted more by aging), the relative workforce gap is similar.

The implication is that in order to be successful in meeting its future needs, North Dakota would have to recruit an even higher percentage of a shrinking pool of available candidates. Given the difficulty North Dakota already experiences in competing for the current talent pool, ***we conclude that its yield will be of negligible positive impact to our workforce strategy***.

It is even plausible that difficulty in outside recruitment may negatively impact current workforce levels as the remainder of the country sinks deeper into shortage.

One final factor to consider is the comparative retention rate between health professionals who are trained in North Dakota and those who are trained elsewhere (in another state or another country). Reports from North Dakota health systems suggest that turnover rates for physicians trained outside of North Dakota may be double that of those trained in the state. Consequently, any plan that depended on heavy recruitment outside the state would need to include higher head counts to account for higher attrition factors.

## Conclusion

Recruitment of additional health professionals from outside the State of North Dakota cannot be considered as an important component of workforce development strategies.

North Dakota competes on the world market to recruit and retain health care professionals. As North Dakota faces deepening manpower shortages in the decades ahead, the nation as a whole will experience a shortfall of similar or greater magnitude. Increasing competition for a shrinking pool of available health care workers (with higher associated attrition) makes it unlikely that North Dakota could successfully recruit a substantially higher proportion of its workforce from outside the state.

# Option 2: Increase the Number of Healthcare Professionals Trained in North Dakota

A second approach is to grow our own physicians and other health professionals by increasing the number of health professionals trained in the state. This is an important but complex option. This approach has a time lag with a minimum of seven years for physicians to complete education and training, and a slightly shorter time frame for other health professionals. Also, the educational process does not necessarily guarantee a specific number or type of physicians or health professional to meet the health needs of rural North Dakota communities. Finally, it is not easy to accurately predict or respond to a given community's need for health care.

## What are the needs of North Dakota?

To understand the need, we first must review the current status of the healthcare workforce in comparison to the national situation. In North Dakota, the current number of active patient care physicians is 1,364 or 212.6 per 100,000 population. This compares with the U.S. average of 213.5. The current number of active patient care physicians in North Dakota in primary care is 543 or 84.6 per 100,000 population (compared with U.S. rate of 80.1)(AAMC, 2010). While this might indicate that North Dakota is doing well, the U.S. is currently experiencing a decreasing and aging physician workforce with a geographic mal-distribution that is not meeting the current needs of many communities. This is also true for North Dakota. Rural communities have experienced a chronic shortage of primary care physicians. Nationally, one-third of all physicians are in primary care while almost one-half of physicians are in primary care (mostly family physicians) in rural communities (Fordyce et al., WWAMI, 2007). Rural communities have too small a population to support specialists and rely on primary care physicians and other providers to adequately and affordably meet health care needs. Family physicians provide the broadest care to all segments of the population and are essential to addressing the health care needs of our rural and remote communities.

The health of the citizens of North Dakota is extremely important. It is the health care workforce that determines the quality and effectiveness of any health care enterprise (Mullan et al., 2008). The challenge for rural communities is to attract and retain health professionals when technology may be less advanced, salaries may be less competitive and there may be geographic or other challenges. The current healthcare workforce is aging while younger health professionals seek more specialization and better work/life balance. Health care service needs must change to address the increasing demand for the management of chronic disease,

care of the aging with increasing dementia and the need for addressing significant health issues such as obesity. It is in this complex and challenging situation that we need to plan to assure the right health care professionals with the right skills to keep our citizens and populations healthy.

## National recommendations for increasing health professions students

In June of 2006, the Association of American Medical Colleges (AAMC) recommended a 30 percent increase in U.S. medical school enrollment and an expansion of graduate medical education (GME) positions to accommodate this growth. Because GME or residency training is a requirement for licensure in the U.S., increasing the number of medical students without assuring a commensurate number of residency training positions will not address the need.

Many experts have reviewed the background for this recommendation for an increase of 30 percent. Estimating the most effective response to address a current and future need can never be absolutely accurate, but this recommendation is a conservative estimate that takes into account many factors and variables. A 2008 report on the complexities of projecting physician supply and demand includes the following findings that support the increasing demand (AAMC, 2008):

- Aging of the population will drive demand sharply upward
- The U.S. population is projected to grow by more than 50 million
- Increased health coverage will increase demand
- Increased clinical productivity is harder to accomplish with increasing complexity of care
- Increasing the numbers and roles of physician assistants and nurse practitioners may help but the full impact is difficult to predict
- Impact of shortage will include longer wait times, increased travel distances, shorter visit times, expanded use of non-physicians, higher prices and possible loss of access
- Shortages are expected to continue to be especially problematic in poor rural and urban communities
- A 30 percent increase in medical students and increase in GME positions will not eliminate, only moderate the need

## North Dakota's production of medical students

The University of North Dakota School of Medicine and Health Sciences (UND SMHS) is the only medical school in North Dakota. The number of students enrolled in medical school in 2008-09 was 249 or 38.8/100,000 population. This ranks nationally at 12 out of 50 (3 out of 50 for public medical schools). Of those matriculating at that time, 72 percent were students from North Dakota, which ranks at 14 out of 50 for in-state matriculation. In this same study, North Dakota had 116 residents in training, which ranked at 42 out of 50 states but had 78 primary care residents ranking 18 out of 50 (AAMC, 2010). Compared with national bench-

marks, the SMHS is doing a very good job of educating North Dakota students in medicine. Compared with other states, we may have more capacity for training residents.

There is more good news about our school. UND SMHS has consistently ranked in the top five schools for percent of students choosing a family medicine residency program. In a recent study of medical schools, looking at social mission based on producing primary care physicians, physicians who serve HPSA communities and students from underrepresented minorities, UND SMHS ranked in the top 20% of schools. The school did very well in producing primary care physicians and educating students from underrepresented minorities. The diversity in our students is primarily a result of our excellent Indians into Medicine (INMED) program which ranks first in the U.S. in graduating students from federally recognized tribes. Public schools and community-based medical schools such as UND SMHS scored higher in this study. This may be the result of a greater responsiveness to the population-based and workforce needs that concern legislators (Mullan et al., 2010). Schools with smaller research portfolios are also more likely to train physicians for community and population needs. These statistics are positive for the school and for North Dakota.

One result of the decline in national and local medical student interest in primary care residencies has been the increased number of international medical school graduates (IMGs) in these residency programs. In North Dakota, the number/percent of residents who are IMGs is 74/63.8%, which ranks first out of 50 states. While IMGs are more likely to choose primary care and to practice in HPSAs, they are somewhat less likely to stay in practice in rural or underserved areas than U.S. graduates (Hart et al., 2007). As IMGs become settled in the U.S., they tend to move away from their initial practice. One longitudinal comparison of U.S. medical graduates with IMGs showed that almost 90% were practicing in urban settings of the U.S. (Akl et al., 2007). While IMGs serve an important role in caring for U.S. populations, planning for the future needs of our communities needs to consider all options.

In North Dakota, the number of physicians educated at UND SMHS who practice in the state is 424 or 31% of the total. This ranks at 35 out of 50 U.S. medical schools (40 out of 50 of public schools). Physicians graduated from North Dakota residency training programs who practice in North Dakota number 337 or 42.5 percent of the total. This ranks at 33 out of 50. Physicians who graduate from medical school and residency combined number 190, 62.9%, which ranks at 31 out of 50 (AAMC, 2010). Growing and training our own is clearly important. While the highest likelihood of graduates practicing in North Dakota is in those who go to medical school and residency in the state, some medical students cannot receive the training they need in North Dakota and many who leave for residency training return to practice in North Dakota.

## Factors impacting the selection of primary care and rural practice

Rural communities in North Dakota will continue to need high quality physicians

and, in particular, primary care physicians and other health professionals who can provide primary care. There are many personal and experiential factors that impact an individual's decision to choose a specialty and to select a practice site. A 2009 report from the Robert Graham Center suggests that two things are clear: 1) There is a problem with sufficient access to primary care physicians in rural and impoverished areas; and 2) current practice configuration or organization will have great difficulty absorbing all uninsured patients if universal access is achieved. For these reasons and others, it is especially important to understand the factors that influence the decision of medical students and residents, and to consider the opportunities for support and encouragement in this decision. .

What can be done to help assure the right numbers of the right physicians? Studies have shown that medical students' choices of primary care or specialty careers are influenced by (Graham Center, 2009):

- student-related factors such as gender, race and ethnicity, socioeconomic status, rural or urban background, and attitudes and values
- exposure to required Family Medicine curriculum during the third or fourth year of medical school
- specialty income difference
- institutional factors such as state funding, Title VII funding, and the strength of Family Medicine departments

Each one of these items is important but not a direct or certain predictor of career choice. Awareness of the personal factors help to understand the potential and may help in addressing this need through the recruitment and admissions process. Educational experience throughout medical education and residency can be designed to assure quality experiences in primary care and in rural sites. We can advocate for changes in reimbursement and in funding to support these issues.

One systematic review of the literature has shown that medical students with experience in a rural setting are more likely to choose a career in primary care and are three times more likely to practice in a rural community compared to the national average (Barrett et al., 2011). The most successful outcomes for addressing the rural physician shortage have been the comprehensive medical school rural programs. There are six U.S. programs that met the criteria (developed by the authors of a recent article) that included having the primary purpose of increasing the supply of rural physicians, having a defined cohort of students, and having a focused admissions process, a specific rural curriculum and/or an extended full-time required rural clinical curriculum. (These programs are similar to the UND SMHS Rural Opportunities in Medical Education (ROME) program.) All of these programs increased the supply of rural physicians with an average of from 53 percent to 64 percent of their graduates in practice in rural communities. This compares to the national rate of 3 percent for recent medical school graduates planning on rural practice or the 9 percent of physicians currently practicing in rural communities (Rabinowitz et al., 2008).

In 2000, a national survey reported predictors of generalist physicians' decision to care for underserved populations (most rural areas are underserved), identifying four independent factors (Rabinowitz et al., 2000):

- Identifying oneself as a member of an underserved ethnic or minority group
- Growing up in a rural or inner-city area
- Strong interest prior to medical school in practicing medicine in underserved areas
- Participation in National Health Service Corps

Another survey done recently confirmed the factors of coming from a rural background and being a member of an underrepresented minority and also included older age – all of these factors are identifiable at admissions (Wayne et al., 2010).

## Why does primary care matter?

Addressing the supply of physicians through increasing the class size and assuring enough slots for residency training seems like a simple solution. Changing the recruitment and selection process, as well as the educational experience and advocating for state and federal changes to the reimbursement and funding structures is more complicated and time consuming. Why is that comprehensive effort necessary? With the trend downward in medical student interest in primary care, the simple solution will continue to produce physicians in specialty areas who choose an urban practice or who must practice in a populous setting to have enough patients for a viable practice. The result will be a continuing decline in the numbers of health professionals who are able to provide the full spectrum of services to the broad range of ages, and meet the needs of rural communities.

How important is it to have adequate numbers of primary care providers in our communities? Studies have shown that a greater supply of primary care physicians is significantly associated with lower mortality from all causes, whereas a greater supply of specialty physicians is associated with higher mortality. U.S. states with higher ratios of primary care physicians to population had better health outcomes including lower rates of death from heart disease, cancer or stroke; infant mortality; low birth weight; and poor self-reported health. This was even after controlling for sociodemographic measures that can be related to poorer health (such as age, education, income, unemployment) and lifestyle factors (seatbelt use, obesity, smoking). This relationship of improved health with increased primary care is also demonstrated in international studies. In addition to health benefits, there are reductions in health system costs and reductions in disparities across population subgroups.

What is it about primary care that results in these improved health outcomes? Six mechanisms are thought to account for the beneficial impact of primary care on population health (Starfield et al., 2005):

- Greater access to needed services
- Better quality of care
- Greater focus on prevention
- Early management of health problems

- Cumulative effect of the main primary care delivery characteristics
- Role of primary care in managing and avoiding unnecessary and potentially harmful care

The U.S. ranks behind other developed countries in health and health system performance, due partly to a long decline in the interest and vitality of primary care. The suggestion has been made that the U.S. should move toward having 50 percent of active patient care clinicians (physicians, nurse practitioners, and physician assistants) in primary care practice (Sandy et al., 2009). A recent comparison of health and health care systems in the U.S. and Canada demonstrate these differences. In the U.S., there are 50 percent more specialists than primary care physicians, compared with 10 percent mort specialists in Canada. Costs have been approximately $2500 less per person per year in Canada than in the U.S. Canada ranks significantly higher in most measures of health outcomes than the U.S. and has fewer social disparities in health care and health outcomes. This is attributed to specific healthcare system characteristics and the strong primary care infrastructure in Canada (Starfield et al., 2010).

## Challenges to addressing the pipeline and need for the health professions

Seeking and encouraging applicants from rural communities to apply to health professions schools is an important part of any plan to improve healthcare workforce needs. More future physicians tend to come from urban areas. Some rural educational systems are not able to provide the strong science and math background necessary for success in medical school and this challenge may increase as a result of the recent economic challenges. Additional potential challenges for rural students include coming from a lower educational and socioeconomic status, having fewer role models in health care, experiencing less encouragement for attaining advanced degrees, less technology familiarity, and the need to travel to obtain a medical education. It is important to note, however, studies have shown no significant academic performance differences between students from rural or urban backgrounds (Rosenblatt et al., 2010. WWAMI).

In addition to recommendations for revising the admissions process for medical schools and for changes to curriculum, this report calls for increased financial support from local, state and federal sources for the educational development and support of pre-health professions students and for students that select primary care and rural education and practice. This may include local or regional foundations, state appropriated funds, state Area Health Education Centers (AHECs), Title VII funds, National Health Service Corps (NHSC) and others.

Addressing the needs of health care in our rural communities requires a true partnership with UND SMHS, leaders and healthcare providers in rural communities, state and federal legislators, state health department, foundations and others. Numbers aren't the entire answer to addressing or understanding need. Rural communities' perception of the need for increased physicians or other health professionals may differ from the numbers.

In a recent survey, people's perceptions of access to health care differed and may be based on issues other than availability of care. Accessibility to care may reflect affordability, acceptability, travel distance to access care or ability to make a timely appointment. Also, individuals who are skeptical about medical care are less likely to seek care and therefore more likely to be satisfied with access to care. For these reasons, other initiatives to address affordability, promote open-access office scheduling, promote quality improvement and aid in patient education will increase confidence and aid in understanding true workforce needs (Biola et al., 2009).

## Increasing the numbers of health professions students and residents

Recognizing the health workforce needs in North Dakota and the nation, UND SMHS has proposed an increase in the number of its health professions students and residents by 30 percent. This increase in students is realistic in the long run at UND SMHS, but will require some modifications to meet the needs of additional students. This will include needs for additional faculty, student learning and faculty space, additional clinical sites and a change of the current clinical curriculum to accommodate more interprofessional student learning experiences and more longitudinal experiences.

Assuring an increase in the number of students interested in primary care and rural practice will also require some changes. These will require revising the admissions criteria, continued support and possible expansion of the RuralMed program, curricular changes in the early years to assure the development of competency in primary care, and additional rural community sites and rural physicians for clinical training. The addition of a geriatric program and a public health program will be critical factors in this growth to support the education and to attract students interested in addressing important health care needs of the state. These programs will enhance the experience of primary care for interested students and physicians while developing specific skills for the care of aging individuals and for addressing population health effectively.

Increasing the numbers of residents will be done specifically to attract the interest of our medical school graduates and to assure an effective workforce for North Dakota. Adding additional numbers to our primary care programs with an option for further training in geriatrics, public health, management of chronic disease or mental health and disease prevention/ health promotion will be considered a priority.

## Conclusion

The option to increase the number of health professionals trained in North Dakota, growing our own, to meet the current and future health care needs of the population is a critically important option. North Dakota has an existing workforce need that will continue to grow for the foreseeable future. This need is for all physicians but particularly for primary care and general surgery. The need includes other health professionals and the numbers needed will require ongoing assessment. UND SMHS is ready to strategically implement this growth but will be limited in capacity in faculty and space to

accomplish this effectively with our current resources. Meeting this need successfully will result in improved population health status and help to control costs and quality. While there is a significant time lag in growing our own, the selection of students from rural North Dakota communities with a commitment to rural practice will increase the likelihood of successful recruitment. We can best meet the needs by partnering with ND AHEC and others to address the resources and opportunities needed to increase the pipeline of North Dakota students interested in and prepared for a health professions education. There are a wide variety of pipeline-encouraging programs and activities in place across North Dakota, and even more are planned (see Appendix). Next, the SMHS should change its admissions process to seek and select students with the qualities and experience that result more frequently in the selection of primary care training and rural practice. The School should review and revise the curriculum to assure the development of primary care competencies and to increase the experience in longitudinal clinical care in rural communities. The SMHS should increase the numbers of residents in primary care and offer additional training in needed areas of geriatrics, public health, surgical skills, obstetrics and mental health.

We need to increase the numbers of health professions students trained in North Dakota to address the current gap, to meet the future needs, and to help assure the health status of the population. We will do this by:

- Changing the admission process for all health professions students to encourage selection of health professionals who will practice in North Dakota
- Revising the curriculum to assure the competency of all graduates in primary care skills and to provide increase longitudinal clinical experience in rural communities
- Increasing the numbers of primary care residency positions and offering additional training to meet these needs
- Increasing rural residency experience and considering the development of rural resident tracks
- Increasing the pipeline by developing more and better programs to engage and prepare young students to become successful health professionals

# Option 3: Increasing the Retention of Healthcare Professionals Trained

Successful recruiting of student and residents into primary care and rural practice is one step in addressing the workforce needs of North Dakota. An equally important step is to improve the retention of health professionals in rural practices and communities.

## Factors impacting retention

The first, and necessary, step in addressing the healthcare needs of rural North Dakota is to recruit physicians and other health professionals to practice primary care in rural communities. If they don't stay in practice in those communities, we will not be effectively meeting the needs. Suggestions that affect student specialty selection from a recent report (Rosenblatt et al., 2010) also may impact retention and include:

- Improving Medicaid reimbursement
- Start-up grants or practice development subsidies
- Tax credits for rural/underserved area practices
- Providing substitute physicians (locum tenens support)
- Malpractice immunity for providing voluntary or free care
- Payment bonuses/ other incentives by Medicaid or other insurance carriers
- Subsidies for the installation of effective electronic health records
- Medicaid reimbursement of telemedicine

Very few studies have been done regarding retention of physicians in communities beyond the study of mandatory service for National Health Service Corps (NHSC) physicians or other obligations. In a recent study, it appears that recruiting and retention are distinct processes. Generally, the factors that influence recruitment are not directly related to retention. Physicians have reported over time that staying in practice in a rural community is affected by local poverty, social and professional isolation, a lack of amenities, and the hardship of rural practice – long hours, frequent on-call shifts and low income (Pathman et al., 2004).

## Approaches to improving retention

This study by Pathman and others compared physicians through repeated surveys in rural HPSA communities with rural non-HPSA communities and found no significant difference between the two in retention. The conclusion of this study confirms other studies that found that the principal factor affecting rural physician shortages is that too few physicians are recruited. There were two characteristics of the physicians who remained in rural

practice (HPSA or non-HPSA) longer—owning their practice and being on-call fewer than two times weekly. Even though recruitment may be the primary factor, these issues affecting retention are more modifiable than many of the issues affecting recruitment. Suggestions include:

- Promoting practice ownership through low-interest loans and start-up guarantees
- Offering leadership opportunities
- Providing a greater voice in clinic policies and work schedules
- Reducing on-call frequency by coordinating cross-coverage
- Providing telephone triage systems
- Providing full-time physician staffing in local emergency rooms

## The need for study to evaluate effectiveness of programs

There continues to be a need to study and to better understand the factors or approaches that positively impact retaining quality physicians in a community. An international report that included an extensive review of the literature has shown that while most studies on retention are done on physicians, there is little information on financial incentives and there is a lack of coherence between the strategy to retain physicians and the factors that matter for health workers choosing and remaining in a location (Dolea et al., 2010).

Another international study addresses whether compulsory programs such as NHSC work for retention in rural or remote areas. The conclusion was that no rigorous study has been done to compare the outcomes between workforce disparities in countries with compulsory service to those without compulsory service. Additional conclusions, in addition to further evaluation, are that for success in any compulsory program, good planning and transparency of the rationale and requirements are important. Also, successful retention depends on the support of the health care system and the benefits to the health care worker – pay, housing, continuing education and clinical backup or supervision (Frehywot et al., 2010).

## Continuing professional development

Communities can help retain good physicians and health professionals by being aware of the challenges and needs for their continuing education and development. Two unique aspects of rural medical practice are the scope of practice and the distance from major urban centers with specialist services. Rural practice includes clinic, house calls, nursing home care, hospital admissions and care, emergency room care, obstetric care, general surgery and anesthesia. Rural physicians practice a wider range of procedures, play an important role in initial management of trauma, and have to provide care unique to location such as wilderness, industrial, specific cultural or agricultural medicine. The reality of rural practice attracts certain types of individuals interested in this breadth and variety. Continuing in this practice requires the confidence and skills that come from support and access to continuing professional development. Learning new information or

skills and spending time away with peers is essential to continuing a healthy and rewarding practice. One challenge is that rural physicians generally cannot leave their community for continuing education or professional development. Medical schools can be very helpful in retention of rural physicians by creating programs for education and training that provide content that is needed by rural physicians, methods that are accessible through outreach to the community or distance technology, or immersion re-training experiences. Communities can support their physicians by providing financial support for professional development, arranging for physician coverage, and arranging for interesting exchange opportunities between rural and urban physicians. The needs of rural physicians are unique and can only be met successfully if there is flexibility and variety to address different needs (Curran et al., 2010).

## Increased retention of graduates

We know that medical students who do their residency training in a location have an increased likelihood of practicing in that location. One approach to increasing the needed workforce is to attract students to and retain individuals from our own residency programs. There are a variety of interventions that are likely to increase the retention of graduating physicians within the state. These include revising and refining the admissions process to select students most likely to remain within the state to practice and revising the curriculum to ensure optimal exposure to primary care experiences. We feel that it is very important to provide increased longitudinal clinical experiences in rural communities. Reducing debt burden through the RuralMed program, where the four year tuition costs are defrayed if the physician agrees to practice family medicine in a rural area of North Dakota for five years, will address one issue that may impact the decision to practice rural primary care. Role models are extremely important and influential in decision-making for our students and residents. The SMHS should partner with physicians and healthcare systems to optimize and enhance mentoring and affinity relationships.

## Conclusion

Research has shown that the principal factor in addressing physician shortage is successful recruitment. To be successful in keeping a quality healthcare workforce, however, there are modifiable factors related to work experience that will lead to better retention that should also be considered. Increasing the types and length of experience in rural communities during education and training will help develop more confident, informed decision-making about choosing rural practice.

Many graduates and clinical faculty currently practice in our rural communities and we hope to increase those numbers. We will continue to advocate for and administrate funding for scholarship/loan repayment for students who commit to rural practice such as the RuralMed program. We will work in partnership with rural health systems and physicians to encourage and support mentoring. UND SMHS can work to inform and advocate for issues related to reimbursement and

practice support in partnership with health care systems and local and state government. We can develop and provide continuing health professions education and training opportunities to meet the specific needs of rural practitioners and encourage collaboration for learning and for coverage.

While recruitment is the principal factor impacting rural health workforce, retention is also important. We can help with retention of our rural health professionals by:

- Seeking funding for and administrating scholarships and/or loan repayment for students committed to rural practice
- Advocating for appropriate reimbursement and practice support
- Developing continuing education and training opportunities to enhance the professional experience and skills of our rural health professionals
- Creating collaborative relationships to share expertise and coverage

The SMHS can increase the retention of graduating physicians within the state by:

- Revising and refining the admissions process to select students interested in rural practice
- Revising the curriculum to ensure optimal exposure to primary care and rural experiences
- Reducing debt burden through the RuralMed program
- Partnering with physicians and health care systems to optimize relationships

# Other Options

We believe that the three foregoing options represent the major alternatives to address current and future workforce needs. Looking ahead, there may be other avenues to explore, such as the potential to utilize alternate staffing models in areas of persistent shortage. As an example, increased deployment of physician assistants and advanced practice nurses in our most rural communities could potentially ameliorate some level of physician shortage. We hope to explore these options in future editions of this report.

# Three

# The Health Status of North Dakota

# The Health Status of North Dakota

The health of individuals and communities is influenced by factors ranging from health-related behavior (accounting for 40% of deaths in the U.S.; IOM, 2009) to the onset of chronic disease commonly associated with aging.

The health of a state, community or individual can be assessed using a variety of measures ranging from health-related quality of life to health-condition specific measures to death rates. Measures can focus in a number of different areas ranging from mortality measures (e.g., life expectancy at birth) to prevalence of chronic disease (percentage of adults with cancer).

While there are scores of measures that can be selected to build a set reflective of priority areas, there are a few key measures that are common to many health status assessments. *Life expectancy at birth* is a leading indicator of a population's state of general health. In 2000, the nation's life expectancy at birth was at a record high of 76.9 years. North Dakota is tied in rank for the third longest life expectancy at 78.7 years (U.S. Census Bureau, Populations Division, 2005).

Another measure used to judge general health is the *age-adjusted death rate* of a population (the rate is adjusted to control for variations in age across populations). In the United States this rate is 776.4 deaths per 100,000 population. North Dakota ranked 17th in age adjusted death rate at 726.7 deaths per 100,000 population in 2006 (Heron et al., 2008).

*The percentage of adults reporting fair or poor health* is another important indicator of the health of a population. Overall, North Dakotans report better health status than the national average. On the measure "How is your general health?" 12.5% of North Dakotans answered "fair" or "poor" versus the national average of 14.8%; whereas more North Dakotans (55.7%) reported "excellent" or "very good" versus the national average (54.2%; U.S. Department of Health and Human Services, Centers for Disease Control, Behavioral Risk Factors Surveillance System [CDC, BRFSS], 2008).

## Health-related behaviors and other selected topic areas

The extent to which North Dakotans engage in health-related behaviors such as tobacco use, dietary practices, physical activity, and alcohol consumption is important to consider because of the significant impact they can have on overall health. Dimensions of health-related behaviors are measurable and amenable to interventions ranging from individual responsibility to community efforts to public policy and employment-based programs.

## Health-related behaviors

**Alcohol and Substance Abuse.** Alcohol and illicit drug use exact a heavy toll on the lives and families of North Dakotans and the economy of the state. Compared to the nation as a whole and to other states, alcohol use and abuse is the biggest substance-related problem facing North Dakota (U.S. Department of Health and Human Services, Office of Applied Studies [OAS], 2007; CDC, BRFSS, 2008).

North Dakota has some of the highest state rates in recent alcohol use and binge drinking, regardless of age group. For example, among North Dakotans aged 12 to 20 years, 38.5% consumed alcohol in the past 30 days and 29.5% engaged in binge alcohol use in the past 30 days (OAS, 2007). These figures rank North Dakota as second-highest in recent alcohol use and highest in recent binge alcohol behavior among all states. North Dakotans rank near the bottom among the states with persons (33.8%) who perceive great harm associated with consuming five or more drinks at a time once or twice a week (OAS, 2007). Both attitudes and knowledge are contributing factors that could be targeted through pilot projects or evidence-based strategies to alter substance abuse behavior that carries with it significant potential for physical, mental, and societal harm.

In addition to concern regarding alcohol abuse among ND adults, there is also evidence that it extends to younger individuals (North Dakota State Epidemiological Outcomes Workgroup, 2008). Children and young adults are following the pattern of the state's adults who use and abuse alcohol at rates that are high relative to other states. North Dakota children and young adults, who are not of legal drinking age, engage in recent and binge alcohol use at elevated frequency (OAS, 2007). Further, North Dakota students in grades 9–12 are substantially more likely than their U.S. counterparts to have recently driven a vehicle after consuming alcohol (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Adolescent and School Health, 2008). Among DUI arrests in the state, persons aged 21–24 are the most frequent offenders and their arrest rate has substantially increased in recent years (Weltz, 2008).

Associated with illicit drug use, arrests in North Dakota have increased by 3% from 2,256 in 2006 to 2,323 in 2007. Approximately 76% of drug arrests involved males in 2007, and 12% of arrests involved juveniles under the age of 18. In the past decade, 89% of drug arrests were for possession (versus sale or manufacture) and about three-quarters of drug arrests involved marijuana (Weltz, 2008). Methamphetamines are also a problem in North Dakota, but to a lesser extent. North Dakota's 2004 meth lab seizure rate per 100,000 population placed it in the top 20% of all states.

In 2005, North Dakota followed the lead of other states by restricting the availability of cold medicines containing pseudoephedrine. The restriction of pseudoephedrine, a key ingredient in manufacturing methamphetamine, is part of a nationwide movement to cut meth use. In recent years, meth lab incidents have been drastically reduced and meth pos-

session arrests have been somewhat reduced in North Dakota (Weltz, 2008).

**Immunization.** In North Dakota, immunization rates and vaccine preventable outbreaks are monitored by the Immunization Program of the Disease Control Division, North Dakota Department of Health (ND DoH). This program maintains and updates a statewide computerized vaccination database (the North Dakota Immunization Information System [NDIIS]). This system keeps vaccination records for both adults and children in one centralized source that is accessible by providers and school personnel. Unfortunately, at this time, the NDIIS is not linked to medical records and does not have important capacity such as providing reminder notices for upcoming vaccinations (ND DoH, 2008).

Capacity such as this is an important strategy given that North Dakota is now slightly below the national average for immunization rates (National Immunization Survey, 2008). The national average for children receiving recommended immunizations in 2007 was 77.4%, while North Dakota's rate was 77.2%.

Among adults aged 65 and over, North Dakota ranks above the national average for both influenza and pneumonia vaccinations. North Dakota ranks 25th in adults aged 65 and over that have had influenza vaccines within the past year (73% of population, compared to the national average of 72%). North Dakota ranks 14th in adults aged 65 and over that have ever had a pneumonia vaccination (70.5% of population, compared to the national average of 67.3%; CDC, BRFSS, 2008). There is clearly room to increase vaccination rates among North Dakota adults.

**Injury and Violence.** Injuries are often predictable, preventable and carry significant cost. Both intentional injuries (e.g., suicide, homicide, and assaults) and unintentional injuries (e.g., falls, motor vehicle crashes, and sports injuries) typically result in costly emergency department visits, hospitalizations, loss of productivity, disability and/or death. In North Dakota, unintentional injury is the leading cause of death for ages 1 through 34; the second leading cause of death for ages 35 through 44; and the fifth leading cause of death overall (ND DoH, Division of Injury Prevention and Control, 2005). Among all injuries motor vehicle crashes are the leading cause of injury-related death, followed by suicide, falls, poisoning, and homicide (North Dakota Division of Vital Records, 2009).

*Motor vehicle related injuries.* Motor vehicle crashes (MVC) remain the leading cause of injury-related death and disability in the state. In 2006, North Dakota had a rate of 1.44 motor vehicle fatalities per 100 million vehicle miles traveled, higher than the national average of 1.37. Among surrounding states, Minnesota's rate is lower at .89; and South Dakota's and Montana's rates are higher at 1.7 and 2.4, respectively. Among fatal crashes in 2007, 57% involved alcohol; in 59%, victims were not wearing seat belts; and in 43%, victims were driving at excessive speed (North Dakota Department of Transportation [ND DoT] Drivers License and Traffic Safety Division, 2008). Traffic death totals did decline by six percent in ND from 2007-2008. Contributory factors include increased enforcement of seat belt and

drunk-driving laws along with decreased road traffic due to high fuel costs and recessionary pressures (Copeland et al., 2009). MVC fatalities disproportionately affect American Indians in North Dakota. Despite accounting for only 4.9% of the population, American Indians accounted for 17.3% of the MVC fatalities from 1999 to 2003 (Division of Injury Prevention and Control, 2005).

*Seat belt use* in North Dakota is showing a positive trend; however, even with this increase in seat belt use, the state still ranks below the national average of 82.4%. North Dakota currently has a secondary seat belt law, meaning nonusers can only be cited after being stopped for another reason. Nationally, states with primary seat belt laws (nonusers may be stopped and cited independently of any other traffic behavior) have higher seat belt use percentages (Hedlund et al., 2008). Given the direct link between motor-vehicle-crash-related deaths and seat belt use, encouraging this no-cost preventive behavior can save lives

*Suicide.* Suicide is the second leading cause of injury deaths among North Dakotans (North Dakota Division of Vital Records, 2008). For more information on this important topic see Section Four of this report on Health Care in North Dakota.

*Falls.* In 2007, falls were the third leading cause of injury death among North Dakotans (North Dakota Division of Vital Records, 2008). During the period from January 2000 through July 2004, according to the state's trauma registry, falls were the leading cause of trauma admissions (Division of Injury Prevention and Control, 2005).

*Fall-related injuries and deaths* are most common among women over the age of 60. Age often complicates recovery from falls and may lead to secondary medical conditions, decreases in strength, and limited mobility. The high proportion of falls among the elderly is a particular concern given the state's aging population (ND DoH, Division of Injury Prevention and Control, 2005). Acute and chronic debilitation in the elderly resulting from falls can carry high costs (e.g., require ongoing rehabilitation or nursing home care) which drives up the costs of public programs like Medicaid and Medicare and ultimately affects health care costs for virtually everyone.

Fall prevention education could be extended across North Dakota through senior citizen centers, media campaigns and other venues.

**Nutrition and Physical Activity.** Healthful nutrition and physical activity are key components in preventing obesity and have a positive effect on overall health. Unfortunately, North Dakotans are part of the national trend toward a decrease in healthful eating and an increase in sedentary lifestyles. Tracking measures of physical activity (e.g., percentage of adults meeting the recommendation for moderate physical activity—at least five days per week for 30 minutes per day of moderate intensity activity) and health nutrition (e.g., percentage of adults eating the recommended five or more fruits and vegetables a day) are important given the association of physical activity and healthful nutrition with decreased risk for

diabetes, high blood pressure, depression and colon cancer as well as maintaining healthy bones and joints. Lack of physical activity and poor nutrition are also the major contributors to the rapidly growing problem of obesity, which is associated with many chronic conditions, poor quality of life, and premature death (Office of the Surgeon General, 2008). This is of increasing concern since in 2007, 62.9% of the nation was overweight or obese and North Dakota was slightly higher at 64.9% (Calorielab, 2008).

Healthful eating includes a diet rich in fruits, vegetables, and whole grains and decreasing red meat intake and foods high in saturated fats. Among North Dakota adults only 21.9% of ND adults eat the recommended five or more fruits and vegetables a day, less than the national average of 24.4% (CDC, BRFSS, 2008).

Even more significant, among ND youth in 9th through 12th grade, 83.4% reported they do not eat the recommended five or more fruits or vegetables a day, compared with the national average of 78.6 % (U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion [NCCDPHP], 2008).

On a more positive note related to physical activity, more North Dakota adults (52.7%), report moderate physical activity compared to a national average of 49.5% (NCCDPHP, 2008). And, related to physical activity, fewer ND students (25%) in 9th through 12th grade report watching 3 or more hours of television per day than the national average of 35.4% (Youth Risk Behavioral Survey, 2008).

Healthful nutrition and physical activity can be particularly difficult to engage in given the expense of healthful foods, time demands on individuals, weather during winter months, and lack of wellness facilities in small towns. However, many efforts (e.g., school, workplace) are underway to encourage healthful eating and exercise. Of particular note is the newly formed North Dakota Healthy Eating and Physical Activity Partnership whose mission is to collaborate across the state to prevent and control chronic conditions through healthful eating and physical activity. The Partnership has developed a state action plan creating a framework for improving policies and programs related to healthful food and physical activity. This framework is designed to help communities work together to create environments that support individuals ability to make healthful food choices and increase overall physical activity by increasing access to good nutrition and places for physical activities (D. Askew, personal communication, January 2009).

**Tobacco Use.** The use of tobacco is the number one preventable cause of death and disease in North Dakota. Every year, 874 North Dakotans die from tobacco-related illness. Secondhand smoke exposure contributes to the deaths of 80–140 North Dakotans annually. Smoking costs North Dakota $375 million annually in direct medical expenditures and lost productivity.

North Dakota adults and children smoke cigarettes at rates that are comparable to U.S. rates. However, the percentage of the state's American Indian adults who smoke cigarettes is over twice as high as the rate of white adults (48.9% vs. 20.1%;

Behavioral Risk Factor Surveillance System, 1997–2006).

Smokeless tobacco use in North Dakota appears higher than the U.S. rate for both adults (CDC, BRFSS, 2008) and children (NCCDPHP, 2008). Regarding recent use of any tobacco product, North Dakota adults' prevalence is equivalent to the U.S. prevalence, and North Dakota children's prevalence is higher than the U.S. children's prevalence (OAS, 2007).

Smoking among students in grades 9 through 12 dropped 19.5% between 1999 and 2007; however, adult smoking has declined much more slowly, from 23.3% in 2000 to 20.9% in 2007.

Beginning in 2001, the Department of Health received funding for statewide tobacco programs through the Community Health Grant Program, funded by the Master Settlement Agreement (ND DoH, Division of Tobacco, 2008). These statewide efforts have been associated with significantly reducing the number of youth who start using tobacco, providing assistance with quitting for adults and youth, and working to reduce exposure to secondhand smoke. A statewide smoke-free law in 2005 prohibits smoking in all public places and places of employment with some exceptions (ND DoH, Division of Tobacco, 2008). In order to further tobacco control, North Dakotans voted in 2008 to fund tobacco control programs to CDC-recommended levels and established a North Dakota Tobacco Prevention and Control Advisory Committee (N.D. Tobacco Prevention, 2008).

A number of important steps have been taken to decrease smoking rates among North Dakotans through legislation, education and other strategies. However, given available information, targeting American Indian populations in particular and adult populations could be priority areas of focus.

## Selected topic areas

*Children's health is discussed as a separate topic to draw attention to its importance. Other sections in the Environmental Scan provide additional focus to selected children's health issues.*

**Children's Health.** The health of children is a critically important focus for a number of reasons, ranging from the effect of significant childhood illnesses as a stressor for ND families to chronic illness (e.g., diabetes) that can bring a lifetime of health care costs and the need for health care services.

On some measures, ND children do extremely well while on others, there are clear opportunities for improvement in their health and well-being. In 2008, North Dakota ranked 7th in the nation for child well-being by the National Kids Count Program. This program uses 10 measures to rate states in children's health. Areas where North Dakota ranks high include ranking 1st in the nation in low percentage of teen drop-outs and 1st in children living with a parent with full-time employment. Another indicator used worldwide as a measure of community health is the infant mortality rate. North Dakota ranks 15th in the nation for infant mortality rates. In 2005, there were 6 infant deaths per 1,000 with a significant decline in deaths since 2001 at 8.8 deaths per 1,000. The ND infant mortality rate is better than the national average of 6.7 infant deaths per 1,000. While the decline

in the state's infant mortality rate has tended to mirror a national trend, since 2000, nationwide improvements have stalled (Annie E. Casey Foundation, 2009).

Areas of concern that present improvement opportunities for North Dakota are the child death rate and teen death rate. North Dakota ranks 31st in the nation for child death rate and 35th in the nation for teen death rate. Both the child and teen death rates show worsening trends since 2000.

The teen death rate has risen by 54% and the child death rate has risen by 21% (North Dakota Kids Count, 2008). The increasing rate in teen fatality is due primarily to increasing suicide rates. In North Dakota, the North Dakota Child Fatality Review Panel (NDCFRP) reviews all deaths of children up to age 18 in order to understand child death causes and provide information for future prevention efforts.

According to the NDCFRP, motor vehicle crashes are the leading cause of childhood death in North Dakota. All 27 vehicular childhood deaths in 2006 were determined to be preventable. In 19 of these deaths, safety restraints were not used, 14 deaths involved excessive speed, 7 involved drugs or alcohol, and 7 involved an unlicensed or suspended driver (North Dakota Child Fatality Review Panel, 2008). Given that these are preventable deaths, there are opportunities to strengthen or create strategies ranging from public education campaigns and expansion of treatment services to legislative remedies.

**Implications.** Monitoring the extent to which North Dakotans engage in health-influencing behaviors is important in order to reduce future burden caused by negative health behaviors. Behaviors that compromise health come with very high costs, and existing networks of concerned groups that include education, health care, faith-based, public sector, law enforcement, and other stakeholders should examine how they can work collaboratively to build on or realign current programs designed to address these issues. Where they exist, proven strategies should be considered and supported, and where such evidence is lacking, pilot projects should be developed and evaluated. For example, some evidence-based strategies to improve health and prevent disease in communities can be found at http://www.thecommunityguide.org/index.html (a website sponsored by the Community Guide Branch, National Center for Health Marketing [NCHM], Centers for Disease Control and Prevention).

## Leading causes of death in North Dakota

While the proportion of the population affected differs somewhat, generally speaking, leading causes of death found across the nation are also common in North Dakota. Knowing key characteristics about leading causes of death facilitates targeting efforts (e.g., prevalence, urban or rural, men or women) in order to decrease both loss of life and financial loss. Information regarding trends over time can assist in determining whether new or strengthened efforts are effective. In 2007, the causes of death for North Dakota residents included heart disease (26%), cancer (23%), Alzheimer's disease (7%), stroke (6%), accidental (5%), chronic lung disease (5%), diabetes (4%), influ-

enza/pneumonia (2%), and all other causes (23%); (North Dakota Division of Vital Records [NDDVR], 2008). Heart disease as a cause of death in North Dakota has steadily declined over the past twenty years. In 2006, for the first time, the age-adjusted rate fell below that of cancer. Over the years, cancer death rates have declined but at a much slower rate than heart disease (NDDVR, 2008). This section summarizes key information and trends related to these and other common causes of death in North Dakota.

**Cardiovascular Disease.** Cardiovascular disease affects about one in three Americans (American Heart Association, 2008). Conditions that fit in this category include heart attacks, angina, coronary heart disease, and high blood pressure. Heart attacks levy a heavy toll on the health of Americans, accruing a prevalence of 8.1 million in 2005 and causing 158,000 deaths in 2004 (Ho et al., 2007; American Heart Association, 2008). The prevalence of heart attacks in North Dakota has been decreasing (e.g., 4.4% in 2005 and 4% in 2006, 3.9% in 2007) (NCCDPHP, 2008). This compares to a higher national rate of 4.2% of U.S. adults experiencing a heart attack in 2007. In North Dakota, men (5.2%) have a higher prevalence for heart attacks, compared to women (2.6%). Heart attack prevalence by race in North Dakota is unknown. Counties with the highest prevalence of heart attacks tend to be rural in nature (North Dakota Department of Health [NDDH] 2007). The estimated cost (including direct and indirect) of cardiovascular disease in North Dakota in 2006 was $920 million (Moum et al., 2007).

North Dakota matches the nation in terms of the percentage of the overall population with coronary heart disease (4.1% for both) (Moum et al., 2007; National Center for Chronic Disease Prevention and Health Promotion, 2008). Men in North Dakota have a higher prevalence (5.2%) of angina/coronary heart disease than women (2.9%). As with heart attacks, angina/coronary heart disease prevalence by race in North Dakota is largely unknown and counties with the highest prevalence of angina/coronary heart disease tended to be rural (NDDH, 2007). The higher prevalence of cardiovascular disease in rural North Dakota is likely due in part to a higher average age of rural residents, compared to their urban counterparts.

High blood pressure, a risk factor for cardiovascular disease, is a highly prevalent condition that contributes to premature death, heart attack, stroke, and renal disease (United States Preventive Services Task Force, 2007; American Heart Association, 2008). In 2007, 26% of North Dakota adults said they have been told they have high blood pressure. This figure is lower than the national prevalence of 27.8% (NCCDPHP, 2008). Men and women in the state tend to be equally affected by blood pressure (26% and 25.9%, respectively). As with coronary heart disease, counties with the highest prevalence of high blood pressure tend to be rural (NDDH, 2007).

*Stroke* contributes substantially to morbidity and mortality among U.S. residents, afflicting 5.8 million Americans in 2005 and accounting for 17% of cardiovascular disease-related deaths (AHA, 2008). In 2007, stroke affected 2.3% of North Da-

kota adults, compared to 2.6% of U.S. adults (Moum et al, 2007; NCCDPHP, 2008). Stroke is the third-leading cause of death in both North Dakota (5.5% of deaths in 2007; ND Division of Health, 2008) and the United States (5.9% of deaths; Kung et al., 2008). Women in North Dakota (2.5%) have a higher prevalence of stroke than men (2.0%) and once again rural regions present with higher prevalence of stroke than urban regions (NDDH, 2007).

In North Dakota, stroke prevalence appears to be increasing, which is likely due in part to the state's increasingly aging population. To illustrate, 1.8% of the population had a stroke in 2003, compared to 2.3% in 2007 (NCCDPHP, 2008).

**Cancer.** Cancer is the second leading cause of death in the nation, accounting for one-fourth of all mortality. Each year about 1.43 million persons are diagnosed with cancer and 566,000 persons die of the disease (American Cancer Society [ACS], 2008). Approximately 10.8 million Americans were living with cancer in 2004 (ACS, 2008). Although people of all ages contract cancer, it is primarily an older person's disease. About three-quarters of all cancers are diagnosed in persons 55 years and older. By gender, U.S. males have a 45% chance of developing cancer in their lifetime; for females it is approximately 37% (ACS, 2008). Research indicates that some racial minorities (e.g., Africans and Native Americans) have higher age-adjusted rates of some cancers and cancer-related health risk factors (ACS, 2002; Denny et al, 2003; Kaur, 2005).

Each year in North Dakota approximately 3,500 people are diagnosed with a new cancer, and approximately 1,400 state residents die from cancer. In 2004, there were approximately 23,370 state residents (3.7%) living with cancer. In general, North Dakota males are substantially more likely than North Dakota females to die from cancer (NDDVR, 2008). This trend is true even after accounting for age. Overall cancer diagnoses and deaths rise dramatically after age 54 for both sexes, but particularly males. Four cancer sites—lung, colorectal, breast, and prostate—account for 55% of cancer cases in North Dakota (North Dakota Cancer Coalition, 2008), and these same four cancers

**Cancer Testing Prevalence, North Dakota and United States, 2006**

| | ND | U.S. | ND Ranking/51 |
|---|---|---|---|
| Ever had a colonoscopy/ sigmoidoscopy (adults aged 50+) | 56.5% | 57.1% | 31st highest |
| Fecal occult blood test within past two years (adults aged 50+) | 22.2% | 24.2% | 36th highest |
| Pap test within the past three years (women aged 18+) | 84.5% | 84.0% | 24th highest |
| Mammogram within past two years (women aged 40+) | 77.2% | 76.5% | 24th highest |
| PSA test within past two years (men aged 40+) | 52.2% | 53.5% | 32nd highest |

Source:
National Center for Chronic Disease Prevention and Health Promotion (2008).
North Dakota does have several notable programs that aim to prevent and control cancer. For example, the North Dakota Division of Cancer Prevention and Control administers Women's Way, a program that provides breast and cervical cancer screenings to eligible women in North Dakota; from 1997 through October 2008, this program has provided screenings to 9,579 women.

Table 4. Cancer Testing Prevalence

account for 49% of cancer deaths in the state (NDDVR, 2008). This pattern of common cancer sites parallels national data. The estimated cost (including direct and indirect) of cancer in North Dakota in 2007 was $500 million (ACS, 2008). Cancer survival rates for the United States have steadily increased over the past several decades. This is believed to be the result of a number of factors including higher rates of cancer screening, fewer late-stage diagnoses, and improvements in health care treatment and technology. The survival rates for all cancer types are highest when diagnoses are made at earlier stages of the disease. Late-stage diagnoses occur in the North Dakota population and thus offer an opportunity for improved screening and the potential to increase survival rates. The highest percentage of late-stage cancer diagnoses occurs with lung cancer (80%), followed by colorectal (58%), cervical (45%), female breast (30%), prostate (14%), and urinary bladder (11%). Women are more likely than men to be diagnosed at late-stage for colorectal and urinary bladder cancer, and men are slightly more likely than women to be diagnosed at late-stage for lung cancers in North Dakota.

In terms of cancer screening, a number of tests are well established in their effectiveness to detect cancer early and participation in these screening tests serve as important measures of health care. Blood stool, colon, prostate and mammogram screening are, generally speaking, widely available in North Dakota. Participation in these screening tests in North Dakota has been either stable (blood stool test, PSA and PAP) or has increased (colonoscopy/sigmoidoscopy and mammography). While North Dakota figures are comparable to national figures (see Table 4), there remains ample opportunity to improve screening participation. It should be noted there is no consensus opinion regarding the recommendation for routine PSA testing (Albertsen, 2006; American Cancer Society, 2008) and higher PSA levels may not necessarily indicate the presence of prostate cancer.

**Implications.** Increased efforts/resources are needed to strengthen and expand the state's programs for promoting healthy lifestyles and increasing utilization of cancer screening tests among residents, particularly American Indians. Additionally, there are gaps in critically important data that if closed could lead to better understanding and targeting efforts to some of the leading causes of death in North Dakota.

Gaps in information related to cardiovascular disease and cancer include:

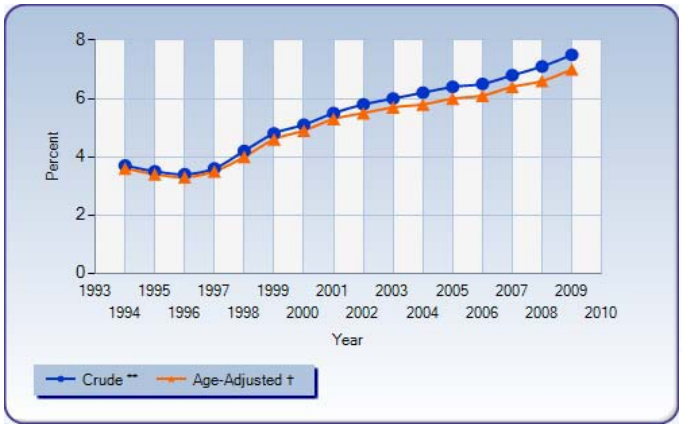
- Cancer incidence trends for American Indians in North Dakota to better track and target resources;
- Cancer incidence rates at regional and local levels to help target screening and other services;
- Impact of travel distance on obtaining cancer care with implications for networking cancer treatment services in a more geographically dispersed manner; and
- Cardiovascular disease prevalence and trends by race and region, along with more information about rurality to inform how best to deploy services targeting this set of serious health problems.

Given the significant disease burden and health services associated with the diseases described in this section, statewide hospital discharge data is very important to inform planning and improve care. As one of a few states without statewide hospital discharge data, state officials, policymakers and researchers are unable to gain information about how North Dakotans with cancer or cardiovascular disease use inpatient and outpatient hospital resources.

## Common health problems in North Dakota

There are a number of health care problems affecting North Dakotans that carry significant health and financial burdens. While some health problems are spread across the state's population others disproportionately affect sub-groups (e.g., elderly, Native Americans, rural citizens).

**Diabetes.** In the United States, 7.8% of the population has diabetes, which is associated with shorter life spans and a risk factor for heart disease, limb amputations, blindness, stroke, and renal failure (North Dakota Department of Health, 2008). Among North Dakota adults, 6.3% indicate they have been told they have diabetes compared to 8% of U.S. adults (National Center for Chronic Disease Prevention and Health Promotion, 2008). Diabetes is found in comparable numbers of men and women in the state and older North Dakotans have a much higher diabetes prevalence than their younger counterparts (ages 35–44: 2.5%; ages 65 and older: 14.7%). Diabetes is far more common among American Indians (13.9%) than among whites (6.1%; North Dakota, 2004–2006). Other characteristics of people with higher prevalence of having been told they have diabetes include persons with obesity (13.9%); high blood pressure (18.3%); high cholesterol (14.3%); a disability (12.2%); fair or poor general health (21.9%); and no leisure time physical activity (10.2%; NDDH, 2008). As with many other serious diseases, rural ND counties tend to have a higher prevalence rate than urban counties (NDDH, 2007).




Source: Centers for Disease Control and Prevention. Available online at: http://apps.nccd.cdc.gov/DDTSTRS/Index.aspx?stateId=38&state=North%20Dakota&cat=prevalence&Data=data&view=TO&trend=prevalence&id=1

* Crude percentage is the raw percentage/unadjusted estimate.

† Age-Adjusted percentage minimizes the effects of different age distribu-

Figure 14. Percent of ND Adults with Diagnosed Diabetes, 1994-2005

The prevalence of diabetes in ND children is estimated via health claims data from Blue Cross Blue Shield of North Dakota. In 2007, it was estimated that just over 4 children per 1,000 (aged 18 and under) have diabetes, a rate almost identical to 2006. However, this rate is markedly elevated from previous years when rates ranged from 2.8 in 2003 to 3.1 in 2005. (NDDH, 2008).

In addition to a trend line that has been generally rising for ND children, increases can also be found in the percentage of ND adults who report ever being told they had diabetes. Figure 14 shows that between 1994 and 2007, there was a 75% increase in the adult population, from 3.6% to 6.3% (NDDH, 2008). The estimated cost (direct and indirect) of diabetes for North Dakotans in 2006 was $209 million (American Diabetes Association, 2008).

Given the significant financial and human toll of diabetes and the fact that this disease can be, in many cases, prevented and managed through behavior (e.g., maintaining healthful weight), deploying strategies, measuring their impact, and tracking prevalence trends over time are important, particularly among the state's American Indians and children.

**Asthma.** Asthma, or inflamed airways in the lungs, is a chronic disease that affects about 20 million Americans. In North Dakota, 7.7% of adults have asthma compared to 8.4% of U.S. adults (NCCDPHP, 2008). Women in North Dakota are more likely to have asthma (9.1%) compared to men (6.2%). Increased age is associated with higher prevalence of asthma. This illness is particularly problematic for the state's American Indian population which has a significantly higher prevalence of asthma (2005: 16.2%; 2006: 20.8%), than Caucasians (2005: 11%; 2006: 9.6%; NDDH). North Dakota counties with the highest asthma prevalence tend to be rural (NDDH, 2007). Generally, the prevalence of asthma in North Dakota is increasing, ranging from 6.8% in 2001 to 7.7% in 2007 (NCCDPHP, 2008). Special attention should be given to American Indian populations in the state related to the prevention and treatment of this disease.

**Arthritis.** Arthritis is the leading cause of disability in the United States, affecting nearly 70 million Americans (one in three adults). While this disease also afflicts children, it is most common in older persons and in women. As the elderly population in the United States increases, the number of individuals with arthritis will increase dramatically (CDC, 2007). In North Dakota, arthritis prevalence is increasing. In 2001, 21% had arthritis compared to 26% in 2005 and 26.9% in 2007 (NCCDPHP, 2008). The 2007 figure is slightly lower than the national prevalence of 27.5% (NCCDPHP, 2008). Arthritis is much more common in women in the state (31.1%) than in men (22.6%). Given the recent trend line of this disease in North Dakota and the projection of increased elderly in the state, information on preventing and treating arthritis can be a valuable contribution to the health status of many citizens while also potentially influencing health care costs associated with this disease. The estimated cost (direct and indirect) of arthritis for North Dakotans in 2003 was $285 million (Yelin, et al, 2007).

**Disability.** North Dakota had the lowest prevalence of disability among all states (NCCDPH, 2008). Disability is defined by the CDC as a limitation in any activities due to physical, mental or emotional problems. Since 2001, the prevalence of ND adults with a disability has remained relatively stable, ranging from 15%–18% (about one in six persons). Women in North Dakota are more likely than men to report having a disability (17.9% versus 15.5%). By race, American Indians (19%) are more likely than Caucasians (16.7%) and persons of other races (13.8%) to have a disability (Muus, 2008; Behavioral Risk Factor Surveillance System, 2001-06). Currently unknown about individuals with disabilities in North Dakota are their major impairments, associated health problems and obstacles to receiving needed health care. Additionally, there is little information about circumstances of school-age children with disabilities.

**Implications.** Addressing the state's most significant health issues includes investing in prevention-related activity, from education (e.g., proper diet and exercise) to wellness activities, to incentivizing healthful decisions. The sensitivity of chronic illness to healthful behaviors and the interest on the part of the public and opinion leaders in addressing health promotion and disease prevention strategies speaks to the importance of offering services and benefits that target fitness, encourage more work and community-based wellness programs and incentives, as well as encouraging businesses and insurers to engage in efforts that target wellness.

To evaluate effectiveness and encourage efficiency, tracking the impact of specific strategies to address the state's health problems is also important. Currently, the North Dakota Department of Health tracks about 20 categories associated with health status (e.g., decreasing the preventable cancer death rate) and health system factors (e.g., increasing the number of hospitals with trauma center designations). While this health indicator project corresponds with the Healthy North Dakota goal of changing and improving the health of North Dakotans, it was not designed specifically to evaluate the state's Healthy North Dakota initiative. The ND DoH is, however, developing a database designed to contribute to a better understanding of health status and system issues (Personal Communication, S. Pickard, February, 2009). Over time, additional efforts could target and track measurable outcomes associated with Healthy North Dakota as well as other initiatives across the state in order to better assess performance improvement and project impact. While this is a significant undertaking it is useful because it can drive efficiency and improved health status.

Additionally, 46 states currently collect statewide hospital discharge data. North Dakota is not one of them. As one of only four states in the country that doesn't collect this information, state officials, health care payers and providers, researchers and others are challenged to understand how persons with chronic and other diseases are using inpatient and outpatient hospital resources to receive needed health care. Initiating this data collection effort can have multiple benefits for the state. Specifically, it can help address the ever-increasing consumer

demand for hospital care information; promote transparency in health care delivery; inform health care planning efforts; facilitate a more equitable distribution of health resources by geographic region; gauge the health burden of various diseases and injuries; allow for measuring and monitoring hospital and emergency department utilization; calculate the cost of hospital care for specific individuals, populations and payers; assess quality of care and access to care for different patient groups (NAHDO, 2007); and support creation of and collaboration among prevention programs and policies (Injury Surveillance Workgroup, 2003).

At the highest level of analysis, the health status of North Dakotans is on par or slightly better than that of the nation as a whole. The age-adjusted death rate in North Dakota is lower than the U.S. average, and life expectancy is the third highest in the nation. North Dakota has a very low prevalence of disability, and North Dakotans self-report better health status than the national average.

However, there are conditions in which North Dakotans fare worse than those in other states. As an example, alcohol abuse (which is highly correlated to a number of disease processes, accidental injury, and violence) is a large problem in our state. Rates of recent alcohol use and binge drinking are some of the highest in the country for both adults and underage youth.

There is also evidence of decline in health status by some important measures. North Dakota has a rapidly increasing rate of obesity, which corresponds to increased diabetes, heart attack, stroke, and other morbid conditions.

Disparities in health status also exist among various populations. Disease burden is disproportionately high in minority and our most rural populations.

Beyond access to adequate health care services, one of the major opportunities for improvement of health status rests in our ability to positively influence health related behaviors, such as proper nutrition, physical activity, elimination of tobacco and substance abuse, motor vehicle safety, and immunization.

# Four

# Health Care in North Dakota

# Health Care in North Dakota

Characteristics of the health care system influence the health of North Dakotans. These characteristics include the types of health provider organizations, the quality of care delivered, access to health services and the costs of both providing and obtaining these services. This overview of selected features of health care delivery describes important dimensions of North Dakota health care including selected strengths and limitations and examples of opportunities for improving this essential infrastructure.

## Health Care Organization and Infrastructure

**Hospitals.** North Dakota has six tertiary-care hospitals located in the four largest cities (Bismarck, Fargo, Grand Forks, and Minot). The six hospitals serve the state as major providers of general and specialized services. In addition to the six urban hospitals, there are 39 hospitals in rural areas including two Indian Health Service hospitals located at Fort Yates and Belcourt. Each of the six hospitals has network relationships with a number of rural hospitals, clinics, and other provider groups.

Critical Access Hospitals (CAHs), the predominant category of hospitals in the state, are required by federal law to network with general acute-care hospitals for transfer agreements and other issues (see Figure 15). In addition, a number of CAHs have created networks with each other or with urban hospitals to address quality improvement, health information technology (HIT), shared service agreements, program development, and community and/or staff education. Most hospitals in North Dakota operate in an integrated delivery system with medical clinics.

North Dakota hospitals are aging. Many of them were built during the Hill-Burton era (a federal initiative following World War II) and are over 50 years old. These aging structures are also becoming outdated in

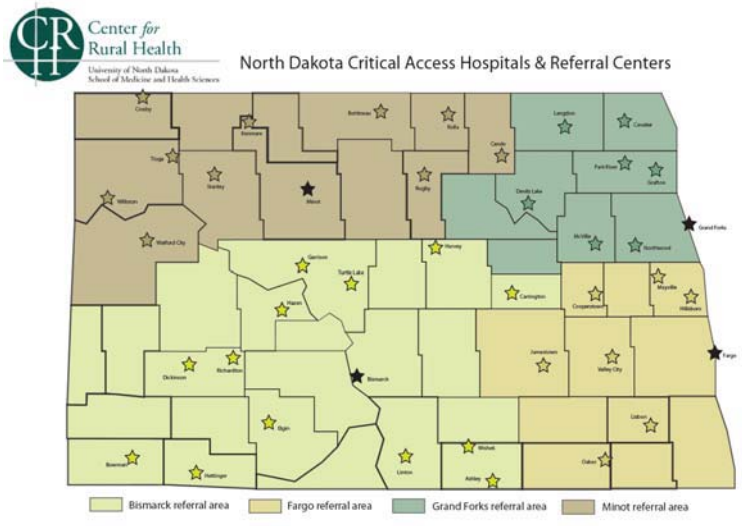



Figure 15. ND Critical Access Hospitals & Referral Centers
Source: *UND Center for Rural Health*

the midst of a changing health care system. Hospitals are faced with a choice of whether to replace entire structures, renovate, or expand existing facilities. A study of 10 rural hospitals across the nation found that renovations cost between $1 and $17 million and will likely result in increased physician referrals, market share, physician recruitment and retention, community satisfaction as well as improved operating margins (Rural Hospital Renovation & Expansion Study Group, 2008).

**Ambulatory Care.** There are approximately 305 ambulatory care centers, including those that provide primary and specialty care (see Figure 16). Approximately 65 of these are federally designated as Rural Health Clinics. There are also four Community Health Centers (CHC) operating in North Dakota. One is in Fargo and the other three are in rural areas. The state's rural based CHCs are somewhat unique in comparison to most states in that they operate through network arrangements in which each of the three manage clinics in two to four communities. To meet federal goals for patient volume, North Dakota rural CHCs provide access points in multiple communities to meet those volume thresholds. Local decisions such as these reflect the direct implication of population decline in rural areas on access to care and the arrangements necessary to meet those obligations.

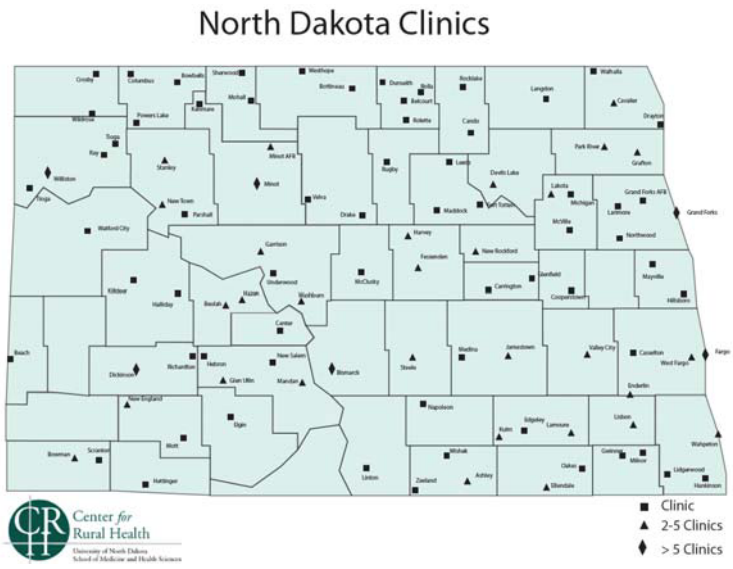



Figure 16. North Dakota Clinics
Source: *UND Center for Rural Health*

**Public Health.** Public health is an important and fundamental set of health services which has made significant contributions to improving the health status of most Americans, rural and urban. At the same time, it remains unheralded and misunderstood. A rural ND public health director once remarked, *"If I'm doing my job well you don't even know I'm here."* While acute care, long term care, primary care, and emergency care attract much of the spotlight garnering more public awareness and attention, public health throughout the 20th Century and now into the 21st Century has significantly changed the lives of millions of Americans. Some of the accomplishments associated with public health include, but are not limited to the following: development and widespread access to vaccinations, control of infectious disease (e.g., through emphasis on clean water and im-

proved sanitation), fluoridation of drinking water, provision of safer and healthier foods, access to family planning, increased motor vehicle safety, and tobacco control. Disease prevention and health promotion are highly associated with public health.

While each public health unit can organizationally determine its own mission and primary focus, there are some common services provided. All ND units provide the following: immunizations (for all ages), blood pressure screening (adults and school-age children), scoliosis screening (school-age children), vision screening (school-age children), high risk infant follow-up, and vitamin B-12 injections. In addition, most but not all units provide the following services: maternal and child health (e.g., home visits, Sudden Infant Death Syndrome follow-up visits, and child health services); health promotion (e.g., diabetes, foot care, and community wellness programs); communicable disease (e.g., tuberculosis and skin and scalp conditions); school health (e.g., hearing screenings and AIDS education); environmental health (e.g., public water system inspection, environmental sanitation services, and water pollution control); occupational health nurse activities; mental health; skilled nursing activities; and maternal and child health initiative grants.

Public health in North Dakota is provided through 28 single and multi-county local public health units. All 53 counties are covered through this arrangement. Availability of public health services, particularly through rural-based units, is increasingly challenged.

Access to public health services can be hampered by large geographic areas covered by single public health districts, particularly in the western part of the state. North Dakota's low income and aging populations rely disproportionately on public health services and yet, are most likely to have challenges obtaining services because of transportation and special needs. Simply put, limited public health staff and infrastructure can equate to limited public health services.

**Long-Term Care.** There are three primary types of long-term care (LTC) facilities in North Dakota: assisted living, basic care, and nursing. There are 62 assisted-living facilities, 39 of which are rural, 58 basic-care facilities in North Dakota (37 rural) and 83 nursing facilities (66 rural). The number of LTC beds in the state has been an issue for both the industry and policymakers. Allocation and distribution of each of these types of facilities involves important considerations given populations shifts and consumer preferences.

**Emergency Medical Services.** All of the state's 53 counties are served by at least one ambulance service. However, some ambulance response times in rural areas have increased because of closure of local services (e.g., Minnewaukan now covered by Devils Lake). There are pockets of North Dakota with ambulance response times of over 30 minutes. The implications for patient outcomes related to these changes are unknown. No research is underway to determine impact on EMS patient morbidity or mortality or to test strategies to deploy at least some services using telehealth technology. Evaluating the impact of redistribution of this front-line service should be a priority as EMS

should be reasonably available in terms of time to obtain care.

There are over 4,300 EMS personnel in the state (first responders, EMT-Basic, EMT- Intermediary, and EMT-Paramedic). This part of North Dakota's health care system relies very heavily on volunteers (approximately 3,900), particularly in rural areas. The ND Division of Emergency Medical Services and Trauma (DEMST) estimates that 90 to 95% of EMS personnel in ND are volunteers (compared to national rates of 57%–90%). In spite of overall growth in the number of EMTs, statewide there have been growing pockets of EMS workforce shortages particularly in more remote areas of the state.

There are 141 licensed ambulance services of which 119 are Basic Life Support (BLS) and 22 are Advanced Life Support (ALS). All urban ambulances in the state are ALS; however, only about eight rural ambulances provide ALS (ND Emergency service 2008).

**Trauma System.** Thirty-seven of North Dakota's 45 hospitals are designated trauma centers (see North Dakota Trauma Center Coverage Map). Since 2007, the ND Flex Program has made funds available to assist critical access hospitals to obtain a trauma designation. Four hospitals have applied for and received support, each anticipated to receive a trauma designation in 2009.

There are significant challenges facing North Dakota's trauma system, including fielding ongoing system-wide performance improvement efforts, developing a formal critical care transportation network (with combined ground and air medical resources), increasing the ability to generate statewide reports from the trauma registry, and improving access to data that could help to better understand and respond to basic injury problems.

**Oral Health.** Access to oral health care is problematic for millions of Americans due to a variety of factors, including financial barriers, transportation difficulties, long travel distances to care, and problems with navigating government assistance programs (American Dental Association, 2009).

Much of North Dakota is identified as a dental health shortage area (see the workforce section for more information). Persons without adequate access to preventive and acute dental care may ultimately seek more expensive and potentially less effective care in hospital emergency departments. In fact, a study of North Dakota emergency department (ED) utilization found that 1.1% of all ED visits pertained to oral health problems (Muus, Knudson & Poltavski, 2003). About two-thirds of these patients had no health insurance or had Medicaid coverage.

There is limited information about the status of dental health in North Dakota's population. However, commonly used measures are absence of all permanent teeth in individuals over age 65 and loss of one or more permanent teeth among adults aged 18 and older. Compared to the national average, a larger percentage of over age 65 North Dakotans have no permanent teeth (ND 23% versus national 19%) (NCCDPHP, 2008). In North Dakota, 44.4% of adults aged 18 and older had one or more teeth extracted in 2006. This figure is slightly higher than the national average of 43.9% (NCCDPHP, 2008).

**Mental Health.** North Dakotans tend to experience slightly higher rates of mental health problems than the national average. Mental illness can trigger an array of challenges, ranging from decreased work productivity to strained family relationships. Mental illness, while not uncommon, is often highly stigmatized, and consequently, individuals are frequently reticent to seek care, particularly when there is a perception that others will learn of their illness.

There are a number of important measures that illustrate the status of mental health in the ND population. While 11.3% of Americans 18 years of age and older experienced serious psychological distress over the past year, North Dakota is slightly higher at 11.6%. By comparison, Minnesota and South Dakota have a smaller percentage of their population reporting serious distress (11.3% and 10.7%, respectively) while Montana's rate is higher (12.5%). In terms of specific diagnoses, 7.5% of Americans 18 and older report at least one major depressive episode (2005–2006), while in North Dakota, the percentage of this population is slightly higher at 7.9%.

For all age cohorts, North Dakota had a higher percentage of citizens suffering a major depressive episode than found in Minnesota and South Dakota (U.S. DHHS, 2006).

The most serious outcome of mental illness is attempted suicide. Nationally, there are over 30,000 suicides each year, with two-thirds of suicidal deaths occurring on the first attempt (People Prevent Suicide, ND). In North Dakota, suicide was the 9th leading cause of death from 1999 to 2005, averaging about 80 suicidal deaths per year (Suicide Prevention Resource Center, ND). The Agency for Healthcare Research and Quality (AHRQ) ranked North Dakota 19th in 2007 with a rate of 11.2 suicidal deaths (per 10,000 population) compared to a national rate of 10.4 (AHRQ, ND).

In North Dakota, males account for 84% of suicides and individuals aged 20–29 have the highest suicide rate by age cohort (18% of ND suicides). Youth, aged 15–19, account for 14% of suicides, and people aged 70 and older account for 13% of suicides. In 2005, there were almost 300 hospitalizations for suicide attempts in North Dakota, with males accounting for about 70% and with people aged 20–29 generating the highest hospitalization rate (Suicide Prevention Resource Center, ND). Use of firearms to commit suicide was the leading method in North Dakota, followed by suffocation and poisoning.

The mental health system in North Dakota relies heavily upon the ND Department of Human Services' Division of Mental Health and Substance Abuse (DMHSA), which has public responsibility for mental health services. DMHSA functions as the "State Mental Health Authority," overseeing services delivered through eight regional human service centers and the North Dakota State Hospital in Jamestown. The human service centers provide crisis stabilization and resolution, inpatient services, psychiatric and medical management, social services, residential services and supports, vocational and educational services, and supportive employment. The state hospital provides physical, medical, psychological, and other services and is accredited and Medi-

care certified (North Dakota Department of Human Services, 2008).

Throughout the state there are 31 facilities or programs providing mental health services, including the eight regional human service centers. This includes both public and private organizations such as Prairie St. John's in Fargo and the Stadter Center in Grand Forks. Most provide multiple forms of care services. Eight provide both inpatient and outpatient services; seven supply residential services; six offer residential and outpatient services; four have outpatient services; four provide general mental health services; and two supply inpatient, outpatient, and recreational services (U.S. DHHS, ND).

**Pharmacy.** North Dakota has 236 pharmacies.; 49% are in rural communities and 51% are urban (defined as communities of 5,000 or more) (ND Pharmacy Association, 2009). Rural pharmacies, like other rural health providers, have felt the pressures of reimbursement and workforce shortages. Over the past 20 years, 26 rural pharmacies closed in North Dakota and a number of others were at risk of closing (McCarthy et al., 2008). Each year more pharmacists retire and, in some cases, are not replaced by new pharmacist-owners. This can contribute to access-to-care issues, particularly in rural areas as one pharmacy may serve an expanding geographic area. In response to increasing challenges with maintaining access to pharmacy services, a telepharmacy pilot project initiated in 2001, now a national model, has helped to maintain services at retail businesses, nursing homes and even hospitals across the state.

**Health Information Technology.** Health information technology (HIT) adoption across the nation has been particularly slow in rural and underserved areas (National Advisory Committee on Rural Health and Human Services, 2006). The state of North Dakota is no exception. In 2007, the North Dakota legislature created an unfunded HIT Steering Committee to steward and facilitate the adoption of HIT in the state. Since no recent information existed on the status of HIT uptake across North Dakota's health care facilities, the Center for Rural Health conducted an assessment. Findings indicate that there is significant HIT adoption across large provider organizations, with all six of the state's urban hospitals having some form of electronic medical records (EMR). However, only 14 of 37 rural hospitals have implemented some level of EMR, indicating an urban–rural digital divide (see Figure 17). The pace for rural adoption has slowed due in no small part to the significant cost considerations associated with EMR implementation.

Since 2005, only three rural hospitals had adopted electronic medical records, and this was due to financial resources made available through the federal Critical Access Hospital-HIT grant (Dickson, Nissen, & Rodriguez, 2008). Almost 80% of responding long-term care facilities indicated they do not have an EMR.

Development of HIT within the public health community is also slow. Electronic systems are used by public health to report to state and national agencies; however, they are not integrated, and 80% indicate they do not have an electronic client management system. A survey of clinics conducted by the ND Health Care

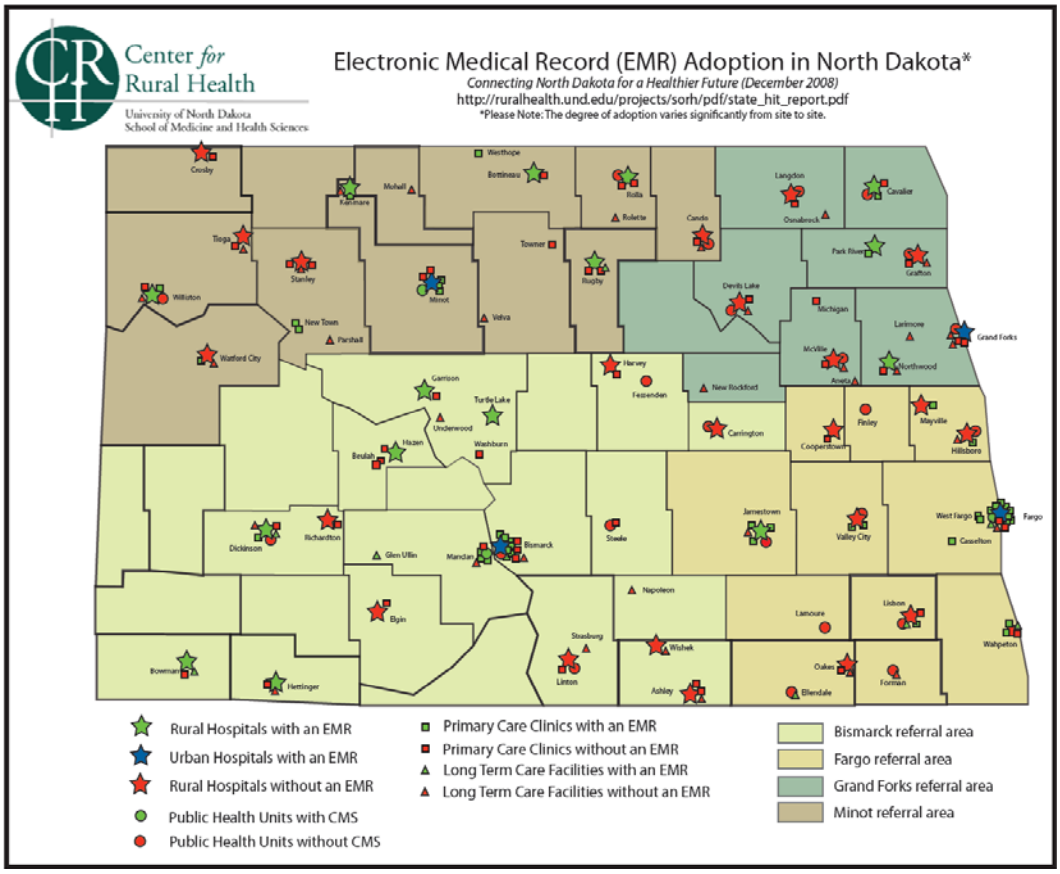



Figure 17. EMR Adoption in North Dakota
Source: *UND Center for Rural Health*

Quality Review, Inc. found similar results. Of the six largest health care systems, five are using EMRs in their clinics. Only two independent rural clinics (i.e., clinics not formally associated with an urban clinic or system) had EMRs (Kjos, 2008).

The link between HIT and quality is clearly recognized by ND providers who indicate that quality of health care and improved patient safety are two of the three top reasons for pursuing HIT applications. However, financial constraints (both up-front purchasing costs and reimbursement) present a major barrier to adopting HIT, according to survey respondents. For example, the approximate cost of EMRs for small hospitals can run as high as $850,000 to $1.2 million. For a clinic setting, EMR costs may range between $15,000 and $25,000 per physician.

In 2009, the Legislature established a Health Information Technology Advisory Committee (HITAC), appropriated money for the health information technology office, match for federal grants, established a loan funds and provided an appropriation for anticipated federal funds.

Also in 2009, Congress passed the American Recovery and Reinvestment Act of and it specifically included a section on Health Information Technology for Economic and Clinic Health (HITECH). The HITECH section of the act focused specifically on health information technology. Health IT will allow for comprehensive management of medical information and

its secure exchange between health care consumers and providers. Broad use of HIT has the potential to improve health care quality, prevent medical errors, increase the efficiency of care provision and reduce unnecessary health care costs, increase administrative efficiencies, decrease paperwork, expand access to affordable care, and improve population health.

The Information Technology Department (ITD), applied on behalf of the HITAC, for the HITECH State Health Information Exchange Cooperative Agreement Program funding. In March 2010, North Dakota was awarded a $5.343 million dollar cooperative agreement. The focus of the cooperative agreement is to establish a process for providers to share information between each other through a health information exchange. It is being implemented in two phases. Phase one includes the development of a strategic and operational plan, and Phase two will be the implementation of those plans.

The ONC has issued standards for electronic medical records and created a certification process for electronic medical records to coincide with the Center for Medicare and Medicaid Services meaningful use incentive program. This program encourages eligible professionals and hospitals to begin using electronic medical records in a meaningful way by providing an incentive to them initially. However, if they do not use electronic medical records in a meaningful way by 2015, the payment they receive through the Medicare program will be decreased.

The 2009 Legislature provided $5 million dollars for a low interest revolving loan fund to assist providers acquire certified electronic medical record systems. A loan application process was developed and released. It consisted of three stages, the initial application, on-site readiness assessment and a final Bank of North Dakota loan application. Fourteen providers completed an initial application with loan requests of $7.2 Million and the HITAC committee selected twelve providers, totaling $5 million, to move on to stage two and three.

## Quality of HealthCare

*"Policymakers considering the future for U.S. health care may take a cue from well-functioning rural health care systems such as those described in North Dakota, where providers regularly collaborate to improve services for patients and achieve outcomes that are often superior to the current high-cost systems elsewhere (McCarthy et al., Commonwealth Fund, 2008)."*

Changes are underway across the nation to drive improvement in health care quality through (1) revamping payment policy for health care services, (2) public reporting of health care provider performance, and (3) redesigning the organization and delivery of health care services. Increasingly, both public and private payers (e.g., Medicare, large business coalitions, and insurance companies) are linking payment to publicly reported performance on sets of quality care measures.

Two perspectives merit consideration in terms of quality of care in North Dakota. First, how does North Dakota perform as a state compared to other states and to the nation as a whole? Second, are there differences in performance across ND fa-

cilities? There are measures of care quality where other states' performances exceed North Dakota's and, consequently, where opportunities to improve care quality exist. However, North Dakota, in general, tends to rank high in care quality and low in costs paid by both public and private payers alike. High quality and low cost health care tends to be associated with the availability of primary care services (Starfield, Shi, and Macinko, 2005). Compared to other states, North Dakota has a higher proportion of primary care providers.

In response to the second question, while North Dakota compares favorably to other states, there is variability in the quality of care provided across North Dakota, most often related to urban versus rural care (urban in this case defined as counties where large acute care hospitals are located—Ward, Cass, Burleigh, Grand Forks counties). Variation in care quality provides opportunity to improve care that consumers receive. Improvement, however, requires a commitment of resources, including technical assistance and information.

There are a number of public and private sector sources that issue performance data for use by consumers, health care providers, payers, policymakers, and others. For example, the federal Agency for Health Care Research and Quality (AHRQ) is required by law to produce an annual report on care quality (AHRQ, 2010). The report details how North Dakota does on a set of health care quality measures. As the dashboard indicator shows, compared to all states for 2007, quality performance for North Dakota, summarized across about 100 measures, is in the strong range, with no individual measures below average (Figure 18).

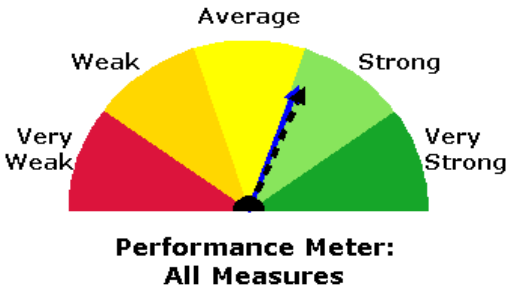



Figure 18. North Dakota dashboard on health care quality compared to all states
Source: *AHRQ, 2010*

Despite challenges, based on available data, the state's health care systems perform better than many others in providing consumers with relatively high-quality and efficient health care services. Nevertheless, within the state, there are clear opportunities for quality improvement. Enhancing networking and communication, and sustaining and strengthening primary care are pivotal to quality health care in the state.

## Access to Health Care

Problems with access to health care are generally associated with lack of health insurance coverage, lack of available providers, and geographic distance to obtain care. Delays in accessing care are driven by various factors, including transportation, cost, and insurance barriers. For example, affordability of prescription drugs is problematic for segments of the population. Unmet health care needs and delays in seeking care are associated with increased emergency room use, longer hospital stays, poorer health outcomes, and shorter life spans (IOM, 2003; IOM, 2009).

Historically, North Dakota has been concerned with citizen access to affordable health care (Baird, 2006a). For example, in 1995 the state legislature expanded the Medicaid program, which included extending coverage for dependents up to age 22, or age 26 for full-time students. In 2003, the North Dakota Department of Health was awarded a federally funded State Planning Grant (SPG) to conduct a study of the uninsured and to provide technical assistance to state policymakers to help identify options for expanding health insurance coverage. The study identified an uninsured prevalence of 8.2% (Knudson et al., 2005; Baird, 2006), which translates to approximately 51,920 people, or about the population of Bismarck. The SPG-funded study found important differences in insurance coverage by location, age, race, and size of employer (discussed below). This information can be useful for more efficiently targeting policy and program strategies to particular groups.

In terms of geographic location, 44% of the uninsured reside in very rural areas, 36% reside in the four urban communities, and about 20% live in large rural towns. In terms of specific age groups, young adults (ages 18–24) have the highest percentage of uninsured (15.9%; Baird, 2006a), and 8.1% of children under the age of 18 do not have coverage. Many of these children may be eligible for public programs (Knudson et al., 2005), and efforts have been made in North Dakota to streamline related application processes.

Recent efforts have increased the number of children enrolled in the Medicaid and Healthy Steps, North Dakota's State Children's Health Insurance Program. Children of the working poor who do not qualify for Medicaid or SCHIP can participate in the Caring Program for Children, a program of the North Dakota Caring Foundation to help these children receive health, dental, and mental health care (a limited primary health care insurance plan). The Caring for Children program is sponsored by different entities, including Dakota Medical Foundation and Blue Cross Blue Shield of North Dakota, and it is partnering with the United Way agencies. Since its inception in 1989, the program has provided free benefits to more than 4,500 children.

In terms of insurance rates by race, North Dakota's American Indian population has a very high rate of uninsurance (32%), almost five times the percentage of Caucasians (6.9%; Knudson, et al., 2005; Baird, 2006b). Contrary to commonly held opinion, the Indian Health Service (IHS) is not a health insurance program, and while health services are available through IHS, they are driven by a budget that is not sufficient to meet health care needs. In North Dakota, there are American Indians who meet eligibility criteria for public programs (e.g., Medicaid) but who are not enrolled. As with other segments of the uninsured population, outreach enrollment efforts are particularly important.

Regarding employment status, 72% of uninsured adults in the state are employed and a majority work in businesses with fewer than 11 employees. Overall, 64% of employers in the state offer health insurance coverage to their employees (Muus et al., 2005). The larger the employer, the more likely they are to offer

insurance, with 94% of businesses with 50 or more employees offering insurance compared to 55% of businesses with fewer than 11 employees. The most common reasons cited by employers as to why they do not offer insurance are that premiums are too high or that employees are covered elsewhere. However, North Dakota's average cost for insurance is among the lowest in the United States (Muus et al., 2005; Baird, 2006a).

North Dakota's workers' compensation insurance premiums has ranked among the lowest in the country (North Dakota Workforce Safety and Insurance, 2008). North Dakota's premium rate of $1.08 per hundred dollars of payroll compares to the national median of $2.26. Health insurance costs, for employer sponsored plans, are lower in North Dakota for both individual and family plans when compared to the national rates.

North Dakota's health delivery system comprises a diverse set of public and private mechanisms, including hospitals, ambulatory clinics, public health entities, and long-term care organizations. Overall, North Dakota's health care is characterized as being lower cost and generally higher quality than most states.

# Five

# Recommendations

# Healthcare Planning for North Dakota

The foregoing analysis leads to the inevitable conclusion that there is going to be an increasingly large gap between the demand for healthcare services (which will grow substantially over the next 15 years) and the supply of physicians and other healthcare providers. To bridge this gap, we propose a four-pronged approach to ensure effective, efficient, timely, and affordable healthcare for all North Dakotans:

- Reduction of disease burden, thus reducing the demand for healthcare services and the related costs
- Augmentation of the physician and other healthcare provider workforce through increased retention of graduates
- Augmentation of the physician and other healthcare provider workforce by increasing the medical, health science student, and resident class size
- Improvement of the healthcare delivery system in North Dakota

This combination of reduced demand and increased supply of healthcare resources, along with necessary improvements in the healthcare delivery system, should bring the demand/supply equation into better balance over the next 15 years. It is important to emphasize that, in our considered opinion, it is only by the combination of all four approaches is ultimate success likely. Relying on only one or two of the four proposed initiatives is unlikely to achieve the degree of success that will be required to meet the coming challenges.

## Reduced disease burden

It is axiomatic to say that the best way to treat disease is to prevent it in the first place. Although simple in concept, disease prevention has proven to be much more difficult to achieve in practice. Nevertheless, we believe that there are several concrete steps which can be taken to begin the process of further disease prevention and reduction. These include strategies to reduce chronic and acute disease by:

- Positively impacting the health-related behaviors of North Dakotans,
- Establishing a Master in Public Health program, and
- Instituting a Geriatrics training program.

**Health Related Behaviors.** Many of the most serious health problems affecting North Dakotans (and all Americans) are caused, or at least made worse, by the personal choices we make about eating, smoking, physical activity, and other self-care (Robert Wood Johnson Foundation, 2009). In fact, these health-related behaviors account for nearly 40% of all deaths in the United States (IOM, 2009).

As an example, chronic diseases such as heart disease, Type II diabetes, and cancer are among the most common and costly health problems. However, they are also among the most preventable, because they share as a common contributing cause our health-related behaviors. One of the best ways to "cure" these widespread diseases is to improve health literacy and the choices people make that affect their health.

The potential impact is huge. The U.S. Center for Disease Control (CDC) estimates that if tobacco use, poor diet, and physical inactivity were eliminated in the U.S., it would prevent 80%of heart disease and stroke, 80% of Type 2 diabetes, and 40% of cancer (CDC, 2008).

Here in North Dakota, there is good evidence that we can improve health-related behaviors through public education and collaboration. Through the combined effort of many agencies and individuals, the percentage of North Dakota youth who currently smoke cigarettes significantly, decreased from 40.6% in 1999 to 22.1% in 2005 (ND Dept of Health, 2007).

Successful improvement of health-related behaviors can avoid not only an enormous toll of suffering and death, it can be accomplished at far less expense than treating the diseases it prevents (RWJ, 2009).

Based on the foregoing factors, we conclude and recommend that public education and other efforts to positively impact the health-related behaviors of all North Dakotans be set as a high priority, to secure the healthy future of our citizens. Further, that public and private agencies and citizens groups be encouraged to form collaborative efforts to attack these issues.

**Master in Public Health (M.P.H.) program.** One of the most practical approaches to improve health education and other public health initiatives in our state is to prepare our health professionals to undertake these roles as they enter practice in our communities. Specifically, having individuals with graduate training in public health (Master in Public Health) can augment capacity and reduce disease burden.

There is not currently another M.P.H. program offered on site in North Dakota by a North Dakota University System institution. The only program that exists is offered online by the University of Minnesota, and thus is not a preferred option for most North Dakota residents. Each of the four-year degree granting institutions in the NDUS offer one or more related undergraduate degrees (including business, human development, agricultural sciences and/or education, nursing and pre-medicine) that would allow students to use the M.P.H. program as point of entry to the field of public health.

There is an established need and demand for more North Dakota practitioners to be trained in public health as determined in a survey by Dr. Terry Dwelle of the North Dakota Department of Health. The training needs to be practical and delivered in both modular and distance formats to meet the needs of these potential students. Dr. Mary Wakefield, former Director of the Center for Rural Health, has stressed the need for better training in health management and policy issues for hospital and clinic administrators in North

Dakota. The proposed curriculum meets these ends, and thus fills an important educational gap in the State.

The University of North Dakota and North Dakota State University have partnered to create a graduate-level program in public health that is truly cooperative and integrated. Under the proposed plan, each university would admit its own students, and graduate its own students. But both universities would ensure that their admission standards and polices were complementary, and each university would have a representative on the other university's admission committee. Each university would recognize relevant coursework performed at the other university. The first "half" of the program, comprising some 22 credits and termed the "core courses", would be taught jointly by the two universities, with half the courses taught at one university, and half at the other. There would be no substantial duplication of course offerings, the guiding principle being that the universities would select the strongest candidate core courses for enrollment by all students. The second "half" of the program, comprising some 21 credits and termed the "specialization courses or tracts," would be offered at both universities, with each university offering unique specialization areas that emphasized and reflected their particular areas of programmatic strength (e.g., pharmacy delivery for NDSU and rural health care delivery for UND). Since these specialization tracks are based on discipline specific courses unique to each institution, there is no duplication of courses being taught in the specialization tracks. Students at either university could select any specialization tract, regardless of where they were enrolled. Many if not most of the courses will be offered online, so that most students would not be required to commute extensively between the two universities, although it is likely that some degree of travel will be involved.

Both institutions performed independent market surveys of the total course-specific costs that a potential M.P.H. student might experience to establish what a competitive cost might be. In reviewing the range of costs, the universities jointly determined that a per credit hour cost of $600 was both competitive from a market standpoint, as well as viable from the institutions' standpoints (assuming that the requested additional allocated dollars are forthcoming). In discussions with the leadership at NDSU, UND, and the NDUS, the universities determined that the optimal cost structure is in the form of a differential tuition. If the differential tuition is approved, the total cost to the student for the M.P.H. degree will be $25,800 (i.e., $600*43 credit hours), an amount that is competitive in the marketplace. Since North Dakota has several accredited health professions programs in the State, and since North Dakota does not have its own school of public health, the demand for a Master of Public Health degree should be quite good. According to the American Public Health Association, the public health workforce is currently (and in the future) suffering severe shortages. The number of public health workers declined to 158 workers per 100,000 population in 2000 compared to 220 workers per 100,000 in 1980. Within the next few years, state and federal public health agencies could lose up to half of their

workforce to retirement, the private sector, and other opportunities. The salary ranges for Master of Public Health degree employees range between $40,000 and $80,000. Physicians, nurses, pharmacists with MPH degrees would have even higher salaries. The enrollment projections for both institutions are: Year 1 - 20 students; Year 2 - 25 students; and Year 3 - 30 students.

An essential and necessary component of the proposed program is the need for additional appropriated dollars. Only UND and the School of Medicine and Health Sciences have a State Board of Higher Education-approved budget request for additional appropriated funds to be considered in the upcoming legislative session ($1,215,219 included in SMHS request). In an effort to demonstrate both the importance of the appropriated funds, and especially to show just how integrated the approach is, the two universities are proposing that any new appropriated funds awarded to the UND/SMHS for the upcoming biennium be equally shared by the two institutions (i.e., UND and NDSU). The conceptual foundation is clear: a joint and cooperative program needs to be just that—joint and cooperative. In addition to the differential tuition and request for new appropriated funds, both institutions are providing a reallocation of resources to show their commitment to the program. Assuming that the appropriated support is forthcoming this biennium, both institutions plan to begin recruiting students and faculty to begin implementation of the program during the 2012 Fall Semester.

**Geriatrics training program.** Additional faculty and staff positions are requested in geriatrics. As has been outlined above, the population of North Dakota is going to age markedly in the next decade. To provide for this increasingly elderly population, it will essential to greatly expand training in the field of geriatrics. An initiative to develop a geriatrics program has been spearheaded by the SMHS. An extraordinarily generous bequest from the late Eva Gilbertson has provided over five million dollars to the SMHS to initiate a Geriatrics Training and Care Center that will be centered at MeritCare in Fargo, but will be available to train the health care workers of the State. To develop this program, two additional full-time faculty members are requested from new appropriated dollars.

## Increased retention of graduates

As outlined previously in this report, there are a variety of interventions that are likely to increase the retention of graduating physicians within the state. These include:

- Revise and refine the admission process to select students most likely to remain within the state to practice
- Revise the curriculum to ensure optimal exposure to primary care experiences, and to provide increased longitudinal clinical experiences in rural communities
- Reduce debt burden through the RuralMed program, where the four year tuition costs are defrayed if the physician agrees to practice family

medicine in a rural area of North Dakota for five years

- Partner with physicians and health care systems to optimize and enhance mentoring and affinity relationships

We believe that the proposed additional interventions, in addition to what is already being done, should result in the following deliverables that should be demonstrable beginning with the medical school class that is to enter the SMHS this coming summer (2011):

- An increase in the retention of medical school graduates from the current level of 31% up to a benchmark level of 40%, which is *above* the median retention rate for medical schools in United States
- An increase in the retention of medical school graduates who also complete residency in North Dakota from the current level of 61% up to a benchmark level of 70%, which is *above* the median retention rate for residencies the United States

Increased retention alone would add five more physicians from the medical school class and three more physicians from the residency graduating class each year, beginning in 2015 (the year the entering class graduates). Over the subsequent 10 years (.i.e., until the target date of 2025), **increased retention efforts would thus add about 80 additional physicians to North Dakota's workforce, or almost 40% of the shortfall.**

## Increased class size

Increased retention efforts are a necessary but not sufficient approach to meeting the workforce shortage. Accordingly, we believe that an essential component of meeting the healthcare workforce needs of North Dakota is an expansion of class size, or, to use the vernacular expression, "widening the pipeline". The Association of American Medical Colleges has called for an increase in US medical school class size by 30%. An increase in medical student class size by roughly that magnitude should ensure an adequate physician workforce for North Dakota, when coupled with the increased retention efforts outlined above.

Because the SMHS has pioneered a small group learning concept that revolves around teaching groups of eight students, we are proposing an increase in class size of 16 students (i.e., two additional groups of eight students each), or a 29% increase. The SMHS would admit the first expanded class in the summer of 2012, since the School would need the 2011-2012 academic year to flex up to be able to handle the additional students. The first class would therefore graduate in 2016, and would finish residency training no earlier than 2019.

An important consideration regarding the additional students will be their selection. **Because of the critical need for primary care providers for the rural areas of North Dakota, the SMHS will limit offers of admission to the 16 additional students most likely to pursue a rural primary care career.** As has been discussed, there are no absolute predictors of this, but the School will use the best available data and expert opinion in the selection process. At present, the most reliable predictors include a rural background, prior exposure and commitment to rural

medicine, and lower income level of the student's family.

Two important questions need to be addressed before class expansion is entertained. First, can the School find 16 truly qualified additional candidates to accept without diluting the excellent caliber of students already enrolled? And can the School provide an optimal educational experience for an expanded class size?

The SMHS is confident that the answer to both questions is an enthusiastic "yes". The School currently has more than five applicants for every available slot, which is well above the national average of about three to one. In reviewing the list of alternate medical school applicants from prior years who were acceptable for admission but were unable to be accepted due to the lack of available slots, the SMHS is confident that an additional 16 students could be accepted without a deleterious effect on the quality of the student class. Similarly, the SMHS is actively exploring novel educational approaches to enhance the student learning experience for an expanded class size without jeopardizing the quality of the clinical experience. By utilizing new pedagogical methods such as the use of what are termed "longitudinal clerkships" as well as the use of previously untapped clinical sites, the School believes that an outstanding educational experience will be available for an expanded class size.

But simply increasing the medical student class size is likely to be insufficient to meet the needs of North Dakota unless additional residency slots are available in the state for post-graduate training. The optimal retention of physicians occurs when the students go to school and enter residency within the same state; in those cases, about two out of three students remain in-state. Simply increasing class size will result in about one out of three physicians remaining in-state for ultimate practice. **Accordingly, we propose the addition of 17 new residency slots to offer to the larger medical school class cohort.**

Two criteria would be used to determine the specifics of the residency designations (i.e., type and location of specialty training): first, what residencies best support the healthcare needs of North Dakotans; and second, what residencies would be most attractive to the SMHS's graduating medical students?

Assuming that the medical school and residency class sizes are increased as proposed, what would be the return for the state of North Dakota? Because we propose using stringent admission criteria for the additional slots and will deploy range of efforts at retention, we are committing to a predicted retention rate of 75% for the additional students (which is a leading benchmark nationwide). Thus, we anticipate that 12 of the 16 additional students will remain within North Dakota to practice medicine. However, the first students will not emerge from residency until 2019. Thus, by 2025, seven cohorts of 12 physicians should be practicing in North Dakota, or a total of 84. **These additional physicians will further narrow the physician shortfall by 40%.**

Thus, increased retention will provide about 40% of the physician shortfall, and increased class size will provide another 40%. The remaining 20% (or 46 physi-

cians) will be recruited as new physician faculty members who will help teach the expanded student and resident classes. Table 5 summarizes the way the physician shortfall will be mitigated.

The workforce shortage will not be limited to physicians. Accordingly, we are proposing an analogous increase of 30 students per year (or an increase of about 15%) for the health science students trained by the SMHS. Why 15% for the health science students and 29% for the medical students? Because most surveys have suggested that the heath science shortfall may be more modest than the physician shortfall, since some of the health science programs around the country have already ramped up their class size.

**Table 5. Elimination of Physician Shortfall**

| **Method of Physician Recruitment** | **Number** | **Percent of shortfall** |
|---|---|---|
| Enhanced retention | 80 | 40% |
| Increased medical student and resident class size | 84 | 40% |
| Additional physician faculty members hired by the SMHS as clinical teachers | 46 | 20% |
| **TOTAL** | **210** | **100%** |

## Improvement in the health care delivery system

Although beyond the scope of this report and the authority of the SMHS Advisory Council, we nevertheless believe that additional improvements in North Dakota's healthcare delivery system are necessary and important. Notwithstanding antitrust issues, it will be important for the "Big 6" as well as the critical access hospitals to develop a more integrated and seamless approach that emphasizes cooperation and coordination rather than competition and market share.

**Additionally, especially given the unique and difficult challenges of depopulation and low population density, alternative healthcare delivery models, including enhanced use of non-physician providers, telemedicine, home care, and medical homes, need to be explored.** Although the future of the Affordable Care Act is unclear, the bill does offer support for some of these approaches, which may work to the advantage of North Dakota and its citizens.

## Recommendations for meeting healthcare and workforce needs

The UND School of Medicine and Health Sciences has widely vetted the proposed workforce plan. The plan has been fully endorsed by the President of the University of North Dakota, the State Board of Higher Education and the School of Medicine and Health Sciences Advisory Council. The workforce plan has five operating budget components, and a single capital budget component. The capital budget item is for a new building to be constructed on the Grand Forks campus; it is essential to house the additional students, faculty, and staff associated with the increased class sizes. Figure 19 depicts the proposed 132,000 sq. ft., four-story addition to


Figure 19. Proposed Health Sciences building to be located to the south of the current SMHS main building, attached via the south entrance portico

the SMHS. The addition of the building would allow the consolidation of the Health Sciences components of the SMHS into one location, while also providing space for the additional 200+ individuals (students, faculty, and staff) associated with the expansion. Currently, the Occupational Therapy and Sports Medicine programs are located on the UND campus, but apart from the SMHS complex. The Clinical Lab Science, Physician Assistant and Physical Therapy programs are landlocked within the SMHS complex, with no room for expansion. The new Health Sciences facility will allow for the relocation of all Health Sciences departments into the new facility. These relocations will also allow the SMHS to reconfigure the space within the SMHS complex to allow for the increase in medical student enrollments. The costs associated with the new building include the following components: new construction $25,000,000; Landscaping and Paving $380,000; Furniture, fixtures, and equipment $1,600,000; Moving Expenses $75,000; Facility Personnel Expenses $35,000; and Fees $1,800,000.

Because student enrollment will grow over several years, and because different programs have different durations, the cost of the program is spread over three biennial budgets. The incremental operating costs for the next three biennia are as follows: 2011-2013 - $5.8 million; 2013-2015 - $ 14.9 million; and 2015-2017 - $7.1 million. Enrollment stabilizes during the third biennium, and no incremental costs are incurred after the third (i.e., 2015-2017) biennium. For the 2011-2013 biennium, the following components outlined in Table 6 have been recommended and endorsed by the State Board of Higher Education and the School of Medicine and Health Sciences Advisory Council:

**Table 6. 2011-2013 Budget Request for Approved Healthcare Workforce Plan**

| **Item** | **Cost** |
|---|---|
| Master in Public Health Program | $1,215,219 |
| Geriatrics Training Program | $1,151,810 |
| 16 additional medical students | $857,600 |
| 30 additional health science students | $402,000 |
| 17 resident positions | $2,170,806 |
| **Total increase in operating base funding** | **$5,797,435** |
| ***New building (capital item)*** | ***$28,890,000*** |

## Economic impact

In addition to the obvious benefits to the health of the North Dakota population, the expansion of the classes will have an important positive economic impact on the state. Currently, the SMHS generates $2.61 for every $1.00 of appropriated funds that it receives. The additional revenue is composed of $0.62 as a result of tuition, $1.00 in grants and contracts (usually federal funds), and $0.99 in ancillary income, such as from physician practice plans, contributions from the federal government to fund certain residency training costs, etc. **Currently, the SMHS generates over $100 million biannually in additional revenue that would be lost to the state's economy if the School did not exist.** The School predicts that with the expansion of the class size, the incremental economic impact would be about three quarters of the current return, or greater than a $2 return for every appropriated dollar invested. **Thus, over the course of the three next biennia, the SMHS estimates that it will generate over $90 million biannually in incremental direct economic activity for the state. And the total direct economic impact of the SMHS over the next three biennia will exceed $400 million.**

Because much of the budget will be allocated to cover clinical training, a substantial portion of the appropriated and ancillary funds will be expended in other than Grand Forks. Table 7 outlines the expected distribution of the additional requested appropriated dollars in the four corners of the state.

**Revised workforce plan.** In December, 2010, North Dakota Governor Jack Dalrymple announced his budget recommendations for the coming biennium. The Executive Budget recommended full funding for the M.P.H. program and the geriatrics training program. However, no funding was recommended for any expansion of class size, or for capital funding for the new building. Discussions ensued between the leadership of the SMHS, the President of UND, the Chair of the SMHS Advisory Council, and the Chancellor of the North Dakota University System. While grateful for the recommended funding of the two programs, it was the consensus of the group that waiting for the next biennium to begin anew the request for class size expansion was not

**Table 7. Anticipated Distribution of Additional Appropriated Funds as a Consequence of Expansion of Class Sizes**

| Region of North Dakota | Incremental Funds |
|---|---|
| Northeast quadrant | $1,900,000 |
| Southeast quadrant | $1,900,000 |
| Southwest quadrant | $1,150,000 |
| Northwest quadrant | $847,435 |

advisable for two important reasons: first, every year delay in class expansion makes the shortfall worse; and second, it will take at least a year to achieve the necessary approvals from regulatory bodies to initiate the class size expansion. Thus, it was felt to be critical to initiate the expansion of the class this coming biennium, if only so that funding would be available to pursue the regulatory endorsements required to expand the various class sizes. Accordingly, a revised workforce plan was expeditiously developed by the SMHS. The plan was endorsed by the President of UND, the Chair of the SMHS Advisory Council, the Chancellor of the North Dakota University System, and subsequently by the full State Board of Higher Education.

The revised plan has three phases:

- Initiate (2011)
- Study (2012-2013)
- Build (2013-2015)

The **Initiate phase** begins the expansion of the class sizes. It is based on an expansion of class size absent the availability of a new building. Because space at the SMHS is already at a premium, it would entail shoehorning additional people into already tight space. Nevertheless, the tradeoffs make it worthwhile. **The updated plan calls for 8 additional medical students/year, 15 additional health science students, and 9 new residency slots at a cost of $1,779,050 in this coming biennium.** The 9 new residency slots would be in specialty areas that support the healthcare needs of North Dakota, and would be attractive to the School's graduating senior medical students. Proposed slots would be utilized for novel combined training programs, including Family Medicine/Surgery, Family Medicine/Psychiatry, Family Medicine/ Preventive Medicine, Family Medicine/Public Health, and Family Medicine/OB-GYN. The extant Family Medicine residencies are federally funded through the three years of required experience. The 9 additional requested slots would be used for the one or more years of supplemental training in surgery, psychiatry, preventive medicine, public health, and OB-GYN that would prepare the residents for the unique challenges of practice in rural North Dakota. This innovative idea could well become a leader in preparing rural family medicine physicians. The residents would not become fully trained as a surgeon or a psychiatrist; they would simply acquire additional skills and knowledge that would allow them to confidently handle a wider array of clinical problems than currently.

The **Study phase** would petition the Legislature to commission an interim study, in conjunction with the SMHS Advisory Council, to study further the proposal to continue the class size increase, and the need for a new building. The Interim Committee would need to have broad representation, especially from the western/rural parts of the state.

The **Build phase** would be dependent on having this coming session's Legislature commit its intention to a new building next biennium (i.e., 2013-2015) if the Interim Committee supports further growth in class size and the need for a new building.

However, should the Legislature, after reviewing the results of the Interim

Committee Study, decide to downsize back to the current class size and terminate the residencies, the total cost would be limited to $6,036,905 ($1,779,050 in 2011-13, $3,775,145 in 2013-15, and $482,709 in 2015-2017). Eight additional medical students, 15 additional health science students, and 9 additional residents will have been trained in the process, however.

A healthcare plan for North Dakota has been developed, vetted, and approved by multiple stakeholders. The plan calls for reducing disease through the initiation of a master of public health program as a combined undertaking by UND and NDSU, and a geriatrics training program. The plan also provides for an expanded workforce through greater retention of graduates and an expansion of the medical school, health sciences, and residency classes. To accommodate the attendant growth, a new building is also required.

A revised plan was subsequently developed that begins the class size expansion as planned, but at about half the size. The plan includes an expanded study phase, and delays implementation of the planned class size expansion for the two years required for the interim study to be completed and the findings reported back to the Interim Committee of the State Legislature.

# Six

# Appendix A

# Appendix A

## K-16 Pipeline Activities Provided through the ND Area Health Education Center (AHEC), the UND Center for Rural Health (CRH), and Other Entities

| Activity | Description | Age | Numbers of Students |
|---|---|---|---|
| AHEC: CAME (Community Assistance for Medical Education) Grants | Northern Lights SADD program traveled around North Dakota and the Midwest, presenting "Pack It Up," a tobacco education program led by youth | 14-18 | Not available |
| Health Career Fairs - Discussions | NDSU Career Fair | 15-30 | 175 |
| | Fargo Career Expo | 14-17 | 2500 |
| | Mayville State Career Fair | 16-18 | 150 |
| | Health Care Career discussion at North Valley CTC | 16-18 | 15 |
| | Health Care Career Discussion at North Valley CTC | 16-18 | 30 |
| | Health Care Career Discussions at Four Winds Community School | 14-19 | 140 |
| | Jamestown Health Technology & Trades Career Fair | 15 | 1200 |
| | Health, Tech & Trades Career Expo at NDSU Career expo | 14-15 | 275 |
| | Mayville State Stem Career Fair | 17-18 | 150 |
| AHEC: HIPAA training/job shadowing | HIPAA training has been implemented through collaboration with Minot's Trinity Hospital, North Dakota Career & Technical Education, and North Dakota AHEC. This initiative began to assist health careers instructors across the state place high school students in job shadowing opportunities. | 16-18 | 129 |
| CRH: HIPAA training | HIPAA training is available at no charge to students and educators through a collaboration with the Center for Rural Health and The UND School of Medicine & Health Science. HIPAA | | |

| | | | |
|---|---|---|---|
| | requires all personal health information (PHI) be kept private and secure by all persons that handle, or have access to, that information. Since many health care program students, faculty, instructors, and staff use PHI as part of the educational process (i.e. students in the clinical setting, job shadowing, Scrubs Camps, use of case studies, etc...), these individuals must be trained on the specifics of HIPAA compliance. | | |
| CRH: HIPE Week Health in Partnership in Education) | Distribution of health care information to teachers, counselors, principals, health facilities statewide | 5-17 | Not applicable |
| AHEC: HOPE Grants (Health Occupations Partnering with Education) | "You Can be a Life Saver", awarded to Hillsboro Medical Center, provided 8 hours of First Aid and CPR training for eight 6th, 7th & 8th graders at Hillsboro Public School. | 11-13 | 8 |
| | Langdon Area Schools provided a learning opportunity for 62 students in the 7th and 8th grade by presenting "Hands on Health Careers Fair". | 12-13 | 62 |
| | Students were introduced to a variety of health. Munich Public Schools and Langdon EMS provided CRP training to 32 7th-11th grade students. | 12-17 | 32 |
| | "Inspector Wellness & the Case of the Many Medical Careers" presented by First Care Health Center in Park River. Students learned about medical careers, participated in hands-on medical tests, procedures and activities, and took an ambulance ride. The students also participated in a Medical Field Trip to First Care Health Center in Park River where they and "Inspector Wellness" helped solve the "Case of the Many Medical Careers". | 10-11 | 117 |
| | The Scranton Scrubs Camp (CRH and AHEC) used their HOPE Grant award to incorporate a patient simulator into the student's health care experience. | 10,13,15 | 256 |

| | | | |
|---|---|---|---|
| AHEC: INMED summer institute | AHEC helped to develop a wellness program in conjunction with the Summer Institute. Students learned about healthy lifestyles and team work by participating in sports activities, exercise programs and nutrition programs. | 11-18 | 68 |
| CRH: In-A-Box (Bones & Muscles, Brain, Eye, Ear, Guts) Loan Program | The In-A-Box program provides current health and science activities to students in grades 4-12, to inspire them about the possibilities of a career in health care. In-A-Box allows students to explore aspects of scientific careers, the body, and the environment through these self-contained "Exploration in Science and Health" kits. Five boxes with educational materials, focusing on different body parts, are available for loan to North Dakota educators and health facilities and for special programs or for classroom use (Scrubs Camps, career fairs, etc.). | | |
| AHEC: Nursing Co-op students | AHEC provided grants to communities in Mayville, Aneta, Grafton, East Grand Forks (Head Start), Bowman to place nursing students on summer rotations. | 18-24 | 5 |
| AHEC/UNDSMHS: Science Day | Distributed highlighters to the students | 9-10 | 203 |
| Rural-Collaborative in Occupational Learning(R-COOL) Health Scrubs Camps | A new program of the Center for Rural Health, UNDSMHS. Purpose to increase awareness, interest and understanding of health careers available in rural North Dakota through creative and interactive activities. The R-COOL-Health Scrubs Camps are one-day learning experiences in which students are able to explore health career options by hearing from local health care professionals and participating in exciting hands-on activities. Partnerships between schools, health care facilities and economic or job development authorities were required in order to increase collaboration and awareness of the economic impact of health care. | | |

| | | | |
|---|---|---|---|
| Spring 2010 Camps | Beulah/Hazen<br>Mott/Regent<br>Bottineau/Newburg, Westhope<br>Devils Lake<br>Dickinson/Hettinger/Killdeer/New England/South Heart/Richardton<br>Elgin/Carson/New Leipzig/Flasher/Glen Ullin<br>Ellendale/Oakes<br>Harvey/Fessenden<br>Langdon/Maple/Osnabrock/Cavalier/ Park River<br>Wallhalla/Edmore/Devils Lake<br>Mayville/Portland/Clifford/Galesburg/ Hatton/Buxton/Reynolds/Hillsboro/ Finley/Sharon/Page/Hope<br>Rugby/Wolford<br>Sheyenne/Maddock/Minewaukan/ Rolette/Warwick/Fort Totten/Devils Lake<br>Wahpeton/Colfax/Fairmont/Hankinson/ Lidgerwood/Wyndmere | 12-14<br>11-19<br>11-14<br>9-10<br>11-19<br>13-15<br>11-18<br>11-15<br>12-19<br><br>14-18<br><br>12-14<br>9-10<br><br>10-15 | 94<br>9<br>75<br>120<br>217<br>54<br>39<br>67<br>22<br>50<br>14<br>63<br>62<br>19<br>9 |
| Spring 2011 Camps completed | Mayville/Portland/Clifford/Gailsburg/ Hatton/Buxton/Reynolds/ Hillsboro/ Finley/Sharon/Page/Hope | 13-18 | 17 |
| ND Skills USA | EAHEC/CRH: partnered in sponsoring a first time luncheon for students competing in health related skills competition and information about health care careers. CRH also supported two recipients, who won top state competition, participation in the National Skills USA conference. | 18-21 | 250 |
| **NEW PROGRAMS COMING SOON - AHEC**<br>HOSA (Health Occupations Student Association) | HOSA is an organization which promotes career opportunities in the health care industry which is to be implemented per AHEC grant guidance in 2011-12. | 15-20 | State-wide |

| | | | |
|---|---|---|---|
| Summer Academies | To be implemented June 2011 in partnership with Bismarck Public Schools for staff support and the Missouri River Area Career and Technical Center providing hands-on health care career opportunities for rural schools in the SWAHEC area and include Ashley, Beulah, Bismarck, Center-Stanton, Elgin-New Leipzig, Flasher, Gackle-Streeter,<br>Garrison, Goodrich, Hazen, Hazelton, Moffit, Braddock, Kidder County, Linton, Mandan, McClusky, Napoleon, New Salem, Selfridge, Solen-Cannonball, Standing Rock, Strasburg, Turtle Lake-Mercer, Underwood, Washburn, White Shield, Wilton, Wing, Wishek, Zeeland | 13-15 | 30 |
| Marketplace for Kids | This will be done beginning March 2011-May 2011. AHEC will present at the 10 locations across the state. | 10-13 | |
| **CRH:** Rural Collaborative Opportunities for Occupational Learning in Health (R-COOL) Health Academy | A new program which is an off-shoot of the Scrubs Camps, created by the Center for Rural Health, UNDSMHS. Purpose to increase awareness, interest and understanding of health careers. The R-COOL-Health Scrubs Academy will be a three-day learning experience, held on UND campus in which middle school students will be able to explore health career options by hearing from local health care professionals, participating in exciting hands-on activities to include the SMHS human simulator center.<br>Grand Forks (2011) | <br><br>9-15 | <br><br>40 |
| Scrubs Camps 2011 | <br><br>Ashley (2 camps)<br>Ellendale/Oakes (ages 10-11)<br>Northwood<br>Williston/Ray/Grenora/Trenton/ Alexander/District 8 (Garden Valley, Round Prairie, Stony) | <br><br>9-19<br>9-12<br>12-18<br>9-11 | Anticipated<br><br>40<br>53<br>123<br>60 |

| | | | |
|---|---|---|---|
| | Langdon/Maple/Osnabrock/Cavalier/ Park Rover/Walhalla/Edmore/Devils Lake | 12-19 | 28 |
| | Bottineau/Newburg/Westhope | 10-11 | 75 |
| | Northwood | 12-19 | 125 |
| | Rugby/Wolford | 12-14 | 60 |
| | Wahpeton/Colfax/Fairmont/Hankinson/ Lidgerwood/Wyndmere | 11-15 | 30 |
| **OTHER PROGRAMS** | | | |
| Grand Forks Family Medicine Residency Program's Mission Physician | State-wide program to expose students to careers in health care. The program runs for 5 weeks during June and July and is offered to students from rural communities and has been in operation for 5 years | High School | 50 students per year |
| Dr. Tom Arnold's Medical Explorers program – Dickinson, ND | Started in 1994, an extension of the Boy Scouts of America; the explorer's program is a national entity in itself. Students receive didactic and hands on shadowing in a variety of health care areas monthly. | 14-20 | 10-20 per year |
| UND SMHS Mentoring for Youth Program Southwest Campus – Bismarck | Long-term mentoring opportunity for medical students, nursing students and injury prevention students with 7th and 8th grade students around issues of adolescent health related to substance abuse, violence, suicide, early teen pregnancy, and HIV prevention. | 12-14 | Not available |

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No citations.

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# Section 3

## The Health Status of North Dakota

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# Section 4

## Health Care in North Dakota

**The materials in this section of the report are drawn from "An Environmental Scan of Health and Health Care in North Dakota: Establishing the Baseline for Positive Health Transformation", Volkov, Boris, PhD, Gibbens, Brad, MPA, Wakefield, Mary, PhD, RN, Center for Rural Health, UND School of Medicine and Health Sciences, 2009. The entire report can be viewed at http://ruralhealth.und.edu/projects/escan/pdf/vol1-2.pdf**

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# Section 5

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