



Sanford Hillsboro
Community Health Needs Assessment
2012-2013

dba Sanford Hillsboro Medical Center EIN#45-0230400

Sanford Hillsboro

Community Health Needs Assessment 2012-2013

rev. 6/10/13

Table of Contents

	Page
Purpose	5
Acknowledgements	6
Executive Summary	9-13
Description of Sanford Hillsboro	15
Description of the Hillsboro Community	15
Study Design and Methodology	15
Resource Identification	16
Primary Research	18
Summary of the Survey Results	
• Community Assets/Best Things about the Community	18
○ Figure 1. Level of agreement with statements about the community regarding PEOPLE	
○ Figure 2. Level of agreement with statements about the community regarding SERVICES AND RESOURCES	
○ Figure 3. Level of agreement with statements about the community regarding QUALITY OF LIFE	
○ Figure 4. Level of agreement with statements about the community regarding GEOGRAPHIC SETTING	
○ Figure 5. Level of agreement with statements about the community regarding ACTIVITIES	
• General Concerns about the Community	22
○ Figure 6. Level of concern with statements about the community regarding ECONOMIC ISSUES	
○ Figure 7. Level of concern with statements about the community regarding SERVICES AND RESOURCES	
○ Figure 8. Level of concern with statements about the community regarding TRANSPORTATION	
○ Figure 9. Level of concern with statements about the community regarding ENVIRONMENTAL POLLUTION	
○ Figure 10. Level of concern with statements about the community regarding YOUTH CONCERNS	
○ Figure 11. Level of concern with statements about the community regarding SAFETY CONCERNS	

<ul style="list-style-type: none"> • Community Health and Wellness Concerns <ul style="list-style-type: none"> ○ Figure 12. Level of concern with statements about the community regarding ACCESS TO HEALTH CARE ○ Figure 13. Level of concern with statements about the community regarding SUBSTANCE USE AND ABUSE ○ Figure 14. Level of concern with statements about the community regarding PHYSICAL HEALTH ○ Figure 15. Level of concern with statements about the community regarding MENTAL HEALTH ○ Figure 16. Level of concern with statements about the community regarding ILLNESS 	26
<ul style="list-style-type: none"> • Delivery of Health Care in the Community <ul style="list-style-type: none"> ○ Figure 17. How well topics related to DELIVERY OF HEALTH CARE in the community are being addressed 	29
<ul style="list-style-type: none"> • Personal Health Care Information <ul style="list-style-type: none"> ○ Cancer Screening ○ Health Care Coverage ○ Primary Care Provider ○ Respondents' Primary Care Provider ○ Respondents Representing Chronic Disease 	29
<ul style="list-style-type: none"> • Demographic Information <ul style="list-style-type: none"> ○ Age ○ Education ○ Gender 	33
Secondary Research	35
<ul style="list-style-type: none"> • Health Outcomes <ul style="list-style-type: none"> ○ Mortality ○ Morbidity • Health Factors <ul style="list-style-type: none"> ○ Health Behaviors ○ Clinical Care ○ Social and Economic Factors ○ Physical Environment ○ Demographics ○ Population by Age ○ Housing ○ Economic Security ○ Diversity Profile 	
Health Needs Identified <ul style="list-style-type: none"> • Community Assets/Prioritization Process 	41
Implementation Strategy	43

- 2011 County Health Profile – Traill County, ND
- Definition of Health Variables
- Aging Profile – Traill County, ND
- Diversity Profile – Traill County, ND
- Maps:
 - Mortality – Map 1 – Premature Death
 - Morbidity – Maps 2-5
 - Health Factors – Maps 6-12
 - Clinical Care – Maps 13-20
 - Social and Economic – Maps 21-27
 - Physical Environment – Maps 28-31
 - Demographic – Maps 32-36
- Table 1 – Asset Map
- Table 2 – Prioritization Worksheet
- 2nd Biennial Report – Health Issues for the State of ND – 2013

Sanford Hillsboro Community Health Needs Assessment 2012-2013

Purpose

Sanford Hillsboro is part of Sanford Health, an integrated health system headquartered in the Dakotas and the largest, rural, not-for-profit health care system in the nation with locations in 126 communities in eight states.

Sanford Hillsboro has undertaken a Community Health Needs Assessment as required by the Patient Protection and Affordable Care Act, and as part of the IRS 990 requirement for a not-for-profit health system to address issues that have been assessed as unmet needs in the community.

The 2010 PPACA enactment requires that each hospital must have: (1) conducted a community health needs assessment in the applicable taxable year; (2) adopted an implementation strategy for meeting the community health needs identified in the assessment; and (3) created transparency by making the information widely available. For tax-exempt hospital organizations that own and operate more than one hospital facility, as within Sanford Health, the new tax-exemption requirements apply to each individual hospital. The first required needs assessment falls within the fiscal year July 1, 2012 through June 30, 2013.

The purpose of a community health needs assessment is to develop a global view of the population's health and the prevalence of disease and health issues within the community. Findings from the assessment serve as a catalyst to align expertise and develop a Community Investment/Community Benefit plan of action. There is great intrinsic value in a community health needs assessment when it serves to validate, justify and defend not-for-profit status and create opportunity to identify and address public health issues from a broad perspective.

A community health needs assessment is critical to a vital Community Investment/Community Benefit Program that builds on community assets, promotes collaboration, improves community health, and promotes innovation and research. A community health needs assessment also serves to validate progress made toward organizational strategies and provides further evidence for retaining not-for-profit status.

Acknowledgements

Sanford Health would like to acknowledge and thank the following individuals for their input into the Community Health Steering Committees and the Greater Fargo Moorhead Community Health Needs Assessment Collaborative for their expertise while performing the assessment and analysis of the community health data. The assessment provides support for the future directions of our work as the region's leading health care system.

Sanford Hillsboro/Mayville Steering Group

- Jessie Azure, Tobacco Prevention Coordinator, Mayville, ND
- Roger Baier, BS; CEO, Sanford Mayville Medical Center
- Melissa Beach, Executive Director, Traill Co. Economic Development Commission, Hillsboro, ND
- Glennis Endrud, Board Member, Sanford Mayville, Mayville, ND
- Julie Flaten, Board Member, Sanford Mayville, Mayville, ND
- Gary Hagen, Board Member, Sanford Mayville, Mayville, ND
- Jay Hendrickson, Director of Career Services, Mayville State University, Mayville, ND
- Kim Jacobson, Director, Traill County Social Services, Hillsboro, ND
- Ken Kornkven, Board Member, Sanford Mayville, Mayville, ND
- Jac McTaggart, CEO, Sanford Hillsboro, Hillsboro, ND
- Gail Mooney, Traill County Commissioner, Cummings, ND
- Catherine Pladson, Board Member, Sanford Mayville, Mayville, ND
- Brenda Stallman, Public Health Administrator, Hillsboro, ND

Sanford Enterprise Steering Group:

- *Enterprise Lead:* Carrie McLeod, MBA, MM, LRD, CDE; Office of Health Care Reform, Community Benefit/Community Health Improvement
- *Sioux Falls Region Co-Lead:* Bruce Viessman, CFO, Sanford Health Network Sioux Falls
- Mike Begeman, Chief of Staff/Vice President of Public Affairs
- Maxine Brinkman, CPA; Director of Financial Decisions and Operations Support
- Michelle Bruhn, CPA; CFO, Health Services Division
- Randy Bury, COO, Sanford Medical Center USD
- Jane Heilman, BA; Senior Corporate Communication Strategist
- Kristie Invie, BS, MBA; Vice President for Clinical Performance
- Joy Johnson, Bemidji Region Co-Lead, VP, Business Development and Marketing, Bemidji
- Ashley King, Bemidji Co-Lead, Intern in Bemidji
- JoAnn Kunkel, CFO, Sanford Health
- Tiffany Lawrence, CPA; Fargo Region Co-Lead, CFO, Sanford Medical Center Fargo
- Martha Leclerc, MS; Vice President, Office of Health Reform and Strategic Payment
- Doug Nowak, MBA; Executive Director, Decision Support
- Heather Vanmeveren, CPA; Director of Accounting

Sanford Fargo Region Steering Group:

- *Enterprise Lead:* Carrie McLeod, MBA, MM, LRD, CDE; Office of Health Care Reform, Community Benefit/Community Health Improvement
- *Fargo Region Co-Lead:* Tiffany Lawrence, CPA; CFO, Sanford Medical Center Fargo
- Roger Baier, BS; CEO, Sanford Medical Center Mayville
- Maxine Brinkman, CPA; Director of Financial Decisions and Operations Support
- Joann Foltz, RN, BSN, PHN; CEO, Sanford Medical Center Wheaton
- Chuck Gulsvig, Director of Public Affairs
- Mary Kara, RHIA, BS; Quality Analyst

- Jac McTaggart, CEO, Sanford Hillsboro
- Angela Novak, MBA; VP, Sanford Health Marketing
- Heather Rye, MBA, PHR; HR Advisor, Sanford Health Network Fargo
- Les Wietstock, MSA; CFO Sanford Health Network Fargo

We express our gratitude to the following individuals and groups for their participation in this study.

We extend special thanks to the city mayors, city council/commission members, physicians, nurses, school superintendents and school board members, parish nurses, representatives from the Native American community, Faith Community Leaders, as well as legal services, mentally and physically disabled, social services, non-profit organizations, and financial services for their participation in this work. Together we are reaching our vision “to improve the human condition through exceptional care, innovation and discovery.”

Our Guiding Principles:

- All health care is a community asset
- Care should be delivered as close to home as possible
- Access to health care must be provided regionally
- Integrated care delivers the best quality and efficiency
- Community involvement and support is essential to success
- Sanford Health is invited into the communities we serve

The following key community stakeholders participated in this assessment work:

- Ole Aarsvold, Retired Farmer, Blanchard, ND
- KrissAnn Anderson, Clifford, ND
- Jessie Azure, Tobacco Prevention Coordinator, Mayville, ND
- Melissa Beach, Executive Director, Traill County Economic Development Commission, Hillsboro, ND
- Mike Bradner, Principal, MPCG Schools, Mayville, ND
- Jeremy Brandt, Principal, Central Valley Public School, Buxton, ND
- Chuck Breen, Physician and Sanford Mayville Board Member, Hillsboro, ND
- Paulette Bowersox, Clerk of Court, Hillsboro, ND
- Tom Capouch, Banker, First Farmers Bank, Portland, ND
- Dan R. Christianson, Retired, Ag Country Farm Credit Services, Hillsboro, ND
- Mike Doeden, Ambulance Driver, Hillsboro, ND
- Mark Duncan, Clinic Manager, Sanford Mayville Clinic, Mayville, ND
- Marlene Eblen, Deputy Clerk of Court/County Recorder for Traill County, Hillsboro, ND
- Stacy Elliott, Early Childhood Teacher, MaSU CDP, Clifford, ND
- Glennis Endrud, Board Member, Sanford Mayville, Mayville, ND
- Lee Erickson, Coordinator, Northern Lights SADD, Hillsboro, ND
- Julie Flaten, Board Member, Sanford Mayville, Mayville, ND
- Teresa Forseth, Teacher, Hillsboro Public School, Hillsboro, ND
- Julie R. Foss, County Recorder, Traill County, Hillsboro, ND
- Bonnie Freeland, FNP, UND College Health, Grand Forks, ND
- Justin Grinde, Loan Officer, Ag Country Farm Credit Services, Hillsboro, ND
- Gary Hagen, Board Member, Sanford Mayville, Mayville, ND
- Sylvia Hansen, Retired, Hillsboro, ND
- Jay Hendrickson, Director of Career Services, Mayville State University, Mayville, ND
- Scott Hovde, Banker, Goose River Bank, Mayville, ND
- Les Hurt, Senior Loan Officer, Ag Country Farm Credit Services, Hillsboro, ND
- Kim Jacobson, Director, Traill County Social Services, Hillsboro, ND
- John Jorgensen, Loan Officer, Goose River Bank, Hillsboro, ND

- Lesa Kempf, Board Member, Sanford Mayville, Mayville, ND
- Rick Kent, Farm Manager, Hillsboro, ND
- Ken Kornkven, Board Member, Sanford Mayville, Mayville, ND
- Angela Kritzberger, Former Executive Foundation Director, Sanford Hillsboro, Hillsboro, ND
- Bill Krivarchka, Physician, Eastern ND AHEC, Mayville, ND
- April Kroepflin, Respiratory Therapist, Lincare, Grand Forks, ND
- Deb Kylo, Mayville, ND
- Pamela Lacher, Social Worker, Traill County Social Services, Hillsboro, ND
- Kathy Larson, Project Coordinator, Trail County Economic Development, Hillsboro, ND
- Corey McGillis, Board Member, Sanford Mayville, Mayville, ND
- Chris McInnes, Nurse, TDHU, Hillsboro, ND
- Karla Mehus, Administrative Assistant, Sanford Mayville, Mayville, ND
- Donald A. Moen, Mayor, Mayville, ND
- Gail Mooney, Traill County Commissioner, Cummings, ND
- Betsy Mortenson, Mayville, ND
- Kendall Nichols, NDSU Extension Agent, Hillsboro, ND
- Daniel Nilles, Shift Administrator, American Crystal Sugar, Hillsboro, ND
- Janice K. Olstad, Board Member, Sanford Mayville, Mayville, ND
- Laurie Paperfuss, Teacher, GST Education Services, Portland, ND
- Paula Pederson, Hillsboro, ND
- Catherine Pladson, Board Member, Sanford Mayville, Mayville, ND
- Darla Preston, Paraprofessional, Hillsboro School, Hillsboro, ND
- Michael Rexine, Optometrist, Rexine Family Eyecare, Mayville, ND
- Kevin Rogers, Superintendent of Hatton Schools, Hatton, ND
- Tammy Scharck, Field Representative, US Census, Mayville, ND
- Jody Schill, Hillsboro, ND
- Lynn Schultz, Eligibility Worker, Hillsboro, ND
- Brenda Stallman, Public Health Administrator, Hillsboro, ND
- Kathy Strandberg, Eligibility Worker, Medicaid, Hillsboro, ND
- Melissa Stuart, Assistant Manager, Blanchard, ND
- Stacy Ust, Customer Service Rep, Dakota Heritage Bank, Portland, ND
- Sara Vaagene, Pharmacist, Mayville, ND
- Doris Vigen, Director of Nursing, Sanford Mayville, Mayville, ND
- Connie Weber, County Treasurer, Hillsboro, ND

Sanford Hillsboro Community Health Needs Assessment 2012-2013

Executive Summary

Purpose

The purpose of a community health needs assessment is to develop a global view of the population's health and the prevalence of disease and health issues within the community. Findings from the assessment serve as a catalyst to align expertise and develop a Community Investment/Community Benefit plan of action. There is great intrinsic value in a community health needs assessment when it serves to validate, justify and defend not-for-profit status and create opportunity to identify and address public health issues from a broad perspective. A community health needs assessment is critical to a vital Community Investment/Community Benefit Program that builds on community assets, promotes collaboration, improves community health, and promotes innovation and research. A community health needs assessment also serves to validate progress made toward organizational strategies and provides further evidence for retaining not-for-profit status.

Study Design and Methodology

Sanford Health Fargo convened key health care leaders and other not-for-profit leaders in the Fargo Moorhead community to establish a Fargo Moorhead Community Health Needs Assessment Collaborative. A primary goal of this collaborative is to craft standardized tools, indicators and methodology that can be used by all group members when conducting assessments and also be used by all of the Sanford medical centers across the enterprise. After much discussion, it was determined that the Robert Wood Johnson Framework for county profiles would be our secondary data model.

A subgroup of this collaborative met with researchers from the North Dakota State University Center for Social Research to develop a survey tool for our key stakeholder groups. The survey tool incorporated the University of North Dakota's Center for Rural Health community health needs assessment tool and the Fletcher Allen community health needs assessment tool. North Dakota State University and the University of North Dakota Center for Rural Health worked together to develop additional questions and to ensure that scientific methodology was incorporated in the design.

This community health needs assessment was conducted during FY 2012 and FY 2013. The main model for our work is the Association for Community Health Improvement's (ACHI) Community Health Needs Assessment toolkit.

The following qualitative data sets were studied:

- Hillsboro/Mayville Community Health Needs Assessment of Community Leaders

The following quantitative data sets were studied:

- 2011 County Health Profile for Traill County
- Aging Profiles for Traill County
- Diversity Profiles for Traill County

The following secondary research was reviewed to support the assessments that were conducted for North Dakota facilities:

- Second Biennial Report Health Issues for the State of North Dakota 2013
<http://www.med.und.edu/community/files/docs/second-biennial-report.pdf>

Asset mapping was conducted by reviewing the data and identifying the unmet needs from the various surveys and data sets. The process implemented in this work was based on the McKnight Foundation model - Mapping Community Capacity by John L. McKnight and John P. Kretzmann, Institute for Policy Research at Northwestern University.

Each unmet need was researched to determine what resources were available in the community to address the needs. The Hillsboro/Mayville Community Collaborative performed the asset mapping and reviewed the findings. The group conducted an informal gap analysis to determine what needs remained after resources were thoroughly researched. Once gaps were determined the group proceeded to the prioritization process. The multi-voting methodology was implemented to determine what top priorities would be further developed into implementation strategies.

Key Findings – Primary Research

Sanford Health Hillsboro/Mayville distributed the Community Health Needs Assessment survey tool that was developed by the Greater Fargo-Moorhead Community Health Needs Assessment Collaborative to key stakeholder groups through various methods in an effort to reach people with and without access to personal computers. This survey was implemented as a method of gathering input from a broad cross section of the Hillsboro/Mayville community.

The Internal Revenue Code 501 (r) statute requires that a broad base of key community stakeholders have input into the needs of the community. Those community members specified in the statute include: persons who represent the broad interests of the community served by the hospital facility including those with special expertise in public health; Federal, tribal, regional, state and or local health or other departments or agencies with information relevant to the health needs of the community served; leaders, representatives, or members of medically underserved, low-income, and minority populations.

Sanford extended a good faith effort to engage all of the aforementioned community representatives in the survey process. The list of individuals who agreed to take the survey and also submit their names are included in the acknowledgement section of this report. In some cases there were surveys that were submitted without names or without a specified area of expertise or affiliation. We worked closely with public health experts throughout the assessment process.

Public comments and response to the community health needs assessment and the implementations strategies are welcome on the Sanford website under “About Sanford” in the Community Health Needs Assessment section.

The findings discussed in this section are a result of the analysis of the survey qualitative data.

Respondents had very high levels of agreement that their community has educational opportunities and programs, people are friendly, helpful, supportive, the community is a good place to raise kids, and there is quality health care.

However, respondents agreed the least that there community is socially and culturally diverse, there is effective transportation, and that there is tolerance, inclusion, and open-mindedness in their community.

Respondents were most concerned about cost and availability of child care and elder care, bullying and substance abuse. Environmental issues regarding garbage and litter, water quality, air quality, and noise levels were not a large concern.

Among health and wellness concerns, respondents were most concerned about the costs associated with health insurance, health care, and the availability and/or cost of dental and vision care and the cost of prescription drugs.

Respondents were also concerned about physical health issues, particularly obesity, poor nutrition and eating habits, and inactivity or lack of exercise. The adequacy of health insurance (e.g. amount of co-pays and deductibles) and access to health insurance coverage (e.g. pre-existing conditions), as well as chronic disease (e.g. diabetes, health disease, multiple sclerosis) stress and the availability of services and providers addressing mental health issues were also among the top health and wellness concerns among respondents. Respondents were least concerned about the provider not taking new patients.

Community Assets/Best Things about the Community

Respondents indicated the top five community assets or best things about the community were: there are quality higher education opportunities and institutions, the community is a good place to raise kids, there are quality school systems and programs for youth, there is quality health care, and people are friendly, helpful, and supportive.

Services and Resources

Respondents had high levels of agreement that there is quality health care, quality higher education opportunities and institutions, access to quality food, as well as quality school systems and programs for youth in their community.

Respondents agreed the least that there is effective transportation in their community. Overall, respondents had a high level of agreement with positive statements regarding services and resources issues in their community.

Respondents were most concerned about the cost of child care or the availability of child care, the cost and or availability of elder care, resources to meet the needs of the aging population, activities for youth and availability of services for families. Respondents did not indicate a high level of concern with availability or access to a grocery store,

Respondents had a high level of agreement that there were many recreational and sports activities. Although there is moderate agreement, respondents agreed the least that there were great events and festivals in their community. Respondents did not indicate that there was concern over water, air or noise pollution.

Youth Concerns

Respondents were most concerned over bullying among youth. The least concern listed among respondents is the school dropout rates and truancy.

Safety Concerns

Respondents were most concerned about substance abuse, and child abuse and neglect. Among the issues with the least amount of concern were violent crimes and prostitution.

Community Health and Wellness Concerns

Access to Care

Respondents were most concerned with cost of health insurance, cost of health care, availability and/or cost of dental/vision care, cost of prescription drugs, adequacy of health insurance, access to insurance when a pre-existing condition is present. Respondents were the least concerned about providers not taking new patients, translator services and the time it takes to get an appointment.

Substance Use and Abuse

The Respondents level of concern with statements about the community regarding substance use and abuse was moderately high for alcohol use and abuse, drug use and abuse, and smoking. Respondents did not have a high level of concern for the presence of drug dealers in the community.

Physical Health

Respondents were most concerned about obesity, lack of exercise and poor nutrition eating habits. Respondents were least concerned with the availability of good walking or biking options and the availability of exercise facilities.

Mental Health

Respondents agreed the most that stress; the availability of qualified mental health providers and the availability of services for addressing mental health were most concerning. Although there was still moderate concern, respondents were the least concerned about depression.

Illness

Respondents had a high degree of concern for cancer and chronic disease. Respondents were least concerned with communicable diseases.

Delivery of Health Care in the Community

Respondents were asked to rate how well delivery of care issues are being discussed in their community. Respondents reported that the areas doing very well include access to emergency services (e.g. ambulance and 911), the number of health care staff in general, and health services for heart disease and other specialty care. Respondents thought that the following are not being addressed well: health services for obesity, mental health services, and the cost of the delivery of health care.

Personal Health Care Information

The top three reasons respondents gave for their choice of primary health care provider were quality of services, being influenced by their health insurance, and location.

More than 50% of respondents said they had not had a cancer screening or cancer care in the past year. The most common reason for not having done so was because the doctor had not recommended it. Fear, unfamiliarity with recommendations, and not knowing who to see were not considered to be the main reasons respondents gave.

Health Care Coverage

Respondents were asked how they had paid for health care costs, for themselves or family members, over the last 12 months. A majority of respondents said they had paid for health care costs over the last 12 months by health insurance through an employer. Personal income and private health insurance were also used.

Primary Care Provider

The top three reasons respondents gave for their choice of primary health care provider were location, availability of services and quality of services. Being valued as a patient was important to more 50% of respondents.

Respondent's Primary Health Care Provider

Respondents were asked which provider they used for their primary health care. Over 90% of respondents said they use Sanford Health as their primary health care provider. Many respondents stated multiple Sanford sites as their primary health care provider. Seven of the sixty-eight respondents to this question did not give the location at Sanford where they access care. Forty-four percent (44%) of respondents listed Sanford Hillsboro as their primary health care provider.

Demographic Information

The majority of respondents are 35 to 54 years old. Most respondents have a Bachelor's degree or higher, including 2% who have a graduate or professional degree. Sixty-nine percent (69%) of respondents are female.

Respondents Representing Chronic Disease

Respondents were asked to select their personal general health conditions/diseases. Weight control received the most responses with 39.1% of participants selecting this condition. The chronic diseases found among respondents include arthritis, cancer, heart disease, diabetes, Alzheimer's, hypertension and depression.

Implementation Strategy

The following unmet needs were identified through a formal community health needs assessment, resources/asset mapping, and multi-voting prioritization process:

- Mental Health
- Services for the Elderly
- Day Care

Implementation Strategy: Mental Health Services

- Define services currently available
- Define mechanisms to educate service area
- Define education process and secure outside resources
- Develop directory with resources and outsource information
- Distribute directory to various groups, entities and secure email addresses and updates
- Participate in Sanford One Mind as determined by the Enterprise three-year plan

Implementation Strategy: Services for the Elderly

- Update directory of available services
- Print/distribute

Implementation Strategy: Day Care

- Determine specific needs
- Request assistance from outside services to secure day care services
- Find location for services
- Request community assistance (e.g. keeping day care profitable)
- Ongoing process – monitoring the needs and services

Sanford Hillsboro Community Health Needs Assessment 2012-2013

Sanford Health, long been dedicated to excellence in patient care, is on a journey of growth and momentum with vast geography, cutting-edge medicine, sophisticated research, advanced education and a health plan. Through relationships built on trust, successful performance, and a vision to improve the human condition, Sanford seeks to make a significant impact on health and healing. We are proud to be from the Midwest and to impact the world. The name Sanford Health honors the legacy of Denny Sanford's transformational gifts and vision.

Our Mission: *Dedicated to the Work of Health and Healing*

We provide the best care possible for patients at every stage of life, and support healing and wholeness in body, mind and spirit.

Our Vision: *To improve the Human Condition through Exceptional Care, Innovation and Discovery*

We strive to provide exceptional care that exceeds our patients' expectations. We encourage diversity in thought and ideas that lead to better care, service and advanced expertise.

Our Values:

- **Courage:** *Strength to persevere, to use our voice and take action*
- **Passion:** *Enthusiasm for patients and work, commitment to the organization*
- **Resolve:** *Adherence to systems that align actions to achieve excellence, efficiency and purpose*
- **Advancement:** *Pursuit of individual and organizational growth and development*
- **Family:** *Connection and commitment to each other*

Our Promise: *Deliver a flawless experience that inspires*

We promise that every individual's experience at Sanford—whether patient, visitor or referring physician—will result in a positive impact, and for every person to benefit from a flawless experience that inspires.

Guiding Principles:

- *All health care is a community asset*
- *Care should be delivered as close to home as possible*
- *Access to health care must be provided regionally*
- *Integrated care delivers the best quality and efficiency*
- *Community involvement and support is essential to success*
- *Sanford Health is invited into the communities we serve*

Description of Sanford Hillsboro

Sanford Hillsboro is a 16-bed Critical Access Hospital with 36 long-term care beds and 16 assisted living units. Sanford Hillsboro provides general acute care services, physical, occupational and speech therapy, radiology, IV therapy, lymphedema management, nutrition consultation, respite care, restorative nursing, pharmacy consultation, swing bed, bariatric, pathology, and ambulance services.

Description of the Hillsboro Community

Hillsboro is located in Traill County, North Dakota, and is the county seat. Hillsboro was founded in 1881. The population was 1,603 at the 2010 census. The Hillsboro Public School system provides residents with an elementary school and a high school.

Located on Interstate 29, halfway between the two metropolitan centers of Grand Forks and Fargo-Moorhead, Hillsboro has seen steady population growth in recent years and has become somewhat of a bedroom community.

Hillsboro sits on the banks of the Goose River in eastern North Dakota. Located in the center of the fertile Red River Valley, the area around Hillsboro is prime agricultural land and very flat. Agriculture has dominated the area's economy from the beginning.

One of the more obvious effects the agricultural community has had on Hillsboro is found at the American Crystal Sugar sugar beet plant directly north of town. The large plant, located on U.S. Highway 81, has been responsible for both an increase in population and a steady stream of available jobs during the last few decades that it has been open.

Study Design and Methodology

In May 2011 Sanford Health Fargo convened key health care leaders and other not-for-profit leaders in the Fargo Moorhead community to establish a Fargo Moorhead Community Health Needs Assessment Collaborative. A primary goal of this collaborative is to craft standardized tools, indicators and methodology that can be used by all group members when conducting assessments and also be used by all of the Sanford medical centers across the enterprise. After much discussion it was determined that the Robert Wood Johnson Framework for county profiles would be our secondary data model.

The Internal Revenue Code 501 (r) statute requires that a broad base of key community stakeholders have input into the needs of the community. Those community members specified in the statute include: persons who represent the broad interests of the community served by the hospital facility including those with special expertise in public health; Federal, tribal, regional, state and or local health or other departments or agencies with information relevant to the health needs of the community served; leaders, representatives, or members of medically underserved, low-income, and minority populations.

Sanford extended a good faith effort to engage all of the aforementioned community representatives in the survey process. The list of individuals who agreed to take the survey and also submit their names are included in the acknowledgement section of this report. In some cases there were surveys that were submitted without names or without a specified area of expertise or affiliation. We worked closely with public health experts throughout the assessment process.

Public comments and response to the community health needs assessment and the implementations strategies are welcome on the Sanford website under "About Sanford" in the Community Health Needs Assessment section.

A subgroup of this collaborative met with researchers from the North Dakota State University Center for Social Research to develop a survey tool for our key stakeholder groups. The survey tool incorporated the University of North Dakota's Center for Rural Health community health needs assessment tool and the Fletcher Allen community health needs assessment tool. North Dakota State University and the University of North Dakota Center for Rural Health worked together to develop additional questions and to assure that scientific methodology was incorporated in the design.

Finally, it was the desire of the collaborative that the data would be shared broadly with others and that if possible it would be hosted on a web site where there could be access for a broad base of community, state and regional individuals and groups.

This community health needs assessment was conducted during FY 2012 and FY 2013. The main model for our work is the Association for Community Health Improvement's (ACHI) Community Health Needs Assessment toolkit.

The following qualitative data set was studied:

- Hillsboro/Mayville Community Health Needs Assessment of Community Leaders

The following quantitative data sets were studied:

- 2011 County Health Profiles for Traill County
- Aging Profiles for Traill County
- Diversity Profiles for Traill County

The following secondary research was reviewed to support the assessments that were conducted for North Dakota facilities:

- Second Biennial Report Health Issues for the State of North Dakota 2013
<http://www.med.und.edu/community/files/docs/second-biennial-report.pdf>

Asset mapping was conducted by reviewing the data and identifying the unmet needs from the various surveys and data sets. The process implemented in this work was based on the McKnight Foundation model - Mapping Community Capacity by John L. McKnight and John P. Kretzmann, Institute for Policy Research at Northwestern University.

Resource identification

Each unmet need was researched to determine what resources were available in the community to address the needs. The Hillsboro/Mayville Community Health Needs Assessment Collaborative Committee performed the asset mapping and reviewed the findings. The group conducted an informal gap analysis to determine what need remained after resources were thoroughly researched. Once gaps were determined the group proceeded to the prioritization process. The multi-voting methodology was implemented to determine what top priorities would be further developed into implementation strategies.

Hillsboro/Mayville Community Health Needs Assessment of Community Leaders

The purpose of the community leader survey was to explore the views of key leaders in the Mayville/Hillsboro area (e.g. health professionals, social workers, educators, elected leadership, and nonprofit leaders) regarding the resident population's health and the prevalence of disease and health issues within the community.

The Hillsboro/Mayville Community Health Needs Assessment Committee identified the key community leaders for both Hillsboro and Mayville and the surrounding areas. The key stakeholder survey was loaded onto Survey Monkey and the link to the survey was sent by email to all identified community stakeholders with computer access. Paper surveys were handed out at meetings for those stakeholders who did not have access to a computer, and the completed survey data was entered into the data base by medical center staff.

The community leaders' survey included a set of questions at the end relating to the respondents' name, title, affiliation, area of expertise, city/town, and state. These questions were included to fulfill the current interpretation of IRS requirements for non-profit hospitals conducting community health needs assessments as part of the new compliance requirements imposed by the PPACA law on March 23, 2010.

2011 County Health Profiles

The County Health Profiles are based largely on the County Health Rankings from the Mobilizing Action Toward Community Health (MATCH), a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute. State and national benchmarking required additional data sources, including the U.S. Census Bureau, Small Area Health Insurance Estimates, and the Centers for Disease Control and Prevention's National Center for Health Statistics – the Health Indicators Warehouse.

Aging Profiles

The Aging Profiles are based on data from the U.S. Census Bureau, 2010 Census Summary File 1, and 2006-2010 American Community Survey Five-Year Estimates (sample data). The estimates presented are meant to give perspective on characteristics across age categories; however, because they are based on sample data, one should use caution when interpreting small numbers. Blank values reflect data that is missing or not available.

Diversity Profiles

The Diversity Profiles are based on data from the U.S. Census Bureau, 2010 Census Summary File 1, and 2006-2010 American Community Survey Five-Year Estimates (sample data). The estimates presented are meant to give perspective on characteristics across race and ethnic categories; however, because they are based on sample data, one should use caution when interpreting small numbers. Blank values reflect data that is missing or not available. Racial categories not represented include Native Hawaiian and Other Pacific Islander alone, Some Other Race alone, and Two or More races.

Limitations

The Hillsboro/Mayville Community Health Needs Assessment Collaborative attempted to reach many more key community and county stakeholders for the purpose of determining the needs of the community. There were 81 members of this key stakeholder group who completed the survey or part of the survey.

The survey asked for individual perceptions of community health issues and is subjective to individual experiences which may or may not be the current status of the community.

Primary Research

Summary of the Survey Results

Respondents had very high levels of agreement that their community has educational opportunities and programs, people are friendly, helpful supportive, the community is a good place to raise kids, and there is quality health care. However, respondents agreed the least that their community is socially and culturally diverse, there is effective transportation, and that there is tolerance, inclusion and open-mindedness.

Respondents were most concerned about cost and availability of child care and elder care, bullying, and substance abuse. Environmental issues regarding garbage and litter, water quality, air quality, and noise levels were not a large concern.

Among health and wellness concerns, respondents were most concerned about the costs associated with health insurance, health care, the availability and/or cost of dental and vision care and the cost of prescription drugs. Respondents were also concerned about physical health issues, particularly obesity, poor nutrition and eating habits, and inactivity or lack of exercise. The adequacy of health insurance (e.g., amount of co-pays and deductibles) and access to health insurance coverage (e.g., pre-existing conditions), as well as chronic disease (e.g., diabetes, health disease, multiple sclerosis), stress and the availability of services and providers addressing mental health issues were also among the top health and wellness concerns among respondents. Respondents were least concerned about the provider not taking new patients.

Community Assets/Best Things about the Community

Using a 1 to 5 scale, with 1 being “not at all” and 5 being “a great deal,” respondents were asked to rate their level of agreement with various statements about their community regarding people, services and resources, and quality of life.

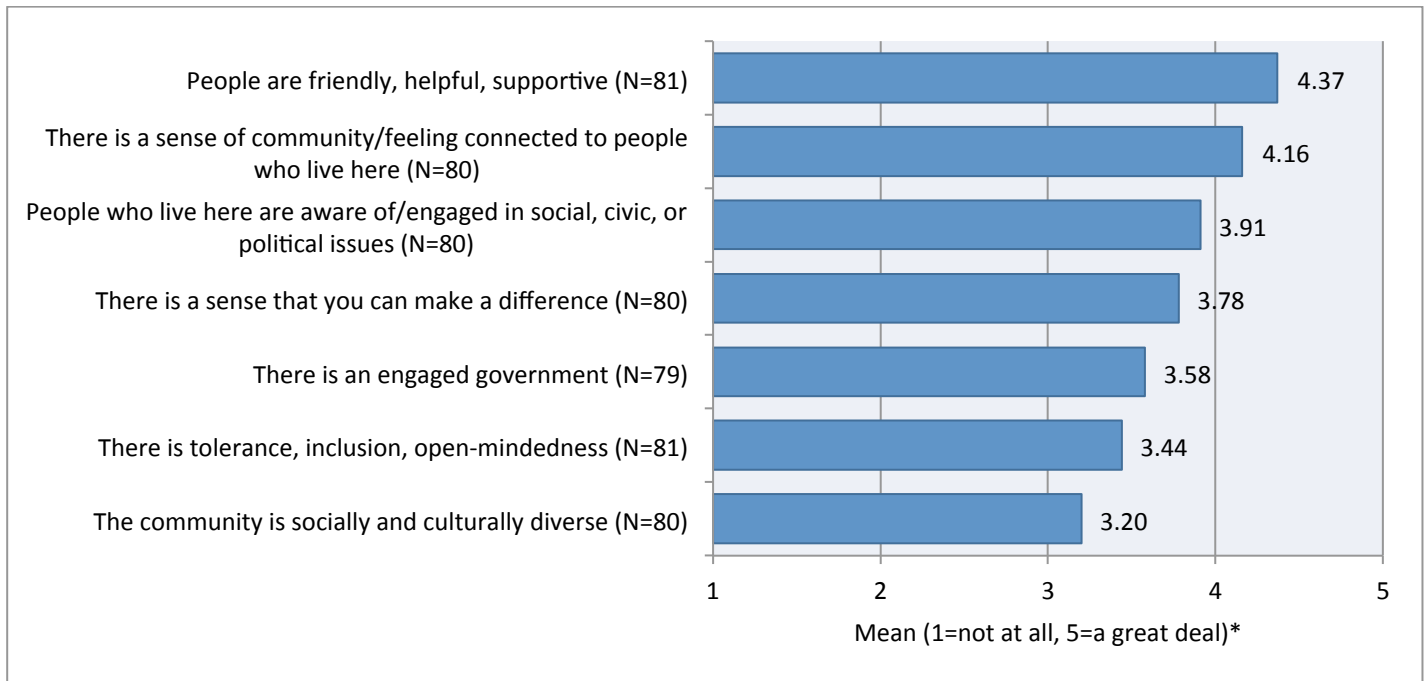
Respondents indicated the top five community assets or best things about the community were: there are quality higher education opportunities and institutions, the community is a good place to raise kids, there are quality school systems and programs for youth, there is quality health care, and people are friendly, helpful, and supportive.

People

Overall, respondents had moderately high levels of agreement regarding positive statements that reflect the people in their community (*Figure 1*).

- On average, respondents agreed the most that people in their community are friendly, helpful, and supportive.
- Respondents also had a fairly high level of agreement that there is a sense of community or feeling connected to people who live here.
- Although still a moderate level of agreement, respondents agreed the least that the community is socially and culturally diverse.

Figure 1. Respondents' level of agreement with statements about their community regarding PEOPLE



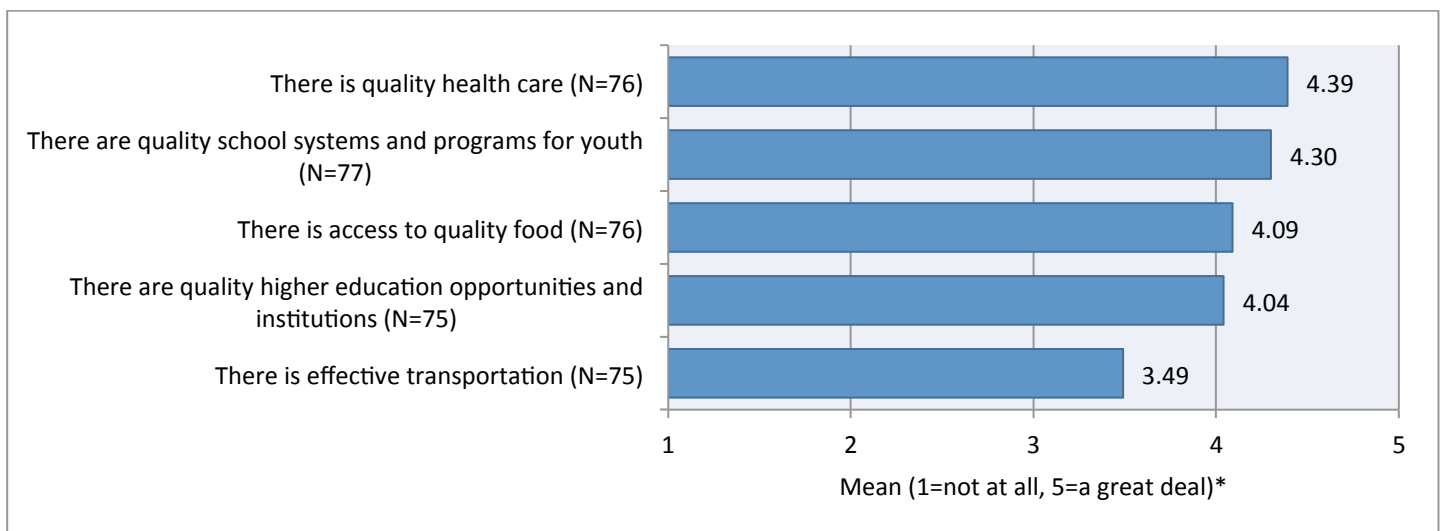
*Means exclude "do not know" responses.

Services and Resources

Respondents had high levels of agreement that there is quality health care, quality higher education opportunities and institutions, access to quality food, as well as quality school systems and programs for youth in their community.

Respondents agreed the least that there is effective transportation in their community. Overall, respondents had a high level of agreement with positive statements regarding services and resources issues in their community.

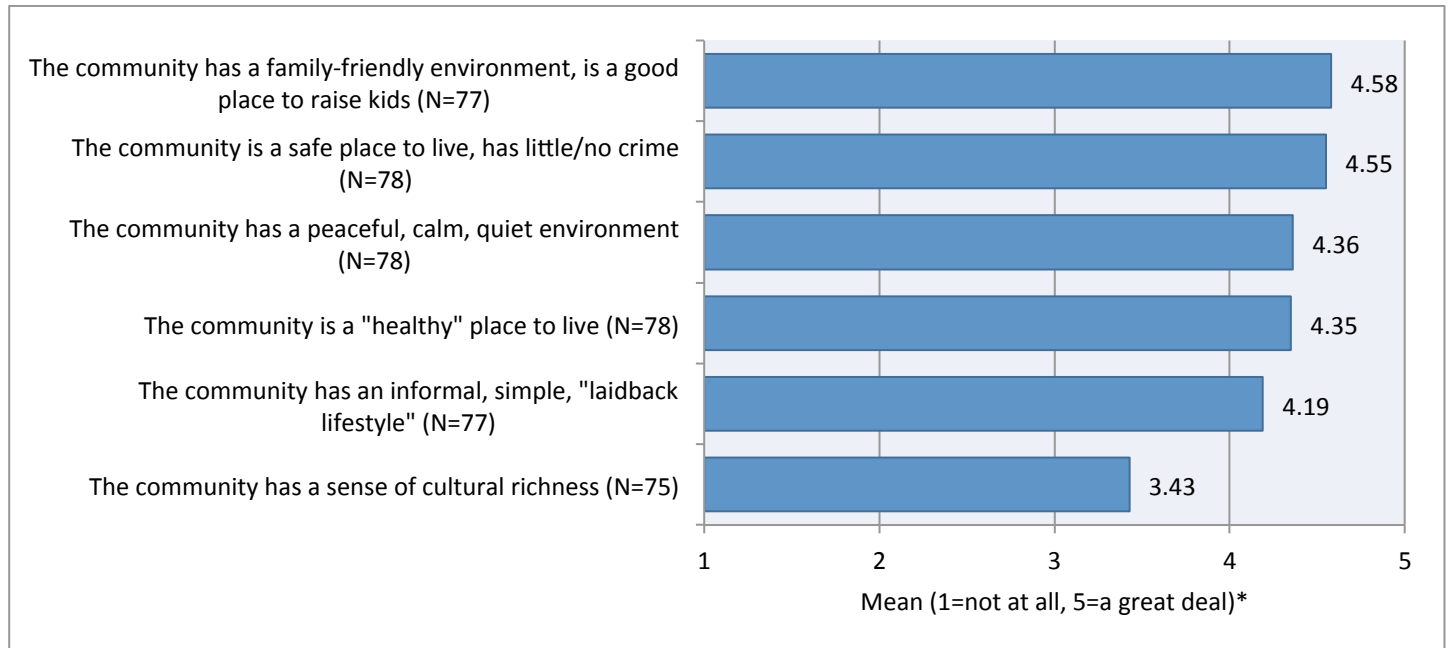
Figure 2. Respondents' level of agreement with statements about their community regarding SERVICES AND RESOURCES



*Means exclude "do not know" responses.

Quality of Life

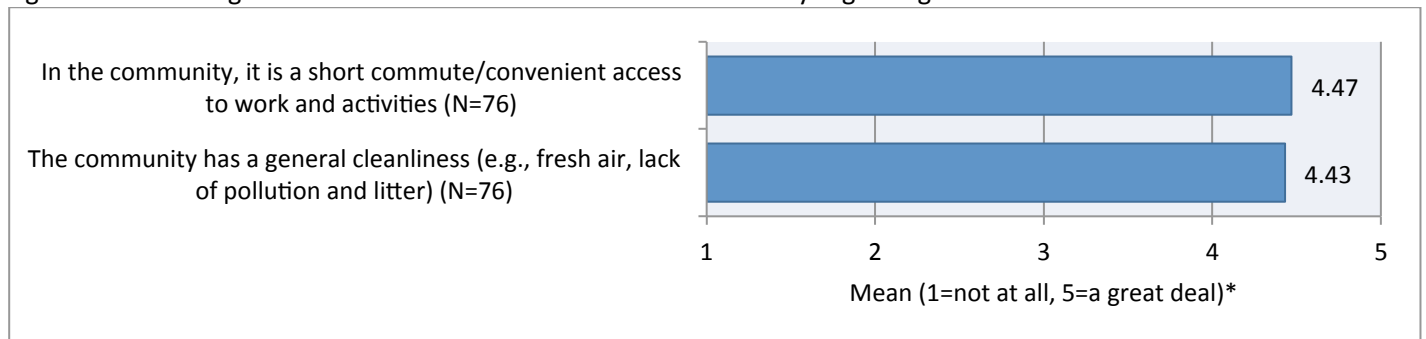
Figure 3. Level of agreement with statements about the community regarding QUALITY OF LIFE



*Means exclude "do not know" responses.

Geographic Setting

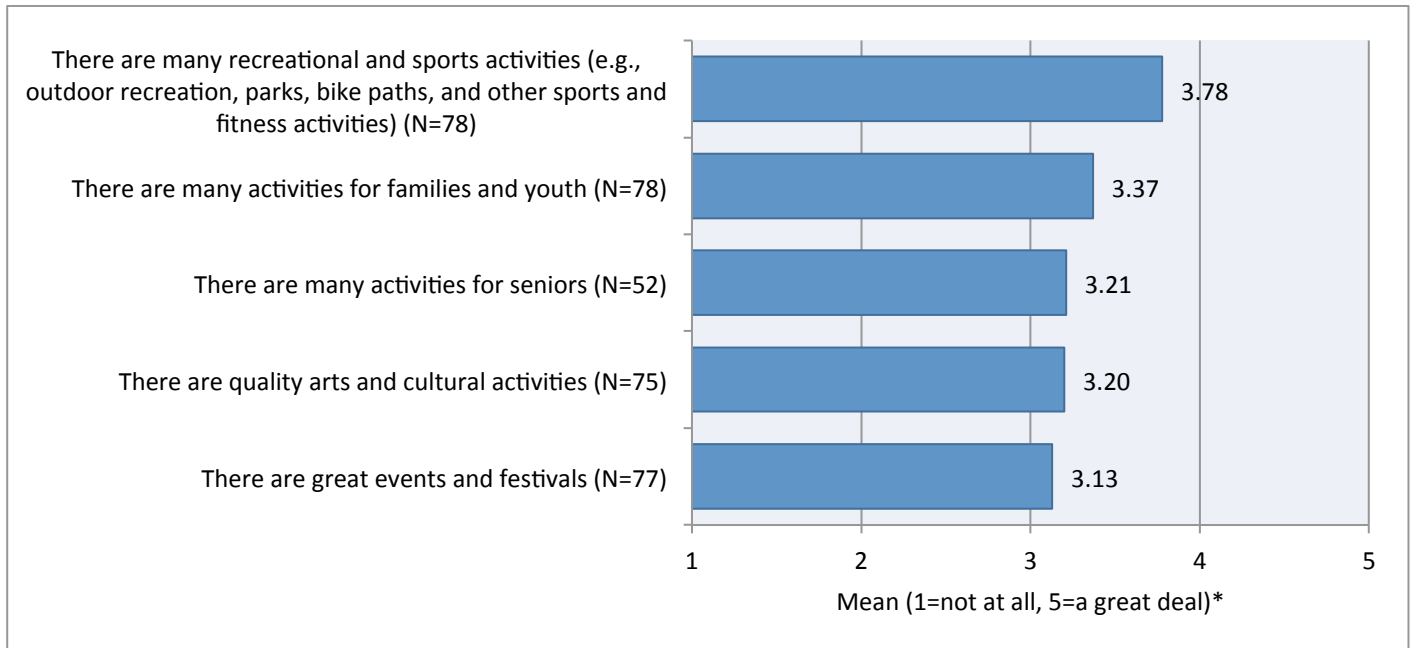
Figure 4. Level of agreement with statements about the community regarding the GEOGRAPHIC SETTING



*Means exclude "do not know" responses.

Activities

Figure 5. Level of agreement with statements about the community regarding ACTIVITIES



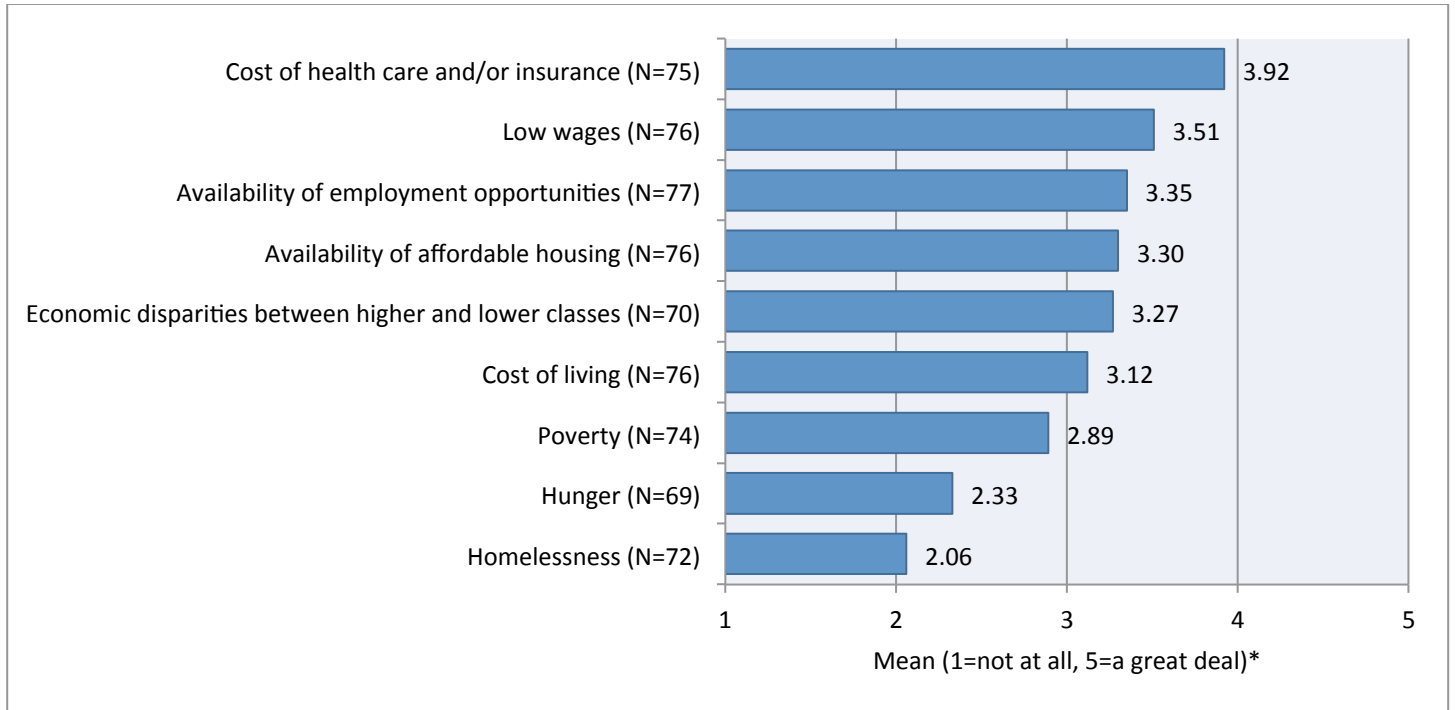
*Means exclude "do not know" responses.

General Concerns about the Community

Respondents were asked to rate their level of concern with various statements regarding ECONOMIC ISSUES, SERVICES AND RESOURCES, TRANSPORTATION, ENVIRONMENTAL POLLUTION, YOUTH CONCERNS, and SAFETY CONCERNS in their community.

Economic Issues

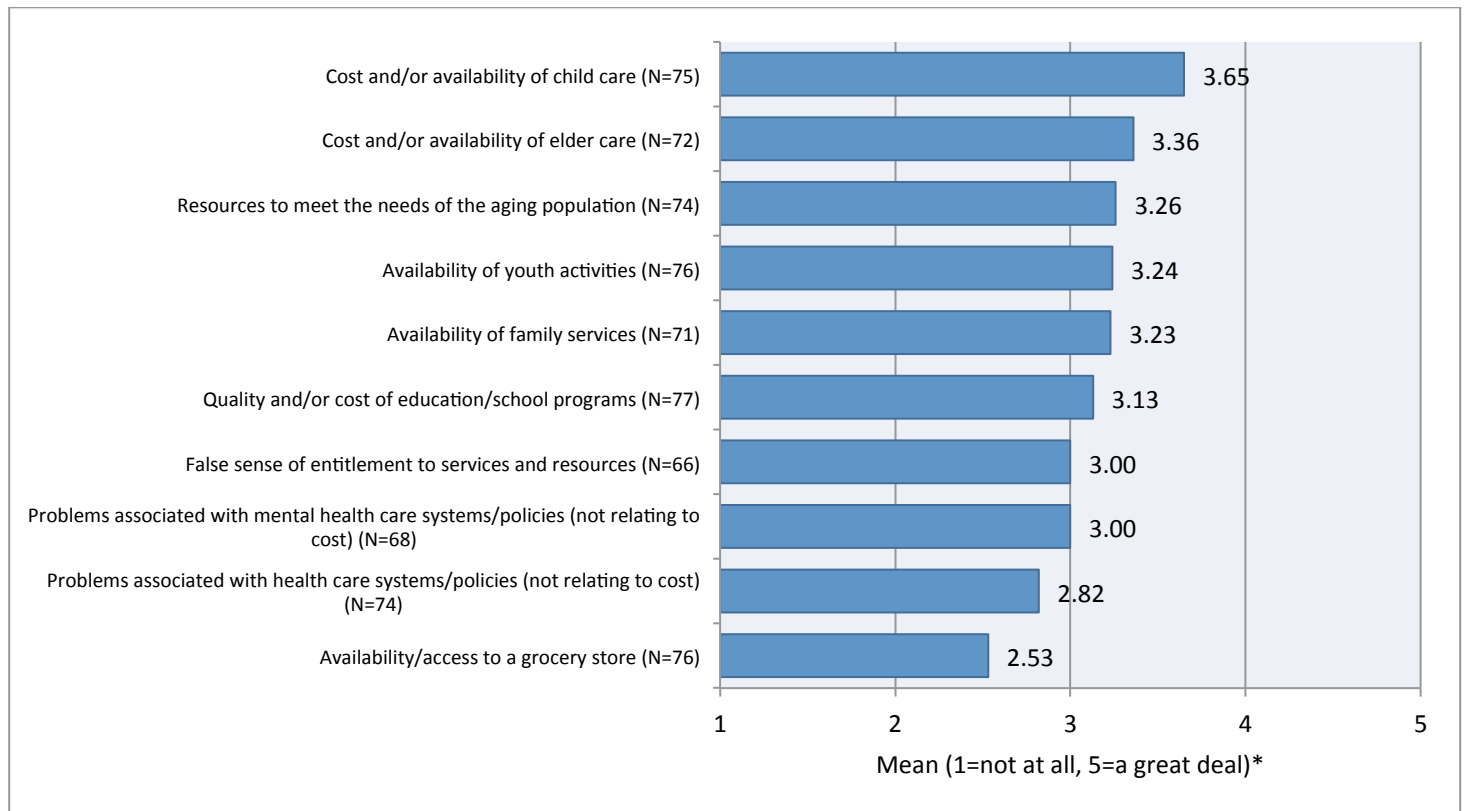
Figure 6. Level of concern with statements about the community regarding ECONOMIC ISSUES



Means exclude "do not know" responses.

Service and Resources

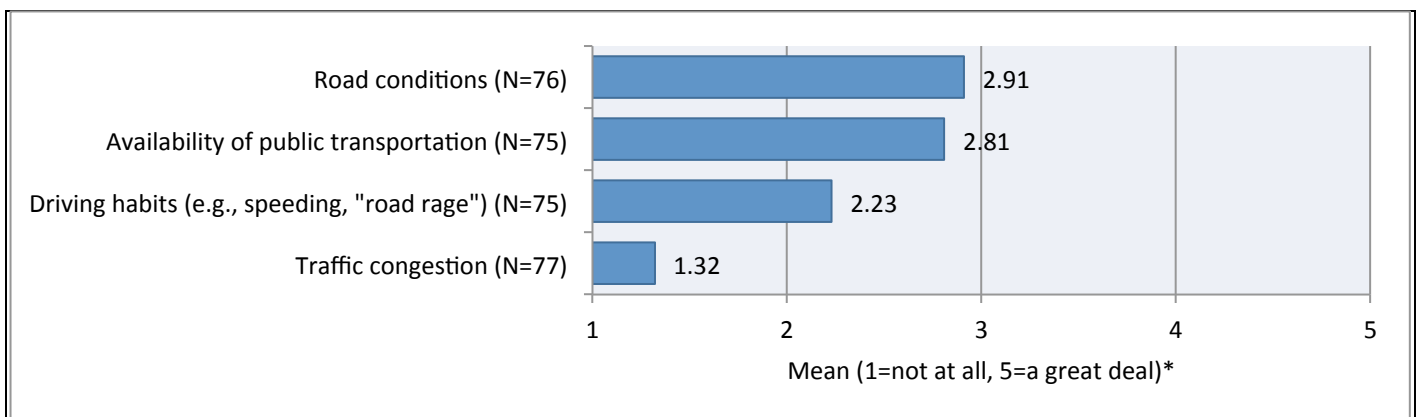
Figure 7. Level of concern with statements about the community regarding SERVICES AND RESOURCES



*Means exclude "do not know" responses.

Transportation

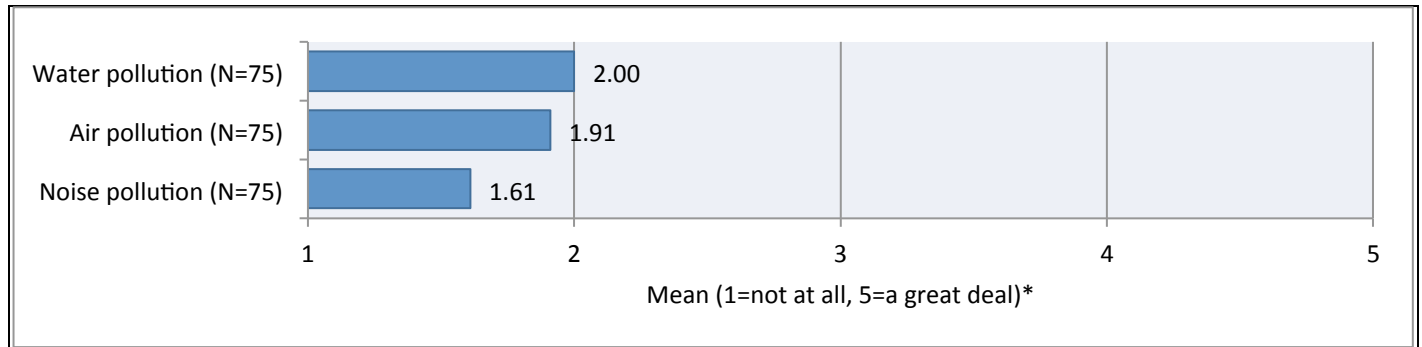
Figure 8. Level of concern with statements about the community regarding TRANSPORTATION



*Means exclude "do not know" responses.

Environmental Pollution

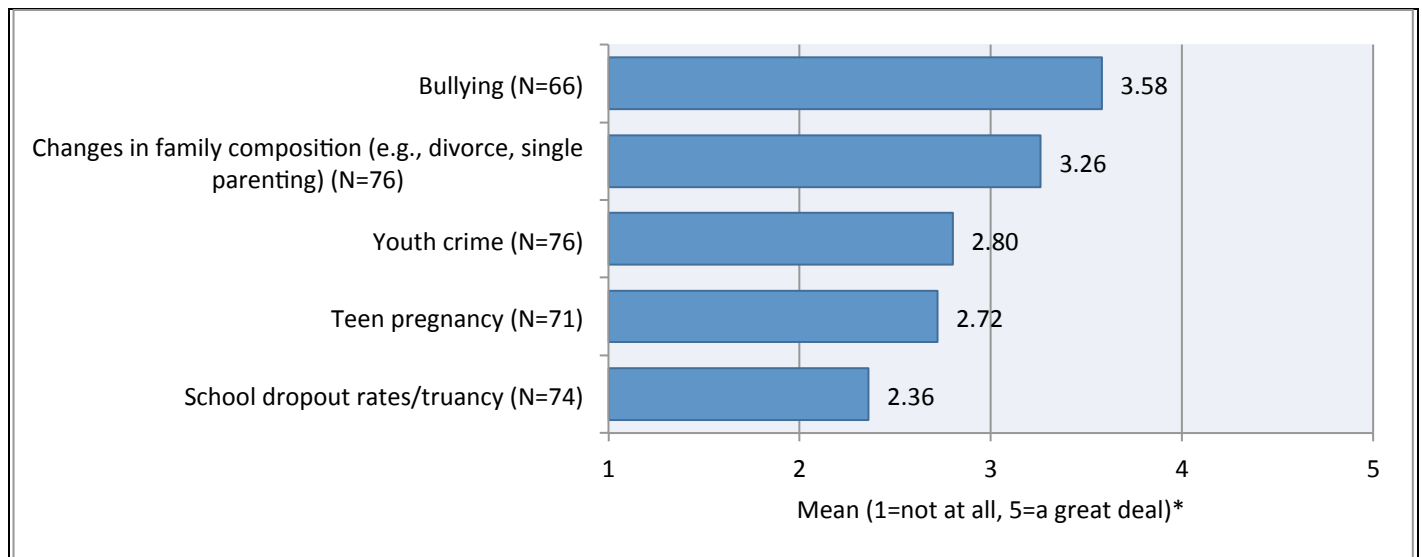
Figure 9. Level of concern with statements about the community regarding ENVIRONMENTAL POLLUTION



*Means exclude "do not know" responses.

Youth Concerns

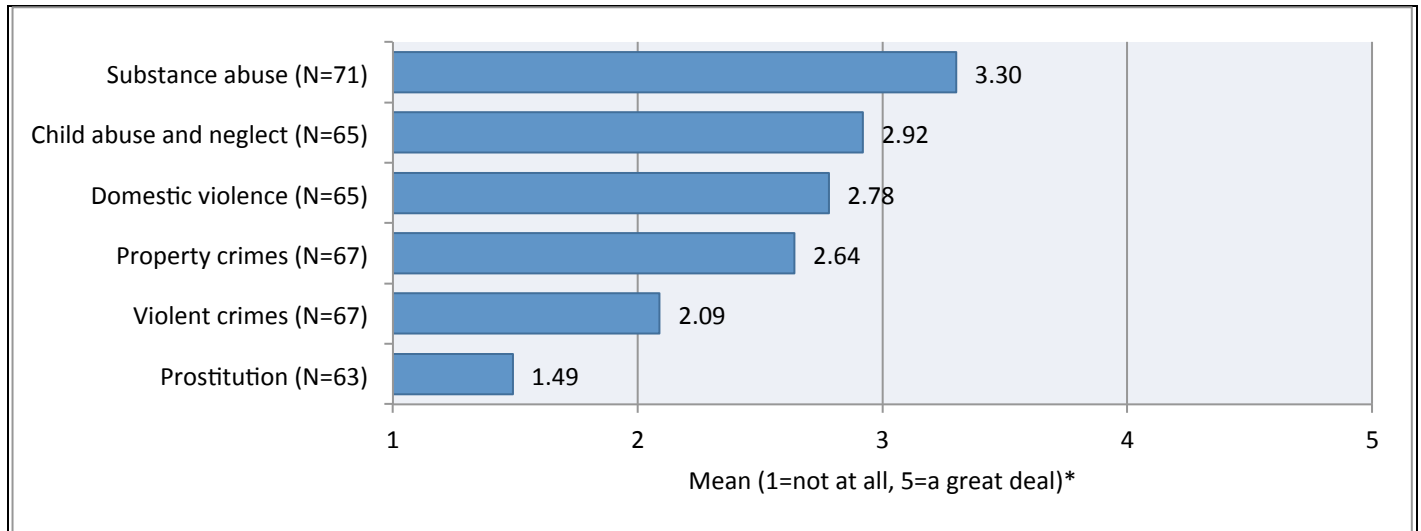
Figure 10. Level of concern with statements about the community regarding YOUTH CONCERNS



*Means exclude "do not know" responses.

Safety Concerns

Figure 11. Level of concern with statements about the community regarding SAFETY CONCERNS



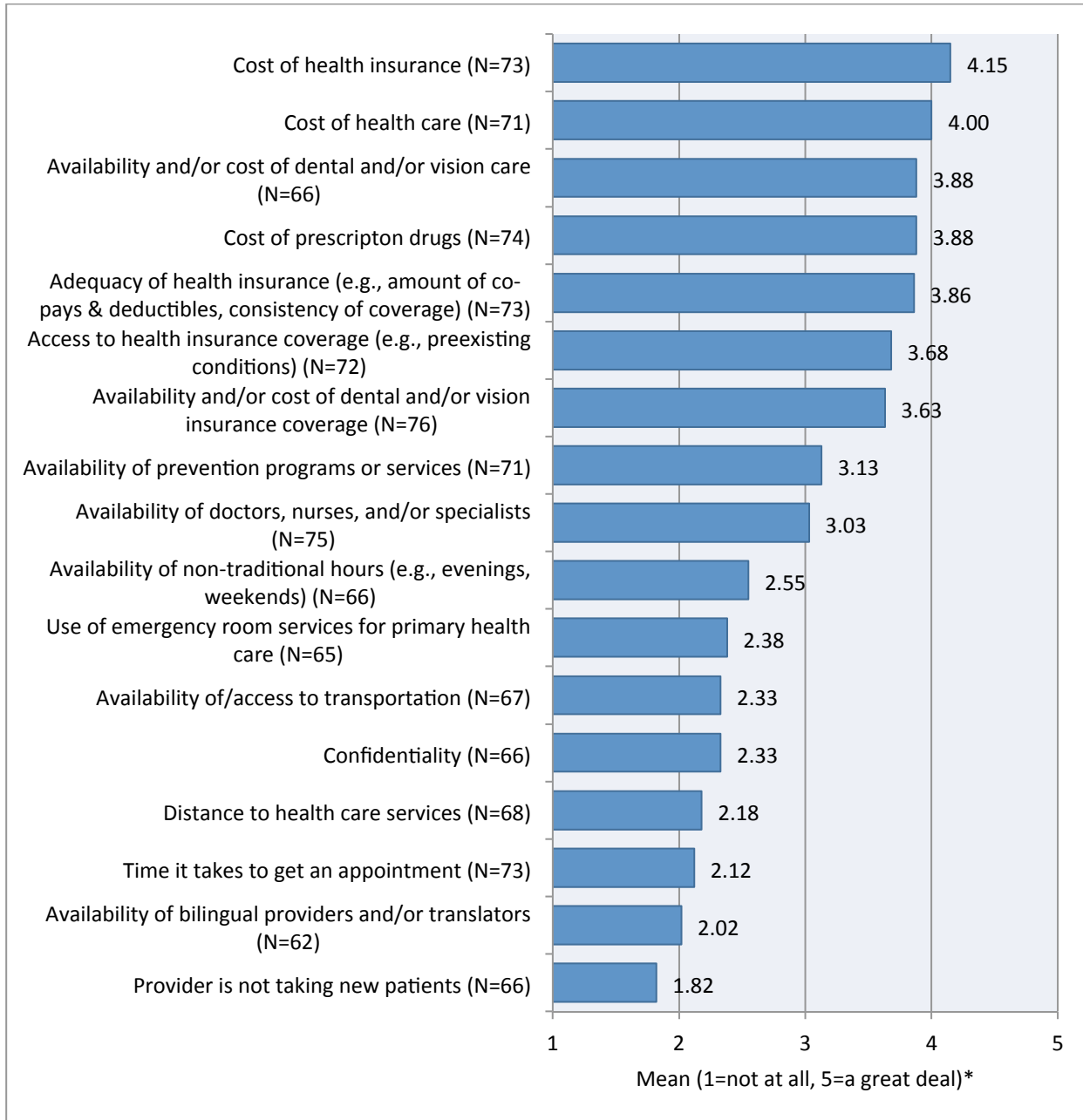
*Means exclude "do not know" responses.

Community Health and Wellness Concerns

Respondents were asked to rate their level of concern about health and wellness issues in their community regarding ACCESS TO HEALTH CARE, SUBSTANCE USE AND ABUSE, PHYSICAL HEALTH, MENTAL HEALTH, and ILLNESS.

Access to Health Care

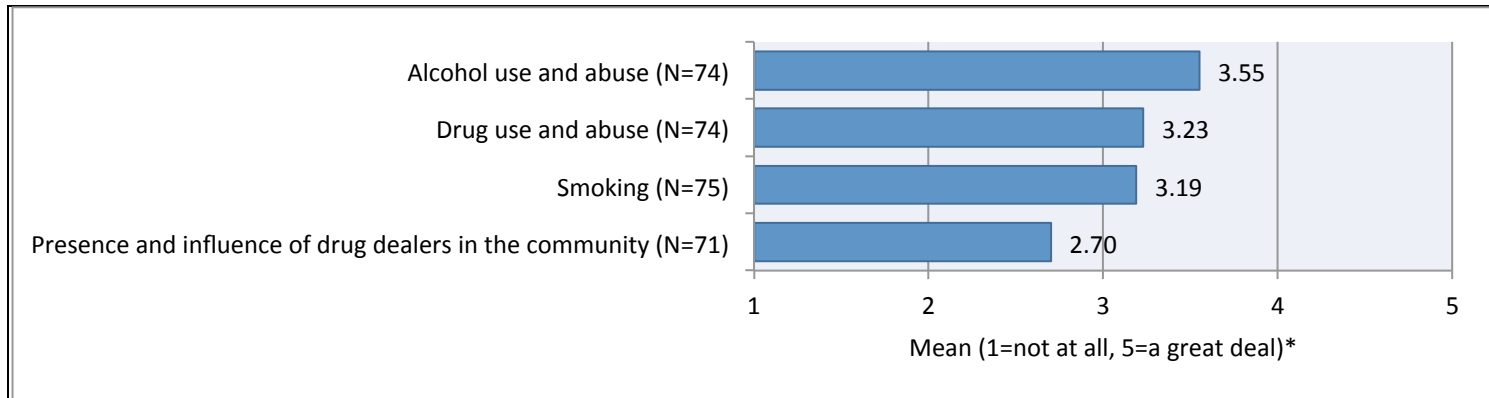
Figure 12. Level of concern with statements about the community regarding ACCESS TO HEALTH CARE



*Means exclude "do not know" responses.

Substance Use and Abuse

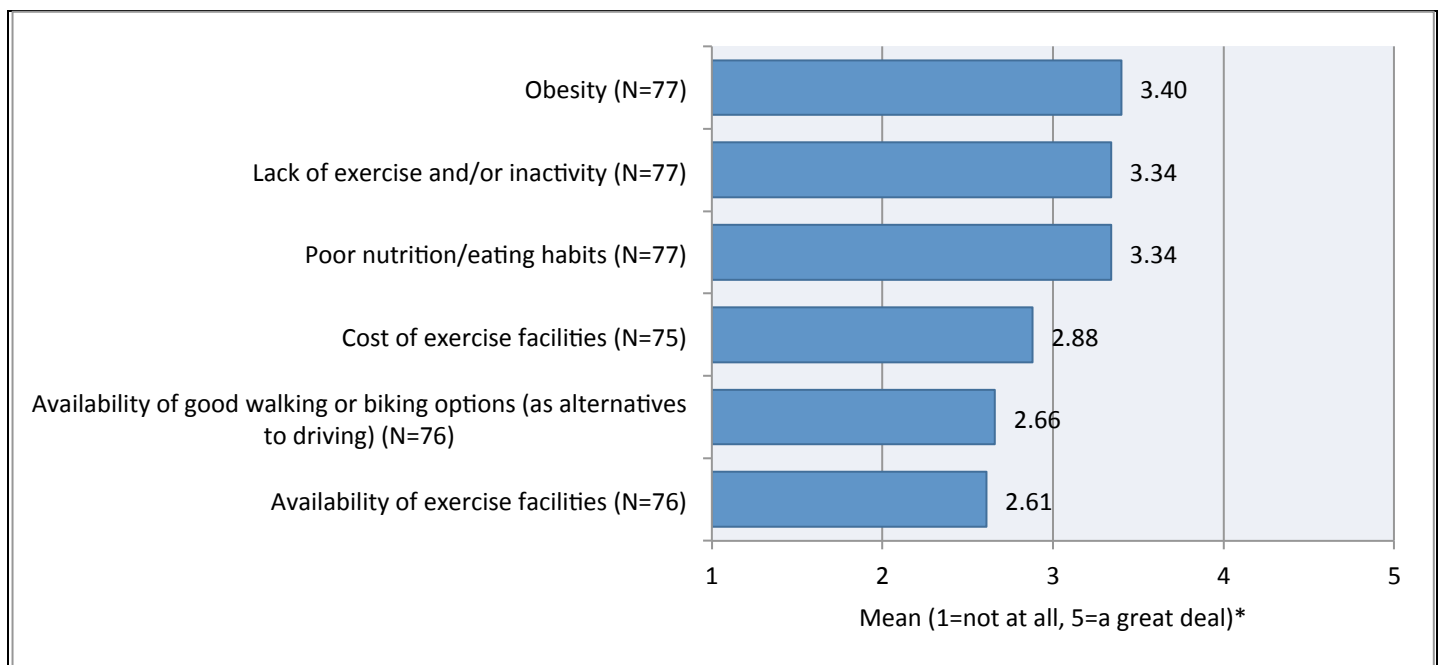
Figure 13. Level of concern with statements about the community regarding SUBSTANCE USE AND ABUSE



*Means exclude "do not know" responses.

Physical Health

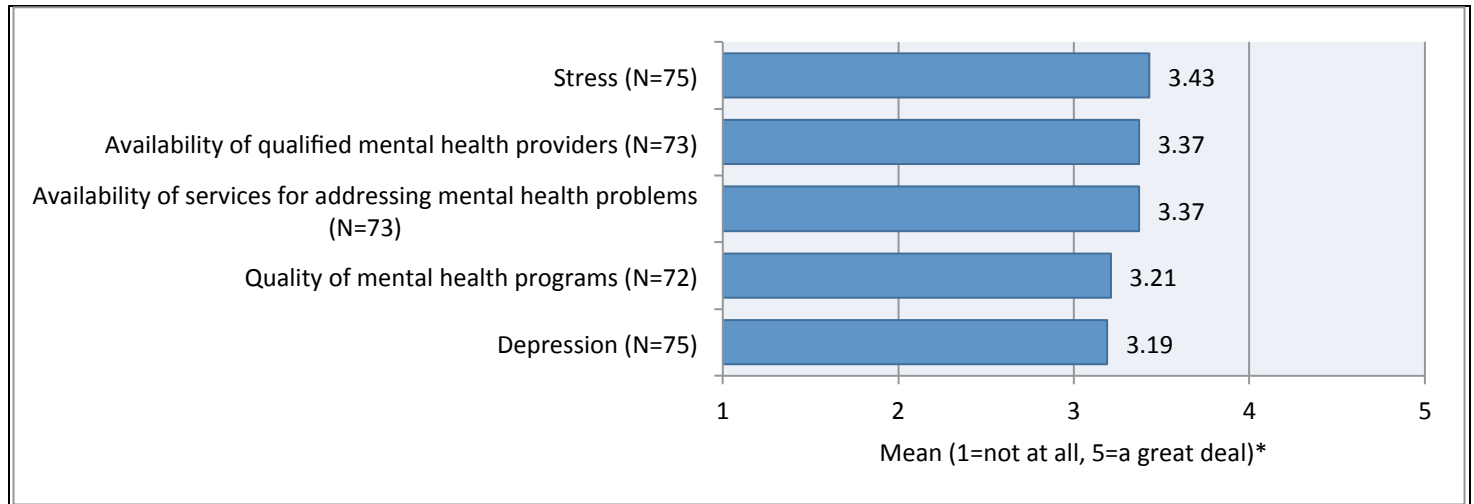
Figure 14. Level of concern with statements about the community regarding PHYSICAL HEALTH



*Means exclude "do not know" responses.

Mental Health

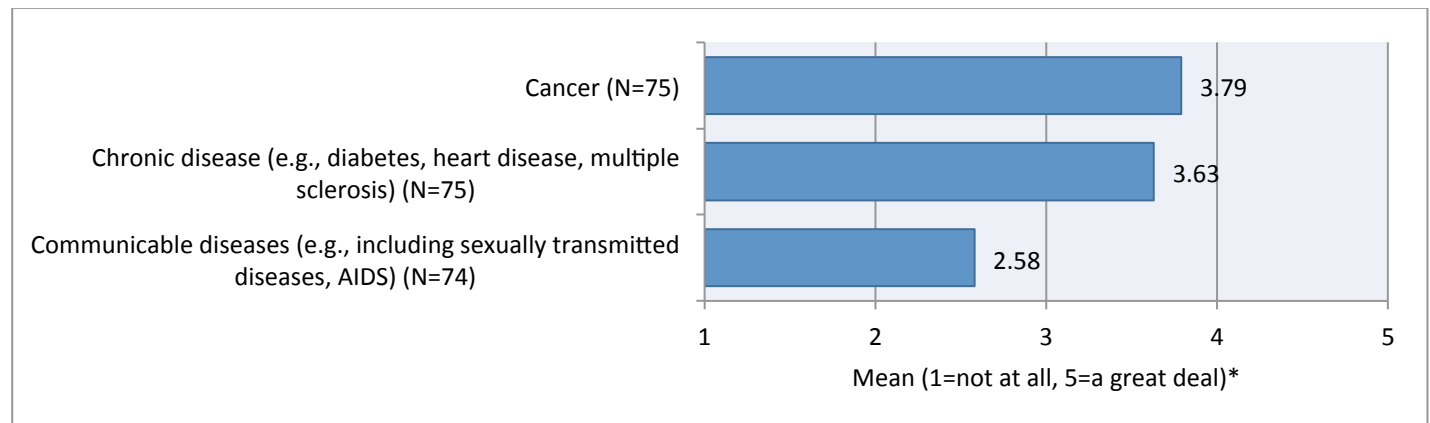
Figure 15. Level of concern with statements about the community regarding MENTAL HEALTH



*Means exclude "do not know" responses.

Illness

Figure 16. Level of concern with statements about the community regarding ILLNESS

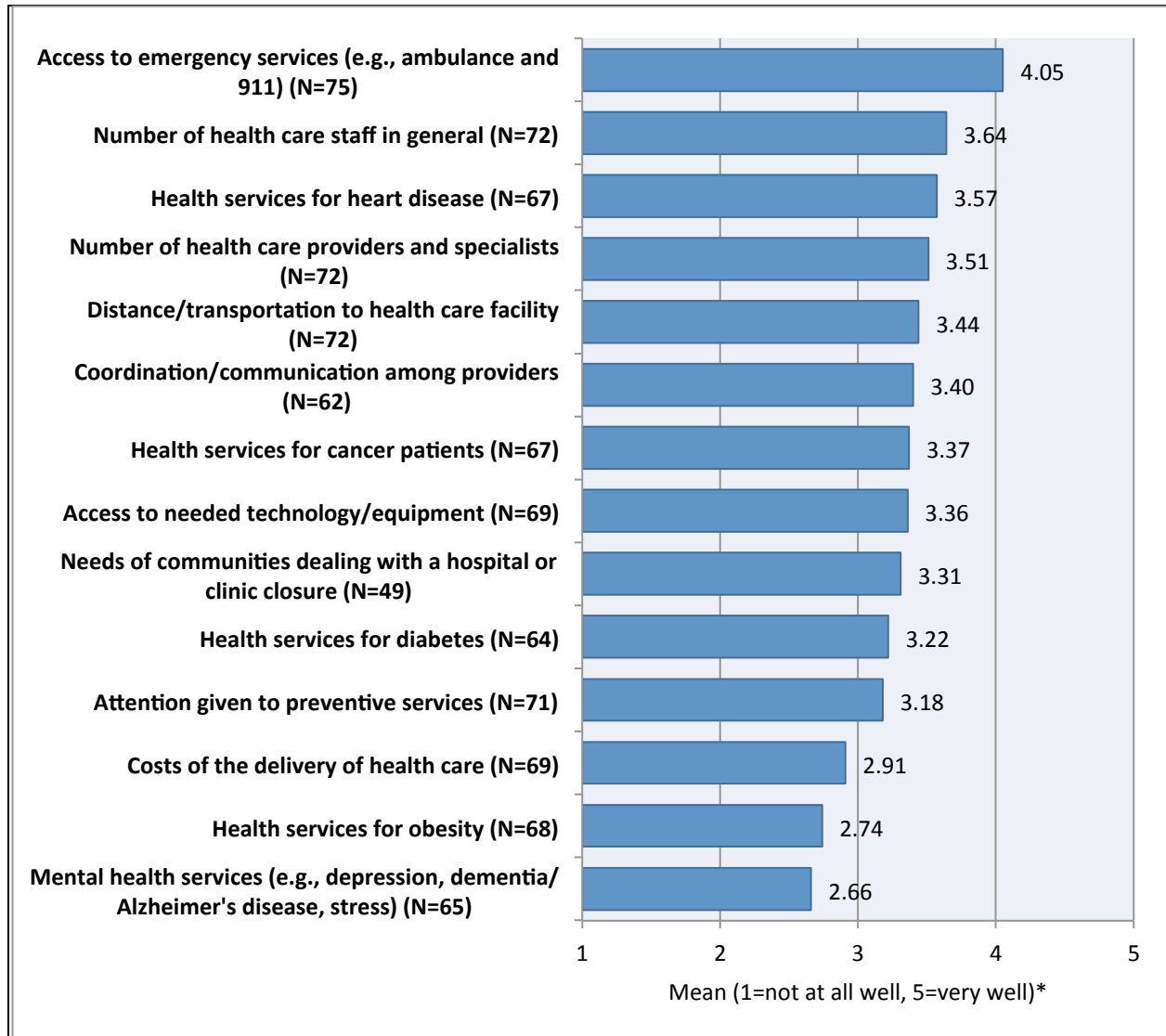


*Means exclude "do not know" responses.

Delivery of Health Care in the Community

Respondents were asked to rate how well DELIVERY OF HEALTH CARE topics are being addressed in their community.

Figure 17. How well topics related to DELIVERY OF HEALTH CARE in the community are being addressed



*Means exclude "do not know" responses.

Personal Health Care Information

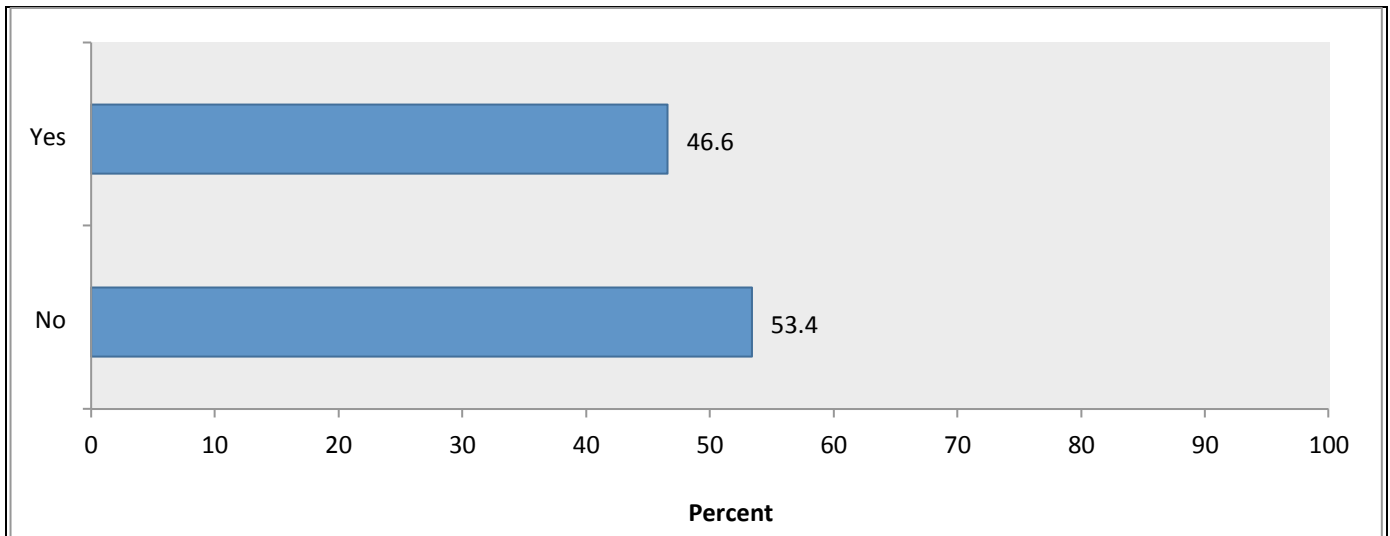
The top three reasons respondents gave for their choice of primary health care provider were quality of services, being influenced by their health insurance, and location.

More than 50% of respondents said they had not had a cancer screening or cancer care in the past year. The most common reason for not having done so was because the doctor had not recommended it. Fear, unfamiliarity with recommendations, and not knowing who to see were not considered to be the main reasons respondents gave.

Respondents were asked whether they had a cancer screening or cancer care in the past year, and if they had not, reasons for not having done so.

- Over 50% said they had not had a cancer screening or cancer care in the past year.

Figure 18. Whether respondents had a cancer screening or cancer care in the past year

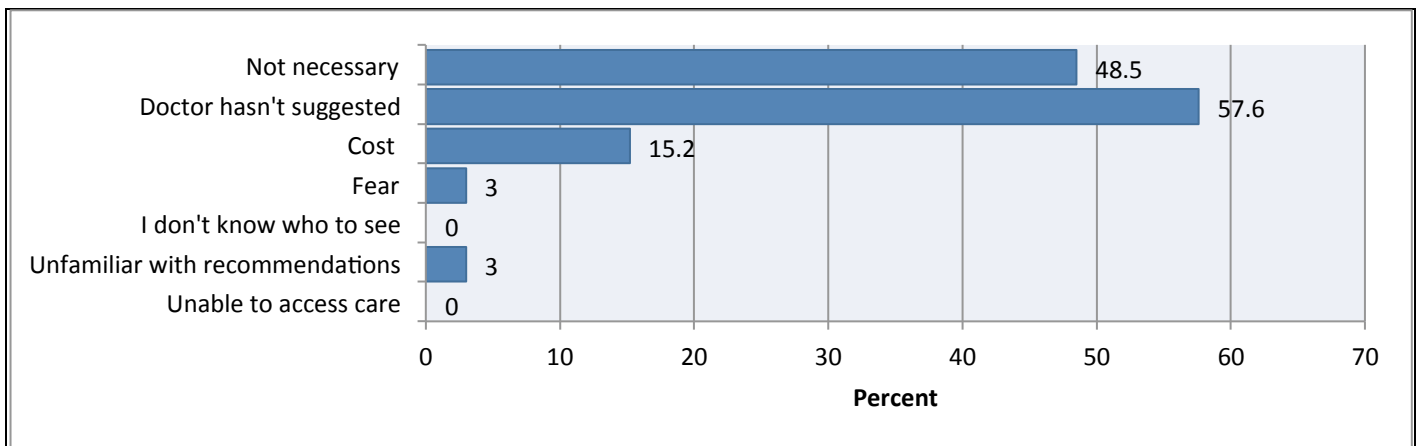


Cancer Screening

Among respondents who had not had a cancer screening or cancer care in the past year, 58% said they had not done so because their doctor had not suggested it. Fifteen percent (15%) stated that cost was a factor.

- Forty-six percent (46%) of respondents stated that they thought the cancer screening was not necessary. Fear was not considered a reason for respondents to not have the screening (Figure 19).

Figure 19. Reasons among respondents who have not had a cancer screening or cancer care in the past year.

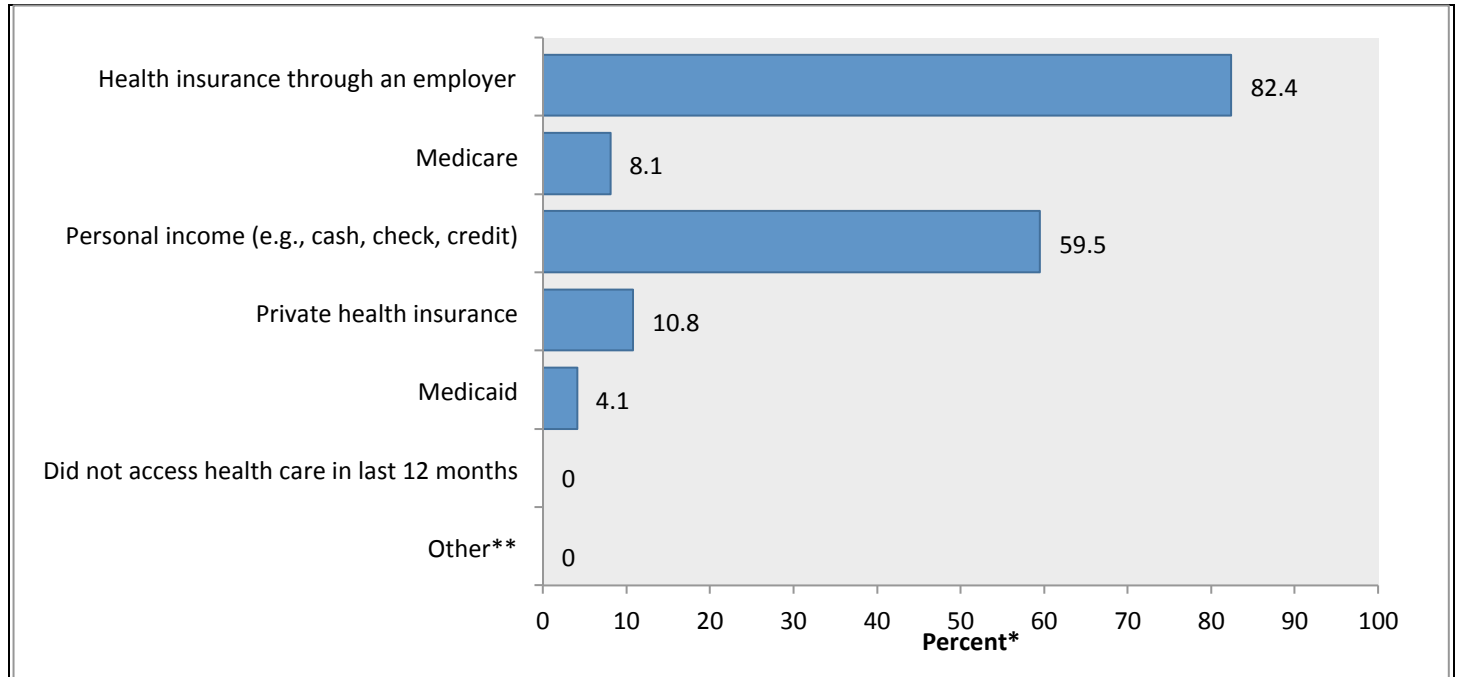


Percentages do not equal 100.0 due to multiple responses.

Health Care Coverage

Respondents were asked how they had paid for health care costs, for themselves or family members, over the last 12 months. A majority of respondents said they had paid for health care costs over the last 12 months by health insurance through an employer. Personal income and private health insurance were also used.

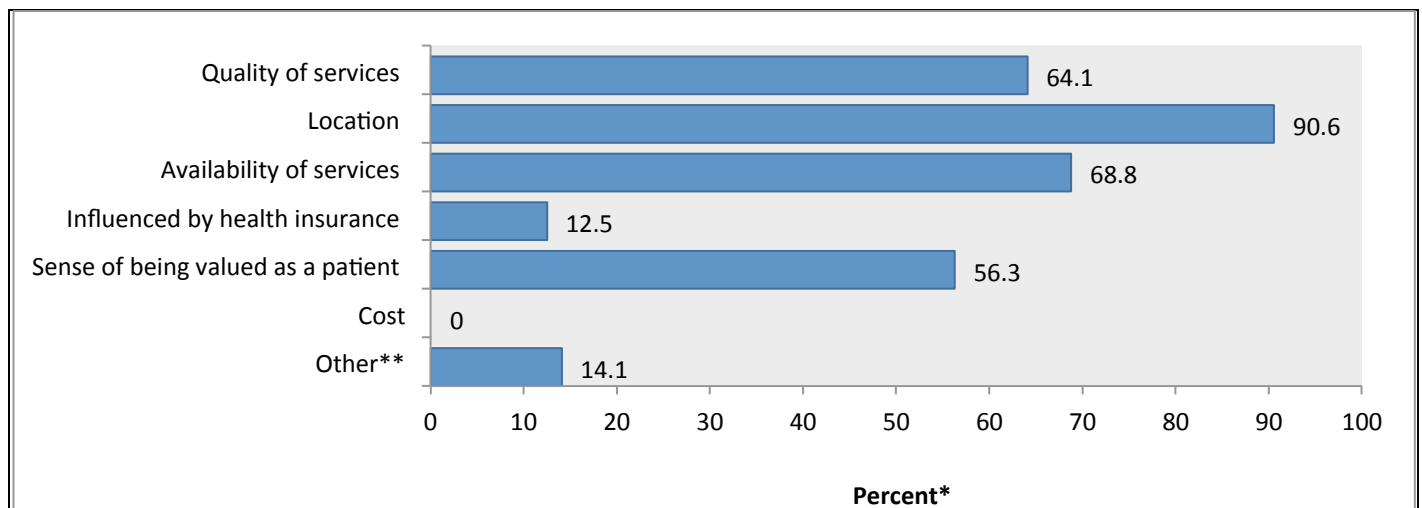
Figure 20. Methods respondents have used to pay for health care costs over the last 12 months



Primary Care Provider

The top three reasons respondents gave for their choice of primary health care provider were location, availability of services, and quality of services (*Figure 21*). Being valued as a patient was important to more than 50% of respondents.

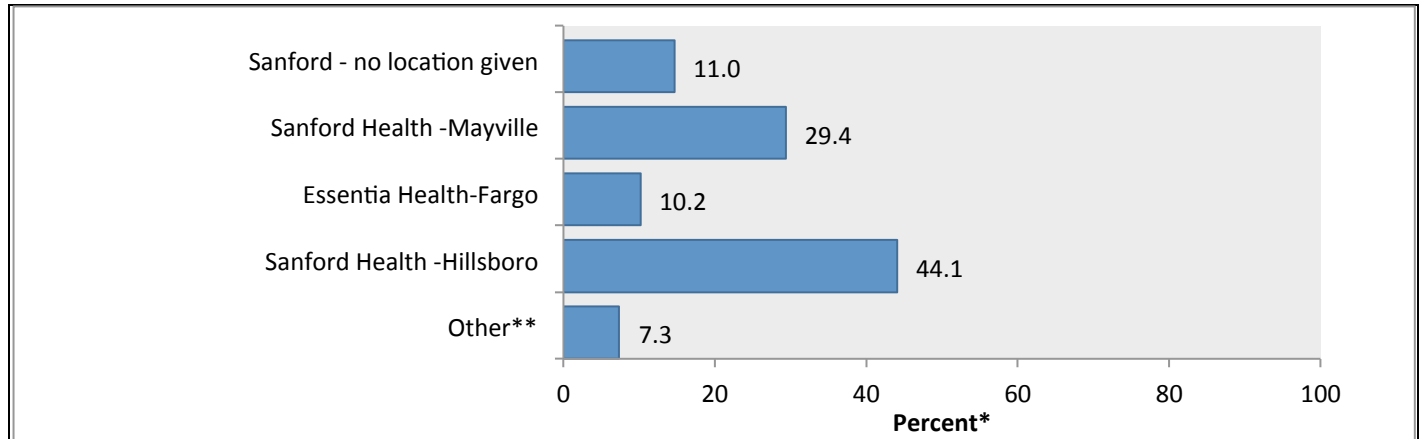
Figure 21. Respondents' reasons for choosing primary health care provider



Respondent's Primary Health Care Provider

Respondents were asked which provider they used for their primary health care. Over 90% percent of respondents said they use Sanford Health as their primary health care provider. Many respondents stated multiple Sanford sites as their primary health care provider. Seven of the sixty-eight respondents to this question did not give the location at Sanford where they access care. Forty-four percent (44%) of respondents listed Sanford Hillsboro as their primary health care provider (Figure 22).

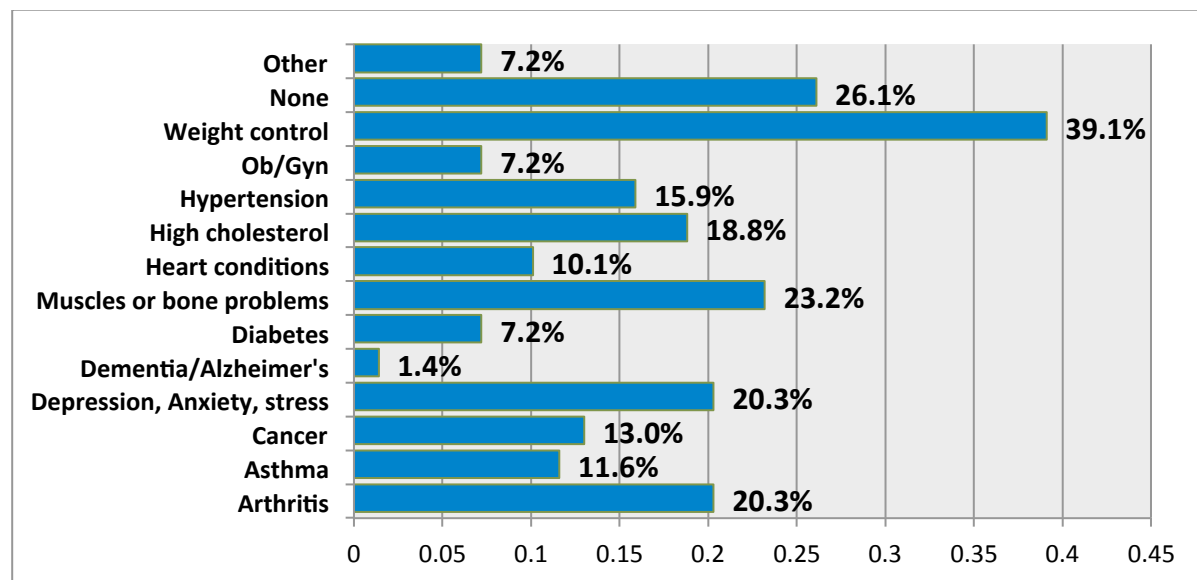
Figure 22. Respondent's primary health care provider



Respondents Representing Chronic Disease

Respondents were asked to select their personal general health conditions/diseases. Weight control received the most responses with 39.1% of participants selecting this condition. The chronic diseases found among respondents include arthritis, cancer, heart disease, diabetes, Alzheimer's, hypertension and depression (Figure 23).

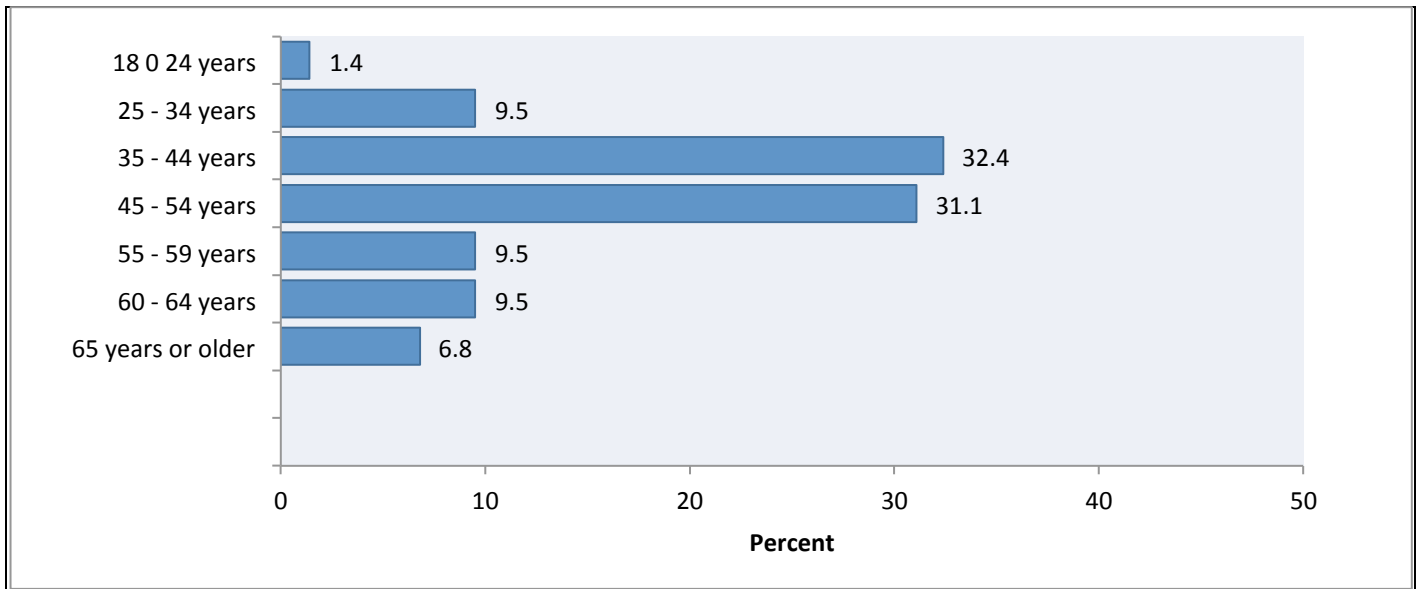
Figure 23. Respondent's health/chronic diseases



Demographic Information

The majority of respondents are 35 to 54 years old.

Figure 24. Respondents' age distribution



Most respondents have a Bachelor's degree or higher, including 21% who have a graduate or professional degree.

Figure 25. Respondents' education

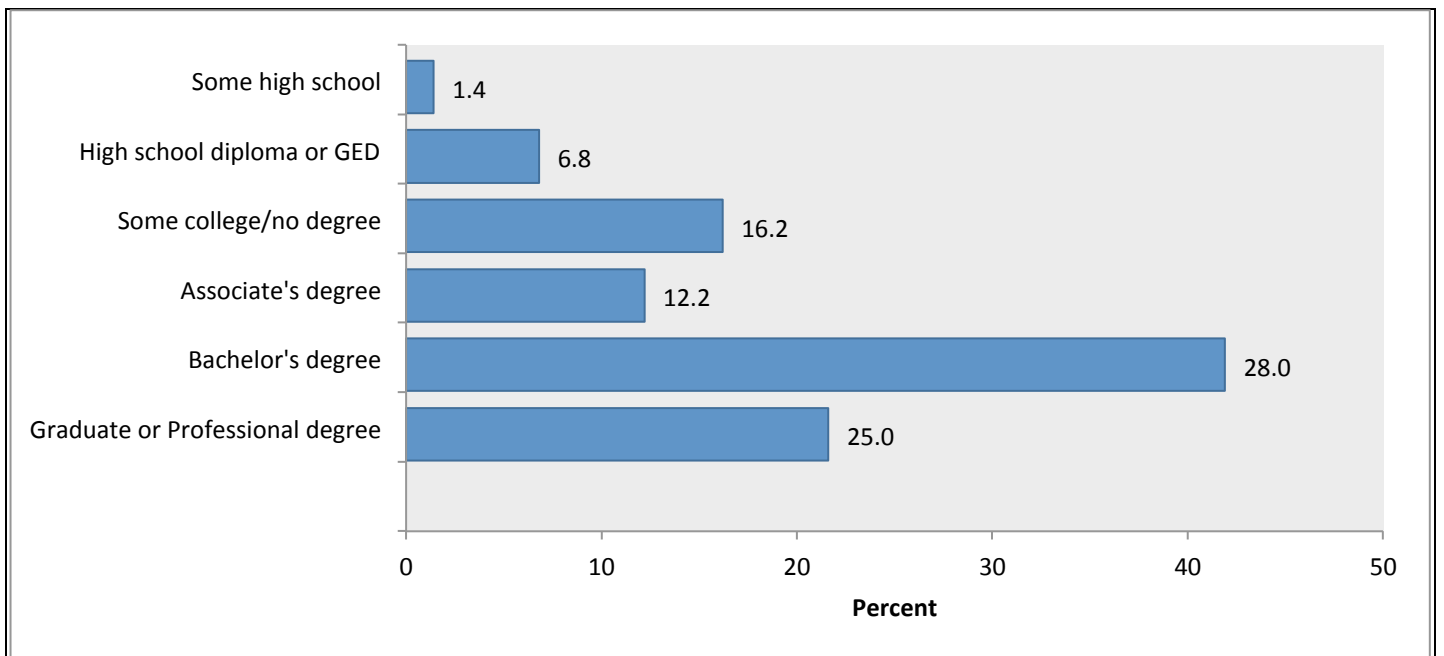
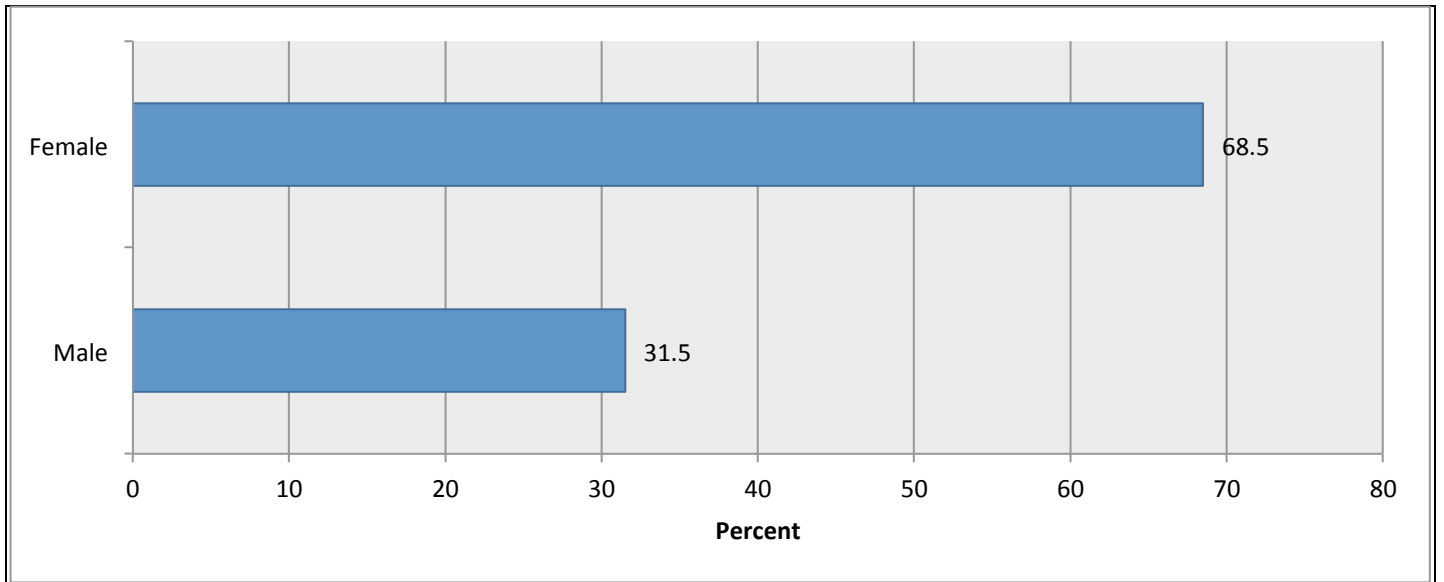


Figure 26. Respondents' gender distribution



Secondary Research

The 2011 County Profiles are based largely on the County Health Rankings from the Mobilizing Action Toward Community Health (MATCH), a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute. State and National Benchmarking required additional data sources including the U.S. Census Bureau, Small Area Health Insurance Estimates, and the Centers for Disease Control and Prevention's National Center for Health Statistics – the Health Indicators Warehouse. The County Profile Data is included in the Appendix.

Health Outcomes

Mortality

The Mortality health outcomes indicate that North Dakota as a state has more premature deaths than the national benchmark. The data for Traill County was not available for this indicator. Map 1 in the Appendix provides a county view of the premature deaths within the five-state region.

		National Benchmark	ND	Traill County ND
Premature death	Years of potential life lost before age 75 per 100,000 (age-adjusted), 2005-2007	5,564	6,330	-

Morbidity

The Morbidity health outcomes indicate that North Dakota citizens self-report more days of poor health (average number of physically unhealthy days reported in past 30 days unhealthy days reported in past 30 days age-adjusted 2003-2009) than the national benchmark; however, Traill County reports slightly better health days and physical health days.

North Dakota self-reports more mentally unhealthy days (average number of mentally unhealthy days reported in past 30 days unhealthy days reported in past 30 days age-adjusted 2003-2009) than the national benchmark. Traill County has a better rate for mentally unhealthy days than the national benchmark.

North Dakota has a higher percentage of low birth weight than the national benchmark. Traill County does not have data for this indicator. Maps 2 – 5 in the Appendix provide county views of the morbidity indicators within the five-state region.

		National Benchmark	ND	Traill County ND
Poor or fair health	Percent of adults reporting fair or poor health (age-adjusted), 2003-2009	10%	12%	9%
Poor physical health days	Average number of physical unhealthy days reported in past 30 days (age-adjusted), 2003-2009	2.6	2.7	2.4
Poor mental health days	Average number of mentally unhealthy days reported in past 30 days (age-adjusted), 2003-2009	2.3	2.5	2.3
Low birth weight	Percent of live births with low birth weight (<2,500 grams), 2001-2007	6.0%	6.4%	-

Health Factors

Health Behaviors

The Health Behavior outcomes indicate that North Dakota has a higher percentage of adult smokers (20% vs. 15%) than the national benchmark. Traill County is lower than the national benchmark with only 13% of adults smoking vs. 15% nationwide. Adult obesity is also higher in the states of North Dakota (28%) and in Traill County (29%) than the national benchmark (25%).

North Dakota (25%) and Traill County (28%) have higher percentages of physical inactivity than the national benchmark (20%).

North Dakota (22%) and Traill County (17%) have higher percentages of binge drinking reports than the national benchmark (8%).

Motor vehicle crash death rates are higher than the national benchmark (12.9) in North Dakota (18.5); however, data was not available for this indicator for Traill County.

Sexually transmitted infections rank substantially higher than the national benchmark (83.0) for North Dakota (300.3), and for Traill County (166.2).

The teen birth rate is higher in North Dakota (26.6) than the national benchmark (22.0), but is lower in Traill County (14.7). Maps 6 – 12 in the Appendix provide county views of the Health Behavior indicators within the five-state region.

		National Benchmark	ND	Traill County ND
Adult smoking	Percent of adults who currently smoke and have smoked at least 100 cigarettes in their lifetime, 2003-2009	15%	20%	13%
Adult obesity	Percent of adults that report a body mass index (BMI) of at least 30 kg/m ² , 2008	25%	28%	29%
Physical inactivity	Percent of adults reporting no leisure physical activity, 2008	20%	25%	28%
Excessive drinking	Percent of adults reporting binge drinking and heavy drinking, (consuming >4 for women and >5 for men on a single occasion) 2003-2009	8%	22%	17%
Motor vehicle crash death rate	Motor vehicle crash deaths per 100,000 population, 2001-2007	12.0	18.5	
Sexually transmitted infections	Number of Chlamydia cases (new cases reported) per 100,000 population 2008	83.0	300.3	166.2
Teen birth rate	Number of teen births per 100,000 females ages 15-19, 2001-2007	22.0	26.6	14.7

Clinical Care

The Clinical Care outcomes indicate that North Dakota (15%) and Traill County (17%) have higher percentages of uninsured adults than the national benchmark (13%). The percentage of uninsured youth is higher in North Dakota (8%) and Traill County (12%) than the national benchmark (7%).

The ratio of population to primary care physicians is higher in North Dakota (655:1) than the national benchmark (631:1). Traill County's ratio is more favorable (565.1).

The ratio of population to mental health providers is much higher in North Dakota (2,555:1) than the national benchmark (2,242:1). Traill County has a much higher ratio (7,912.0).

The number of professionally active dentists is lower than the national benchmark (69.0) in North Dakota (51) and Traill County (12.8).

Preventable hospital stays are higher than the national benchmark (52.0) in North Dakota (71.3) and in Traill County (65.8).

Diabetes screening in North Dakota (85%) is slightly lower than the national benchmark (89%). The rate of diabetes screening is also lower in Traill County (83%) than the national benchmark.

Traill County (77%) ranks higher than the national benchmark (74%) for mammography screenings, while North Dakota (72%) ranks under the national benchmark.

Maps 13 – 20 in the Appendix provide county views of the Clinical Care indicators within the five-state region.

		National Benchmark	ND	Traill County ND
Uninsured adults	Percent of adult population ages 18-64 without health insurance, 2007	13%	15%	17%
Uninsured youth	Percent of youth ages 0-18 without health insurance.	7%	8%	12%
Primary Care Physicians	Ratio of population to primary care physicians, 2008	631:1	665:1	565:1
Mental Health Providers	Ratio of total population to mental health providers, 2008	2,242:1	2,555:1	7,912:0
Dentist rate	Number of professionally active dentists per 100,000 population, 2007	69.0	51.0	12.8
Preventable hospital stays	Hospitalization discharges for ambulatory care-sensitive conditions per 1,000 Medicare enrollees, 2006-2007	52.0	71.3	65.8
Diabetes screening	Percent of Medicare enrollees with diabetes that receive HbA1c screening, 2006-2007	89%	85%	83%
Mammography screening	Percent of female Medicare enrollees that receive mammography screening, 2006-2007	74%	72%	77%

Social and Economic Factors

The Social and Economic Factors outcomes indicate that North Dakota (83%) and Traill County (90%) have lower high school graduation rates than the national benchmark (93%); however, both (ND 72% - TC 76%) have higher percentages of post-secondary education than the national benchmark (68%).

The unemployment rate was substantially higher nationally (5.3%) during 2009, while North Dakota (4.3%) and Traill County (4.3%) were all substantially lower. The unemployment rate in 2012 was substantially better than the national benchmark for North Dakota.

The percentage of child poverty is higher in North Dakota (14%) than the national benchmark (11%). The percentage is lower in Traill County (9%).

Inadequate social support is higher in North Dakota (17%) and Traill County (15%) than the national benchmark (14%).

The percentage of children in single parent households is higher than the national benchmark (20%) in North Dakota (24%), but is lower in Traill County (12%).

The number of homicide deaths in North Dakota (1.7) is higher than the national benchmark (1.0). There was no data available for Traill County for this indicator.

Maps 21 – 27 in the Appendix provide county views of the Social and Economic indicators within the five-state region.

		National Benchmark	ND	Traill County ND
High school graduation	Percent of ninth-grade cohort in public schools that graduates from high school in four years 2006-2007	92%	83%	90%
Some college	Percent of adults ages 25-44 with some post-secondary education, 2005-2009	68%	72%	76%
Unemployment	Percent of population ages 16 and older that is unemployed but seeking work 2009 May of 2012	5.3% 7.9%	4.3% 2.7%	4.3% 3.7%
Child poverty	Percent of children ages 0-17 living below the Federal Poverty Line, 2008	11%	14%	9%
Inadequate social support	Percent of adults that never, rarely, or sometimes get the social and emotional support they need, 2003-2009	14%	17%	15%
Children in single parent households	Percent of children in families that live in a household headed by a parent with no spouse present, 2005-2009	20%	24%	12%
Homicide rates	Number of deaths due to murder or non-negligent manslaughter per 100,000 population, 2001-2007	1.0	1.7	NA

Physical Environment

The Physical Environment outcomes indicate that there is no air pollution or ozone pollution in this area. Access to healthy food is ranked far below the national benchmark (93%) in both North Dakota (35%) and Traill County (20%). In this rural area there can be a far distance to travel to grocery stores, and there are food deserts in some communities where only a gas station convenience store is close to home.

Access to recreational facilities ranks lower than the national benchmark for North Dakota (12.0) and Traill County (0%).

Maps 28 – 31 in the Appendix provide county views of the Physical Environment indicators within the five-state region.

		National Benchmark	ND	Traill County ND
Air pollution-particulate matter	Number of days air quality was unhealthy for sensitive populations due to fine particulate matter, 2006	0	0	0
Air pollution-ozone	Number of days air quality was unhealthy for sensitive populations due to ozone levels, 2006	0	0	0
Access to healthy foods	Percent of zip codes with a healthy food outlet (i.e. grocery store or produce stand/farmers market), 2008	92%	35%	20%
Access to recreational facilities	Number of recreational facilities per 100,000 population 2008	17.0	12.0	0.0

Demographics

Youth account for 22% of the population in Traill County. Elderly account for 19% of the population in Traill County.

One hundred percent (100%) of Traill County is rural compared to 44% of North Dakota and 21% as the national benchmark.

Only 2% of North Dakotans and 1% of the Traill County population is not proficient in English compared to the national benchmark which is 9%.

North Dakota and Traill County - both at 6% - have a low illiteracy rate compared to the national benchmark of 15%.

Maps 32 –36 in the Appendix provide county views of the demographics within the five-state region.

		National Benchmark	ND	Traill County ND
Youth	Percent of total population ages 0-17, 2009	24%	22%	22%
Elderly	Percent of total population ages 65 and older, 2009	13%	15%	19%
Rural	Percent of total population living in rural area, 2000	21%	44%	100%
Not English Proficient	Percent of total population that speaks English less than “very well”. 2005-2009	9%	2%	1%
Illiteracy	Percent of population ages 16 and older that lacks basic prose literacy skills, 2003	15%	6%	6%

Population by Age

The population for this area is relatively young with only 4% older than 85 years of age and only 14% older than 65 years of age.

The gender distribution is 50-50 in Traill County.

	ND	Traill County ND
Total population	672,591	8,121
Percent ages 65 and older	14%	19%
Percent 85 and older	3%	4%
Percent male	51%	50%
Percent female	49%	50%

Based on 2010 Census data

Housing

The majority of individuals in this county own their homes (72%).

	ND	Traill County ND
Percent of occupied housing that is owner-occupied	65%	72%
Percent of occupied housing that is renter-occupied	35%	28%

Based on 2010 Census data

Economic Security

According to the 2010 Census Data, the population of working age in the labor force ranges from 69-77% in North Dakota. Traill County is at 68%. The percentage of those living at less than 100% of the Federal poverty level is 12 % in North Dakota, with 30% living at less than 200% of the Federal poverty level. Both rates are slightly lower in Traill County.

The median household income in North Dakota is \$46,781. Traill County falls slightly below at \$44,290 annual income.

	ND	Traill County ND
Percent of working age population in the labor force	69%	68%
Percent of total population with income less than 100% of poverty	12%	9%
Percent of total population with income less than 200% of poverty	30%	29%
Median household income	\$46,781	\$44,290
Owner occupied housing units	184,117	2,570
Percent spending 30% or more income toward housing costs	17%	16%
Renter occupied housing units	92,525	855
Percent renters spending 30% or more of income toward housing costs	37%	32%

Diversity Profile

The population distribution by race demonstrates that Traill County and the state of North Dakota are predominantly white, followed by the Hispanic origin of any race. American Indians rank third in Traill County and second in North Dakota as the leading race by population.

	ND	Traill County ND
Total population	672,591	8,121
White alone	605,449	7,809
Asian alone	6,909	21
Black alone	7,960	42
Hispanic origin – of any race	13,467	214
American Indian	36,591	64

Health Needs Identified

The identified needs from the surveys and analysis of secondary data indicated the following needs:

- Access to Health Care/Physicians
- Aging /Baby Boomers
- Day Care
- Economic Issues
- Mental Health
- Physical Health/Obesity/Nutrition Education
- Substance Use and Abuse

Community Assets/Prioritization Process

A review of the primary and secondary research concerns was conducted followed by an asset mapping exercise to determine what resources were available to address the needs. Community experts were asked to complete the asset mapping exercise. Individuals who contributed to this work include the health department, social services, education, community members and leaders from the health care facilities within the county.

Table 1 in the Appendix displays the concerns and assessed needs that were determined by the assessment and includes the assets in the community that address the needs.

An informal gap analysis was conducted at the conclusion of the asset mapping work. The gap analysis determined that there were three main areas on which to focus attention. A multi-voting prioritization process determined the priority of the remaining needs.

The priorities that remain include:

- Mental health and care coordination for mental health services
- Services for the elderly
- Day care

Sanford will address obesity and behavioral health through an enterprise-wide implementation strategy. The priority decisions are supported by the Second Biennial Report Health Issues for the State of North Dakota – 2013 that was conducted by the University of North Dakota School of Medicine and Health Sciences and the Center for Rural Health. The study finds that mental health issues are prominent throughout the state and the workforce to

address these concerns is a gap for access to health care. The study also finds that services for the elderly will be an increasing need in North Dakota, the second leading state in the nation for the percentage of population older than 85 years of age. This is a time in life when the population utilizes more health care in general and more health care for acute needs.

Table 2 in the Appendix displays the unmet needs that were determined after the asset mapping exercise and the prioritized list of remaining needs.

IMPLEMENTATION STRATEGY

2013 Community Health Needs Assessment Sanford Hillsboro Implementation Strategy

The following unmet needs were identified through a formal community health needs assessment, resources/asset mapping and multi-voting prioritization process:

- Mental Health
- Services for the Elderly
- Day Care

Implementation Strategy: Mental Health Services

- Define services currently available
- Define mechanisms to educate service area
- Define education process and secure outside resources
- Develop directory with resources and outsource information
- Distribute directory to various groups, entities and secure email addresses and updates
- Participate in Sanford One Mind as determined by the enterprise three-year plan

Implementation Strategy: Services for the Elderly

- Update directory of available services
- Print/distribute

Implementation Strategy: Day Care

- Determine specific needs
- Request assistance from outside services to secure day care services
- Find location for services
- Request community assistance (e.g. keeping day care profitable)
- Ongoing process - monitoring the needs and services

2013 Community Health Needs Assessment Enterprise Implementation Strategy

The following unmet needs were identified through a formal community health needs assessment, resource mapping and prioritization process:

- Mental Health Services
- Obesity

Implementation Strategy: Mental Health Services - Sanford One Mind

- Completion (to the extent resources allow) of full integration of Behavioral Health services in all primary care clinics in Fargo and Sioux Falls
- Completion (to the extent resources allow) of full integration of Behavioral Health services or access to Behavioral Health outreach in all regional clinic sites in the North, South and Bemidji regions
- Complete presentation of outcomes of first three years of integrated Behavioral Health services
- Implementation of integrated Behavioral Health into clinics in new regions
- Design Team for Inpatient Psychiatric Unit, Partial Hospitalization and Clinic Space for Fargo presents recommendations for design of new spaces
- Design Team for Sioux Falls Inpatient Psychiatric Units and Partial Hospitalization

Implementation Strategy: Obesity

- Medical Management for Obesity
 - Develop CME curriculum for providers and interdisciplinary teams across the enterprise inclusive of medical, nutrition, nursing, and Behavioral Health professionals
- Develop community education programming
 - Include the following program options in the curriculum to create awareness of existing resources:
 - Family Wellness Center
 - Honor Your Health Program
 - WebMD Fit Program
 - Bariatric Services
 - Eating Disorder Institute
 - Mental Health/Behavioral Health
 - Profile
- Actively participate in community initiatives to address wellness, fitness and healthy living

APPENDIX

2011 County Health Profile

Trail County

An adaptation of the County Health Rankings Project for the Fargo-Moorhead
Community Health Needs Assessment Collaborative

North Dakota

		Trail	*National Benchmark	North Dakota
HEALTH OUTCOMES				
<i>Mortality</i>				
Premature death	Years of potential life lost before age 75 per 100,000 population (age-adjusted), 2005-2007	-	5,564	6,330
<i>Morbidity</i>				
Poor or fair health	Percent of adults reporting fair or poor health (age-adjusted), 2003-2009	9%	10%	12%
Poor physical health days	Average number of physically unhealthy days reported in past 30 days (age-adjusted), 2003-2009	2.4	2.6	2.7
Poor mental health days	Average number of mentally unhealthy days reported in past 30 days (age-adjusted), 2003-2009	2.3	2.3	2.5
Low birthweight	Percent of live births with low birthweight (<2,500 grams), 2001-2007	-	6.0%	6.4%
HEALTH FACTORS				
<i>Health Behaviors</i>				
Adult smoking	Percent of adults that currently smoke and have smoked at least 100 cigarettes in their lifetime, 2003-2009	13%	15%	20%
Adult obesity	Percent of adults that report a body mass index (BMI) of at least 30 kg/m ² , 2008	29%	25%	28%
Physical inactivity	Percent of adults reporting no leisure time physical activity, 2008	28%	20%	25%
Excessive drinking	Percent of adults reporting binge drinking and heavy drinking**, 2003-2009	17%	8%	22%
Motor vehicle crash death rate	Motor vehicle crash deaths per 100,000 population, 2001-2007	-	12.0	18.5
Sexually transmitted infections	Number of chlamydia cases (new cases reported) per 100,000 population, 2008	166.2	83.0	300.3
Teen birth rate	Number of teen births per 1,000 females ages 15-19, 2001-2007	14.7	22.0	26.6
<i>Clinical Care</i>				
Uninsured adults	Percent of adult population ages 18-64 without health insurance, 2007	17%	13%	15%
Uninsured youth	Percent of youth ages 0-18 without health insurance, 2007	12%	7%	8%
Primary care physicians	Ratio of total population to primary care physicians, 2008	565:1	631:1	665:1
Mental health providers	Ratio of total population to mental health providers, 2008	7,912:0	2,242:1	2,555:1
Dentist rate	Number of professionally active dentists per 100,000 population, 2007	12.8	69.0	51.0
Preventable hospital stays	Hospitalization discharges for ambulatory care-sensitive conditions per 1,000 Medicare enrollees, 2006-2007	65.8	52.0	71.3
Diabetic screening	Percent of diabetic Medicare enrollees that receive HbA1c screening, 2006-2007	83%	89%	85%
Mammography screening	Percent of female Medicare enrollees that receive mammography screening, 2006-2007	77%	74%	72%

HEALTH FACTORS (continued)		Trail	*National Benchmark	North Dakota
<i>Social and Economic Factors</i>				
High school graduation	Percent of ninth-grade cohort in public schools that graduates from high school in four years, 2006-2007	90%	92%	83%
Some college	Percent of adults ages 25-44 with some post-secondary education, 2005-2009	76%	68%	72%
Unemployment	Percent of population ages 16 and older that is unemployed but seeking work, 2009	4.3%	5.3%	4.3%
Child poverty	Percent of children ages 0-17 living below the Federal Poverty Line, 2008	9%	11%	14%
Inadequate social support	Percent of adults that never, rarely, or sometimes get the social and emotional support they need, 2003-2009	15%	14%	17%
Children in single-parent households	Percent of children in families that live in a household headed by a parent with no spouse present, 2005-2009	12%	20%	24%
Homicide rate	Number of deaths due to murder or non-negligent manslaughter per 100,000 population, 2001-2007	-	1.0	1.7
<i>Physical Environment</i>				
Air pollution-particulate matter	Number of days air quality was unhealthy for sensitive populations due to fine particulate matter, 2006	0	0	0
Air pollution-ozone	Number of days air quality was unhealthy for sensitive populations due to ozone levels, 2006	0	0	0
Access to healthy foods	Percent of zip codes with a healthy food outlet (i.e., grocery store or produce stand/farmers' market), 2008	20%	92%	35%
Access to recreational facilities	Number of recreational facilities per 100,000 population, 2008	0.0	17.0	12.0
<i>Demographics</i>		Trail	United States	North Dakota
Youth	Percent of total population ages 0-17, 2009	22%	24%	22%
Elderly	Percent of total population ages 65 and older, 2009	19%	13%	15%
Rural	Percent of total population living in a rural area, 2000	100%	21%	44%
Not English proficient	Percent of total population that speaks English less than "very well," 2005-2009	1%	9%	2%
Illiteracy	Percent of population ages 16 and older that lacks basic prose literacy skills, 2003	6%	15%	6%

*The national benchmark is the 90th percentile (i.e., 10% of counties nationwide ranked better). **Binge drinking is defined as consuming more than 4 (for women) or 5 (for men) alcoholic beverages on a single occasion in the past 30 days. Heavy drinking is defined as drinking more than 1 (for women) or 2 (for men) alcoholic beverages per day on average. - Blank values reflect unreliable or missing data.

Source: The overall format and content of the County Health Profiles is based largely on County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>. Additional data sources include the U.S. Census Bureau, Small Area Health Insurance Estimates, <http://www.census.gov/sahie/> and the Centers for Disease Control and Prevention's National Center for Health Statistics - the Health Indicators Warehouse, <http://healthindicators.gov> and "Health, United States, 2010," Table 109, <http://www.cdc.gov/nchs/hus.htm>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. The 2011 County Health Profile was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Definitions of Health Variables

Definitions of Health Variables from the <i>County Health Rankings 2011 Report Variable</i>	Definition
Poor or Fair Health	Self-reported health status based on survey responses to the question: "In general, would you say that your health is excellent, very good, good, fair, or poor?"
Poor Physical Health Days (in past 30 days)	Estimate based on responses to the question: "Thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?"
Poor Mental Health Days (in past 30 days)	Estimate based on responses to the question: "Thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?"
Adult Smoking	Percent of adults that report smoking equal to, or greater than, 100 cigarettes and are currently a smoker
Adult Obesity	Percent of adults that report a BMI greater than, or equal to, 30
Excessive Drinking	Percent of as individuals that report binge drinking in the past 30 days (more than 4 drinks on one occasion for women, more than 5 for men) or heavy drinking (defined as more than 1 (women) or 2 (men) drinks per day on average
Sexually Transmitted Infections	Chlamydia rate per 100,000 population
Teen Birth Rate	Birth rate per 1,000 female population, ages 15-19
Uninsured Adults	Percent of population under age 65 without health insurance
Preventable Hospital Stays	Hospitalization rate for ambulatory-care sensitive conditions per 1,000 Medicare enrollees
Mammography Screening	Percent of female Medicare enrollees that receive mammography screening
Access to Healthy Foods	Healthy food outlets include grocery stores and produce stands/farmers' markets
Access to Recreational Facilities	Rate of recreational facilities per 100,000 population
Physical Inactivity	Percent of adults aged 20 and over that report no leisure time physical activity
Primary Care Provider Ratio	Ratio of population to primary care providers
Mental Health Care Provider Ratio	Ratio of population to mental health care providers
Diabetes Screening	Percent of Medicare enrollees with diabetes that receive HbA1c screening
Binge Drinking	Percent of adults that report binge drinking in the last 30 days. Binge drinking is consuming more than 4 (women) or 5 (men) alcoholic drinks on one occasion.

Aging Profile

2010 Demographic and Socio-Economic Profile
for the Aging Population Ages 65 and Older

Trails County

North Dakota

CHARACTERISTICS	AGE		
	Total	Less than 65 Years	Ages 65 and Older
<i>Population</i> ¹			
Total population	8,121	6,600	1,521
Percent ages 65 and older	19%	-	100%
Percent ages 85 and older	4%	-	21%
Percent male	50%	52%	41%
Percent female	50%	48%	59%
<i>Living Arrangements</i>			
Total households (by age of householder) ¹	3,394	2,417	977
Percent with family households (i.e., at least two people who are related)	63%	70%	47%
Percent with householder living alone	31%	23%	51%
Grandparents living with their grandchildren* ²	22	6	16
Percent who are responsible for their grandchildren	36%	0%	50%
<i>Housing</i> ¹			
Percent of occupied housing that is owner-occupied	72%	74%	67%
Percent of occupied housing that is renter-occupied	28%	26%	33%
<i>Economic Security</i> ²			
Percent of working-age population in labor force	68%	83%	17%
Percent of total population with income less than 100% of poverty	9%	9%	10%
Percent of total population with income less than 200% of poverty	29%	27%	36%
Median household income (by age of householder)	\$44,290	\$49,782	\$24,688
Owner-occupied housing units (by age of householder)	2,570	1,941	629
Percent spending 30% or more of income toward housing costs	16%	13%	23%
Renter-occupied housing units (by age of householder)	855	487	368
Percent spending 30% or more of income toward housing costs	32%	20%	47%

Note: *The age categories for this indicator are grandparents ages 35 to 59 and grandparents ages 60 and older.

Source: U.S. Census Bureau, ¹ 2010 Census Summary File 1 and ² 2006-2010 American Community Survey 5-Year Estimates (sample data). The estimates presented are meant to give perspective on characteristics across age categories; however, because they are based on sample data, one should use caution when interpreting small numbers. - Blank values reflect data that are missing or not applicable.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. The Aging Profile was prepared by researchers at North Dakota State University in Fargo for Sanford Health. May 2012

Diversity Profile

2010 Demographic and Socio-Economic Profile
for Racial and Ethnic Populations

Trail County

North Dakota

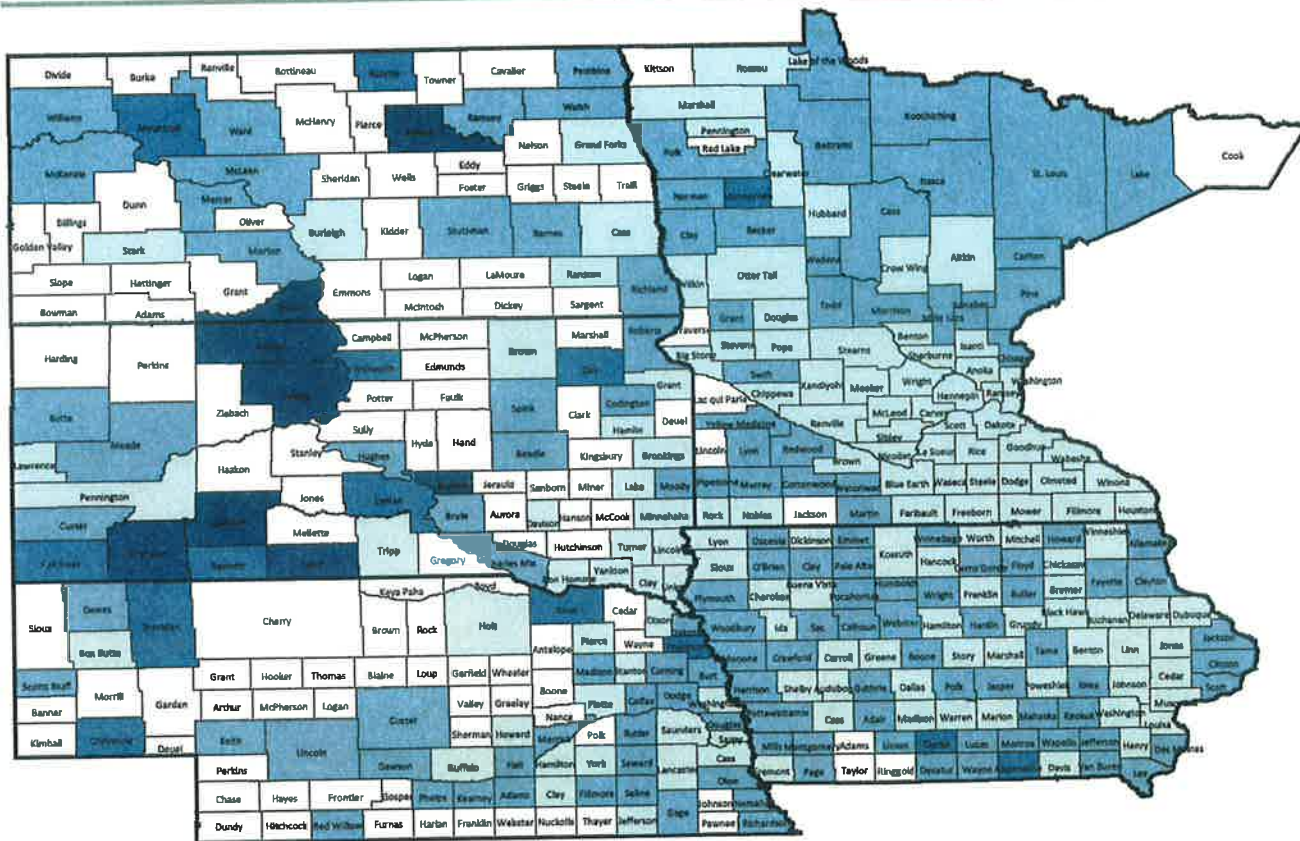
CHARACTERISTICS	Total	RACE				ETHNICITY
		White alone	Black alone	American Indian alone	Asian alone	Hispanic Origin - of any race
<i>Population</i> ¹						
Total population	8,121	7,809	42	64	21	214
Percent ages 0 to 17	22%	22%	7%	23%	33%	41%
Percent ages 18 to 44	31%	30%	79%	47%	48%	45%
Percent ages 45 to 64	28%	29%	14%	27%	14%	11%
Percent ages 65 and older	19%	19%	0%	3%	5%	3%
Median age (in years)	42.6	43.6	23.0	33.0	28.5	20.2
<i>Living Arrangements</i>						
Total households ¹	3,394	3,305	14	28	4	49
Percent with householder living alone	31%	31%	64%	29%	50%	10%
Percent with families with children ages 0 to 17	26%	26%	0%	43%	50%	59%
Grandparents living with their grandchildren ²	22	16	0	0	0	6
Percent who are responsible for grandchildren	36%	50%	-	-	-	0%
<i>Housing</i> ¹						
Percent occupied housing that is owner-occupied	72%	73%	14%	50%	25%	61%
Percent occupied housing that is renter-occupied	28%	27%	86%	50%	75%	39%
<i>Educational Attainment</i> ²						
Percent of persons ages 25 and older with high school degree or higher	88%	88%	100%	100%	100%	47%
Percent of persons ages 25 and older with Bachelor's degree or higher	26%	26%	25%	31%	53%	5%
<i>Economic Security</i> ²						
Unemployment rate	2%	2%	30%	25%	0%	4%
Median household income	\$44,290	\$44,756	\$28,333	\$35,536	\$22,500	\$53,214
Percent of households with income <\$25,000	23%	22%	25%	30%	50%	8%
Percent of persons with income <100% poverty	9%	8%	0%	30%	22%	24%
Percent of children ages 0 to 17 in families with income <100% poverty	11%	9%	-	26%	0%	38%
Percent of elderly ages 65 and older with income <100% poverty	11%	11%	-	-	-	-

Source: U.S. Census Bureau, ¹2010 Census Summary File 1 and ²2006-2010 American Community Survey (ACS) 5-Year Estimates (sample data). The estimates presented are meant to give perspective on characteristics across race and ethnic categories; however, because they are based on sample data, one should use caution when interpreting small numbers. - Blank values reflect data that are missing or not applicable. Racial categories not represented include Native Hawaiian and Other Pacific Islander alone, Some Other Race alone, and Two or More races.

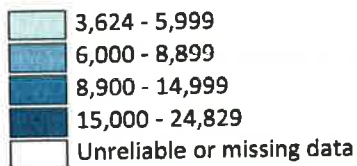
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. The Diversity Profile was prepared by researchers at North Dakota State University in Fargo for Sanford Health. May 2012

Premature Death - A health outcome measure focusing on mortality

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Years of potential life lost before age 75 per 100,000 population (age-adjusted), 2005-2007



CONTEXT

What It Is: Premature death is represented by the years of potential life lost before age 75 (YPLL-75). Every death occurring before the age of 75 contributes to the total number of years of potential life lost. For example, a person who dies at age 25 contributes 50 years of life lost, whereas a person who dies at age 65 contributes 10 years of life lost to a county's YPLL. The YPLL measure is presented as a rate per 100,000 population and is age-adjusted to the 2000 U.S. population.

Where It Comes From: Data on deaths, including age at death, are based on death certificates and are routinely reported to the National Vital Statistics System (NVSS) at the National Center for Health Statistics, part of the Centers for Disease Control and Prevention (CDC). NVSS calculates age-adjusted YPLL rates based on three-year averages to create more robust estimates of mortality, particularly for counties with smaller populations.

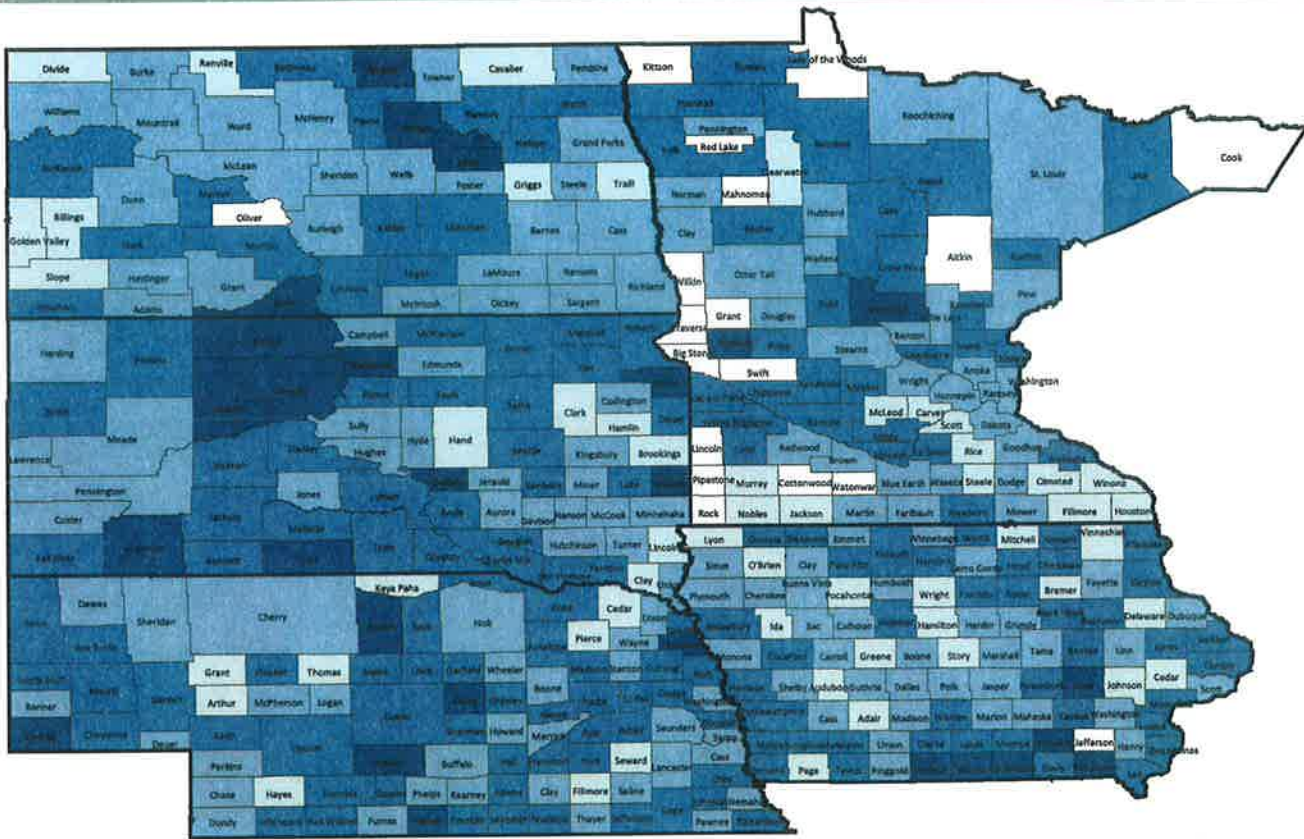
Importance: Age-adjusted YPLL-75 rates are commonly used to represent the frequency and distribution of premature deaths. Measuring YPLL allows communities to target resources to high-risk areas and further investigate the causes of death.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Poor or Fair Health - A health outcome measure focusing on morbidity

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adults reporting fair or poor health (age-adjusted), 2003-2009



CONTEXT

What It Is: Self-reported health status is a general measure of health-related quality of life in a population. This measure is based on survey responses to the question: "In general, would you say that your health is excellent, very good, good, fair, or poor?" The value reported is the percent of adult respondents who rate their health "fair" or "poor." The measure is age-adjusted to the 2000 U.S. population.

Where It Comes From: This measure was calculated by the National Center for Health Statistics using data from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS), a random-digit dial survey. BRFSS data are representative of the total non-institutionalized U.S. population ages 18 and older living in households with a land-line telephone. Seven years of data are used to generate more stable estimates of self-reported health status.

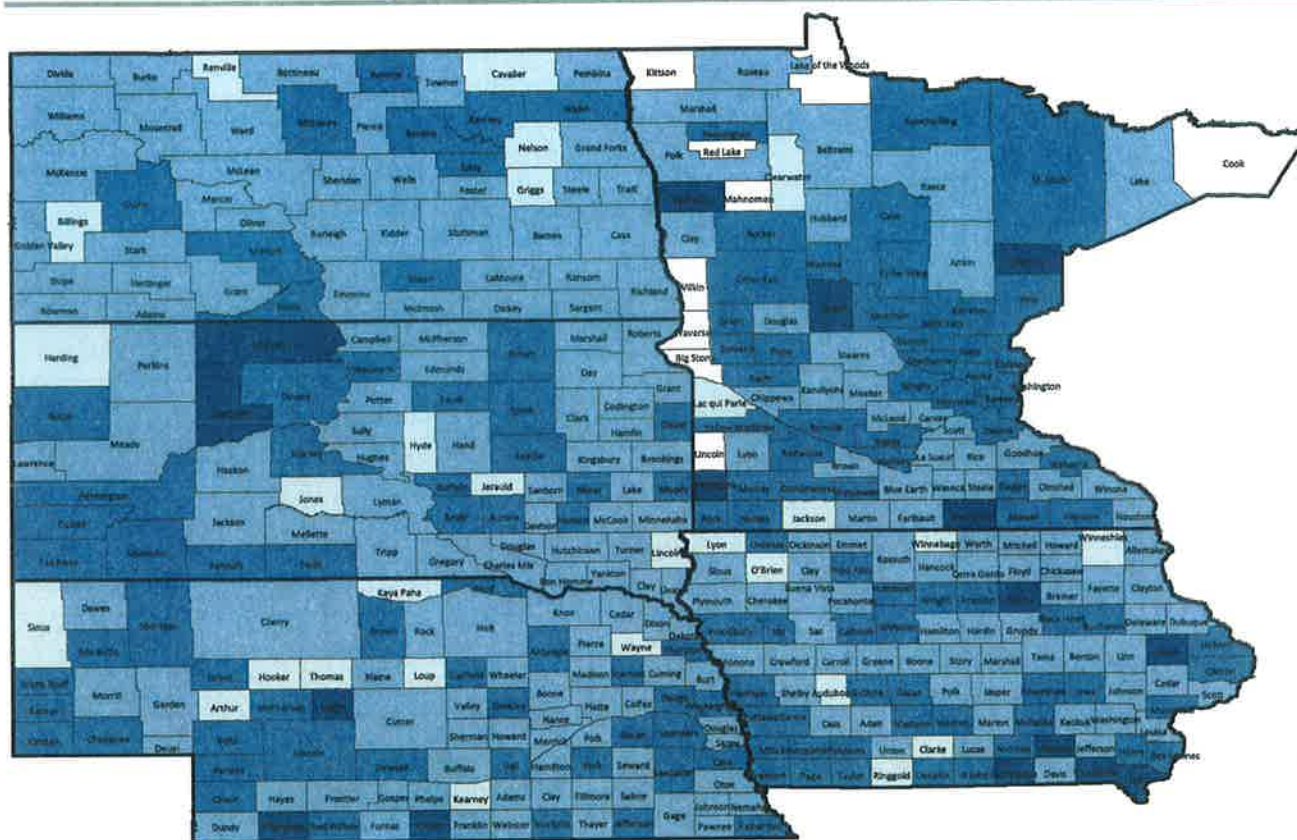
Importance: Self-reported health status is a widely used measure of people's health-related quality of life. In addition to measuring how long people live, it is important to also include measures of how healthy people are while alive – self-reported health status has been shown to be a very reliable measure of current health.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

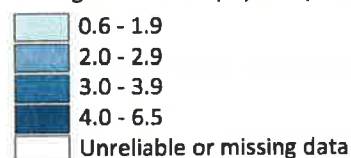
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Poor Physical Health Days - A health outcome measure focusing on morbidity

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Average number of physically unhealthy days reported in past 30 days (age-adjusted), 2003-2009



CONTEXT

What It Is: The poor physical health days measure is based on responses to the question: “Thinking about your physical health, which includes physical illness and injury, for how many days during the past 30 days was your physical health not good?” Presented is the average number of days a county’s adult respondents report that their physical health was not good. The measure is age-adjusted to the 2000 U.S. population.

Where It Comes From: This measure was calculated by the National Center for Health Statistics using data from the Centers for Disease Control and Prevention’s Behavioral Risk Factor Surveillance System (BRFSS), a random-digit dial survey. BRFSS data are representative of the total non-institutionalized U.S. population ages 18 and older living in households with a land-line telephone. Seven years of data are used to generate more stable estimates of poor physical health days.

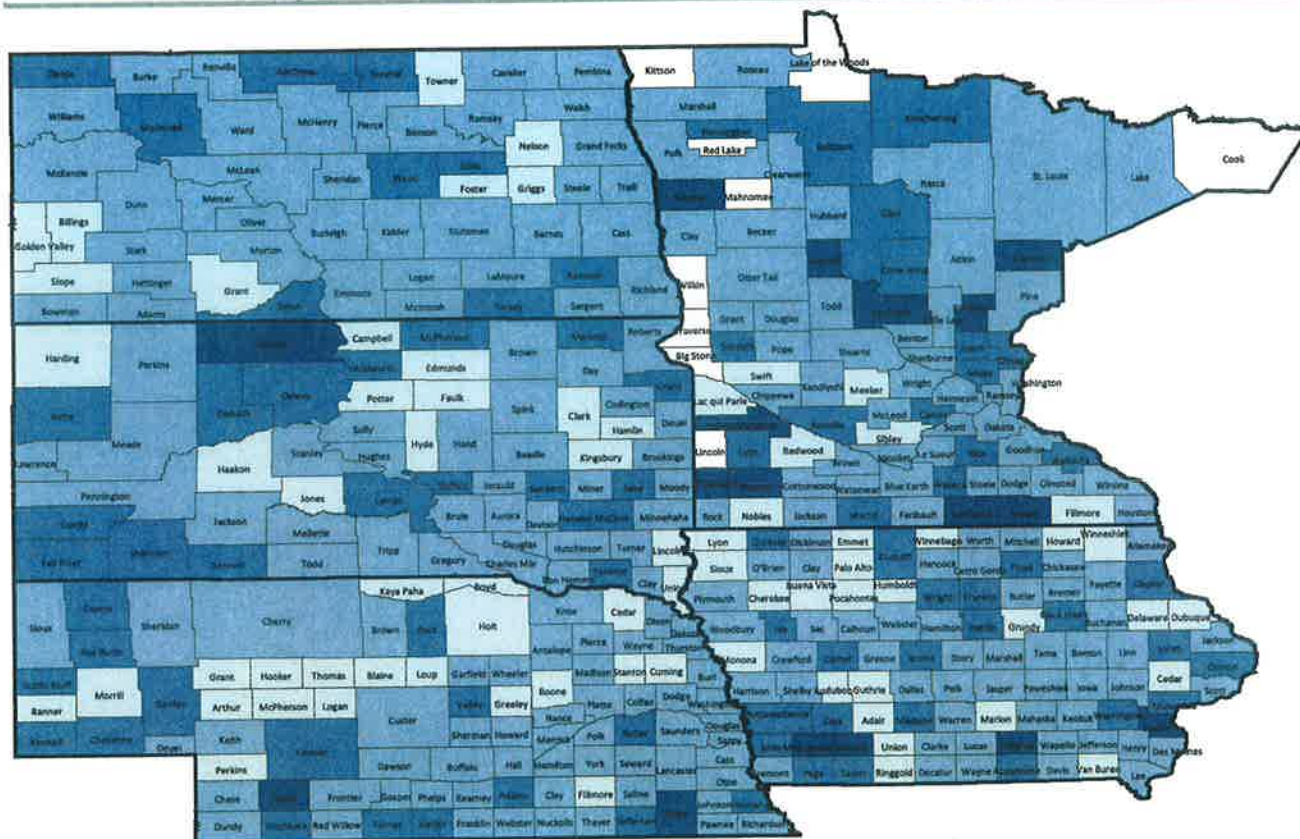
Importance: In addition to measuring how long people live, it is also important to include measures of how healthy people are while alive – people’s reports of days when their physical health was not good are a reliable estimate of their recent health.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

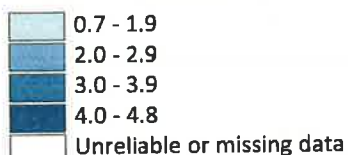
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Poor Mental Health Days - A health outcome measure focusing on morbidity

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Average number of mentally unhealthy days reported in past 30 days (age-adjusted), 2003-2009



CONTEXT

What It Is: The poor mental health days measure is based on responses to the question: “Thinking about your mental health, which includes stress, depression, and problems with emotions, for how many days during the past 30 days was your mental health not good?” Presented is the average number of days a county’s adult respondents report that their mental health was not good. The measure is age-adjusted to the 2000 U.S. population.

Where It Comes From: This measure was calculated by the National Center for Health Statistics using data from the Centers for Disease Control and Prevention’s Behavioral Risk Factor Surveillance System (BRFSS), a random-digit dial survey. BRFSS data are representative of the total non-institutionalized U.S. population ages 18 and older living in households with a land-line telephone. NCHS used seven years of data to generate more stable estimates of poor mental health days.

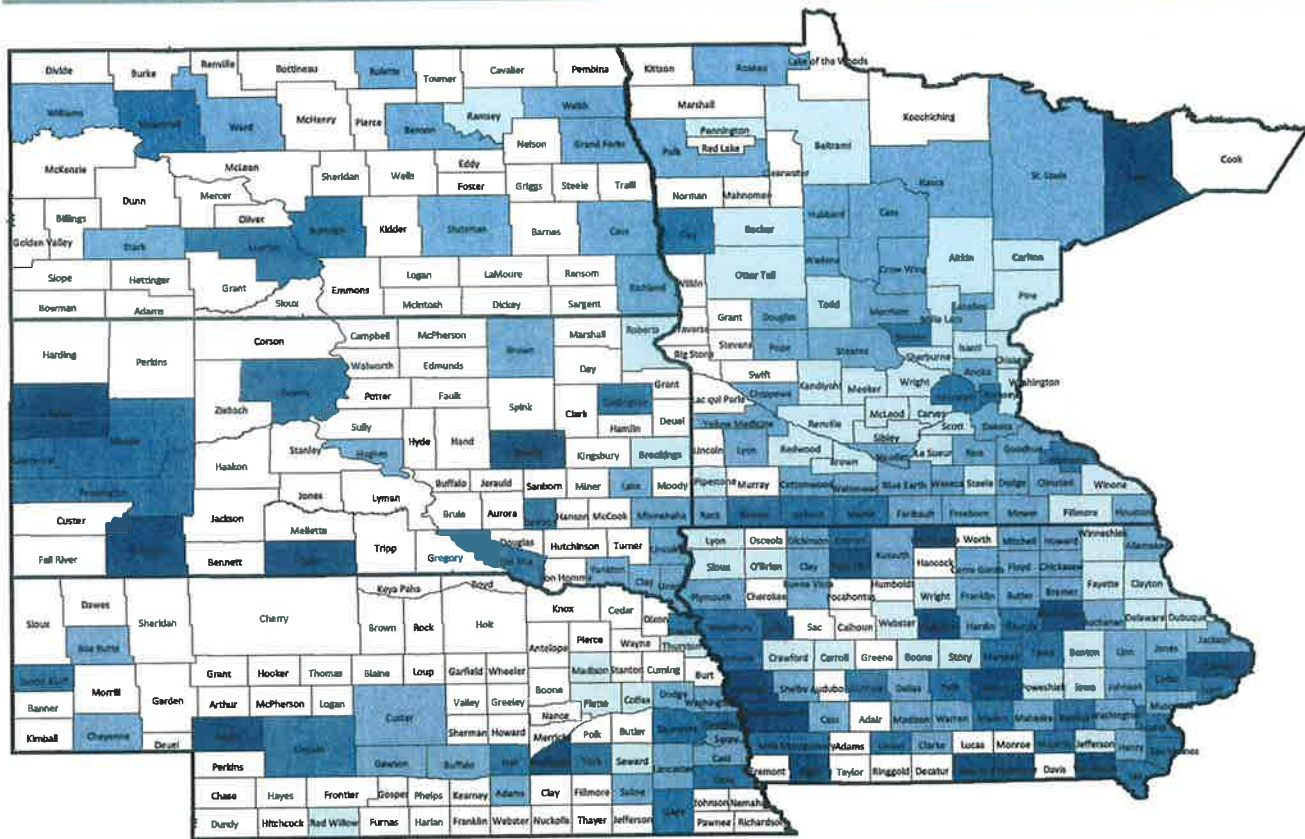
Importance: Overall health depends on both physical and mental well-being. Measuring the number of days when people report that their mental health was not good, i.e., poor mental health days, represent an important facet of health-related quality of life. The County Health Rankings considers health-related quality of life to be an important health outcome.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

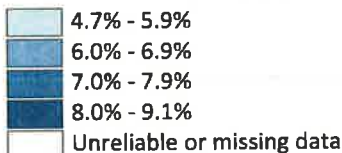
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Low Birthweight - A health outcome measure focusing on morbidity

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of live births with low birthweight (<2,500 grams), 2001-2007



CONTEXT

What It Is: Low birthweight is the percent of live births for which the infant weighed less than 2,500 grams (approximately 5 lbs., 8 oz.).

Where It Comes From: Data on births, including weight at birth, are based on birth certificates and are routinely reported to the National Vital Statistics System (NVSS) at the National Center for Health Statistics (NCHS), part at the Centers for Disease Control and Prevention (CDC). NCHS provides this measure based on the percent of live births with low birthweight for a seven-year period. They use seven-year averages to create more robust estimates, particularly for counties with smaller populations.

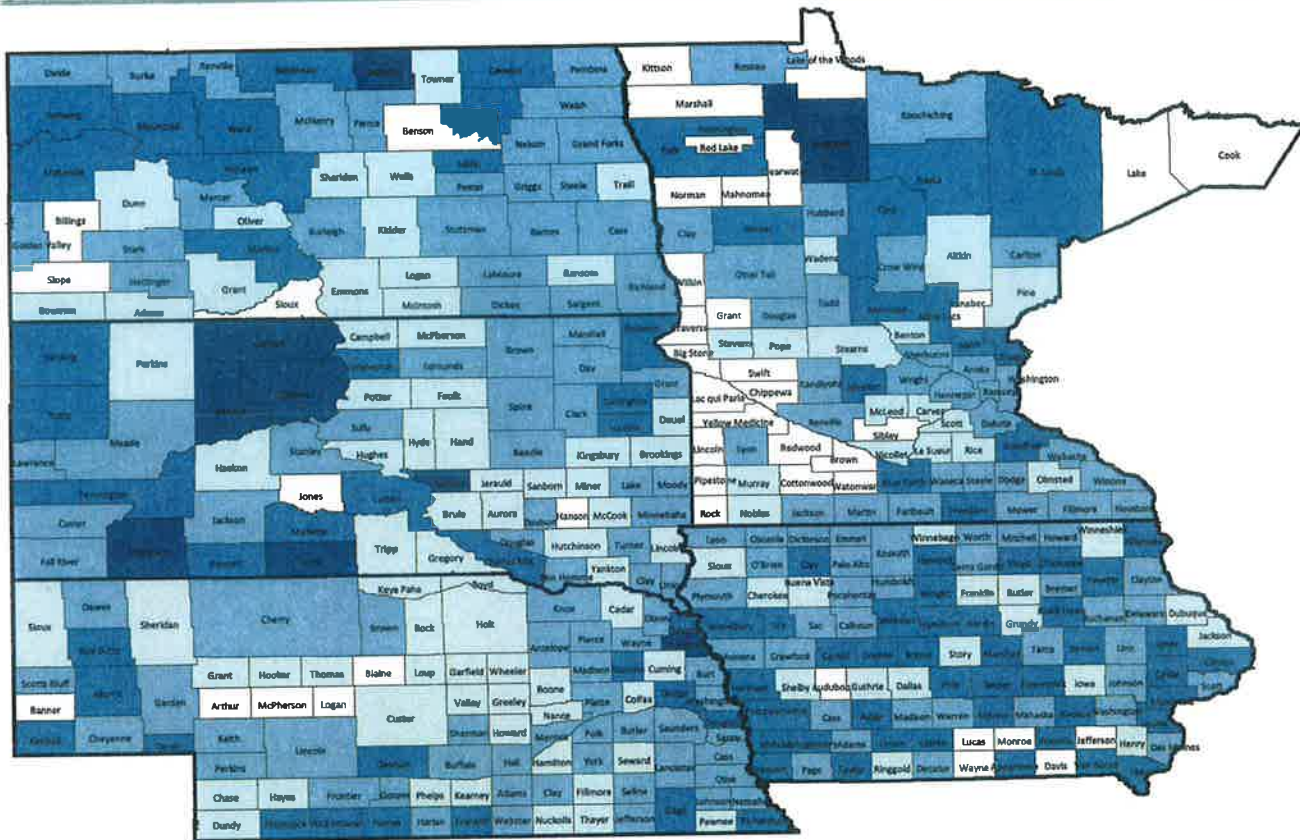
Importance: Low birthweight represents two factors: maternal exposure to health risks and an infant's current and future morbidity, as well as premature mortality risk. The health consequences of low birthweight are numerous.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

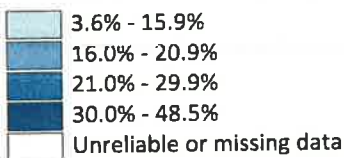
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Adult Smoking - A health factor measure focusing on health behaviors

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adults that currently smoke and have smoked at least 100 cigarettes in lifetime, 2003-2009



CONTEXT

What It Is: Adult smoking prevalence is the estimated percent of the adult population that currently smokes every day or “most days” and has smoked at least 100 cigarettes in their lifetime.

Where It Comes From: This measure was calculated by the National Center for Health Statistics using data from the Centers for Disease Control and Prevention’s Behavioral Risk Factor Surveillance System (BRFSS), a random-digit dial survey. BRFSS data are representative of the total non-institutionalized U.S. population ages 18 and older living in households with a land-line telephone. The estimates are based on seven years of data.

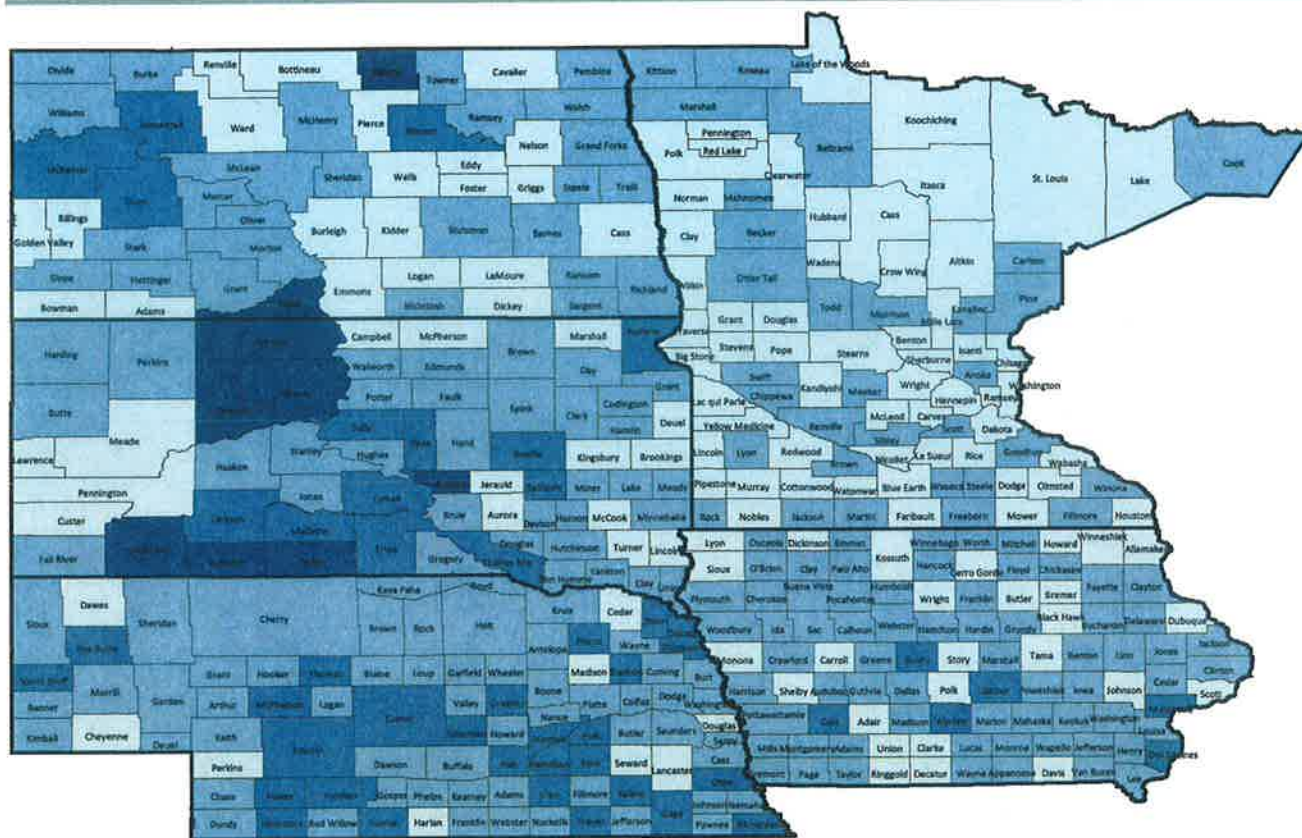
Importance: Each year approximately 443,000 premature deaths occur in the U.S. primarily due to smoking. Cigarette smoking is identified as a cause in multiple diseases including various cancers, cardiovascular disease, respiratory conditions, low birthweight, and other adverse health outcomes. Measuring the prevalence of tobacco use in the population can alert communities to potential adverse health outcomes and can be valuable for assessing the need for cessation programs or the effectiveness of existing programs.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

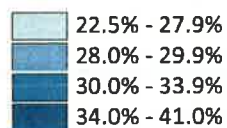
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Adult Obesity - A health factor measure focusing on health behaviors

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adults that report a body mass index (BMI) of at least 30 kg/m², 2008



CONTEXT

What It Is: The adult obesity measure represents the percent of the adult population (age 20 and older) that has a body mass index (BMI) greater than or equal to 30 kg/m².

Where It Comes From: Estimates of obesity prevalence by county were calculated by the CDC's National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation, using multiple years of Behavioral Risk Factor Surveillance System (BRFSS) data. BRFSS data are representative of the total non-institutionalized U.S. population ages 18 and older living in households with a land-line telephone.

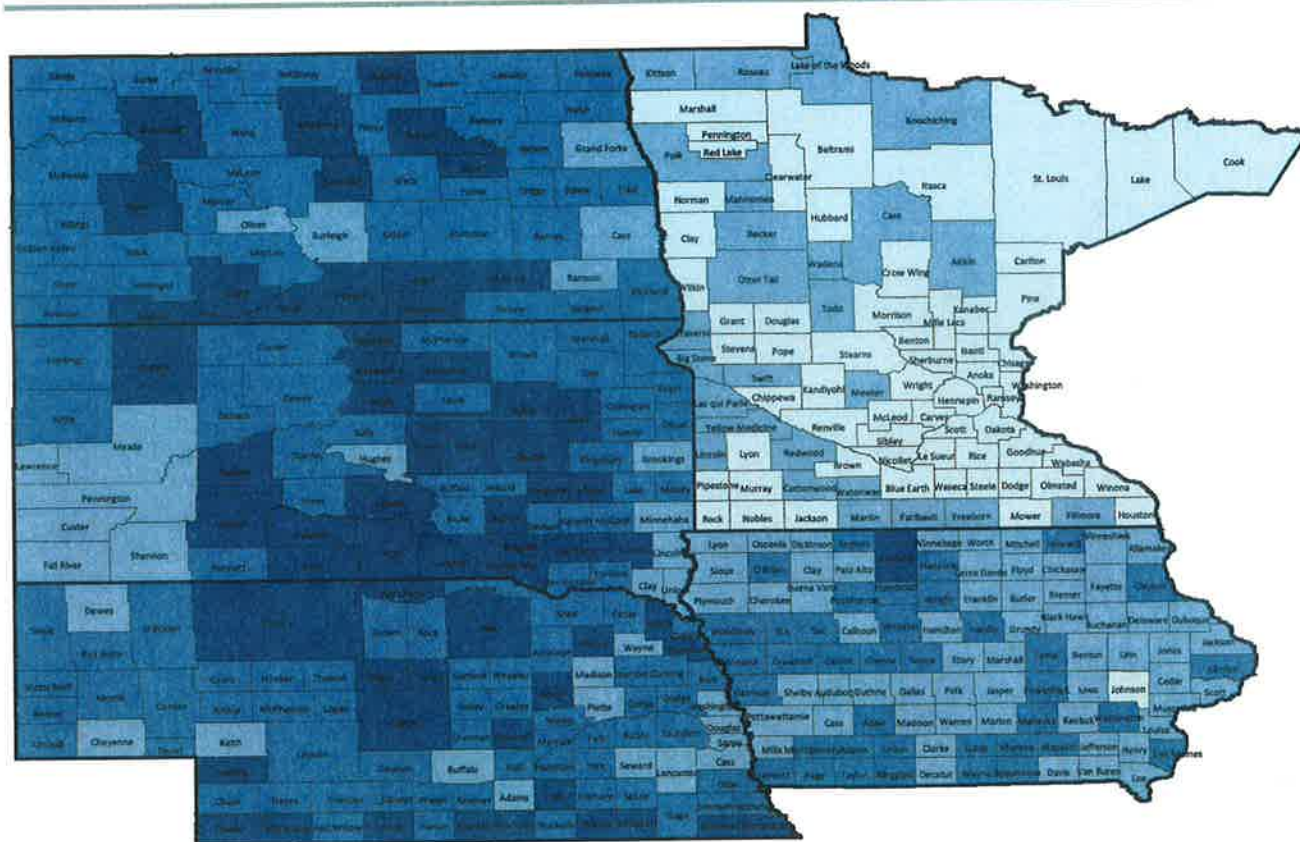
Importance: Obesity is often the end result of an overall energy imbalance due to poor diet and limited physical activity. Obesity increases the risk for health conditions such as coronary heart disease, type 2 diabetes, cancer, hypertension, dyslipidemia, stroke, liver and gallbladder disease, sleep apnea and respiratory problems, and osteoarthritis.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

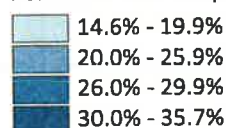
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Physical Inactivity - A health factor measure focusing on health behaviors

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adults reporting no leisure time physical activity, 2008



CONTEXT

What It Is: Physical inactivity is the estimated percent of adults ages 20 and older reporting no leisure time physical activity.

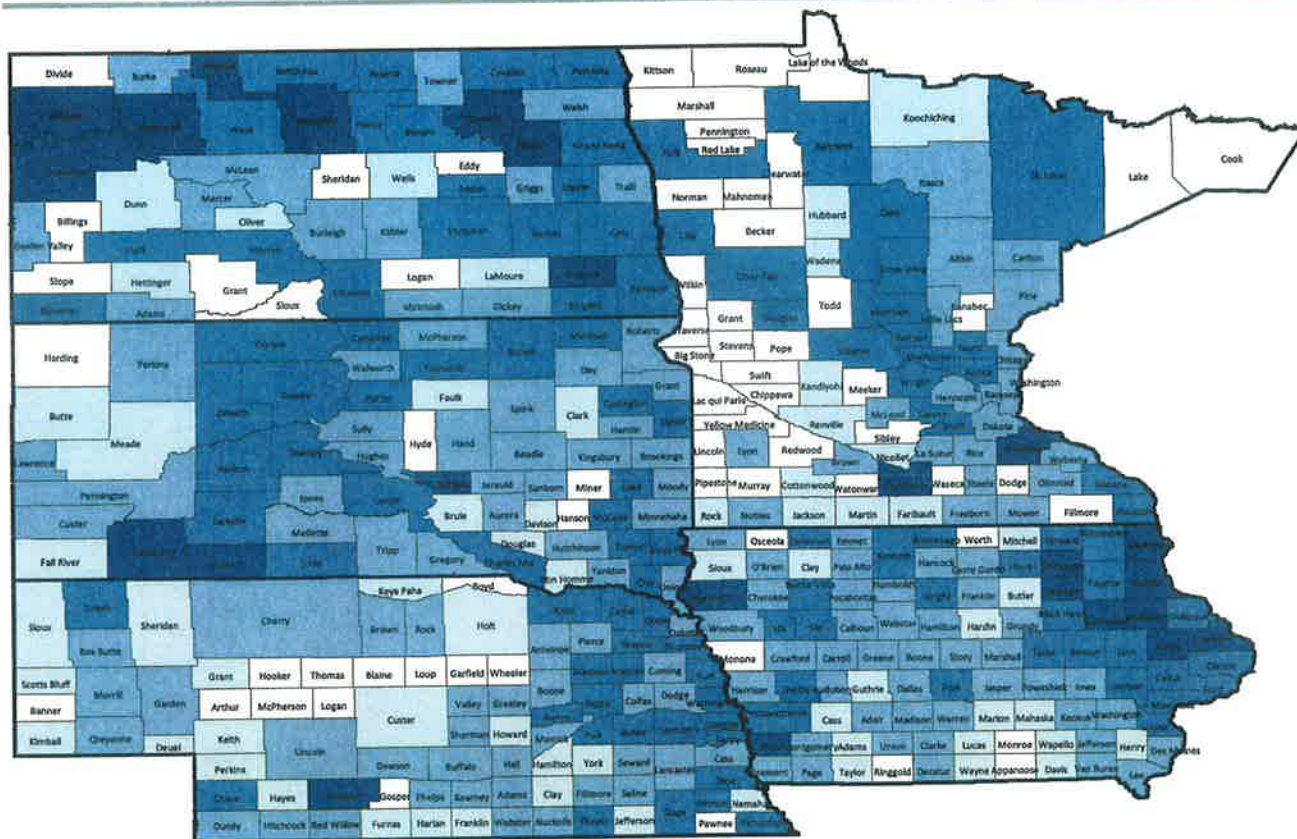
Where It Comes From: Estimates of physical inactivity by county were calculated by the CDC's National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation, using multiple years of Behavioral Risk Factor Surveillance System (BRFSS) data. BRFSS data are representative of the total non-institutionalized U.S. population ages 18 and older living in households with a land-line telephone.

Importance: Regular physical activity is one of the most important things one can do for their health. It can help control weight, reduce risk of cardiovascular disease, reduce risk for type 2 diabetes and metabolic syndrome, reduce risk of some cancers, strengthen bones and muscles, improve mental health and mood, improve ability to do daily activities and prevent falls in older adults, and increase chances of living longer (Centers for Disease Control and Prevention, <http://www.cdc.gov/physicalactivity/everyone/health/index.html>).

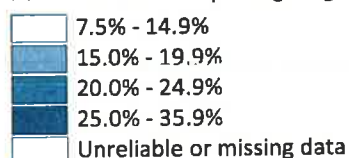
- Data were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project
- a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Excessive Drinking - A health factor measure focusing on health behaviors
 County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adults reporting binge drinking and heavy drinking, 2003-2009



CONTEXT

What It Is: The excessive drinking measure reflects the percent of the adult population that reports either binge drinking, defined as consuming more than 4 (women) or 5 (men) alcoholic beverages on a single occasion in the past 30 days, or heavy drinking, defined as drinking more than 1 (women) or 2 (men) drinks per day on average.

Where It Comes From: This measure was calculated by the National Center for Health Statistics using data obtained from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS), a random-digit dial survey. BRFSS data are representative of the total non-institutionalized U.S. population ages 18 and older living in households with a land-line telephone. The estimates are based on seven years of data.

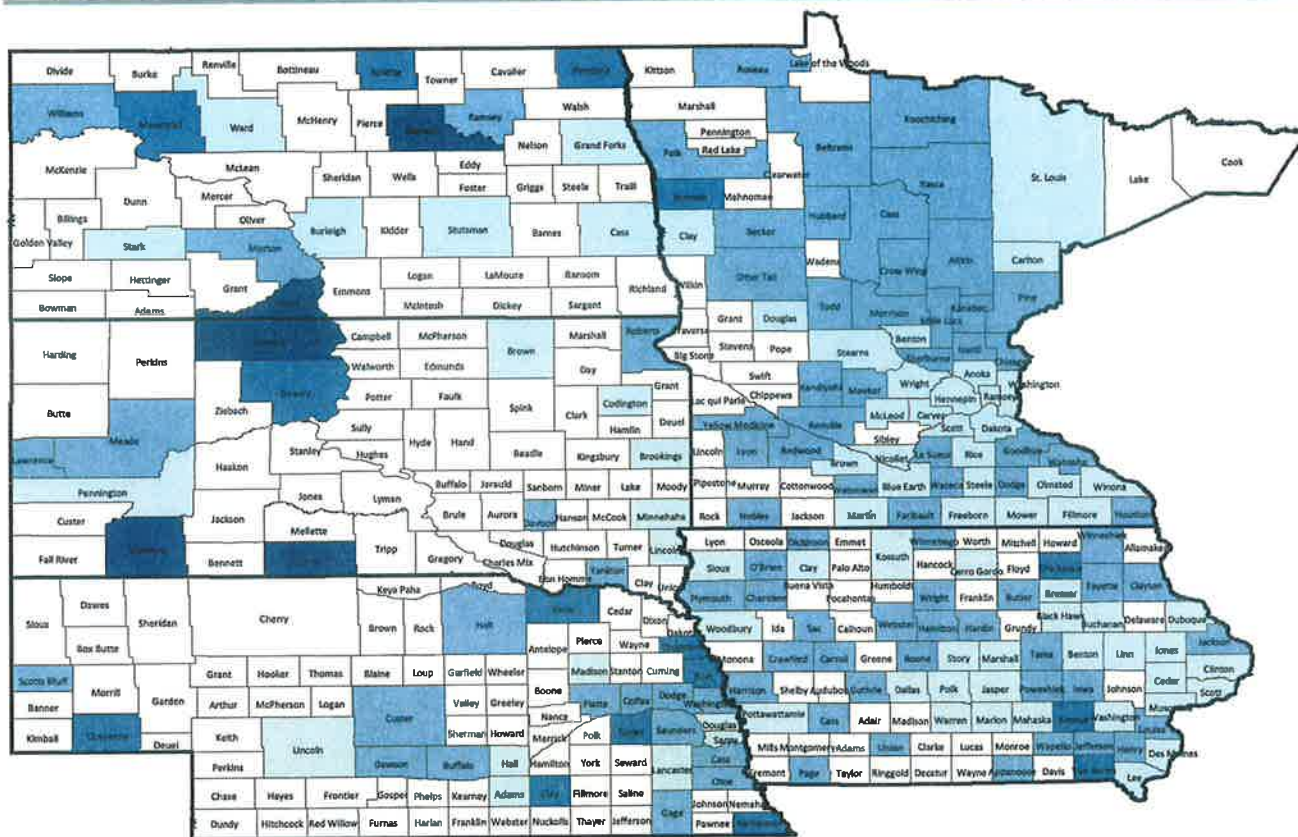
Importance: Excessive drinking is a risk factor for a number of adverse health outcomes such as alcohol poisoning, hypertension, acute myocardial infarction, sexually transmitted infections, unintended pregnancy, fetal alcohol syndrome, sudden infant death syndrome, suicide, interpersonal violence, and motor vehicle crashes.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

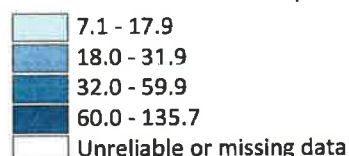
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Motor Vehicle Crash Death Rate - A health factor measure focusing on health behaviors

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Motor vehicle crash deaths per 100,000 population, 2001-2007



CONTEXT

What It Is: Motor vehicle crash deaths are measured as the crude mortality rate per 100,000 population due to on- or off-road accidents involving a motor vehicle. Motor vehicle deaths includes traffic and non-traffic accidents involving motorcycles and 3-wheel motor vehicles; cars; vans; trucks; buses; street cars; ATVs; industrial, agricultural, and construction vehicles; and bikes and pedestrians when colliding with any of the vehicles mentioned. Deaths due to boating accidents and airline crashes are not included in this measure.

Where It Comes From: These data were calculated by National Center for Health Statistics (NCHS), part of the Centers for Disease Control and Prevention (CDC), based on data reported to the National Vital Statistics System (NVSS). NCHS used data for a seven-year period to create more robust estimates of cause-specific mortality, particularly for counties with smaller populations.

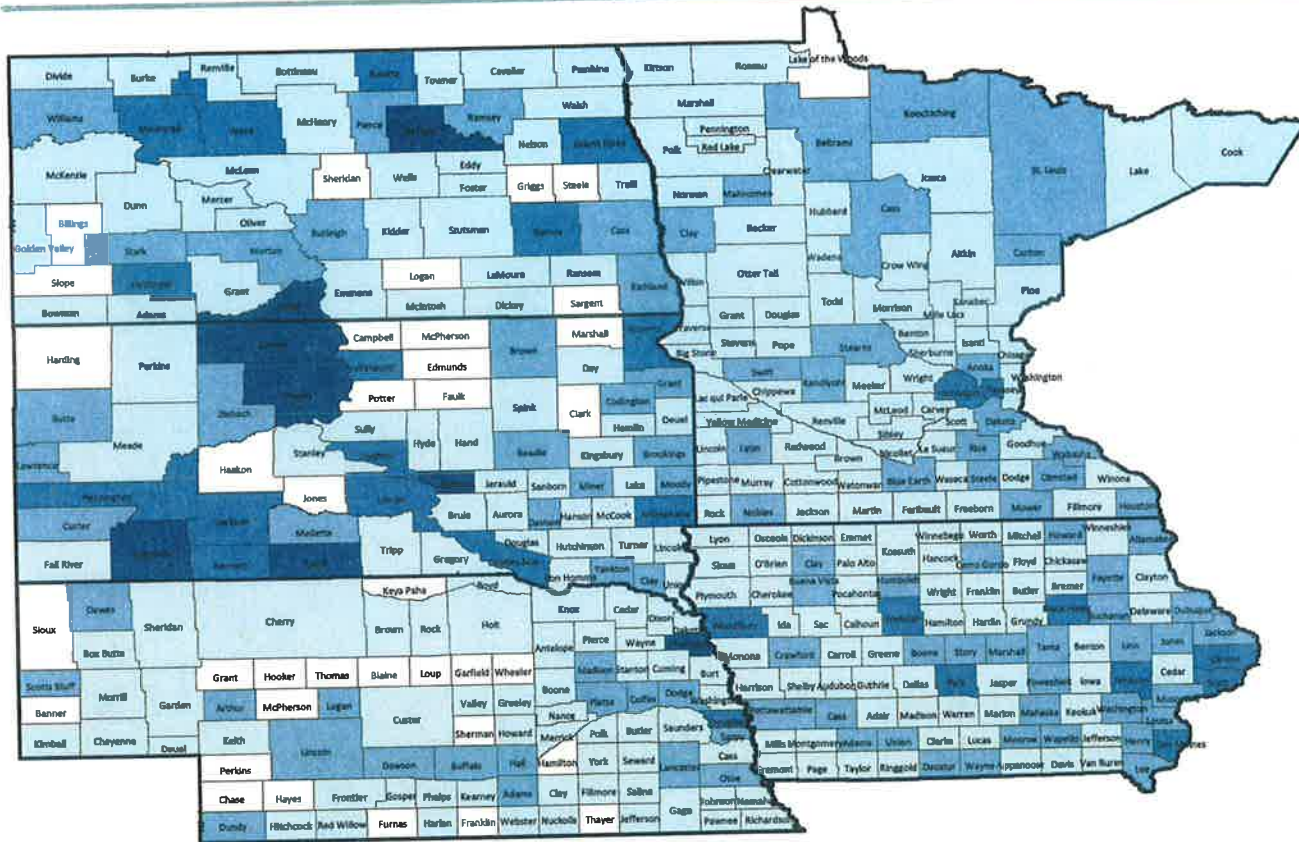
Importance: A strong association has been demonstrated between excessive drinking and alcohol-impaired driving, with approximately 17,000 Americans killed annually in alcohol-related motor vehicle crashes.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

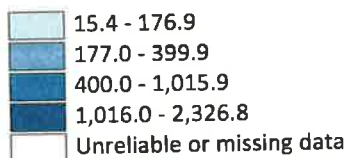
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Sexually Transmitted Infections - A health factor measure focusing on health behaviors

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of chlamydia cases (new cases reported) per 100,000 population, 2008



CONTEXT

What It Is: The Sexually Transmitted Infection (STI) rate is measured as chlamydia incidence (the number of new cases reported) per 100,000 population.

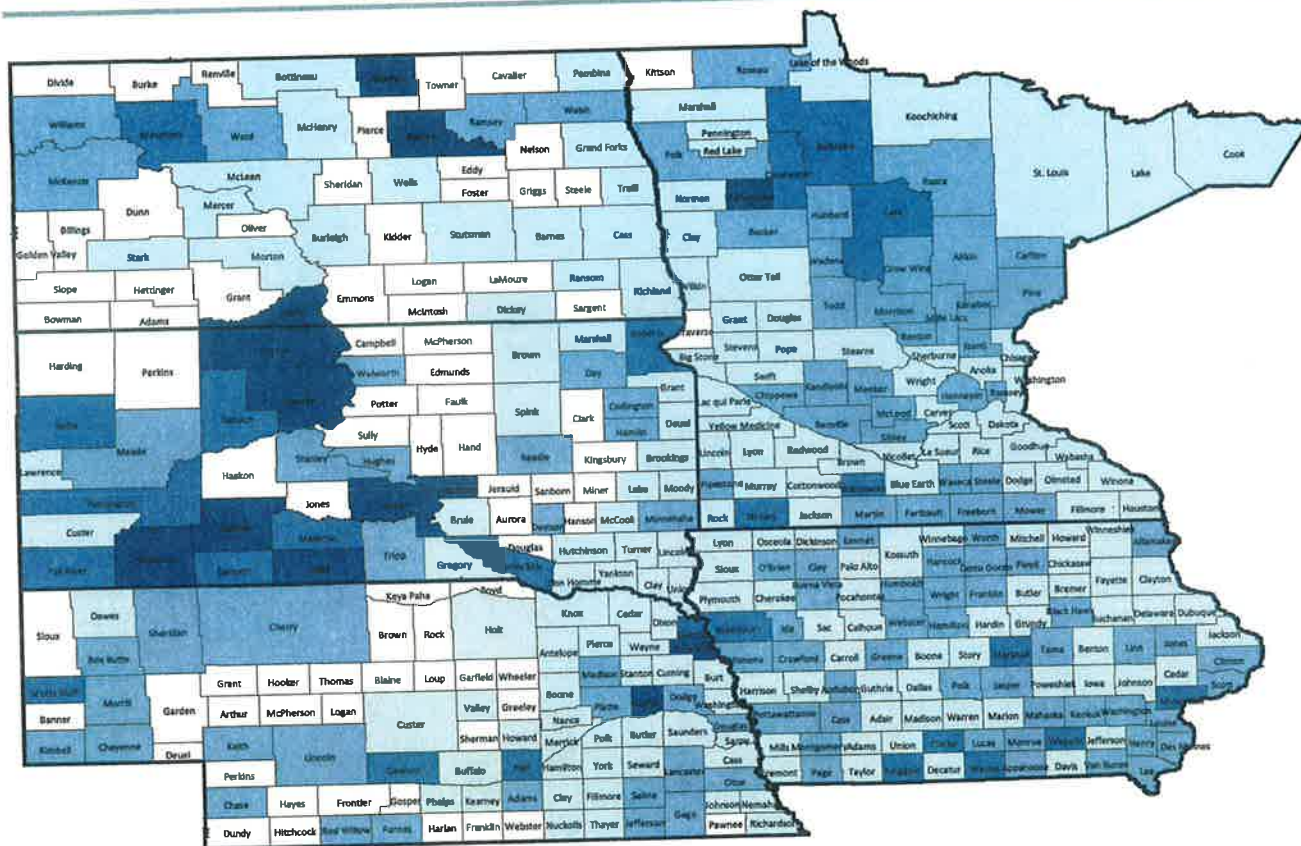
Where It Comes From: The county-level measures were obtained from the CDC's National Center for Hepatitis, HIV, STD, and TB Prevention.

Importance: Chlamydia is the most common bacterial STI in North America and is one of the major causes of tubal infertility, ectopic pregnancy, pelvic inflammatory disease, and chronic pelvic pain. STIs in general are associated with a significantly increased risk of morbidity and mortality, including increased risk of cervical cancer, involuntary infertility, and premature death. However, increases in reported chlamydia infections may reflect the expansion of chlamydia screening, use of increasingly sensitive diagnostic tests, an increased emphasis on case reporting from providers and laboratories, improvements in the information systems for reporting, as well as true increases in disease.

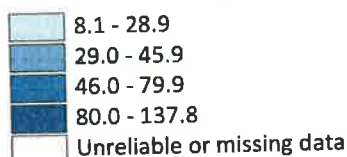
- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Teen Birth Rate - A health factor measure focusing on health behaviors
 County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of teen births per 1,000 females ages 15 through 19, 2001-2007



CONTEXT

What It Is: Teen births are reported as the number of births per 1,000 female population ages 15 through 19.

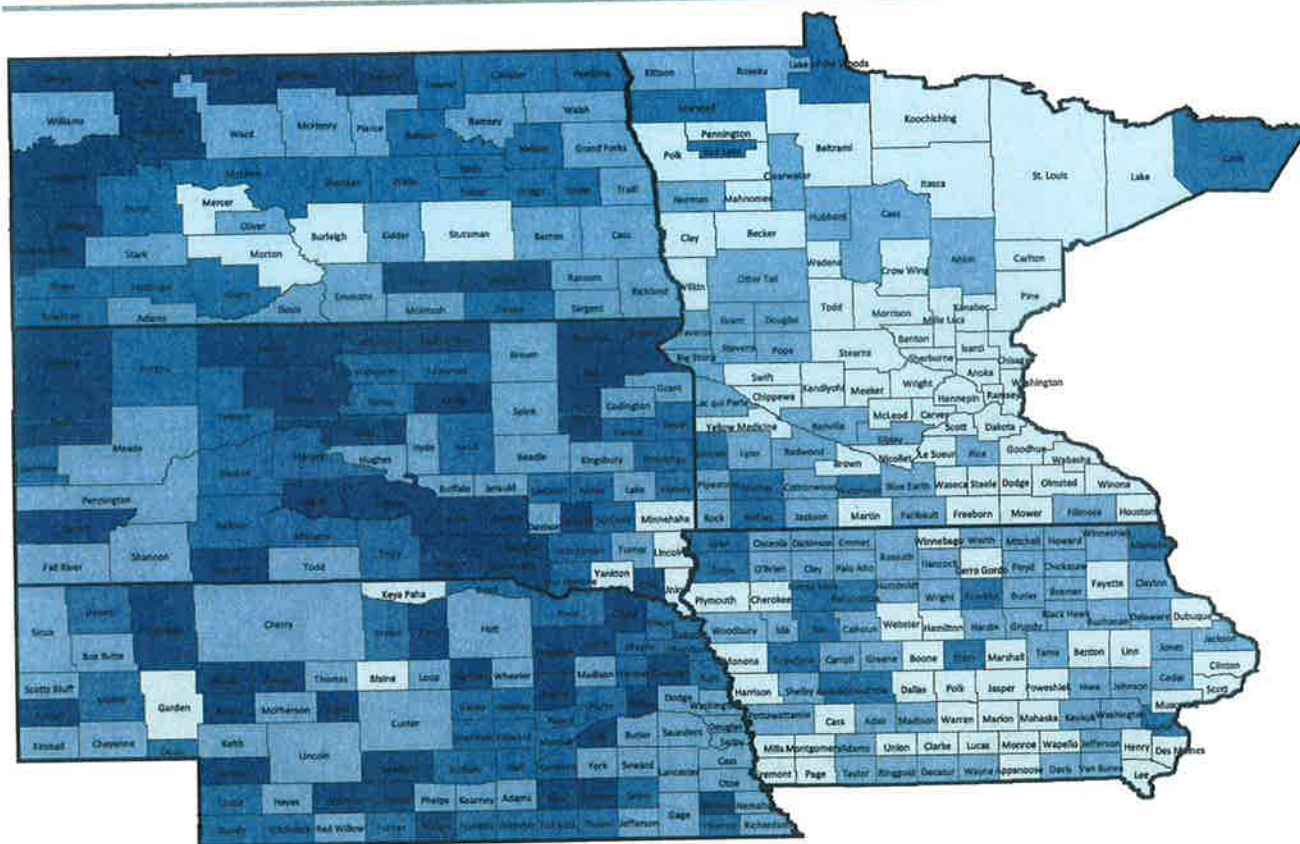
Where It Comes From: Teen birth rates were obtained from the National Vital Statistics System (NVSS) at the National Center for Health Statistics, part of the Centers for Disease Control and Prevention (CDC).

Importance: Teen pregnancy is associated with poor prenatal care and pre-term delivery. Pregnant teens are more likely than older women to receive late or no prenatal care, have gestational hypertension and anemia, and achieve poor maternal weight gain. They are also more likely to have a pre-term delivery and low birth weight, increasing the risk of child developmental delay, illness, and mortality.

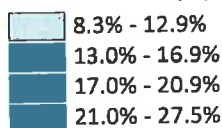
- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Uninsured Adults - A health factor measure focusing on clinical care
 County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adult population ages 18 through 64 without health insurance, 2007



CONTEXT

What It Is: The uninsured adults measure represents the estimated percent of the adult population under age 65 that has no health insurance coverage.

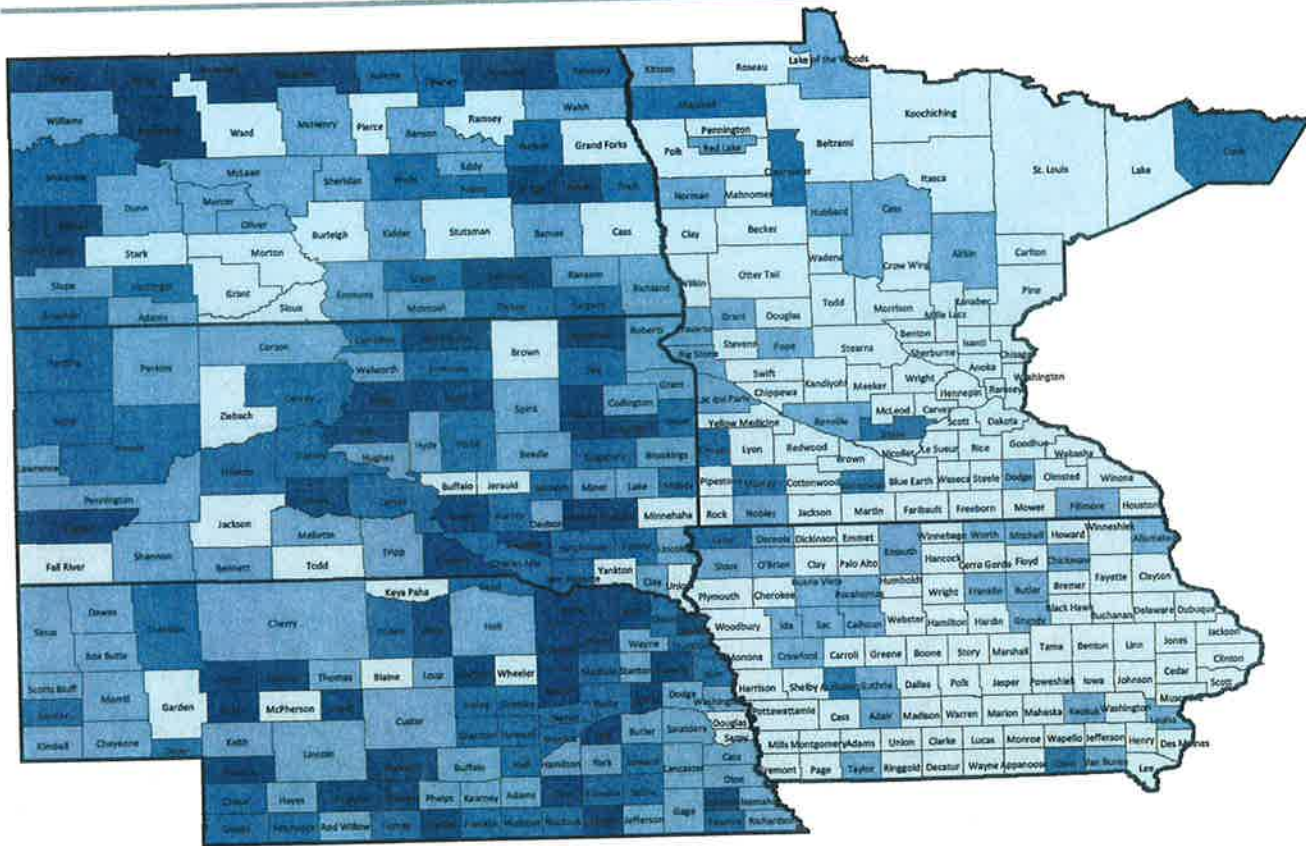
Where It Comes From: The Small Area Health Insurance Estimates from the U.S. Census Bureau provide annual estimates of the population without health insurance coverage for all U.S. states and their counties. The estimates used are for the most recent year for which reliable county-level estimates are available.

Importance: Lack of health insurance coverage is a significant barrier to accessing needed health care.

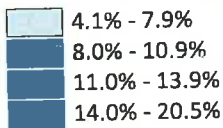
- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Uninsured Youth - A health factor measure focusing on clinical care
 County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of youth ages 0 through 18 without health insurance, 2007



CONTEXT

What It Is: The uninsured youth measure represents the estimated percent of the children ages birth through 18 that has no health insurance coverage.

Where It Comes From: The Small Area Health Insurance Estimates from the U.S. Census Bureau provide annual estimates of the population without health insurance coverage for all U.S. states and their counties. The estimates used are for the most recent year for which reliable county-level estimates are available.

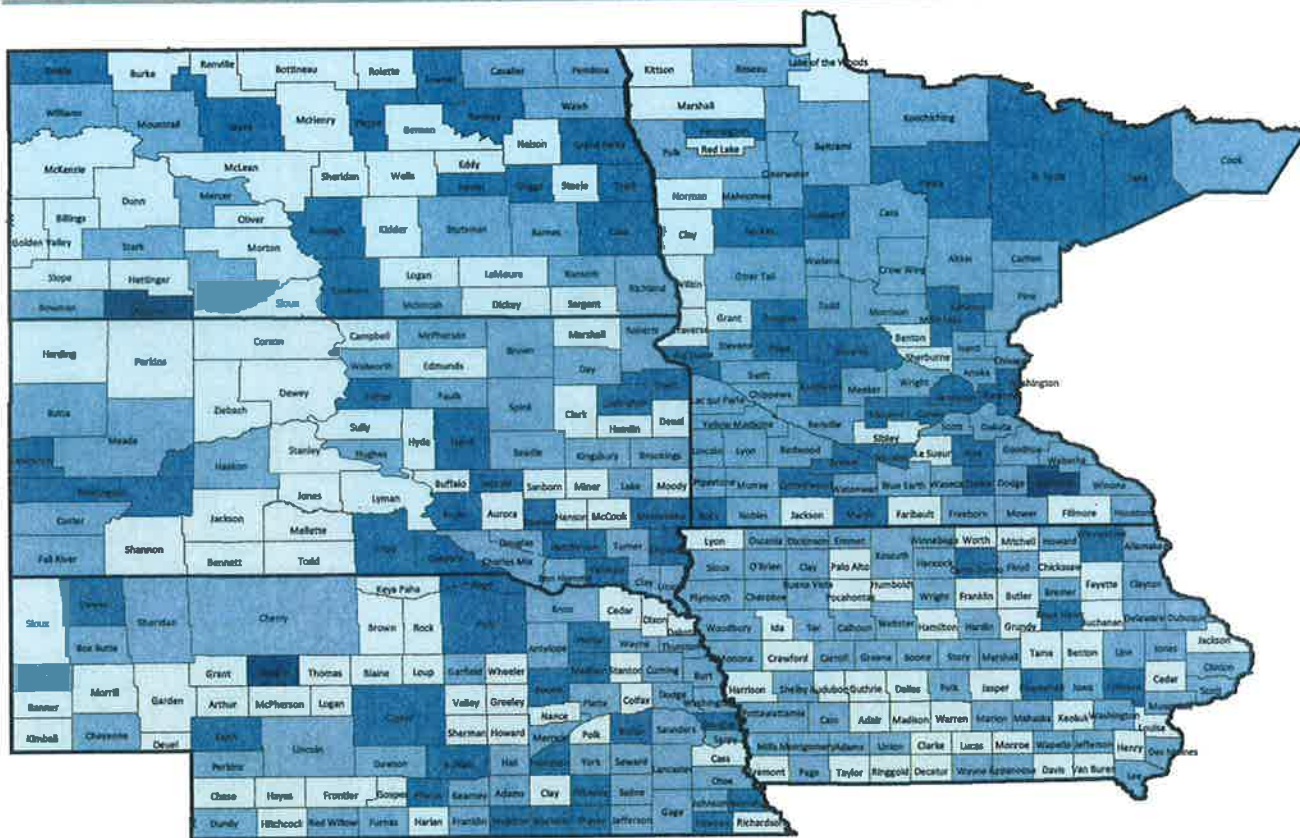
Importance: Children without health insurance are more likely than others to receive late or no care for health problems, putting them at greater risk for hospitalization. In addition to resulting in reduced access to health care, a lack of health insurance can also negatively influence children's school attendance and participation in extracurricular activities, and increase parental financial and emotional stress. (Child Trends DataBank, <http://www.childtrendsdatabank.org/?q=node/297>)

- Data were obtained from the Small Area Health Insurance Estimates (SAHIE), a program of the U.S. Census Bureau, <http://www.census.gov/did/www/sahie/>.

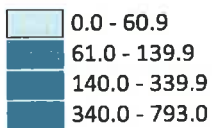
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Primary Care Physicians - A health factor measure focusing on clinical care

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of primary care physicians per 100,000 population, 2008



CONTEXT

What It Is: Primary care physicians include practicing physicians specializing in general practice medicine, family medicine, internal medicine, pediatrics, and obstetrics/gynecology. The measure represents the number of providers per 100,000 population.

Where It Comes From: The data on primary care physicians were obtained from the Health Resources and Services Administration’s Area Resource File (ARF). The ARF data on practicing physicians come from the AMA Master File (2008), and the population estimates are from the U.S. Census Bureau’s 2008 population estimates.

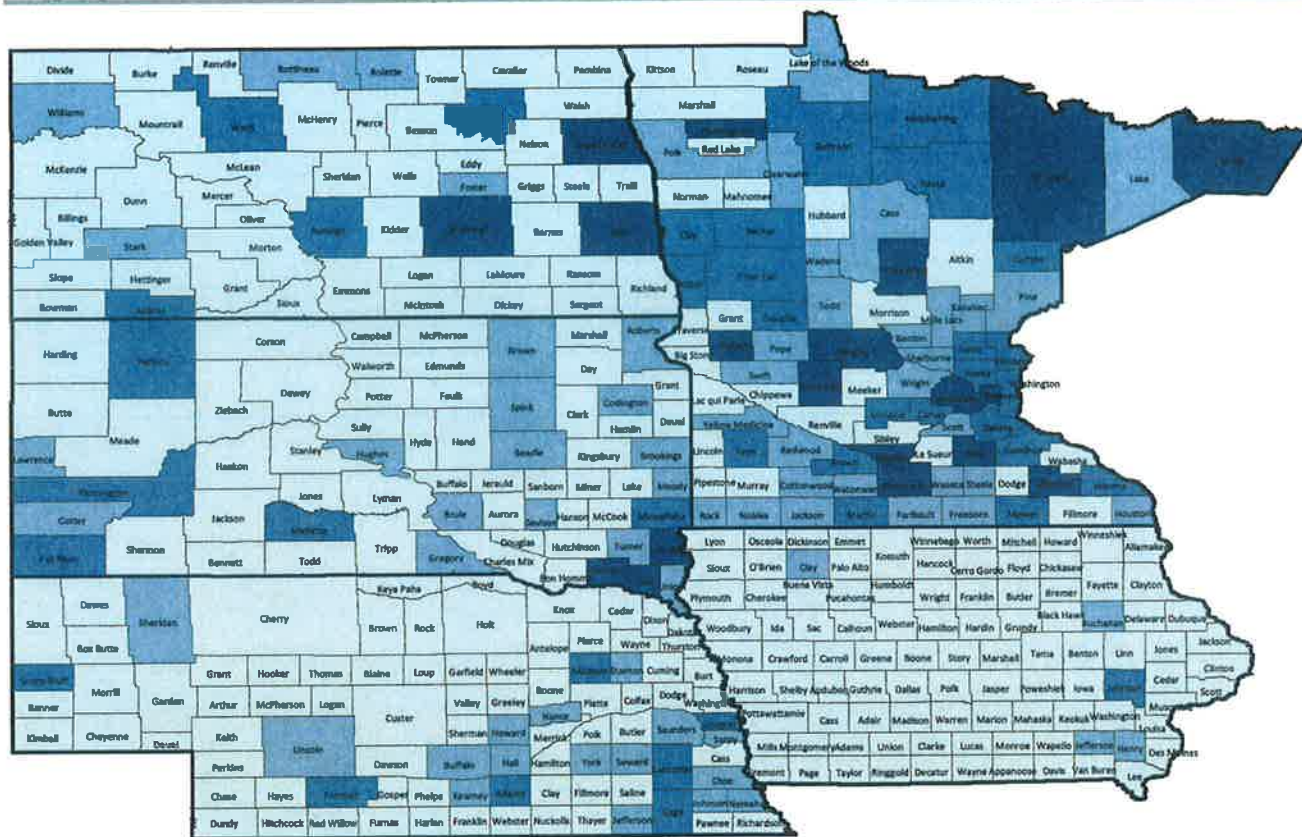
Importance: Having access to care requires not only having financial coverage but also access to providers. While high rates of specialist physicians has been shown to be associated with higher, and perhaps unnecessary, utilization, having sufficient availability of primary care physicians is essential so that people can get preventive and primary care, and when needed, referrals to appropriate specialty care.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

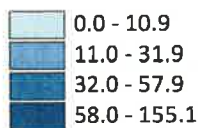
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Mental Health Providers - A health factor measure focusing on clinical care

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of mental health providers per 100,000 population, 2008



CONTEXT

What It Is: Mental health providers include psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists who meet certain qualifications and certifications. This measure represents the number of mental health providers per 100,000 population.

Where It Comes From: Data on mental health providers were obtained from the Health Resources and Services Administration's (HRSA) Area Resource File (ARF).

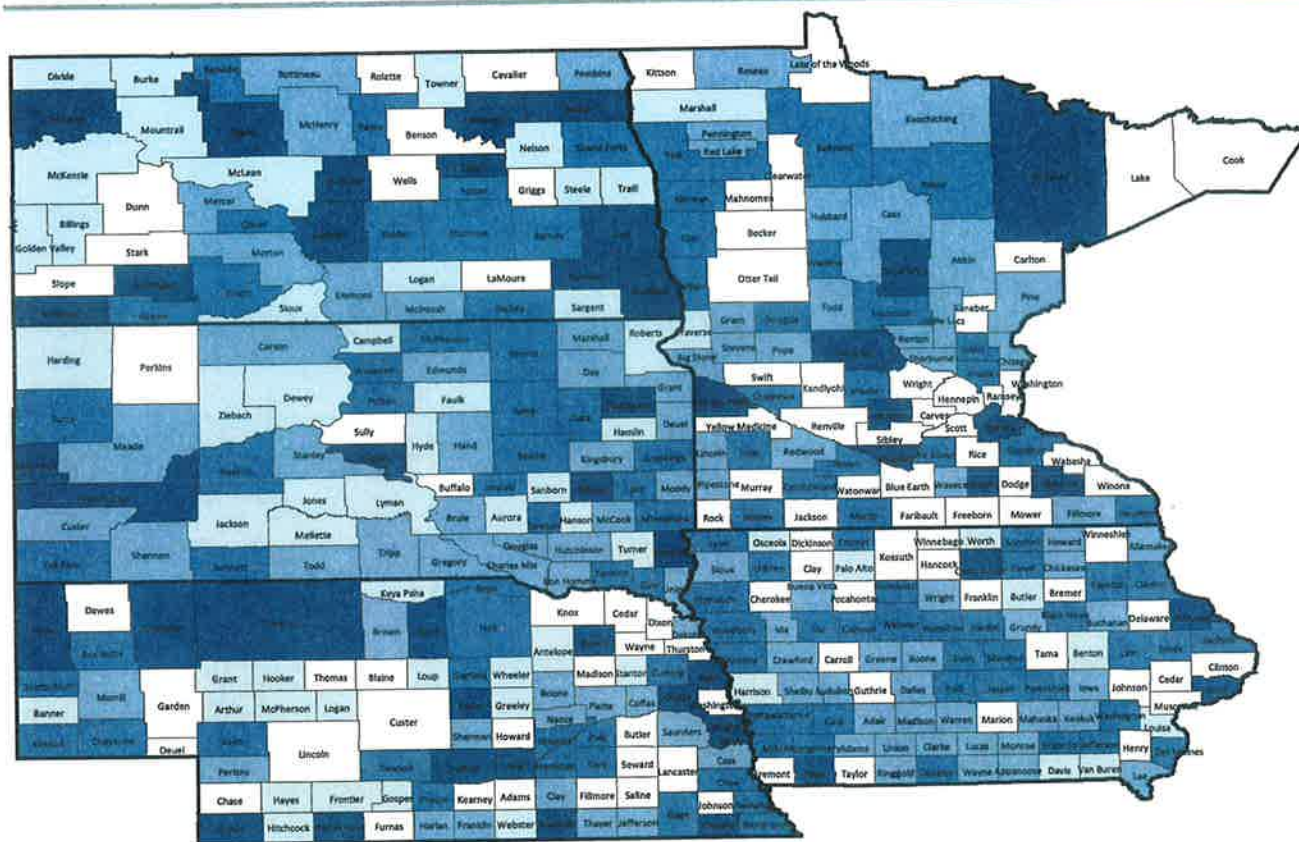
Importance: Even more than other areas of health and medicine, the mental health field is plagued by disparities in the availability of and access to its services. These disparities are viewed readily through the lenses of racial and cultural diversity, age, and gender. A key disparity often hinges on a person's financial status; formidable financial barriers block off needed mental health care from too many people regardless of whether one has health insurance with inadequate mental health benefits, or is one of the 44 million Americans who lack any insurance. (David Satcher, M.D., Ph.D., Surgeon General, <http://www.surgeongeneral.gov/library/mentalhealth/home.html>)

- Data were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

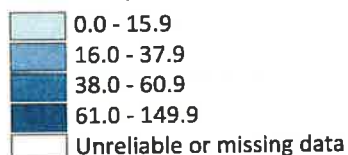
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Dentist Rate - A health factor measure focusing on clinical care

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of professionally active dentists per 100,000 population, 2007



CONTEXT

What It Is: The dentist rate is defined as the number of professionally active dentists per 100,000 population. Professionally active dentist occupation categories include active practitioners; dental school faculty or staff; armed forces dentists; government-employed dentists at the federal, state, or local levels; interns and residents; and other health or dental organization staff members.

Where It Comes From: Data on the number of dentists are tracked by the American Dental Association (ADA) and the American Medical Association (AMA). County-level data are housed in the Health Resources and Services Administration's Area Resource File (ARF) and made available through the Health Indicators Warehouse developed by the National Center for Health Statistics.

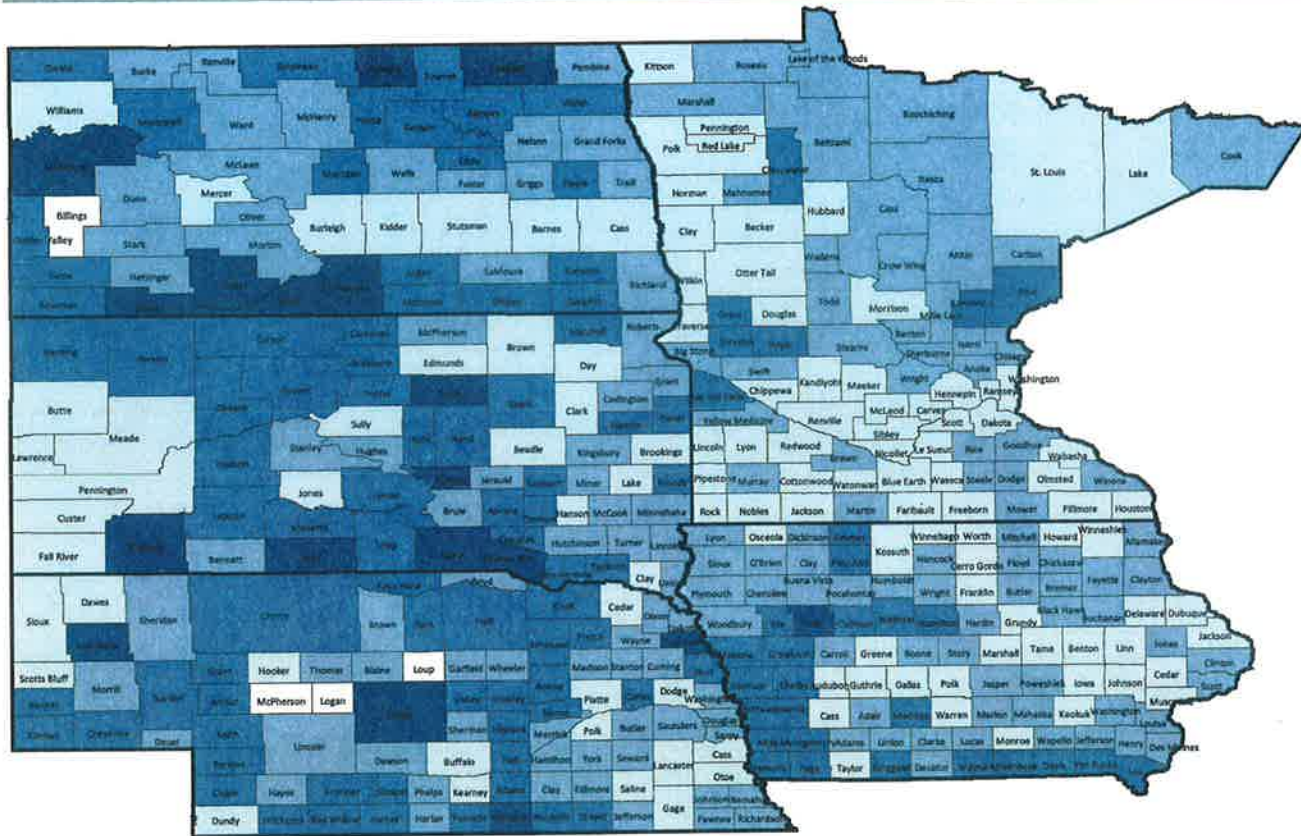
Importance: Today, thanks to fluoride, healthier lifestyles and quality dental care, more people than ever before are keeping their natural teeth throughout their lifetime. Yet for those who live in areas where a dentist is not available or those who cannot afford treatment, getting dental care can be difficult (American Dental Association, <http://www.ada.org>).

- Data were obtained from the Health Indicators Warehouse at <http://healthindicators.gov/> which is maintained by the Centers for Disease Control and Prevention's National Center for Health Statistics.

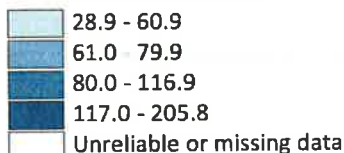
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Preventable Hospital Stays - A health factor measure focusing on clinical care

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Hospitalization discharges for ambulatory care-sensitive conditions per 1,000 Medicare enrollees, 2006-2007



CONTEXT

What It Is: Preventable hospital stays are measured as the hospital discharge rate for ambulatory care-sensitive conditions per 1,000 Medicare enrollees.

Where It Comes From: Estimates of preventable hospital stays were calculated by the authors of the Dartmouth Atlas of Health Care using Medicare claims data.

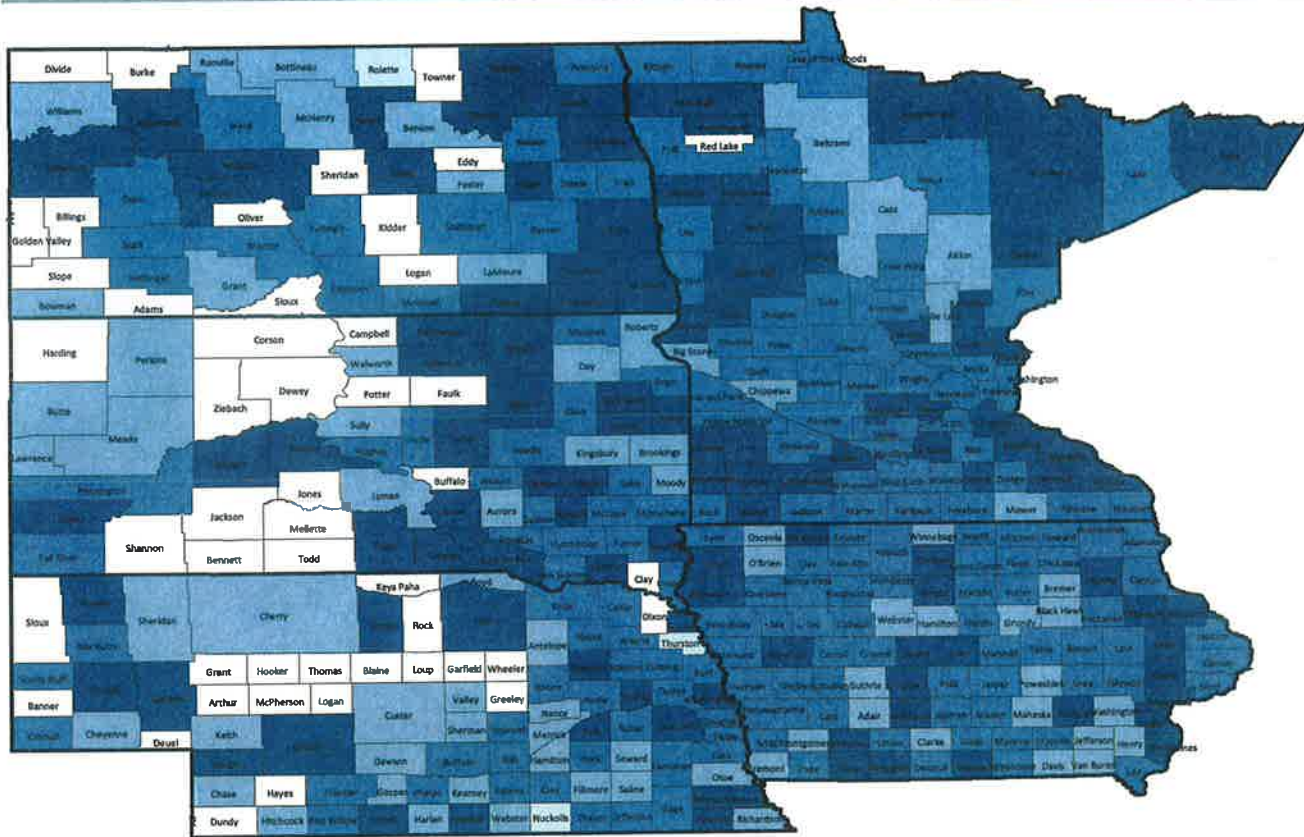
Importance: Hospitalization for diagnoses amenable to outpatient services suggests that the quality of care provided in the outpatient setting was less than ideal. The measure may also represent the population's tendency to overuse the hospital as a main source of care.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

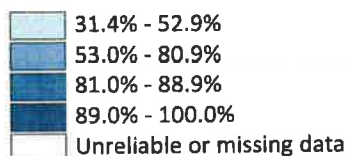
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Diabetic Screening - A health factor measure focusing on clinical care

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of diabetic Medicare enrollees that receive HbA1c screening, 2006-2007



CONTEXT

What It Is: Diabetic screening is calculated as the percent of diabetic Medicare patients whose blood sugar control was screened in the past year using a test of their glycated hemoglobin (HbA1c) levels.

Where It Comes From: Estimates of diabetic screening were calculated by the authors of the Dartmouth Atlas of Health Care using Medicare claims data.

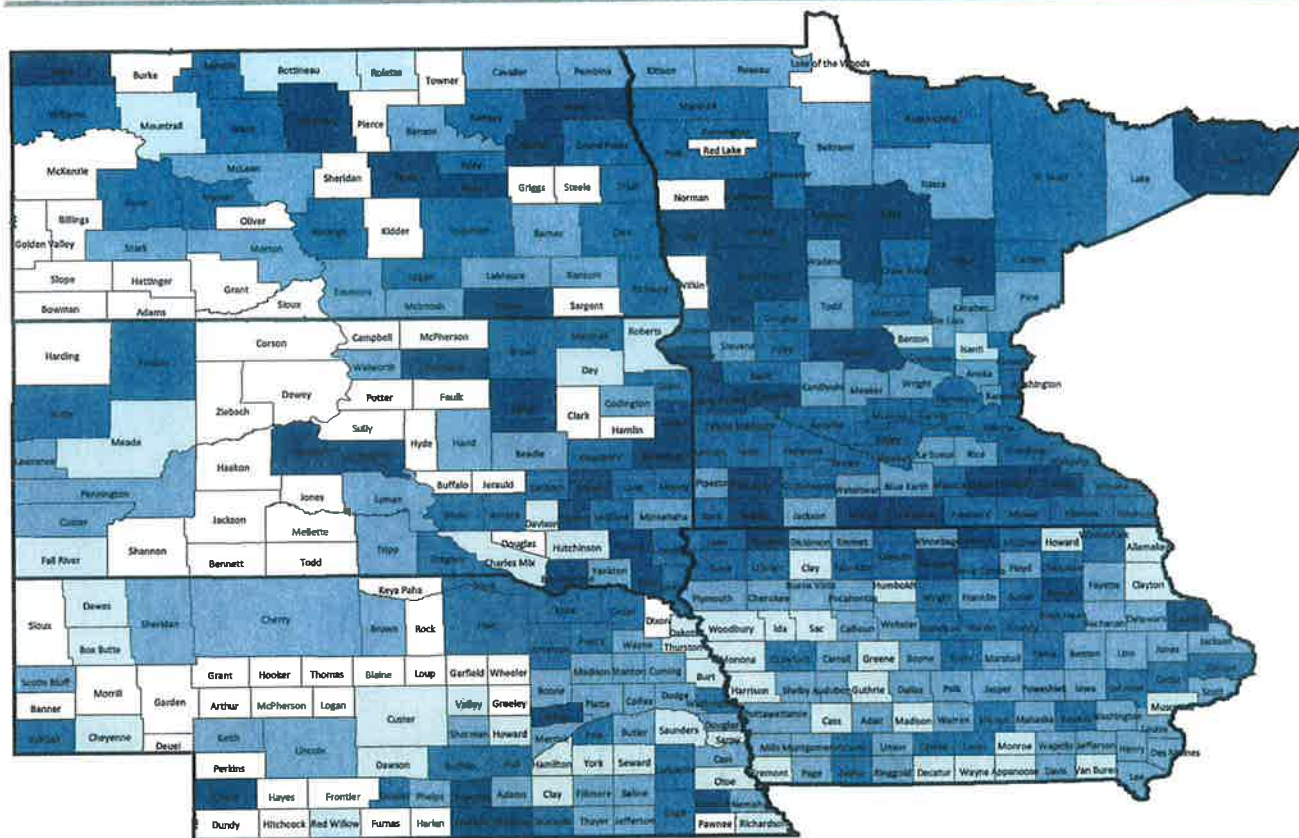
Importance: Regular HbA1c screening among diabetic patients is considered the standard of care. It helps assess the management of diabetes over the long term by providing an estimate of how well a patient has managed his or her diabetes over the past two to three months. When hyperglycemia is addressed and controlled, complications from diabetes can be delayed or prevented.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

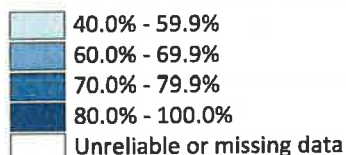
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Mammography Screening - A health factor measure focusing on clinical care

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of female Medicare enrollees that receive mammography screening, 2006-2007



CONTEXT

What It Is: This measure represents the percent of female Medicare enrollees ages 40 through 69 that had at least one mammogram over a two-year period.

Where It Comes From: Estimates were calculated by the authors of the Dartmouth Atlas of Health Care using Medicare claims data.

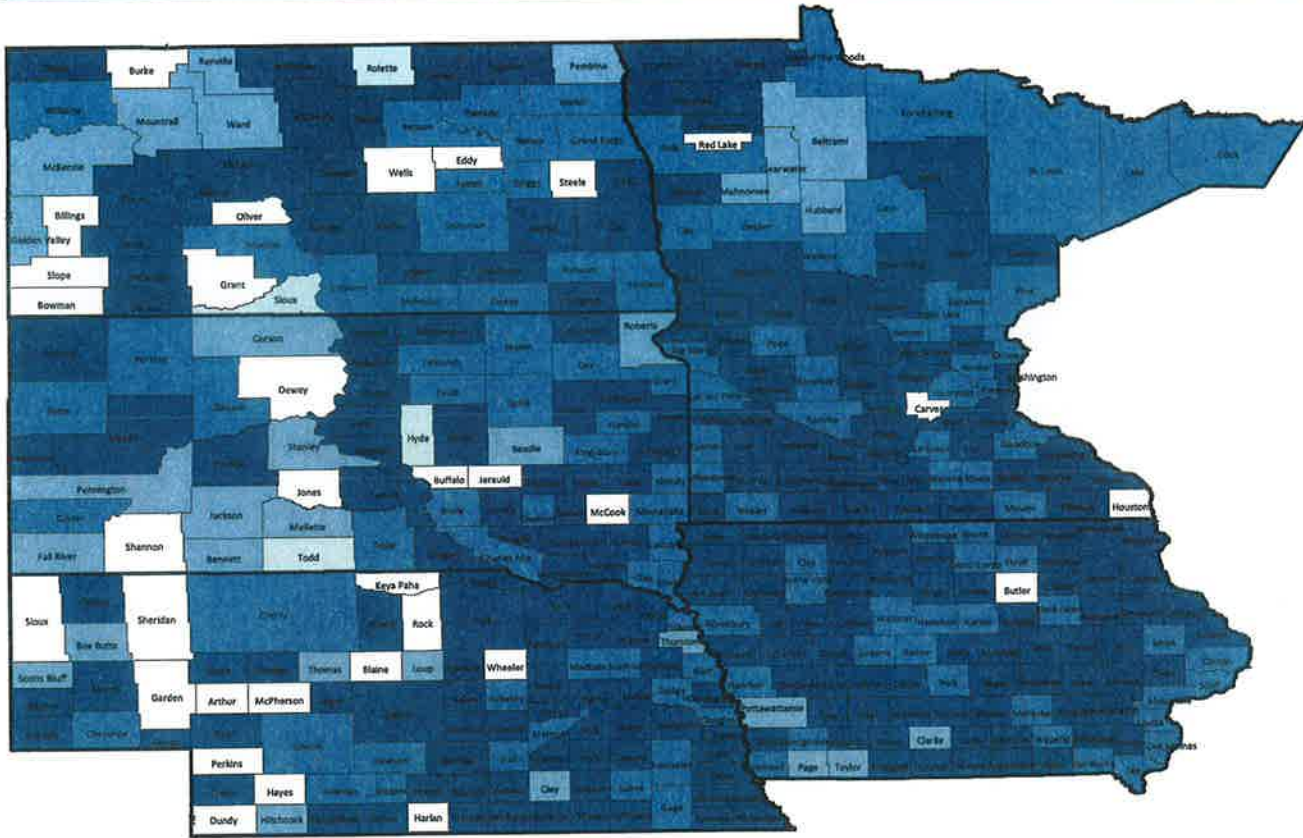
Importance: Evidence suggests that mammography screening reduces breast cancer mortality, especially among older women. A physician’s recommendation or referral—and satisfaction with physicians—are major facilitating factors among women who obtain breast cancer screening. The percent of women ages 40 through 69 receiving a mammogram is a widely endorsed quality of care measure.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

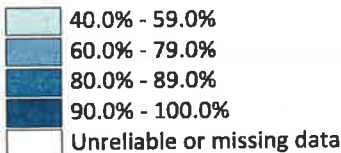
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

High School Graduation - A health factor measure focusing on education

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of ninth-grade cohort in public schools that graduates from high school in four years, 2006-2007



CONTEXT

What It Is: High school graduation, commonly referred to as the averaged freshman graduation rate, is reported as the percent of a county's ninth-grade cohort in public schools that graduates from high school in four years.

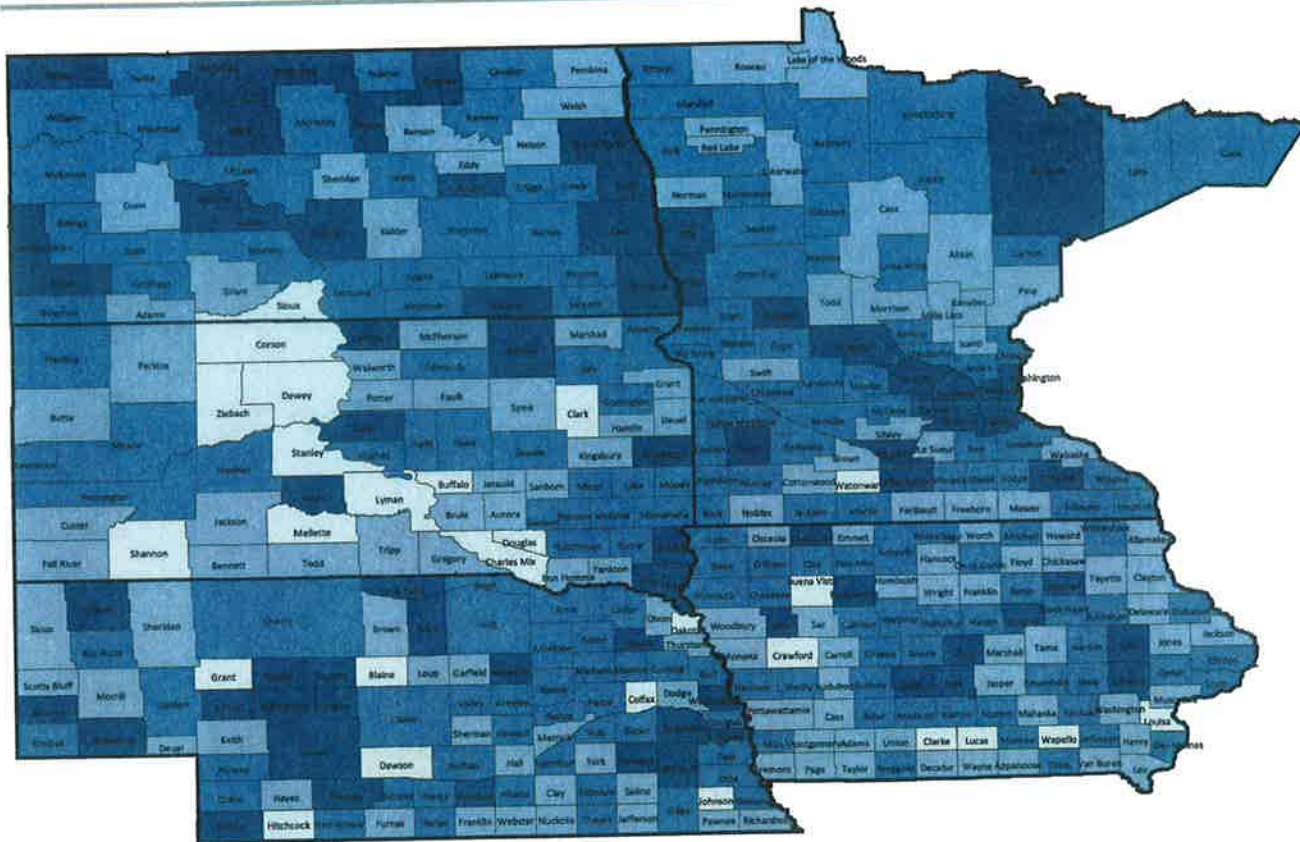
Where It Comes From: Estimates of high school graduation are based on the restricted-use versions of the LEA Universe Survey Dropout and Completion data and the Public Elementary/Secondary School Universe Survey data. These data were requested from NCES for the school year 2006-07.

Importance: The relationship between more education and improved health outcomes is well known, with years of formal education correlating strongly with improved work and economic opportunities, reduced psychosocial stress, and healthier lifestyles.

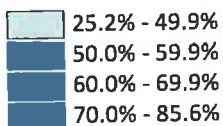
- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Some College - A health factor measure focusing on education
 County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adults ages 25 through 44 with some post-secondary education, 2005-2009



CONTEXT

What It Is: This measure represents the percent of the population ages 25 through 44 with some post-secondary education, such as enrollment at vocational/technical schools, junior colleges, or four-year colleges. It includes individuals who pursued education following high school but did not receive a degree.

Where It Comes From: Estimates of the population ages 25 through 44 with some post-secondary education were calculated using the 5-year estimates from the U.S. Census Bureau's American Community Survey (ACS).

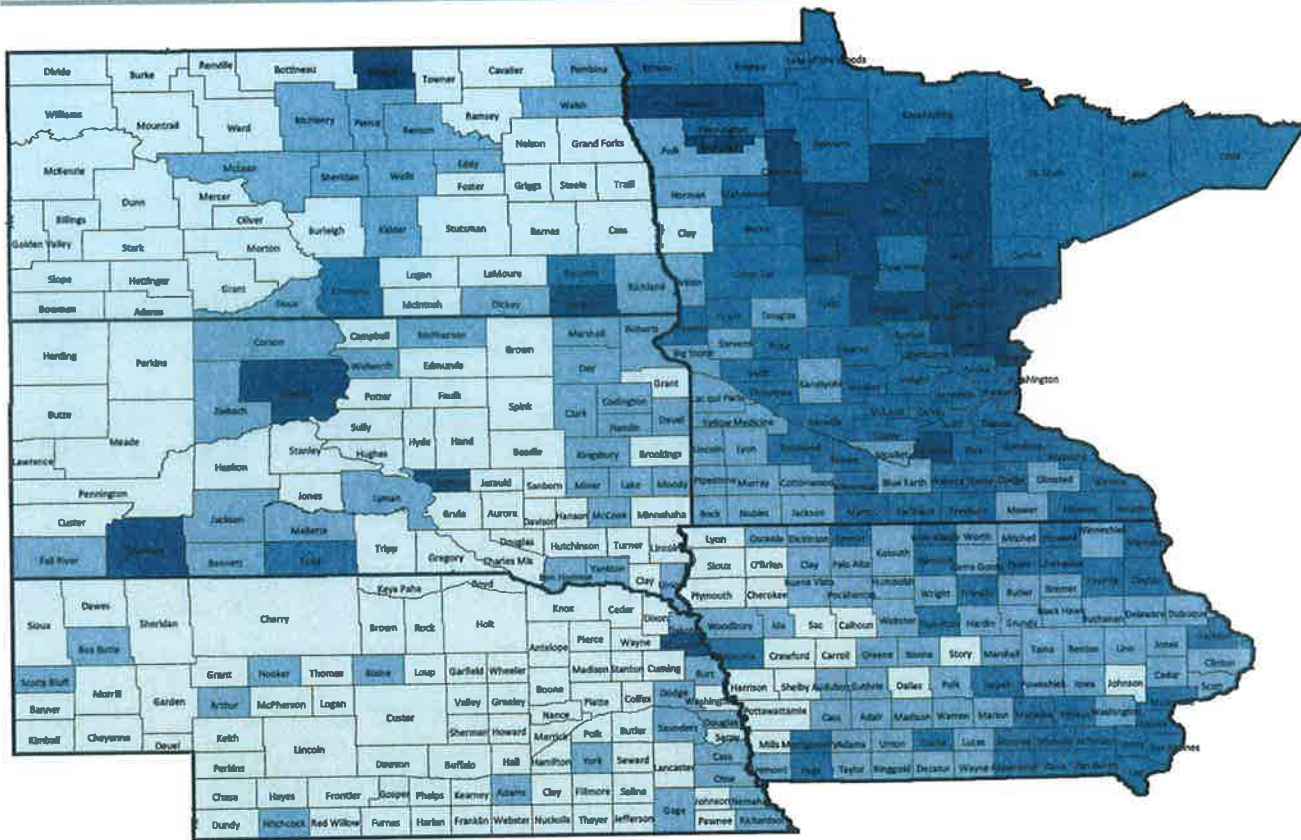
Importance: The relationship between higher education and improved health outcomes is well known, with years of formal education correlating strongly with improved work and economic opportunities, reduced psychosocial stress, and healthier lifestyles.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

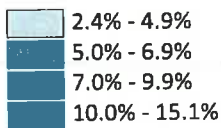
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Unemployment - A health factor measure focusing on labor

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of population ages 16 and older that is unemployed but seeking work, 2009



CONTEXT

What It Is: Unemployment is measured as the percent of the civilian labor force ages 16 and older that is unemployed but seeking work.

Where It Comes From: Data on unemployment is obtained from the Bureau of Labor Statistics (BLS), Local Area Unemployment Statistics (LAUS).

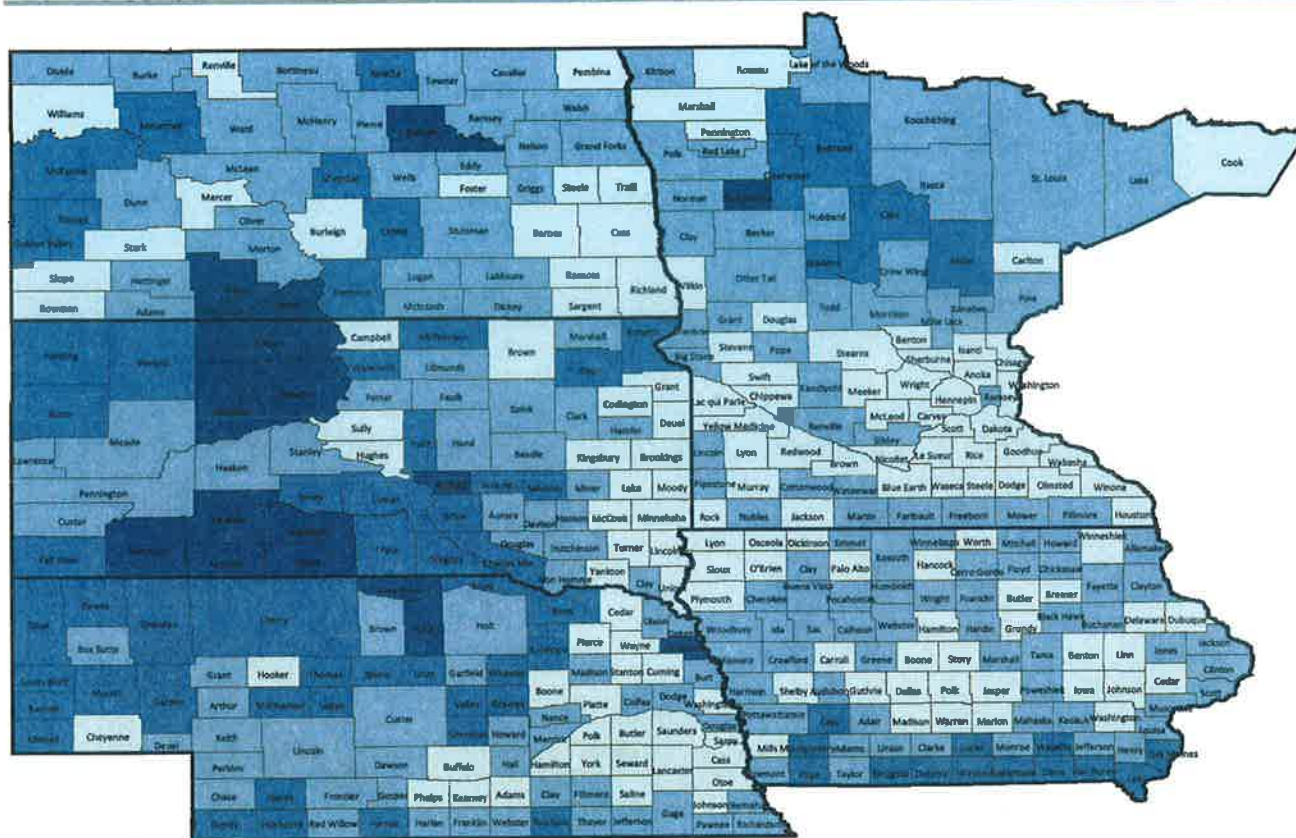
Importance: Unemployment may lead to physical health responses ranging from self-reported physical illness to mortality, especially suicide. It has also been shown to lead to an increase in unhealthy behaviors related to alcohol and tobacco consumption, diet, exercise, and other health-related behaviors, which in turn can lead to increased risk for disease or mortality. Because employee-sponsored health insurance is the most common source of health insurance coverage, unemployment can also limit access to health care.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

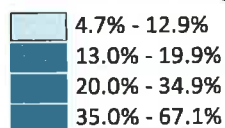
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Children in Poverty - A health factor measure focusing on income and poverty

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of children ages 0 through 17 living below the Federal Poverty Line, 2008



CONTEXT

What It Is: Children in poverty is the percent of children under age 18 living below the Federal Poverty Line (FPL).

Where It Comes From: Children in poverty estimates are provided by the Small Area Income and Poverty Estimates (SAIPE) program through the U.S. Census Bureau.

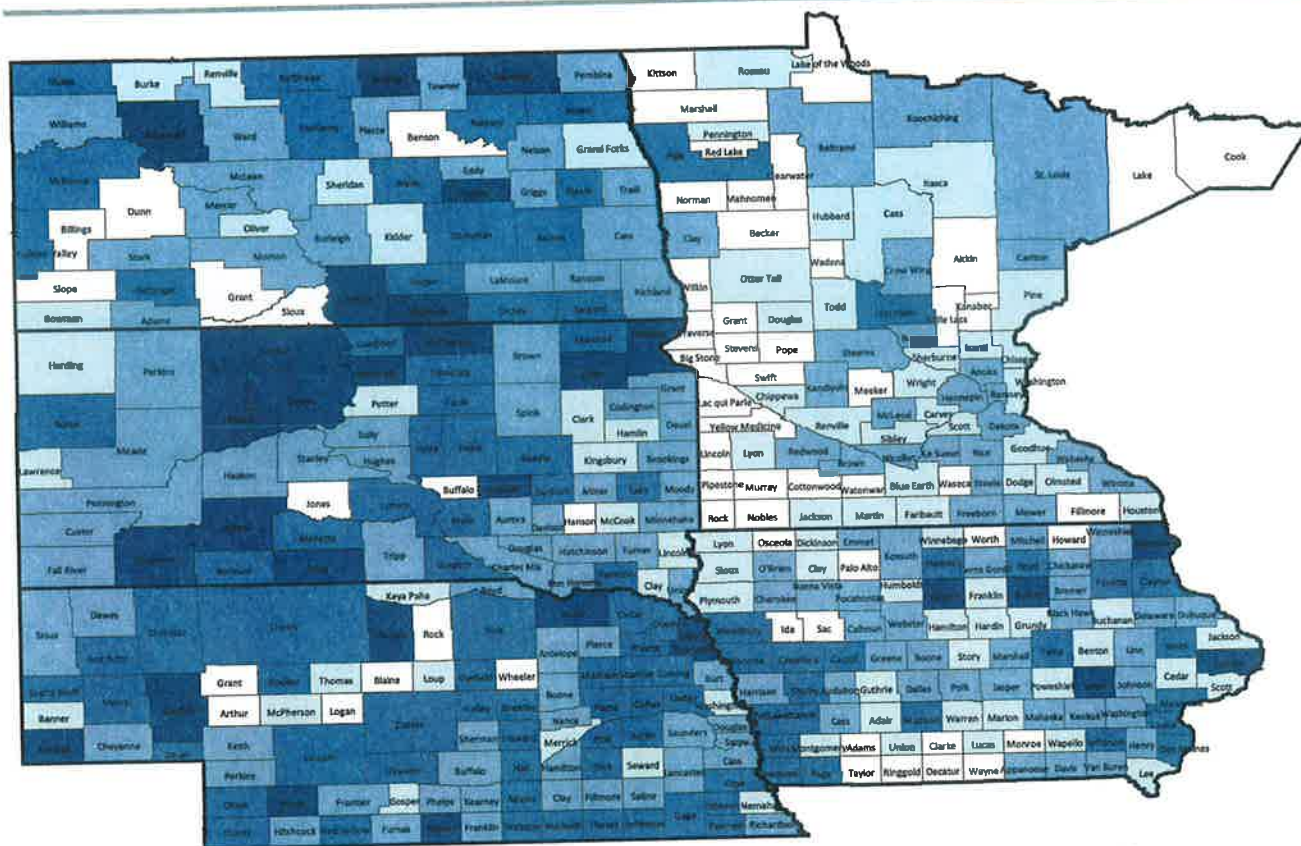
Importance: Poverty can result in negative health consequences, such as increased risk of mortality, increased prevalence of medical conditions and disease incidence, depression, intimate partner violence, and poor health behaviors. While negative health effects resulting from poverty are present at all ages, children in poverty experience greater morbidity and mortality due to an increased risk of accidental injury and lack of health care access. Children's risk of poor health and premature mortality may also be increased due to the poor educational achievement associated with poverty. The children in poverty measure is highly correlated with overall poverty rates.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

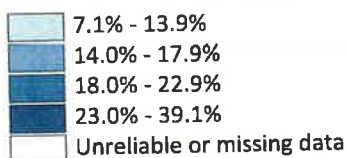
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Inadequate Social Support - A health factor measure focusing on social networks

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of adults that never, rarely, or sometimes get the social and emotional support they need, 2003-2009



CONTEXT

What It Is: The social and emotional support measure is based on responses to the question: "How often do you get the social and emotional support you need?" The value presented is the percent of the adult population that responds that they "never," "rarely," or "sometimes" get the support they need.

Where It Comes From: This measure was calculated by the National Center for Health Statistics using data obtained from the Centers for Disease Control and Prevention's Behavioral Risk Factor Surveillance System (BRFSS), a random-digit dial survey. BRFSS data are representative of the total non-institutionalized U.S. population over 18 years of age living in households with a land-line telephone. The estimates are based on seven years of data.

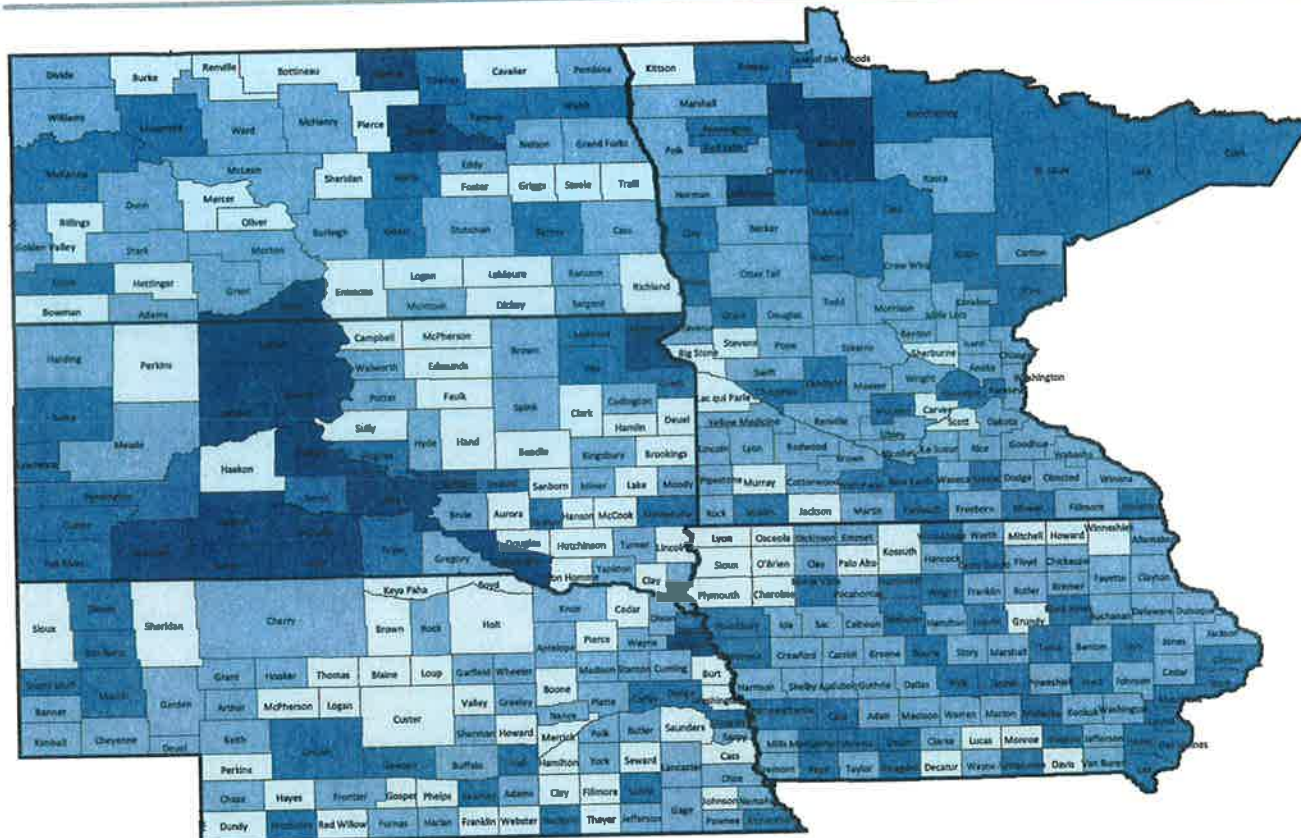
Importance: Poor family support, minimal contact with others, and limited involvement in community life are associated with increased morbidity and early mortality. Furthermore, social support networks have been identified as powerful predictors of health behaviors, suggesting that individuals without a strong social network are less likely to participate in healthy lifestyle choices.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

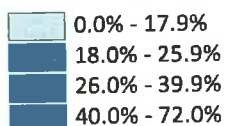
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Children in Single-Parent Households - A health factor measure focusing on families

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of children in families that live in a household headed by a parent with no spouse present, 2005-2009



CONTEXT

What It Is: The single-parent household measure is the percent of all children in family households that live in a household headed by a single parent (male or female householder with no spouse present).

Where It Comes From: Estimates of the percent of children in single-parent households were calculated using data from the U.S. Census Bureau's American Community Survey (ACS) 5-year estimates.

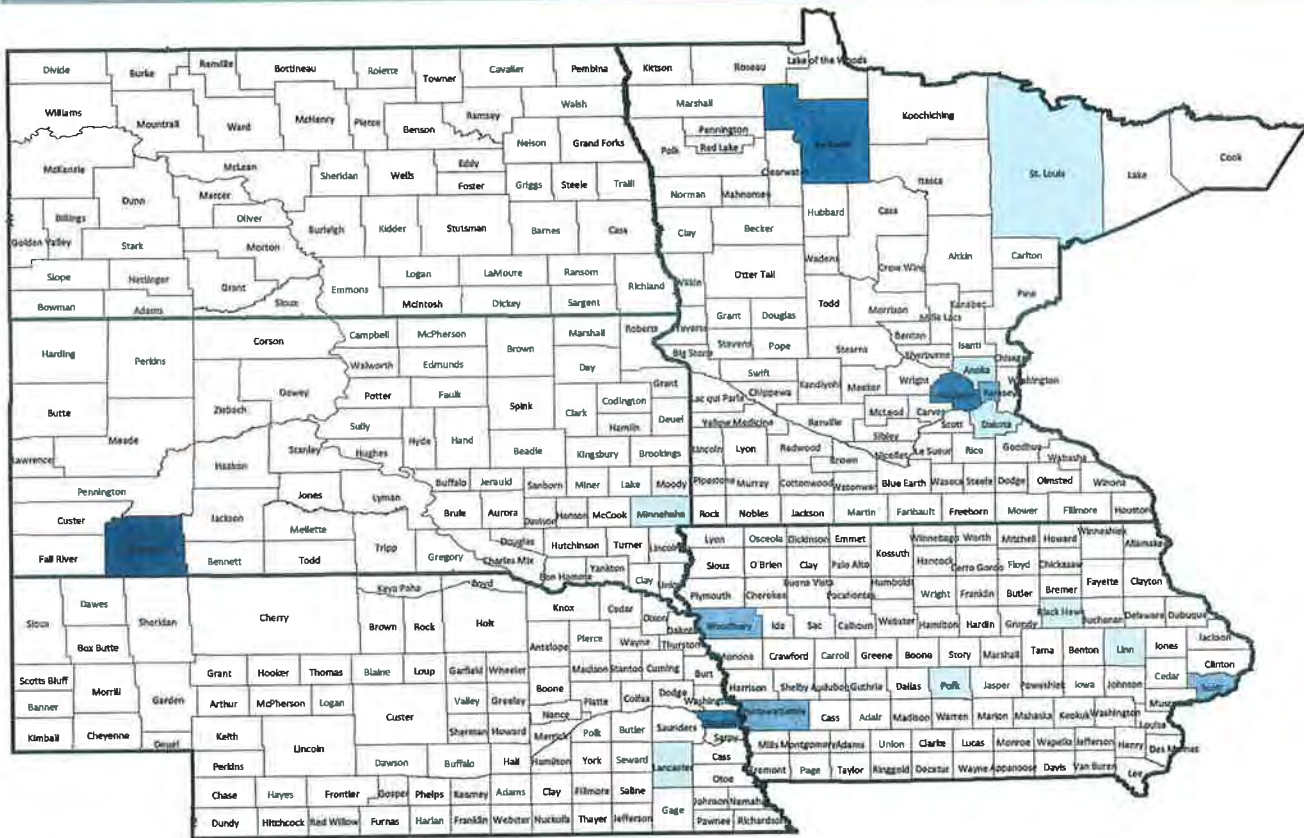
Importance: Adults and children in single-parent households are both at risk for adverse health outcomes such as mental health problems (including substance abuse, depression, and suicide) and unhealthy behaviors such as smoking and excessive alcohol use.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

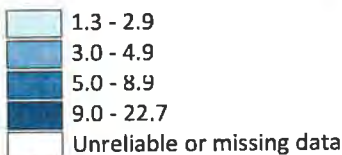
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Homicide Rate - A health factor measure focusing on violent crime

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of deaths due to murder or non-negligent manslaughter per 100,000 population, 2001-2007



CONTEXT

What It Is: Homicide is represented as a crude death rate due to murder or non-negligent manslaughter per 100,000 population.

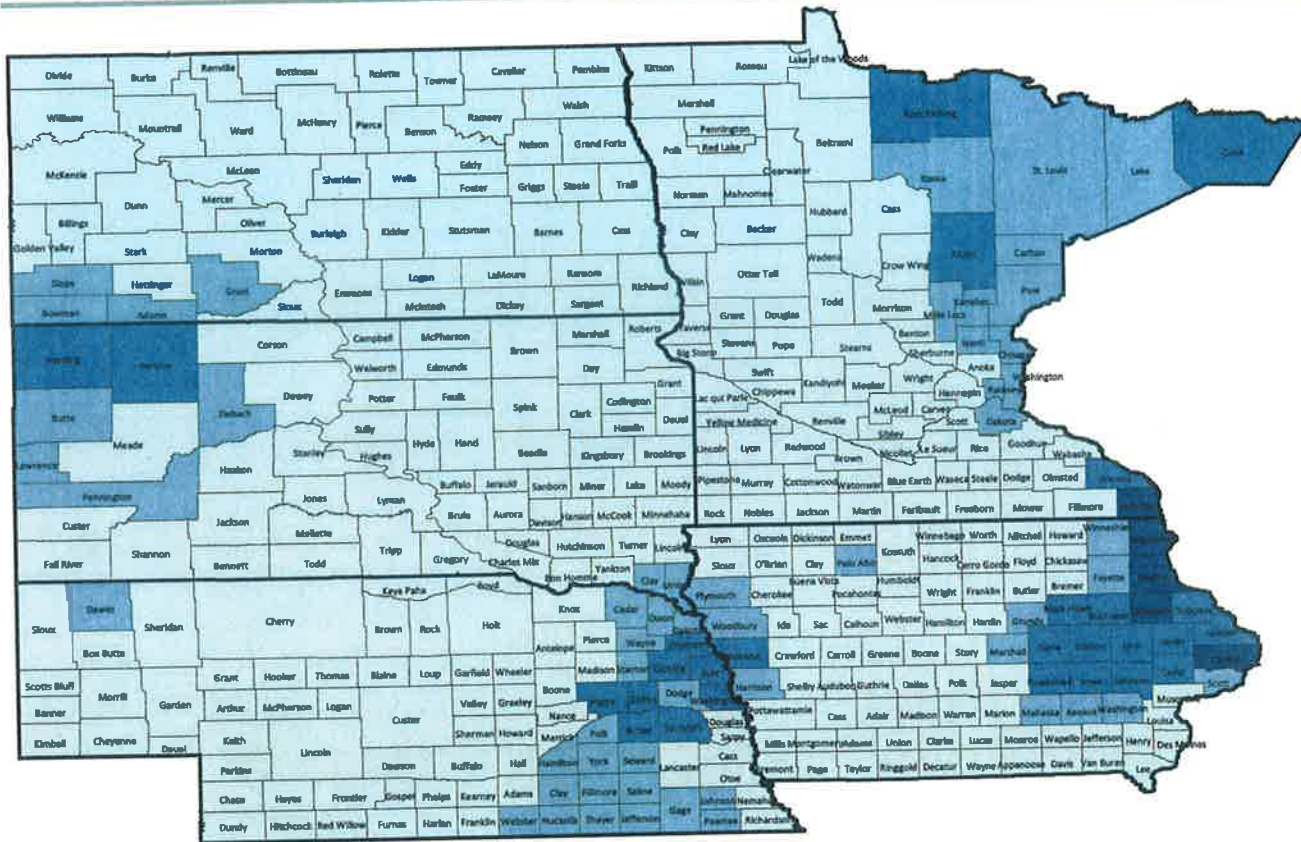
Where It Comes From: These data were calculated by National Center for Health Statistics (NCHS) at the Centers for Disease Control and Prevention (CDC) using data from the National Vital Statistics System (NVSS). NCHS used data for a seven-year period to create more robust estimates of cause-specific mortality, particularly for counties with smaller populations.

Importance: Because homicide is one of the five offenses that comprise violent crime, a homicide rate is used as a proxy when violent crime data are not available.

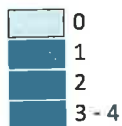
- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Air Pollution-Particulate Matter Days - A health factor measure focusing on physical environment
 County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of days air quality was unhealthy for sensitive populations due to fine particulate matter, 2006



CONTEXT

What It Is: The air pollution—particulate matter measure represents the annual number of days that air quality was unhealthy for sensitive populations due to fine particulate matter (FPM, < 2.5 µm in diameter).

Where It Comes From: The Public Health Air Surveillance Evaluation (PHASE) project, a collaborative effort between the Centers for Disease Control and Prevention (CDC) and the EPA, used Community Multi-Scale Air Quality Model (CMAQ) output and air quality monitor data to create a spatial-temporal model that estimated fine particulate matter concentrations throughout the year. The PHASE estimates were used to calculate the number of days per year that air quality in a county was unhealthy for sensitive populations due to FPM.

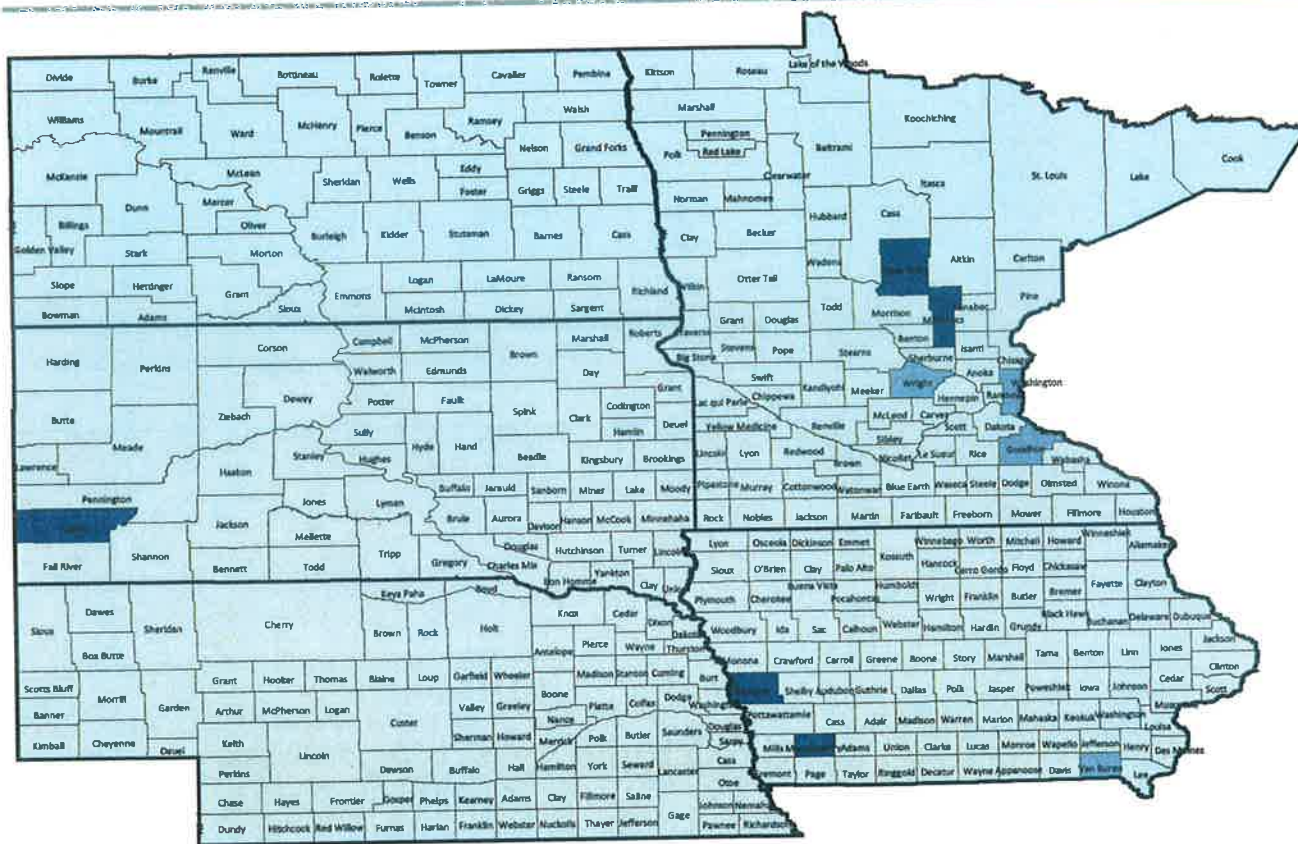
Importance: The relationship between elevated air pollution—particularly fine particulate matter and ozone—and compromised health has been well documented. The negative consequences of ambient air pollution include decreased lung function, chronic bronchitis, asthma, and other adverse pulmonary effects.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Air Pollution-Ozone Days - A health factor measure focusing on physical environment

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of days air quality was unhealthy for sensitive populations due to ozone levels, 2006



CONTEXT

What It Is: The air pollution—ozone measure represents the annual number of days that air quality was unhealthy for sensitive populations due to ozone levels.

Where It Comes From: The Public Health Air Surveillance Evaluation (PHASE) project, a collaborative effort between the Centers for Disease Control and Prevention (CDC) and the EPA, used Community Multi-Scale Air Quality Model (CMAQ) output and air quality monitor data to create a spatial-temporal model that estimated daily ozone concentrations throughout the year. The PHASE estimates were used to calculate the number of days per year that air quality in a county was unhealthy for sensitive populations due to ozone.

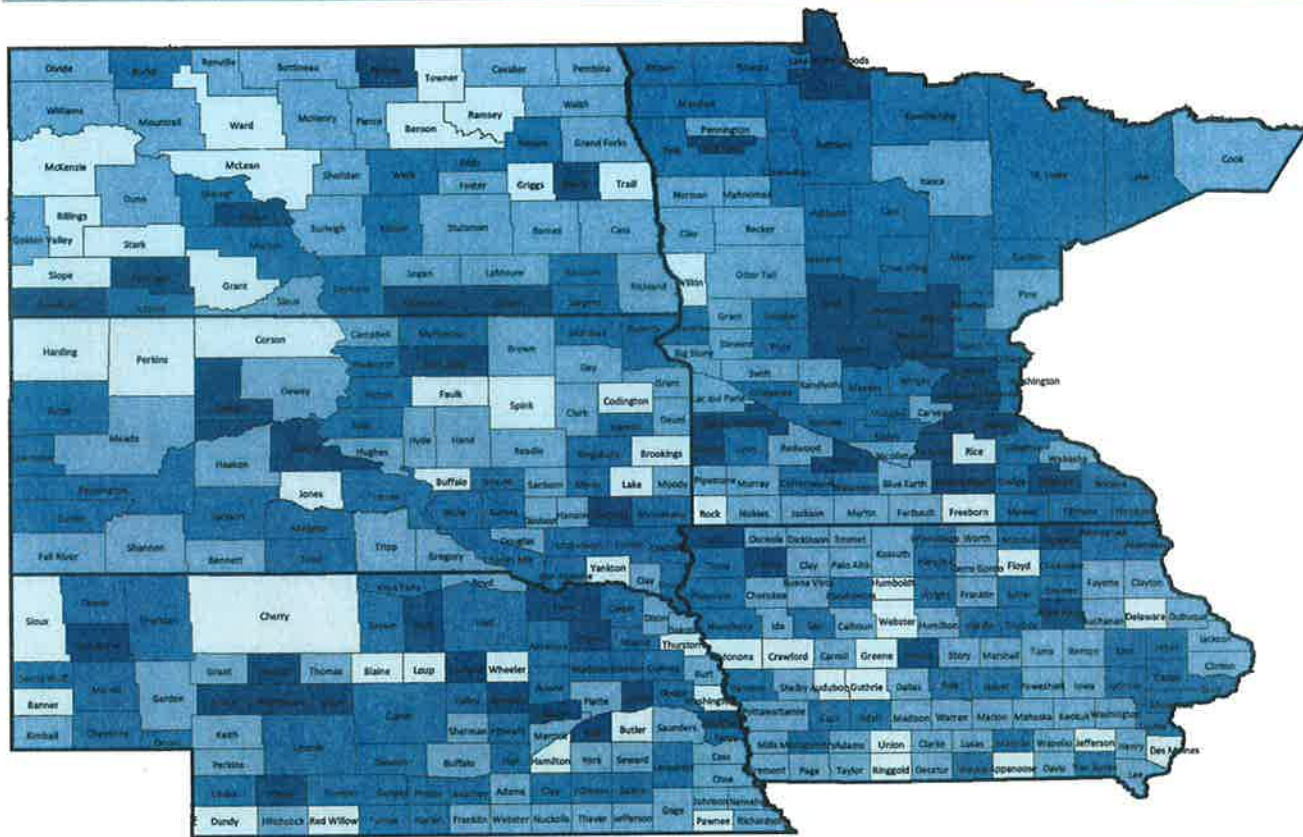
Importance: The relationship between elevated air pollution—particularly fine particulate matter and ozone—and compromised health has been well documented. The negative consequences of ambient air pollution include decreased lung function, chronic bronchitis, asthma, and other adverse pulmonary effects.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

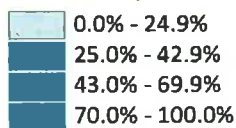
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Access to Healthy Foods - A health factor measure focusing on physical environment

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of zip codes with healthy food outlets (i.e., grocery store or produce stand/farmers' market), 2008



CONTEXT

What It Is: Access to healthy foods is measured as the percent of zip codes in a county with a healthy food outlet, defined as a grocery store or produce stand/farmers' market.

Where It Comes From: The measure is based on data from the U.S. Census Bureau's Zip Code Business Patterns. Healthy food outlets include grocery stores and produce/farmers' markets, as defined by their North American Industrial Classification System (NAICS) codes.

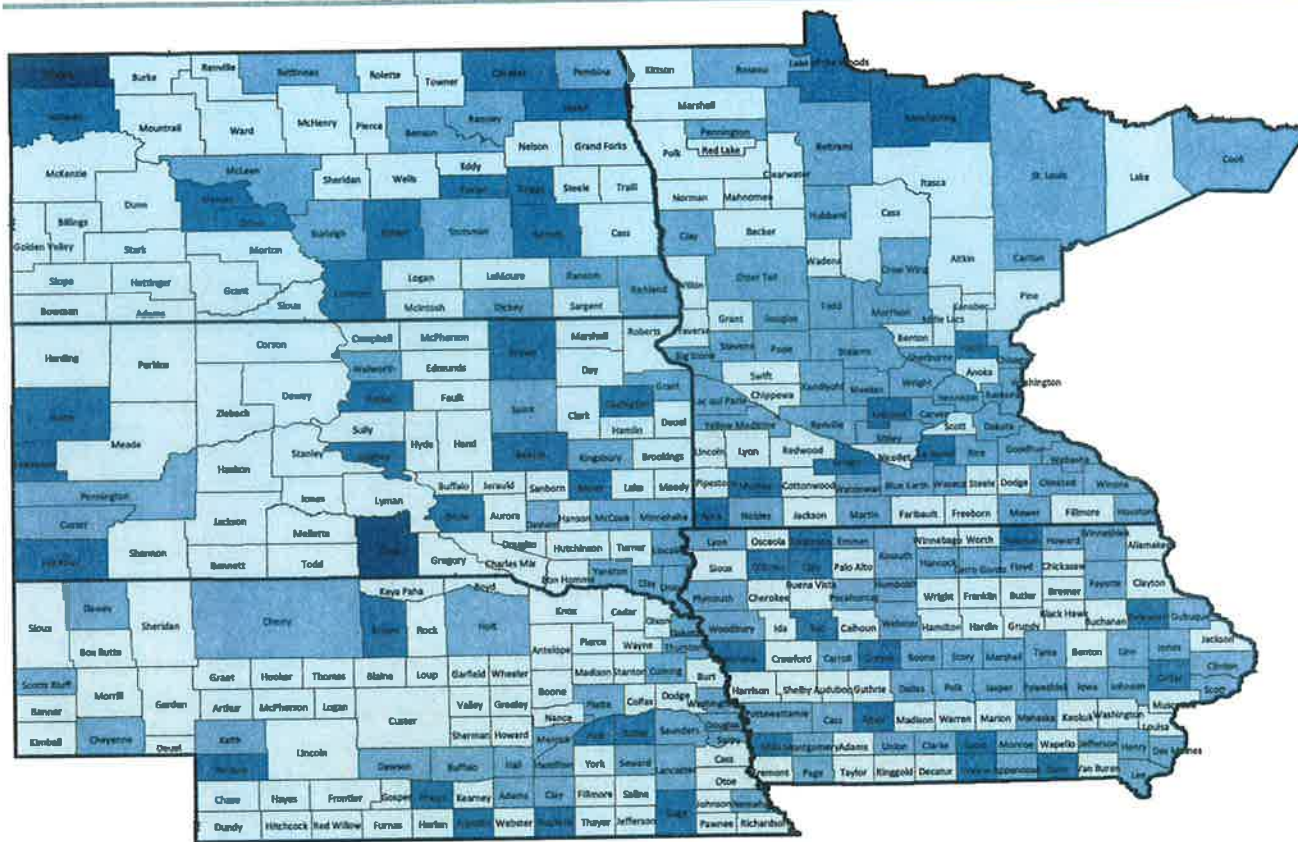
Importance: Studies have linked the food environment to consumption of healthy food and overall health outcomes.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

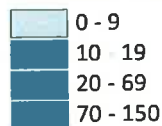
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Access to Recreational Facilities - A health factor measure focusing on physical environment

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Number of recreational facilities per 100,000 population, 2008



CONTEXT

What It Is: This measure represents the number of recreational facilities per 100,000 population in a given county. Recreational facilities are defined as establishments primarily engaged in operating fitness and recreational sports facilities, featuring exercise and other active physical fitness conditioning or recreational sports activities such as swimming, skating, or racquet sports.

Where It Comes From: This measure is based on a measure from United States Department of Agriculture (USDA) Food Environment Atlas, and is calculated using the most current County Business Patterns data set. Recreational facilities are identified by North American Industrial Classification System (NAICS) code 713940.

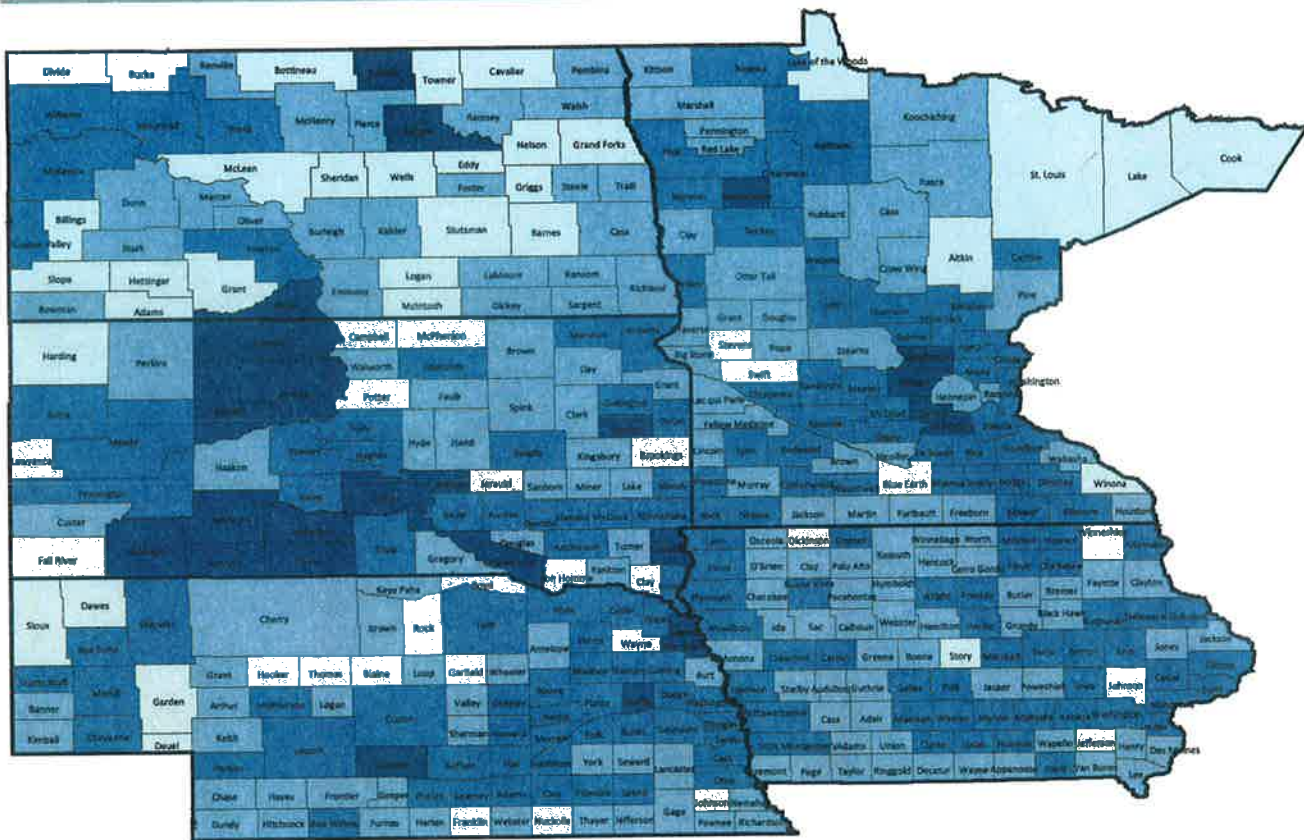
Importance: The availability of recreational facilities can influence individuals' and communities' choices to engage in physical activity. Proximity to places with recreational opportunities is associated with higher physical activity levels, which in turn is associated with lower rates of adverse health outcomes associated with poor diet, lack of physical activity, and obesity.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

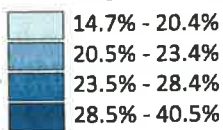
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Youth - A demographic measure

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Persons ages 0 through 17 as a percent of the total population, 2009



CONTEXT

What It Is: This measure represents the percent of a county's population that is less than 18 years of age.

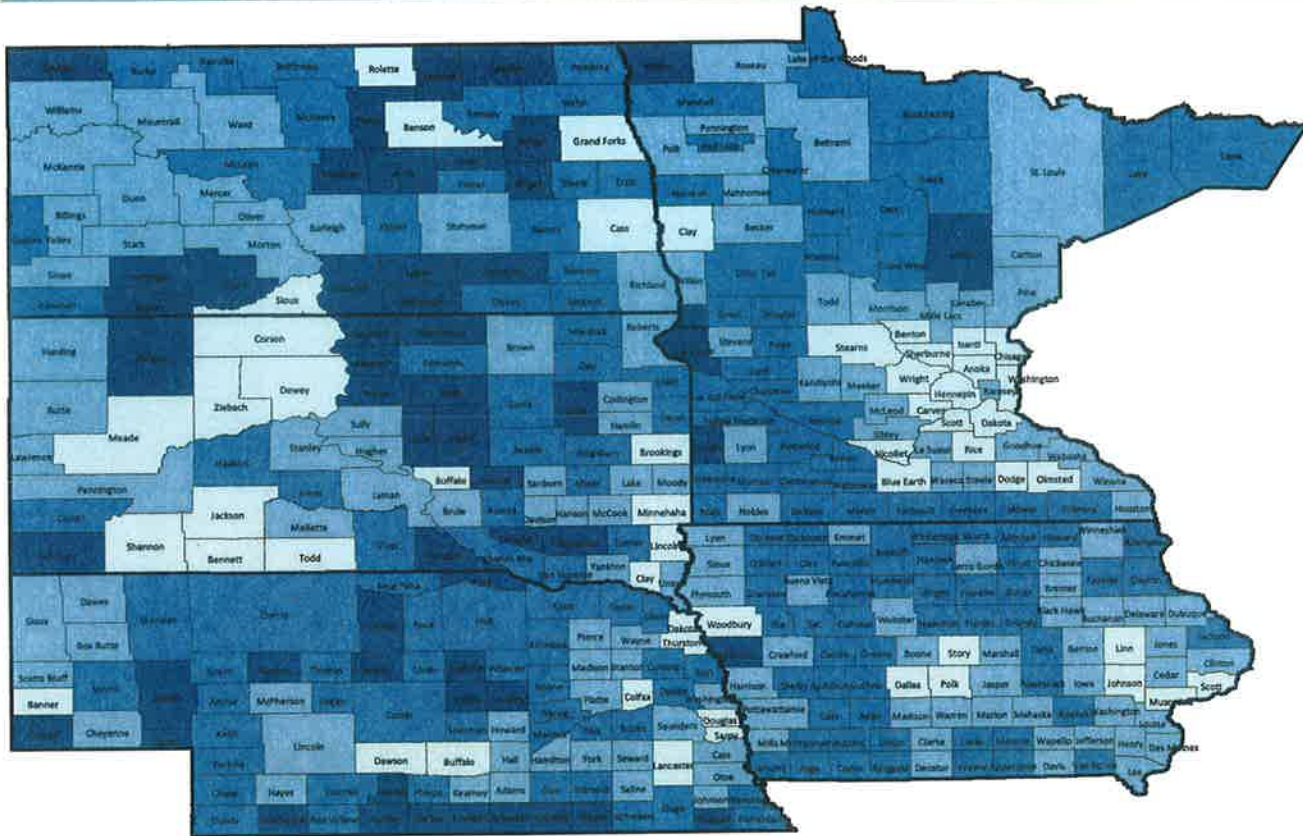
Where It Comes From: County demographic figures come from the U.S. Census Bureau's annual population estimates.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

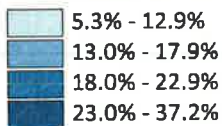
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Elderly - A demographic measure

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Persons ages 65 and older as a percent of the total population, 2009



CONTEXT

What It Is: This measure represents the percent of a county's population that is 65 years of age and older.

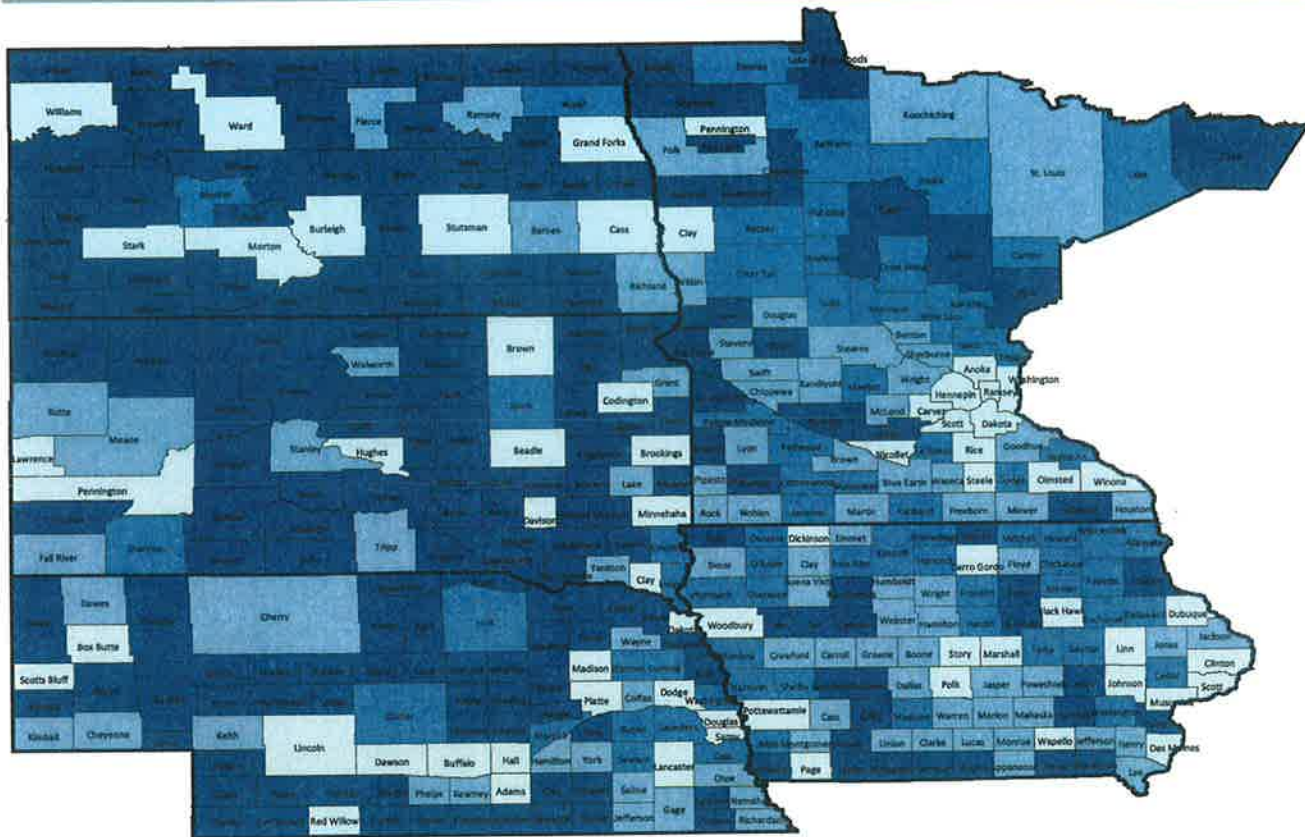
Where It Comes From: County demographic figures come from the U.S. Census Bureau's annual population estimates.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

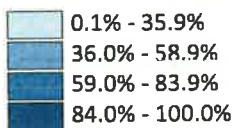
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Rural - A demographic measure

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of total population living in a rural area, 2000



CONTEXT

What It Is: This measure represents the percent of a county's population that lives in a rural area, which the U.S. Census Bureau defines as all territory located outside of urbanized areas and urban clusters. Urbanized areas and urban clusters are geographic areas with a core population density of at least 1,000 people per square mile that are surrounded by areas with an overall population density of at least 500 people per square mile.

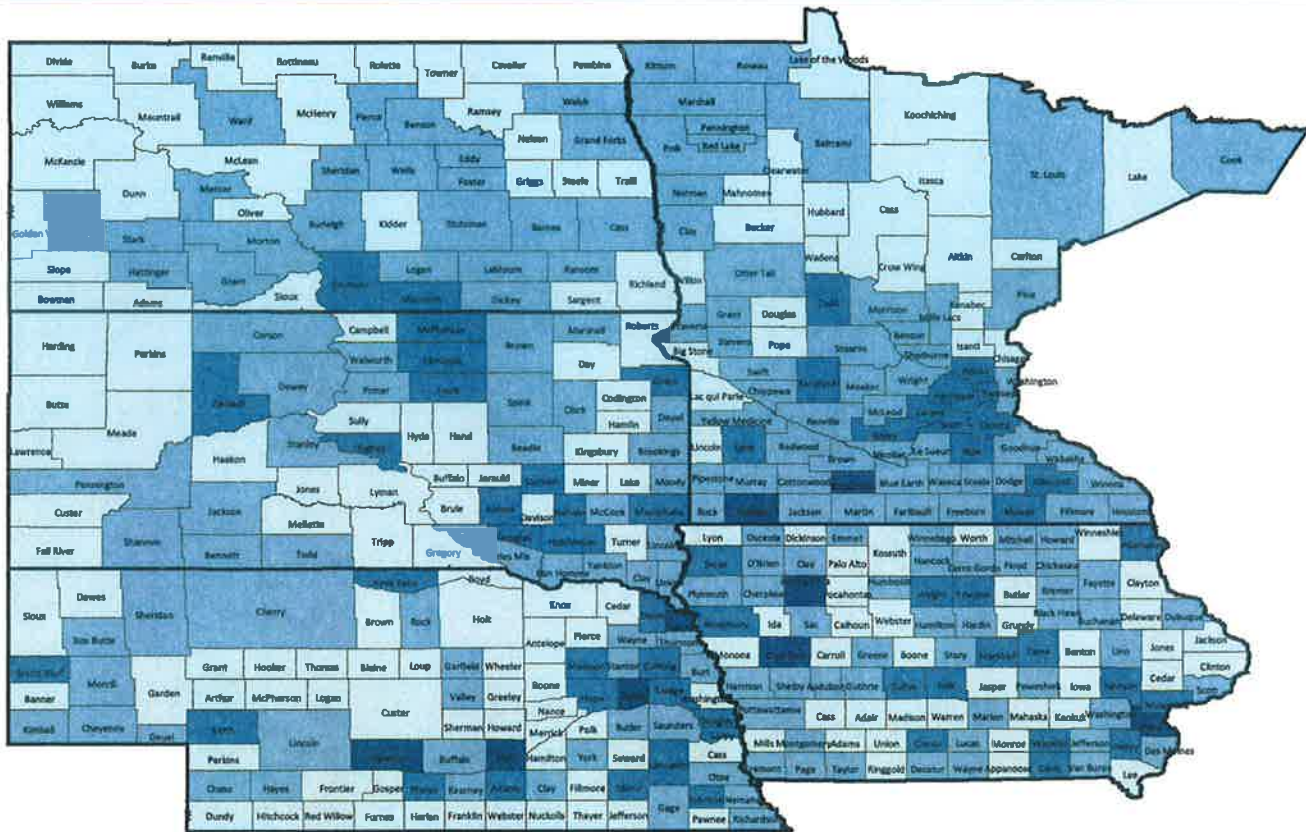
Where It Comes From: This measure is calculated by the U.S. Census Bureau using data from 2000.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

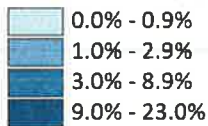
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Not English Proficient - A demographic measure

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of total population that speaks English less than "very well", 2005-2009



CONTEXT

What It Is: This measure represents the percent of the total population that reports speaking English less than "very well."

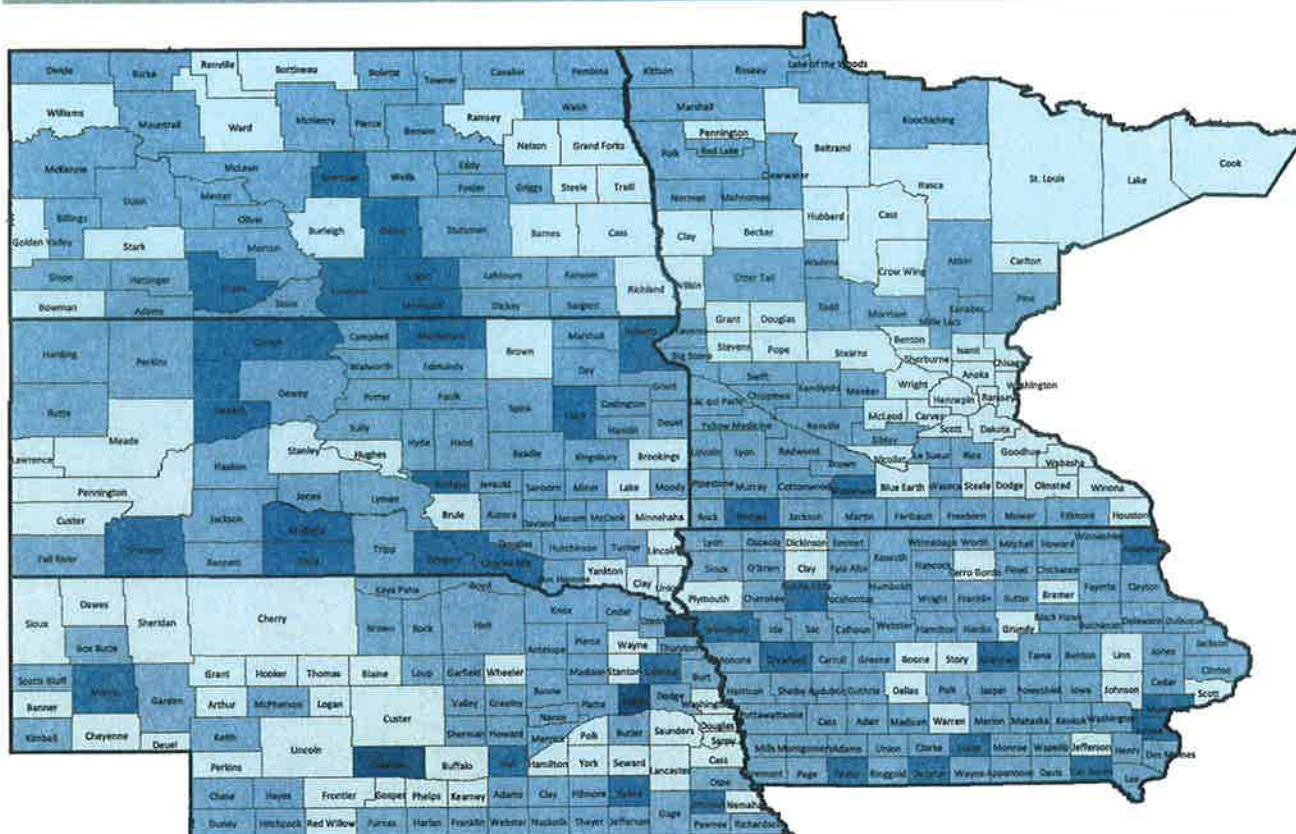
Where It Comes From: Data on spoken English proficiency come from the U.S. Census Bureau's American Community Survey 5-year estimates.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

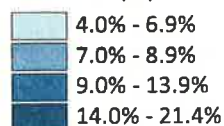
Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Illiteracy - A demographic measure

County distribution map for Iowa, Minnesota, Nebraska, North Dakota, and South Dakota



Percent of population ages 16 and older that lacks basic prose literacy skills, 2003



CONTEXT

What It Is: This measure reflects the percent of the population ages 16 and older that lacks basic prose literacy skills.

Where It Comes From: This measure is obtained from the National Center for Education Statistics and is based on the 2003 National Assessment of Adult Literacy.

- Data and associated context were obtained from County Health Rankings, a key component of the Mobilizing Action Toward Community Health (MATCH) project - a collaboration between the Robert Wood Johnson Foundation and the University of Wisconsin Population Health Institute, <http://www.countyhealthrankings.org/>.

Disclaimer: The data displayed are from the source indicated; we do not vouch for the accuracy of the data or ensure they are the most recent available. The information is intended for personal, non-commercial use. It can be shared freely if it is not used for profit and appropriate acknowledgments are given. This map was prepared by researchers at North Dakota State University in Fargo for the 2011-2013 Fargo-Moorhead Community Health Needs Assessment Collaborative. December 2011

Table 1
Community Health Needs Assessment Asset Mapping
Hillsboro Stakeholders

Identified Concerns	Specific concerns	Alignment with Sanford resources or other community resource partners	Unmet need
Access	<ul style="list-style-type: none"> • Need access to specialists such as geriatric & ortho specialists • Would like clinic hours after 5:00 		
Cancer	<ul style="list-style-type: none"> • Have to travel 30-60 miles to get cancer treatment • Need more cancer screenings 		
Cardiac	<ul style="list-style-type: none"> • Need cardiac rehab locally 		
Child Care	<ul style="list-style-type: none"> • Daycare availability 		
Chronic Disease	<ul style="list-style-type: none"> • Increasing number of those with celiac disease • Increasing number of those with environmental allergies • Sleep apnea • Have to travel 30-60 miles to get dialysis 	Sanford Clinic -- (701) 636-5311	
City Services County Services City Govt.	<ul style="list-style-type: none"> • Taxes/fees 		
Competition	<ul style="list-style-type: none"> • Lack of competition in healthcare 		
Dental Care	<ul style="list-style-type: none"> • Need access to orthodontic services for MA clients • Dental care 1.5 hours north of us is ½ to ¾ cheaper than what we pay in Traill Co. 		

Identified Concerns	Specific concerns	Alignment with Sanford resources or other community resource partners	Unmet need
Diabetes	<ul style="list-style-type: none"> Need services & educational programs for those with diabetes 	Sanford Clinic – (701) 636-5311	
Economic Situation/ Business community	<ul style="list-style-type: none"> Unstable work environment with our major local blue collar employer Long-term effects of the Crystal Sugar lock-out 		
Education	<ul style="list-style-type: none"> Need education in nutrition & exercise Need education on the importance of routine healthcare 		
Elderly	<ul style="list-style-type: none"> Need to address the needs of the aging population Need geriatric specialists Need for services to assist the elderly in living independently Lack of services to detect & prevent neglect of elderly vulnerable adults Increase in dementia & Alzheimer's cases – shortage of staff & facilities able to handle this 	Sanford Clinic – (701) 636-5311	
Emergency Care	<ul style="list-style-type: none"> Availability of ER services 	Sanford Medical Center – (701) 636-3219	
Handicapped	<ul style="list-style-type: none"> Need for services to assist the handicapped in living independently 		
Healthcare Cost/Insurance Cost	<ul style="list-style-type: none"> Concern about the rationing of healthcare (due to Obama Care); too much government involvement in healthcare Concerned about high cost of healthcare Concerned about health insurance for people with pre-existing conditions 		

Identified Concerns	Specific concerns	Alignment with Sanford resources or other community resource partners	Unmet need
Hillsboro	<ul style="list-style-type: none"> Concern about occupancy rates – make sure hospital & clinic in Hillsboro are being utilized Lack of outpatient or referral services that will help sustain occupancy in swing beds & hospital in Hillsboro Need a PA in the ER in Hillsboro 		
Home Care	<ul style="list-style-type: none"> Need care for housebound patients who are unable to get to the clinic or hospital 	Sanford Home Care – (701)-788-4400	
Housing	<ul style="list-style-type: none"> Houses that are condemned but still standing 		
Healthy Nutrition	<ul style="list-style-type: none"> Need a better school lunch program (salad bar, fruit choices) Need a Public Health-based nutritionist available to everyone (not tied to a fee-for-service structure) 		
Marketing	<ul style="list-style-type: none"> Continue marketing so that the area population knows what is available at the Mayville facility 		
Mental Health	<ul style="list-style-type: none"> Need more mental health services If we have services for mental health issues, need to be publicized better Children are diagnosed but services are not utilized by parents because of transportation, cost or time away from work 	Sanford Clinic – (701) 636-5311 NE Human Service Center – (701) 795-3000	
OB Services	<ul style="list-style-type: none"> Prenatal care for young single mothers 	Sanford Clinic – (701) 636-5311	
Obesity	<ul style="list-style-type: none"> Complications from obesity (sleep apnea) Increasing rate of obesity Need educational programs re: obesity 	Sanford Clinic – (701) 636-5311	
Parenting	<ul style="list-style-type: none"> Lack of support for increasing number of grandparents raising their grandchildren 		

Identified Concerns	Specific concerns	Alignment with Sanford resources or other community resource partners	Unmet need
Parish Nursing	<ul style="list-style-type: none"> • Would be advantageous to establish parish nurses in each community to build healthier connections between clients, families, medical providers 	Sanford Faith Community Nursing – (701) 234-5818 (Lois Ustanko)	
Physicians	<ul style="list-style-type: none"> • Availability of healthcare providers • Doctors don't like to try new things • Concerned about coordination/communication between providers • Need physicians & nurses who listen, show that they care about your pain, smile • Issues with referrals – physicians don't follow up on the referral, patients fall "through the cracks" if they don't have a primary physician 		
Pollution	<ul style="list-style-type: none"> • Presence of mold which can lead to an increase in respiratory problems • Noise pollution from the early morning/night train horn • Crop spraying – its effect on trees, animals, humans 		
Prevention Services	<ul style="list-style-type: none"> • More attention should be spent on prevention 	Sanford Clinic – (701) 636-5311	
Substance Abuse	<ul style="list-style-type: none"> • Lack of services for substance abuse • Use of chewing tobacco by young adults/teens • Would like all places to be smoke-free 		
Traffic/City Infrastructure	<ul style="list-style-type: none"> • Concern with young, inexperienced, distracted drivers • Concern with drainage, holes in the road, speed on side streets, bad sidewalks 		
Transportation	<ul style="list-style-type: none"> • Because of being a rural community, transportation & the cost of fuel can be a problem • Need a means of transportation to medical appointments outside the community • Coordinated scheduling of dialysis appointments in Fargo so patients can all go together 	Trail Co. & Steel Co. Bus Vans – (701) 636-5953 West Trail Ambulance – (701) 786-3800	

Identified Concerns	Specific concerns	Alignment with Sanford resources or other community resource partners	Unmet need
	<ul style="list-style-type: none"> • Need transportation at no cost (for the elderly on fixed incomes) 		
Wellness	<ul style="list-style-type: none"> • Need better exercise equipment at the school. • Need affordable exercise equipment at the school that adults could use • Need a nurse & athletic doctor at the school 		
Youth	<ul style="list-style-type: none"> • Drinking, drug use, chewing tobacco • Diet/exercise • Mental health concerns such as depression, anxiety • Lack of boundaries for children; unacceptable behaviors becoming more & more prevalent • Need regular-scheduled sensitivity classes in the schools • Need more youth activities in the summer • Need places for kids to “hang out” • Sexual assault by peers (school aged children) – not being dealt with in the community • Adults who buy alcohol for underage children • Need a better school lunch program (salad bar, fruit choices) • Children who do not have the basic immunizations • Concerned about obesity rates in kids • Kids not enrolled in sports programs (too inactive) • High cost of kids’ summer activities 	<p>NE Human Service Center – (701) 795-3000</p> <p>Teen Line – 1-877-419-7233 (24-hr. counselor line)</p>	
Sanford Specific	<ul style="list-style-type: none"> • Concern about losing the small town qualities of care & concern when taken over by a huge health system with all their protocols & rules • Billing should be more timely • Temperature in the rooms is too cool • Takes a long time for the nurses to return a phone call 		

Identified Concerns	Specific concerns	Alignment with Sanford resources or other community resource partners	Unmet need
	<ul style="list-style-type: none"> ● Need a Diabetic Educator ● Need more help for obesity – not just be told to join Weight Watchers ● Perception that nurses & PAs do not give direct answers 		

Second Biennial Report

Health Issues for the State of North Dakota

2013



SCHOOL OF MEDICINE & HEALTH SCIENCES
ADVISORY COUNCIL



Center for
Rural Health
University of North Dakota
School of Medicine and Health Sciences

UND SCHOOL OF MEDICINE
& HEALTH SCIENCES
THE UNIVERSITY OF NORTH DAKOTA

SCHOOL OF MEDICINE & HEALTH SCIENCES
ADVISORY COUNCIL

This *Report* was prepared by the UND School of Medicine and Health Sciences Advisory Council

David Molmen, MPH
Grand Forks (Chair)

Joshua Wynne, MD, MBA, MPH
Grand Forks (Executive Secretary)

Thomas F. Arnold, MD
Dickinson

John R. Baird, MD
Fargo

Rep. Stacey Dahl, JD
Grand Forks

Terry Dwelle, MD
Bismarck

J. Brian Hancock, MD
Fargo

L. Gary Hart, PhD
Grand Forks

Sen. Ralph L. Kilzer, MD
Bismarck

John M. Kutch, MHSA
Minot

Craig J. Lambrecht, MD
Bismarck

Sen. Tim Mathern, MPA
Fargo

Rep. Ralph Metcalf
Valley City

Maggie D. Anderson, MM
Bismarck

Shari L. Orser, MD
Bismarck

Grant H. Shaft, JD
Grand Forks

Courtney M. Koebele, JD
Bismarck (Ex Officio)

Acknowledgement

We would like to acknowledge the exceptional contributions of the following individuals in the preparation of this *Report*: Brad Gibbens, Dr. Marilyn G. Klug and Mandi Peterson of the Center for Rural Health; Jessica Sobolik and Denis MacLeod of the Office of Alumni and Community Relations; and Laura Cory of Information Resources. We would also like to thank Dr. L. Gary Hart for his contributions.

Introduction and Update

The *First Biennial Report on Health Issues for the State of North Dakota (Report)* was prepared in the fall of 2010 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 health care enterprise. It was published in 2011 to coincide with the 62nd Legislative Assembly of North Dakota, and was produced with the cooperation of the senior leaders of the SMHS. The primary stimulus for the preparation of the *Report* was a revision in the North Dakota Century Code (NDCC) that was instituted by the 2009 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*
 - (2) Provide information regarding the state's health care workforce needs**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*
- (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.*

The *First Biennial Report on Health Issues for the State of North Dakota* provided the first comprehensive analysis of the extant state of health in North Dakota and its health care delivery enterprise. The *Report* found that rural depopulation, out-migration of the young from the state, an increasingly older adult population, low population density and localized population growth in the major cities and in the Oil Patch would result in an increasing imbalance between the demand for health care and the supply of providers that would necessitate the need for more physician and health science providers in North Dakota and better health care delivery systems. The *Report* concluded that North Dakota had a paradox regarding its health care workforce, characterized as shortages amid plenty. The size of the physician workforce in North Dakota was found to be at or better than national norms for most specialties, including all of the primary care disciplines. Despite this, there was a significant distribution problem, with the predominance of providers in the urban areas and a shortage (especially primary care providers) in the rural areas.



The *Report* also offered an analysis of what the future was likely to hold, and concluded that the current shortage of physicians was only going to increase as the population aged and grew in the future. It also found that the shortage of workers in the health care field over the next 15 years would not be limited to physicians. The *Report* determined that an entire cadre of additional health care providers— from nurses to physician assistants to occupational and physical therapists to medical laboratory specialists and others—would be needed to ensure that effective, efficient, and appropriate health care would be available to all North Dakotans.

The *Report* concluded with a proposal for a multifaceted plan to address the health care needs of North Dakota, emphasizing necessary steps to reduce disease burden, increase the health care workforce through enhanced retention of graduates as well as expansion of class sizes, and a call for a better functioning health care delivery system through more cooperation and coordination of the various health care delivery facilities.

Coincident with the release of the *Report*, the SMHS Advisory Council prepared and released its plan for addressing the identified health care workforce needs of North Dakota. Called the Health Care Workforce Initiative (HWI), the plan identified specific steps to reduce disease burden and increase the provider workforce through programs designed to increase provider retention for practice within the state as well as expand the provider network through class size enlargement. The HWI received strong support from University of North Dakota leaders, the SMHS Advisory Council, and a wide variety of constituencies around the state. During the subsequent 2011 session of the Legislative Assembly, it was determined that the HWI would be implemented in two phases. The first phase was implemented immediately following the close of the Legislative Assembly in the summer of 2011, and consisted of a variety of programs to reduce disease burden (including the

initiation of a Master of Public Health training program as a joint undertaking by the University of North Dakota and North Dakota State University, and a program to address geriatric patient needs), increase retention of health professional graduates, and a partial increase in class sizes.

The second phase of the HWI is currently in process. A major component of Phase Two of the HWI is a study by the Legislature of the necessity of implementation of the full HWI (with an additional increment in expansion of class sizes) along with a study of the physical plant space needs that are an integral part of the HWI. The Interim Health Services Committee has finished its analysis of the full HWI during the 2011-2013 interim, along with studying an SMHS *Space*

Utilization Study that was completed recently through funding provided by the Legislature and conducted by JLG Architects assisted by the national design firm of Perkins+Will. The Health Services Committee endorsed full implementation of the Health Workforce Initiative and construction of a new building to house the School of Medicine and Health Sciences.

This *Second Biennial Report on Health Issues for the State of North Dakota* is an update on the developments and changes that have occurred during the interim from 2011 until 2013. It reanalyzes the health of the citizens of North Dakota and the status of our health care delivery systems, utilizing recently available data and more refined future projections. The current *Report* is similar to the first report in its organizational approach—analysis of the current state of affairs; projections for the future; and proposed plans to deal with the identified health care delivery challenges. The current *Report* contains the most up-to-date health care data available anywhere, and it strives to carefully analyze the data to extract the most salient and informative implications about health care and health care delivery within the state. The current *Report* contains a more robust analysis of the health care challenges associated with the oil boom, and strives to propose approaches to ensure that adequate health care is available not only in the Red River Valley, but particularly in the rapidly growing and challenging areas in the western part of the state that are affected by the oil boom. Other enhancements of the *Report* relate to a more complete analysis of the status of nonphysician health care workers, and a greatly expanded section analyzing quality and value indicators in the state. The *Report* concludes with a reemphasis on the importance of adopting the full HWI by the Legislative Assembly during 2013, along with adequately addressing the associated physical plant needs at the SMHS to accommodate the attendant growth in health care workforce students.

Table of Contents

Introduction and Update	ii
Executive Summary	vii
Chapter 1: The Population of North Dakota and Attendant Health Care Needs	1
Chapter 2: The Health of North Dakota	23
Chapter 3: Physician Workforce in North Dakota.....	41
Chapter 4: Primary Care and Specialty Physician Workforce in North Dakota	51
Chapter 5: Other Health Care Workforce in North Dakota	59
Chapter 6: Health Care Organization and Infrastructure in North Dakota	65
Chapter 7: Quality and Value of Health Care	81
Chapter 8: Conclusion	93
Chapter 9: Workforce Development	97
Chapter 10: Recommendations: Health Care Planning for North Dakota	107
Appendix	118

An electronic version of this *Report* is available at:
www.med.und.edu/community/files/docs/second-biennial-report.pdf

Executive Summary

North Dakota, like the rest of the country, is facing a major health care delivery challenge—how to meet the current and rising future demand for health care services with a limited panel of physician and other providers. The problem is particularly acute in rural regions of North Dakota, where there has been a chronic shortage especially of primary care providers dating back four decades or more. Part of the problem in North Dakota is an inadequate number of providers, but a larger portion of the problem is due to maldistribution of providers who are disproportionately located in the larger urbanized areas of the state. The challenge of providing adequate health care in North Dakota will worsen over the next decades through a combination of aging of the population and localized population growth in the Oil Patch and the cities, both of which will increase the demand for health care services.

However, unlike most of the rest of the country, North Dakota has the opportunity to directly address its health care delivery challenges by continuing to implement a well-vetted plan for health care workforce development. That plan, the Health Care Workforce Initiative (HWI), was an outgrowth of the *First Biennial Report on Health Issues for the State of North Dakota 2011*. Phase 1 of the HWI has already been implemented in the interim of 2011–12. In accordance with the expectations specified in the North Dakota Century Code (NDCC 15-52-04), this *Second Biennial Report on Health Issues for the State of North Dakota 2013 (Report)* updates the first report with an assessment of the current state of health of North Dakotans and their health care delivery system,

along with an analysis of steps that need to be taken to ensure that all North Dakotans have access to high-quality health care at an affordable cost now and in the future.

The *Report* begins with an analysis of the population demographics in North Dakota. Standardized definitions are used to define that population—*metropolitan* to denote areas with a core population of 50,000 or more; *micropolitan* (or large rural) to denote areas with core populations of 10,000 to 49,999; and *rural* to denote areas with less than 10,000. About half (48%) of North Dakota's current population resides in metropolitan areas, with almost a third (29%) located in rural areas. North Dakota is one of the least densely populated states in the country, ranking 49th in population density. Also unlike the rest of the country, we have more males than females (51% vs. 49%) and we are older on average; North Dakota, for example, is second only to Rhode Island in the percentage of its population that is 85 years of age or older. Because demand for health care increases proportionately with age, demand for health care services is especially marked in North Dakota. That demand will only increase as the state's citizens grow older. People in rural regions of North Dakota are older, poorer, and have less or no insurance coverage, all of which are challenges to providing adequate health care. Rural regions continue to experience depopulation, except for significant growth in those western regions associated with the oil boom, while the cities continue to grow and prosper. Predictions for population growth in the future are controversial and are tempered by fears of another “boom and

bust” cycle that has been seen before. Nevertheless, even conservative estimates predict a population of about 800,000 by 2040 (a nearly 20% increase), with a reduction in the rural portion of the population by about a third. Rapid growth models predict even greater growth, with one model indicating a population of nearly 1,200,000 by as early as 2020. This would be associated with a dramatic increase in the number of young and middle-aged males.

The *Report* next considers the health of North Dakotans, which in comparison with the rest of the United States is generally good. North Dakotans have a slightly lower problem with obesity than the rest of the United States, and are less likely to report fair or poor health. However, we tend to have a higher risk of cancer and recently experienced a mortality rate that exceeded the national average after having been less for most of the last decade. Across North Dakota, behavioral risks tend to increase as population density decreases; thus, rural areas have the worst behavioral risk, with an increased frequency of obesity, smoking, and drinking, especially in males.

The physician workforce is considered next in the *Report*, which finds that North Dakota is slightly (2%) behind the United States as a whole, and somewhat further behind the Midwest comparison group (4%) as to the number of physicians per population. Our physicians are older, less likely to be in a hospital-based practice, and more likely to be male than elsewhere in the United States. About a quarter of the physician workforce is made up of international medical graduates, about the same as the rest of the country. The University of North Dakota (UND) is an important source of North Dakota physicians, accounting for 42% of the more than 1,000 physicians who graduated from a U.S. medical school. Of all of the physicians in the state, nearly 40% received some or all of their medical training (medical school or residency

or both) at UND. As is the rule for the rest of the United States, there is a striking gradient of physicians depending on geographic region; micropolitan areas (large rural) have about twice as many patients per physician as metropolitan areas, while rural areas have about five times as many. Predictions of inadequate physician supply—if nothing is done—are concerning, with further increases in the number of patients per provider, especially in rural areas. Current estimates indicate a shortage of some 260 to 360 physicians by 2025, primarily the consequence of the heightened need for health care services as the baby boom generation ages but also from retirements in the similarly aging physician workforce (one-third of the physicians in North Dakota are 55 years of age or older). Even more physicians will be needed if the population grows as recently predicted. If the population of North Dakota increases to 800,000 people, around 500 additional physicians will be needed. And if the population grows to 1,000,000 as some have predicted, the state would need about 1,000 more physicians.

The state of primary care physicians (family medicine, general internal medicine, and general pediatrics) is considered next in the *Report*. Compared with the rest of the country, North Dakota is slightly ahead in rural and micropolitan (large rural) areas, but lags the country and the Midwest overall as to the supply of primary care physicians. Primary care physicians in North Dakota are more likely to practice in rural areas compared with specialist physicians, but they still are twice as likely to be found in urban regions as rural areas after correcting for population. Residency training in North Dakota is an especially important conduit of primary care physicians, since nearly half (45%) of them have completed a residency within the state; more than half went to medical school at UND or completed a residency or did both in the state.

And somewhat counter to some perceptions, North Dakota actually has relatively fewer specialists than the rest of the United States or Midwest in certain specialties, including general surgery and obstetrics/gynecology. We have more psychiatrists than other states, although two-thirds of them work in the eastern part of the state, leaving the western parts of North Dakota with a shortage.

Similar trends are found with other nonphysician providers. While nurse practitioners (NP) and physician assistants (PA) are much more likely to be female than their physician counterparts, they too are distributed more in the metropolitan than rural areas in a proportion similar to primary care physicians. This is particularly true for NPs; PAs are the most evenly distributed across North Dakota of any health care provider group. Compared with U.S. figures, North Dakota has about 7% fewer NPs but 37% more PAs. North Dakota has many more nurses (95%) and pharmacists (51%) than the national average, and they too are particularly distributed in the metropolitan areas. In the case of pharmacists, their relative scarcity in rural areas is balanced by a greater supply of pharmacy techs and by a robust telepharmacy program spearheaded by North Dakota State University. North Dakota has one-fourth fewer dentists than the United States as a whole, but almost one-fourth (22%) more physical therapists. Thus, when looking at the entire North Dakota health care provider workforce, there is a consistent finding of a relative shortage of providers in especially rural and micropolitan (large rural) areas compared with metropolitan regions, but with important variations across the state depending on the particular provider type.

The North Dakota health care delivery system consists of 50 hospitals—thirty six smaller critical access hospitals with 25 or fewer acute care beds, six larger general acute care hospitals located in the

four largest cities, three psychiatric hospitals, two long-term acute care hospitals, two Indian Health Service hospitals, one rehabilitation hospital, and about 300 ambulatory care clinics. Outpatient care is augmented by 57 federally certified rural health clinics and five federally qualified health centers. There are forty three trauma centers across the state, with each of the “Big 6” hospitals home to a Level II trauma center. Most emergency medical service support in the state is ground-based and provides basic services; it is under duress because of its dependence on volunteers and a problematic funding stream. There has been an expansion across the state of the deployment and use of electronic health records, but financial and other barriers to full implementation remain. Long-term care in the state is provided by 84 skilled nursing, 64 basic-care, and 73 assisted-living facilities. There are 28 independent local public health units. There are 31 facilities or programs statewide that provide mental health services, but there are ongoing challenges to provide adequate services in the more rural regions of the state.

The *Report* analyzes the quality of health care delivered in North Dakota, and found in general that it is as good as or better than much of the United States, but there appears to have been a decline in several measures in the last few years, particularly in the delivery of acute care services. North Dakota (along with other upper Midwest states) generally provides high-quality care at relatively lower cost than other states in the United States; North Dakota ranked ninth in the country in one assessment undertaken by the Commonwealth Fund.

The *Report* concludes with a call for full implementation of the Health Care Workforce Initiative (HWI) in order to meet the current and future health care needs in the state. Phase 1 of the HWI is already in effect, with specific plans to reduce

disease burden, increase retention of graduates, and expand class and residency size. Full implementation of the HWI would continue efforts to do the following:

- Reduce the impact of chronic diseases through continuation of the master of public health degree and the geriatrics training programs (among other efforts).
- Increase the retention of instate graduates through continued funding of the RuralMed program that encourages family physicians to practice in rural areas, along with multiple other pipeline programs and an updated medical school admission policy.
- Further expand medical and health sciences class size along with residency program expansion in an effort to produce more providers for clinical practice in North Dakota.

To accommodate the class size expansion, additional physical teaching space will be required, and the *Report* strongly endorses the proposal to construct an entirely new physical plant for the School of Medicine and Health Sciences. It is anticipated that perhaps 40 new physicians will need to be added to the workforce each year for the next one to two decades in order to meet the health care needs of North Dakota. This will only be possible through full implementation of the HWI as proposed, including the requisite capital construction.

Finally, the *Report* anticipates the effect that full implementation of the HWI (and associated capital construction) would have on the state—that is, the deliverables (return on investment) of implementing the program. It is only through this approach that North Dakota has a reasonable chance of meeting its health care challenges and providing an adequate cadre of caring, team-oriented primary and specialty-care providers schooled in interprofessional care. About half of the needed practitioners for North Dakota will result from the enhanced

retention strategies of the HWI, and half will be the product of class size and residency expansion. Importantly, full implementation of the HWI will be associated with a major positive economic benefit to the state, with the School of Medicine and Health Sciences alone predicted to generate over \$400 million in direct economic activity over the next three biennia, not to mention the substantial additional economic impact (both direct and indirect) associated with the attendant growth of the state's health care enterprise. But the time to act is now. We have the right plan and already have begun to implement it, with positive early results. The resources are available to fully enact the HWI. Delay accomplishes nothing but further jeopardizes future health care delivery especially in the rural areas of the state. It is now up to the people of North Dakota and their elected representatives to decide how to proceed—whether to act and prepare for the future, or wait and hope that circumstances will somehow change and improve on their own.

ONE
The Population of North Dakota and
Attendant Health Care Needs

INTRODUCTION: STRUCTURAL DESIGN AND PUBLIC POLICY

The U.S. health system is a complex structure. It can be characterized as an array of nationally based, regional, or local systems that provide access to health services. The health provider arrangements and structures can follow a gamut of options from single provider in a clinic to a multistate, managed-care structure. Reimbursement and payment methods rely on both private market forces (individual and employer health insurance purchases) and public instruments that can both complement and conflict with private insurance. It is a multifaceted and intricate system that can be, at times, difficult to navigate, understand, and improve. However, it is our system.

The health workforce is influenced by a number of contextual or environmental factors that shape the scope of the supply and demand for health providers: public policy (federal, state, and sometimes local); demographic and economic conditions; quality of care, health outcomes, and health information technology; state and national certification and oversight boards; and health reform intended to improve the delivery of care, health status, and funding and payment systems. According to the U.S. Department of Health and Human Services, health status refers to one's medical conditions (both physical and mental health), claims experience, receipt of health care, medical history, genetic information, evidence of insurability, and disability.

Public policy sets the ground rules governing much of the organization, payment methods, and formalized structure of the U.S. health system. Public payments also influence the educational framework for the training of health professionals (e.g., federal graduate medical education payments, support of Area Health Education Centers, state and federal support for scholarships and loan repayment).

Health providers rely on both public payment mechanisms and private health insurance, which is most commonly an employer-supported insurance system. Note, however, that the employer-sponsored side of insurance financing has steadily declined since 2000.¹ The delivery of care through predominantly private markets is affected by public payment structures such as Medicare and Medicaid that in turn must conform to the dynamic nature of federalism, which influences the changing roles for federal and state policy formulation. This tends to set the boundaries for responsibility and decision-making in public policy; however, it is a fluid process that is subject to the changing tone of the American electorate and the overall political process. While Medicare is a federal initiative, Medicaid receives both federal- and state-based funding. Federal and state policymakers set the rules for Medicaid with regard to eligibility, covered services, and provider reimbursement. There is a "give-and-take" between the federal government

and individual states concerning Medicaid policy. At times, other branches of government (e.g., the U.S. Supreme Court) intercede as in the recent (June 2012) court ruling on the ability of the federal government to mandate increased Medicaid coverage under the Affordable Care Act (ACA). Medicare is a significant payer for hospitals, medical and health centers, clinics, and health professionals. Medicaid, which constitutes a smaller level of funding for some providers, is still very important. If states such as North Dakota adopt the new Medicaid expansion (i.e., under the ACA, states can increase coverage up to 133% of the federal poverty level in an effort to insure more Americans), Medicaid will become even more important as both a provider funding source and as a public policy platform to increase insurance coverage. Rural hospitals in North Dakota commonly have a Medicare inpatient base of about 60% (for the state's urban hospitals it is closer to 50%).² Medicaid's base is significantly less; however, it is still important. Policies affecting critical payers such as Medicare and Medicaid can, and do, have a profound effect on the bottom line of health care organizations. This in turn is a factor that contributes to health care workforce issues. Both public and private reimbursement streams create the foundation for the ability of a health system to provide and even expand services to meet local needs, hire and pay employees, and to secure the continuation of a system of care. In rural North Dakota, the viability of many local health systems is tenuous, which creates an environment in which it is more difficult to recruit and retain providers, pay providers, and to offer a sense of security for employees.

Health care delivery systems such as hospitals and medical clinics increasingly operate in either informal or formalized provider networks. These networks afford providers the opportunity to better meet local health needs, address operational concerns, and secure greater cooperation. Provider networks are a growing trend in health care and will be accelerated under health reform, particularly in the development of accountable care organizations (ACO). ACOs are health care delivery organizations that utilize payment and care delivery models that link provider reimbursement to quality outcome measures and reduction in the overall cost of care for a specified population of patients. Even in a rural state such as North Dakota, the 36 critical access hospitals (CAHs) participate in nine provider network arrangements with either larger hospital systems or other provider-type networks to address common issues such as quality improvement, technology, education and training, and other needs. Hospitals can belong to multiple networks, so for example, the 36 CAHs participate in 38 quality improvement network arrangements and 37 health information technology (HIT) arrangements, while 34 participate in staff education collaborations and 18 address local health professional recruitment and retention concerns via networks.³ Overall, CAHs in North Dakota have formed collaborative

relationships with other providers (e.g., urban hospitals, rural hospitals, clinics, emergency medical services, public health districts, and long-term care facilities) to address common organizational and community needs to achieve greater efficiencies, maximize cost structures, share resources and skills, and improve organizational performance. The CAHs also serve as local health care hubs in that most (31 of 36 or 86%) also own the local primary care clinic or nursing home; thus, that local integration is critical in maintaining local access to essential services for the public. Networks, partnerships, or collaborative efforts affect health workforce in that they can contribute to stronger, more viable health systems; be mechanisms to address recruitment and retention; and operate as educational and skill development platforms. For example, while all CAHs work in collaborative arrangements with area tertiary hospitals, they also created the North Dakota CAH Quality Network in 2007, where staff, training opportunities, process tools and protocols, patient outcome records for benchmarking data, and practice experience and best practices are shared within the network. The CAH Quality Network contributes not only to the development of rural-based solutions and systems but also to optimizing health professional staff skills and resources.

Payment incentives and disincentives have been gradually introduced to influence patient decision-making (purposely to produce more constructive behavior and better outcomes) and provider treatment decisions (relying more and more on evidence-based practices to affect patient outcomes), and will over time emphasize outcome-based payment over fee-for-service or one based on encounters. A national focus developed in the early 2000s to address quality of care improvement and patient safety issues following the study and reporting of shortcomings in the U.S. health delivery system. A developing interest and need within the health care community is to address system inequities and inefficiencies, which combined with public policy incentives to identify and implement approaches to improve care quality and to assure a higher level of patient safety has come to dominate much of the discussion associated with health reform. A rapidly developing HIT infrastructure has been an essential element to address quality of care, improve health provider communication (both within the provider community and with patients), and develop a higher level of patient awareness and control in matters concerning their own health involvement and status. While prospective payment system (PPS) hospitals (i.e., hospitals that receive a flat-rate-per-case Medicare payment based on a payment schedule associated with a set of diagnosis-related groups) receive Medicare payment incentives to record certain quality metrics specified by the Centers for Medicare and Medicaid Services (CMS), CAHs do not receive such incentives and are reimbursed on an allowable cost basis. Nevertheless, many CAHs collect and report data. One of the focal points of the ND CAH Quality Network is to facilitate an understanding of

how to improve medical outcomes for patients. Thus, in 2012, North Dakota became one of the few states where all of the CAHs report some measures to the national CMS quality database Hospital Compare. By improving the health delivery system both in terms of addressing quality of care issues and incorporating HIT tools, particularly in rural areas, North Dakota is engaged in a process that should result in higher quality and lower cost care as well as producing an environment that is more conducive and attractive for health care systems and medical providers.

Educational institutions and their associated academic health centers, as crucial supply-side agents, respond to the needs for health providers found in the health delivery systems, or the demand-side. Academic centers are also subject to the vagaries of the market and adjust supply based on demand change. For example, health reform will likely produce even more demand for primary care medical providers and public health specialists. New organizational arrangements such as ACOs will begin to operate combined with outcome-based payment through value-based purchasing or bundling payments or both to align with patient-centered care. The ACA as an instrument of health reform may facilitate many of the changes to be found in how care is delivered, how it is financed and reimbursed, and the allocation of resources. The attendant resource allocation will influence the number of health providers and professionals produced, the types of disciplines to be supported in new health organization structures, and the geographic distribution of providers throughout North Dakota and the country. However, the future of the ACA and the degree to which it may be implemented in the future remains uncertain at present, and is part of a highly charged political debate.

The health workforce is influenced by a number of factors that shape supply and demand for health providers:

- Public policy (federal, state, and sometimes local)
- Demographic and economic conditions
- Quality of care, health outcomes, and health information technology
- State and national certification and oversight boards
- Health reform intended to improve the delivery of care, health status, and funding and payment systems

DEMOGRAPHICS

The dynamic nature of population characteristics, including specific income-related associations, are contextual influences affecting not only the health workforce but also the overall health delivery system. These gradual (but sometimes rapid) changes can portend trends that influence societal conditions that frame policy discussions and decisions. Health policy at both a national and state level simultaneously *responds* to changes in the environment (e.g., declining rural population and stagnant rural economies affect the ability of individuals and employers to purchase health insurance, influence health status, apply pressure to the local health system's ability to stay financially viable, and can lessen the ability to either recruit or retain health professionals) and can *produce* changes in the broader context of a community or state (e.g., public policy designed to respond to declining rural population and stagnant rural economies affects health system viability, provider payments, insurance options, and health professional recruitment or retention). As a nation, state, county, or health provider service area experiences demographic changes, the demands for certain types of health services are affected, the ability of the health delivery system to respond is affected, and even the relationship between the community (individuals, organizations, employers, and others) and health systems and provider groups can be transformed.

An area that has experienced the aging of its population will see more demand for chronic care services, home care, and geriatric-focused care with related concerns for transportation services and housing options. The payer-mix for providers will become more dependent upon public payers, particularly Medicare. The demand for health professionals may be modified by attracting professionals with a natural inclination to serve a more geriatric population, but it may be more difficult to attract professionals with an interest in a multigenerational population. An area experiencing rapid population increases because of an expanding economy may see a growing demand for family-centered health services encompassing a broader range of age-related care, urgent and emergency care, and the need for worksite wellness programs. Health care systems must contend with keeping up with demand for more services, including more diversified services, than normally provided. There are economic impacts on the health systems to secure capital improvements for physical plant expansion and technology improvements, and to meet salary demands. Such an upturn in population and economic conditions will likely affect individuals, families, and employers as it relates to the purchasing of health insurance. This can be positive for local health systems and providers if the growth in income and economic conditions translates into a higher rate of insurance coverage; however, if it does not expand coverage, then the negative consequences for the

provider base can threaten the survivability of area providers. Areas weathering depopulation must contend with conditions that threaten the ability of the local health system to maintain existing services, for which the overall demand may decline but for which there is still a need. Even in remote areas, there are legitimate needs to access primary and emergency care; public health functions must be maintained, and reasonable access to acute and specialty services must be secured. In rural North Dakota, depopulation tends to be associated with an increased reliance on an older adult population base. Areas of population decline tend to see a loss in families with children and adolescents, as well as younger working-age populations, with an older adult population staying in the area. Thus, some rural areas simultaneously experience a loss of population coupled with a significantly greater reliance on the remaining older adult population. The overall population decline affects the local health system with corresponding service demand change (i.e., declining for some services while expanding for others, which in turn affects the financial conditions of the system and influences the payer-mix). Some rural health systems respond to such changes by offering satellite clinic services in more remote communities in their service area in which the clinic may be only open two or three days a week as opposed to offering a full-week clinic. The coalescing of population decline and growing reliance on an aged patient base places many rural health systems at financial risk because as overall service demand declines, demand for more specialized services related to an older adult population increases, and the reliance on Medicare and Medicaid increases. In much of rural America—including North Dakota—significant concerns exist regarding the survivability of local health systems.

Demographic factors, economic conditions, and public policy decisions have amalgamated to create a complicated and, in many cases, inhospitable environment for maintaining access to essential health services. A series of community dialogues and meetings conducted by the Center for Rural Health at the University of North Dakota School of Medicine and Health Sciences found concern among rural North Dakotans on measures associated with community dynamics (e.g., local population, local economics, community growth, ability to retain or recruit youth, and housing access) and health system factors (e.g., financial issues facing rural hospitals, health system reform, health workforce, access and availability of care, and emergency medical services).⁴ Rural North Dakotans recognize the barriers and threats to community institutions and the actual community or town itself. The maintenance of these rural institutions and organizations is essential to solidify a health service base, a foundation that is necessary to meet local access-to-care needs, improve population health status, and to contribute to local economic and community development.

Metropolitan, Micropolitan, and Rural Counties

North Dakota is composed of a mixture of several larger cities and clusters of population, many smaller towns, and large areas with low population density. The distribution of its population is another challenging issue for efficient health care delivery. The state has a low population density overall. North Dakota ranks 49th in population density when compared nationally, with 9.7 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.⁵

The growth of the Oil Patch in western North Dakota has health care delivery implications as well. In the national census completed in 2010, North Dakota experienced a 4.7% 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 censuses.^{5,6,7,8} North Dakota's growth mainly occurred in two locations: the cities (Fargo, Grand Forks, and Bismarck), and the western counties (related to oil drilling in the Bakken Formation). The health care delivery implications of this western growth are significant. None of the six major hospital systems is located in the western counties, where most of the health care is delivered through clinics and CAHs. The region is already suffering from a disproportionate shortage of physicians and other health care workers.

To better define the population dispersion across North Dakota, standardized descriptions are used. *Metropolitan* describes a population cluster or area with a core population of 50,000 or greater. The state's three largest cities (Fargo, Bismarck, and Grand Forks) are located in metropolitan areas. *Micropolitan* (or large rural) describes areas with population cores from 10,000 to 49,999. This includes Minot, Dickinson, Williston, and Jamestown. For our purposes, rural constitutes areas with a population cluster of less than 10,000. Both micropolitan and rural are considered nonmetropolitan. Historically, 52% of North Dakota's population has been designated as rural. Depending on the definition of rural, North Dakota is among the five states with the largest component of rural areas.

Frontier is defined as a county with a population density of six or less people per square mile. Thirty-five of the state's 53



counties are classified as frontier. There are only nine of 53 counties with population densities above the state's average density of 9.7 people per square mile. The lowest distribution is found in Slope County (0.6 people per square mile) and the most densely populated is Cass County (84.7 people per square mile). The population density of the United States as a point of comparison is 87.4 people per square mile.⁵

Gender

Unlike the nation, a little more than half of the population of North Dakota is male. This may reflect the employment patterns in the agrarian and oil boom regions, and to the extent it is related to energy-related employment, may increase over time.

Age

Older populations use dramatically more health workforce resources than do younger populations. North Dakota's population is among the oldest in the nation. It is second only to Rhode Island in the percentage of its population 85 years or older. This greatly influences the needs for providers. For example, nationally 1,000 15- to 24-year-olds on average generate 1,700 ambulatory office visits annually, while 1,000 75-and-older Americans would annually make 7,200 visits (over four times as many). If we assume a family physician provides 5,500 office visits a year, the 1,000 15- to 24-year-olds would take up 31% of the physician's practice, while it would take 1.3 family physicians to treat the older patients. Thus the common way of directly comparing the number of North Dakota physicians per 100,000 persons is flawed unless the age of the population is taken into account.

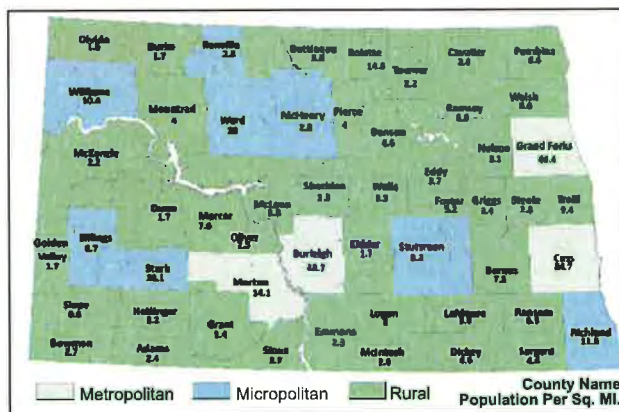


Figure 1. Metropolitan, micropolitan (large rural), and rural counties in North Dakota.^{5,9}

- According to the 2010 census, the distribution of North Dakota's population is as follows: 48% metropolitan (four counties), 23% micropolitan (eight counties), and 29% rural (39 counties).
- The percentage of North Dakota's population considered "frontier" is also among the highest of all states in the nation. Average population density for the state is 9.7 people per square mile.

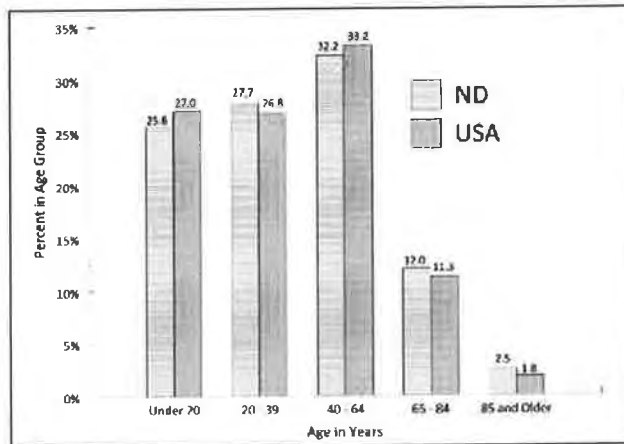


Figure 2. Age of people in North Dakota compared to U.S. in 2010.⁵

- There are more North Dakotans 85 and older compared to the U.S. population (second-highest percentage behind Rhode Island).
- North Dakota compared to the U.S. has 1.4 times the population ages 85 and older.
- There are fewer North Dakotans under the age of 20 and the ages of 40 to 64 relative to the U.S. population.

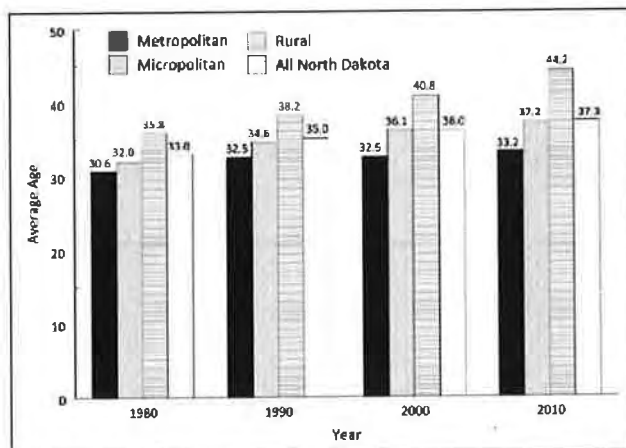


Figure 3. Average age of North Dakota residents from 1980 to 2010 by metropolitan, micropolitan (large rural), and rural counties.^{5, 6, 7, 8, 9}

- The average age for the state has increased from 33 years in 1980 to over 37 years in 2010 (about two years every 10-year census). This trend is projected to increase as the baby boomer population ages.
- Rural North Dakotans are older than either micropolitan or metropolitan North Dakotans. This was true in all four census periods (1980, 1990, 2000, and 2010).
- In 2010, rural residents were about seven years older than those living in micropolitan areas and about 11 years older than the metropolitan residents.
- Rural North Dakota's average age has increased by eight years from 1980 to 2010, whereas metropolitan average age has increased by only approximately three years, and micropolitan age has increased by about five years.

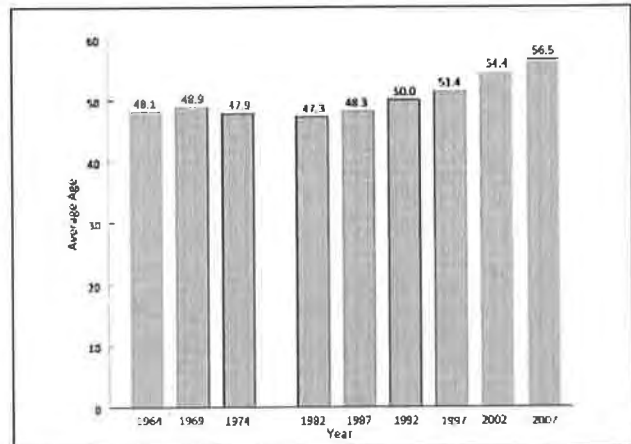


Figure 4. Average age of farmers from 1964 to 2007.¹⁰

- The increase in average age has been especially pronounced in North Dakota farmers, whose average age has risen from 47.3 to 56.5 from 1982 to 2007, or six years every 10 years.

As shown in Figure 3, rural North Dakotans are significantly older than their counterparts in micro- or metropolitan areas, and that disparity is increasing over time.

The higher age in rural North Dakota is likely the consequence of the continuing depopulation of the rural areas, with younger people moving elsewhere. This effect is evident in the agrarian sector, where the increase in average age has been particularly apparent in farmers (see Figure 4). As most rural counties have continued to see a decline in overall population, that decline is commonly associated with a loss of young individuals and families or difficulty in recruiting and retaining young individuals and young families. Older adults are less likely to leave an area where they have spent their entire lives. The effect is one where the overall population declines and the average age of the area increases.

INCOME FACTORS

Poverty

People in poverty tend to have a lower health status. Poor housing, sanitation, and water supply can contribute to disease and ill health. Access to adequate and quality food sources is limited. Poverty is associated with greater rates of illness and shorter life spans. People at 200% or less of the federal poverty level are more likely to have only fair or poor health status and to have sought care through the emergency room as opposed to a clinic setting.¹¹ Access to health services is affected by income level in other ways. Lower income households have a lower rate of health insurance coverage and have less frequent contact with a health provider.¹²

Poverty rates vary based on age, race, geography, and household composition as shown in Figure 5. Poverty is higher in rural than urban North Dakota (about 14% compared to 12%). About 20% of North Dakota's children

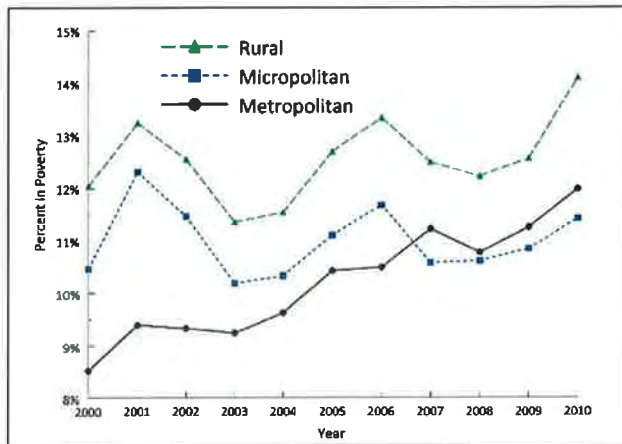


Figure 5. Poverty in North Dakota by rural, micropolitan (large rural), and metropolitan areas.^{8, 15}

- Any person or family whose income falls below a threshold set by the federal Office of Management and Budget (OMB) is considered poor. In 2012, for a family of two this was \$15,130 and for a family of four it was \$23,050. For each additional family member, add \$3,960.
- In 2010, 12.5% of North Dakota residents were in poverty (U.S. had 15.3% in poverty) and lived in all regions of North Dakota.
- Poverty has steadily risen from 8.5% to 12% in metropolitan areas since 2000, and in rural areas it increased from 12.6% to 14.1%.
- In every year, the poverty rate from 2000 to 2010 was higher in rural North Dakota than either micropolitan (large rural) or metropolitan areas. Metropolitan poverty rose above micropolitan poverty in 2007 and has remained higher.

(less than 18 years of age) are in poverty, which compares to about 12% of people in the state who are 65 years and older (nationally the rates are 28% and 14%, respectively).¹³ Children up to 4 years of age living with single mothers in rural areas are more likely to be affected by poverty than those in urban areas of the state. Three-fourths of children from newborn to 4 years old living with single mothers in rural North Dakota were living in poverty in 2008, compared to 55% of children living with single mothers in urban areas.¹⁴

The distribution of poverty across the counties of North Dakota is shown in Figure 6. The highest poverty rates are in rural counties and those with a higher proportion of American Indians.

INSURANCE COVERAGE

Rural areas

North Dakota's rural areas have a lower level of health insurance than other more populated areas.¹⁶ A greater number of farmers purchase health insurance as individuals as opposed to a group market and incur higher premiums

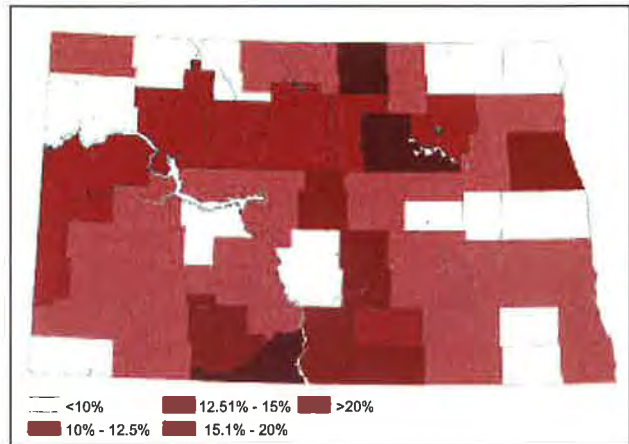


Figure 6. Poverty in North Dakota by counties.¹⁵

- Poverty in North Dakota counties has ranged from 16.7% to 41.4% from 2000 to 2010.⁷
- Three counties in North Dakota have more than 20% of their population in poverty and have been classified under federal guidelines as persistent poverty counties. In North Dakota, these are Rolette County (poverty rate in 2010 of 28%), Benson County (35%), and Sioux County (41%).⁷ The three counties have a significant American Indian population. In other census periods, North Dakota has had five persistent poverty counties (the current three along with Grant and Sheridan). A persistent poverty county is one in which 20% or more of the population were in poverty in three consecutive census periods (currently 1990, 2000, and 2010). In 2010, there were 429 persistently poor counties in the country with 88% being rural.⁷
- Nine counties in North Dakota have more than 15% in poverty.
- There are 14 counties with poverty rates less than 10%.

and out-of-pocket costs. A study of farmers in seven rural states, including North Dakota, found that 17% of farmers or farm family members had delayed seeking care because of high out-of-pocket costs. In North Dakota, 15% of the farmers were in this situation. Forty-nine percent of North Dakota farmers spent more than 10% of their income on health care, in comparison to 44% overall for the farmers in the seven states. The median amount spent out-of-pocket for medical and dental care and prescription drugs was about 15% more in North Dakota in comparison to the seven.¹⁷ This critical demographic factor shows the relationship between individual or family financial resources and the ability to secure health care services even to the extent of not seeking care.

Uninsured

A lack of health insurance or inadequate coverage (e.g., high deductibles and copayments or service limitations) lessens access to care for the individual or family and contributes to worsening financial standings for health facilities and providers. A 2011 survey of North Dakota critical access hospital administrators found that over 90% said that a lack of insurance or having inadequate coverage was a problem, which was an increase from about 75% in a similar survey in 2008. As noted in Figure 7, rural areas have a significantly higher level of uninsured population compared with micro- or metropolitan areas.

The Institute of Medicine estimated that a lack of health insurance accounted for about 18,000 deaths per year in the United States. Less medical care and less timely care are received by the uninsured. Overall, the uninsured get about half as much care as those privately insured and receive fewer preventive services and screening, and on a less timely basis. This includes lower numbers of the uninsured receiving blood pressure and cholesterol checks, which can manifest in higher rates of heart disease, cancer, and diabetes. Pregnant women who are uninsured have fewer prenatal checks. The uninsured have worse health outcomes; conversely, those with health insurance have better health outcomes. The death risk for certain chronic diseases is estimated to be about 25% higher for those without insurance.¹⁸

One of the strongest predictors of whether a person is uninsured is residence in a rural area. Figure 8 shows the distribution of the uninsured across North Dakota; high levels of uninsured are limited to rural areas.

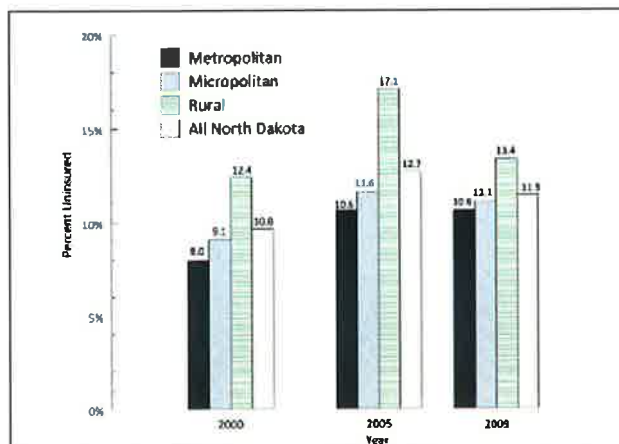


Figure 7. Percentage of North Dakota residents who had no health insurance in 2000, 2005, and 2009.¹⁵

- 11.5% of North Dakota was uninsured in 2009, while 16.1% of the U.S. was uninsured in 2009.
- The percentage of North Dakota population that is uninsured had dropped from 2005 to 2009, especially in rural areas (17.1% to 13.4%); however, the rate in 2009 exceeded the base rate in 2000. The rural rate in 2009 was slightly more than the rate recorded in 2000.
- The percentage of uninsured in metropolitan areas rose almost 3% from 2000 to 2009.
- In all three years, the metropolitan rate of uninsured was below the statewide, rural, and mikropolitan (large rural) rates.

Health Insurance Coverage in North Dakota

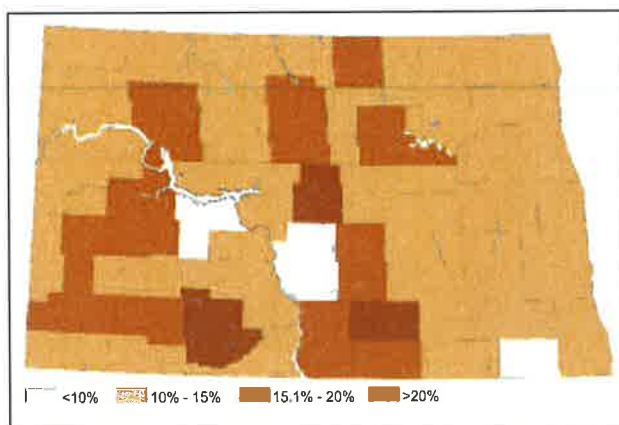
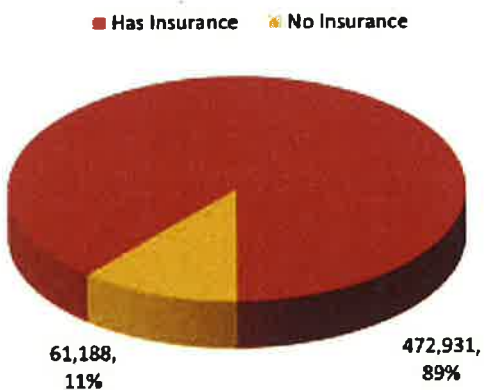


Figure 8. Percentage of uninsured by North Dakota counties.¹⁵

- Three counties have more than 20% uninsured (Grant 25%, Logan 21%, and Sheridan 20%) and 14 counties have more than 15% uninsured. All 17 counties are rural.
- Only three counties have fewer than 10% uninsured (Sargent 8%, Mercer 9%, and Burleigh 9.7%). Two of these counties are rural and one is metropolitan.

DEMOGRAPHICS SUMMARY

Demographic characteristics as discussed contribute to rural health disparities and highlight the access to care and health status issues found in rural North Dakota. In general, the most rural areas in North Dakota are older, poorer, and have less insurance coverage (see Table 1). Each of these factors has been shown to influence the ability of a person to seek care when it is necessary, maintain a regular relationship with a physician or other health professional, better manage health conditions, and ultimately to realize a higher status of health. The actual health condition of the individual may regress because of lower income, less health insurance, and greater age. Rural North Dakotans face more constraints in accessing care and achieving an acceptable health outcome;

the barriers found in rural, in general, are magnified when the impediments facing rural American Indians are factored into the discussion. Health access and health status are typically worse on reservations.

Other chapters will address the unique issues facing health providers and health organizations, particularly rural health providers; however, demographic and economic issues in rural North Dakota, when combined with already financially strapped and workforce-challenged rural hospitals, clinics, and emergency medical services units, make the challenge of delivering appropriate health care particularly difficult. There is added pressure on the rural health system to be responsive in an environment where the population base presents significant and continuing challenges.

Table 1

Summary of demographics in North Dakota's population by metropolitan, micropolitan (large rural), and rural areas.^{5, 9, 15}

	Metropolitan		Micropolitan		Rural	
	N	%	N	%	N	%
Total	325,418	48.38%	154,341	22.9%	192,832	28.7%
Gender						
Male	163,596	50.27%	78,542	50.89%	97,726	50.68%
Female	161,822	49.73%	75,799	49.11%	95,106	49.32%
Age						
Under 20	83,634	25.70%	39,607	25.66%	48,694	25.25%
20-39	106,760	32.81%	42,348	27.44%	37,398	19.39%
40-64	98,645	30.31%	49,377	31.99%	68,684	35.62%
65-84	30,535	9.38%	18,889	12.24%	31,365	16.27%
85 and Older	5,844	1.80%	4,153	2.69%	6,691	3.47%
In Poverty						
Yes	39,018	11.99%	17,634	11.43%	27,203	14.11%
No	286,400	88.01%	136,707	88.57%	165,629	85.89%
Is Uninsured						
Yes	28,865	8.87%	13,028	8.44%	19,295	10.01%
No	242,724	74.59%	105,285	68.22%	124,922	64.78%
Unknown	53,829	16.54%	36,028	23.34%	48,615	25.21%

- Almost half the state's population (48%) lives in a metropolitan area and almost 29% are in a rural area of less than 10,000.
- Gender distinctions are slight with males outnumbering females in all three population classifications.
- A slightly smaller percentage of rural residents are 20 years of age or younger in comparison to the other two population classifications.
- A much smaller percentage of rural residents are young adults (age 20-39) at 19% in comparison to micropolitan (27%) and metropolitan (33%).
- A higher percentage of rural residents are older adults (65-84) and the percentage of rural people who are 85 and older is almost two times as that found in metropolitan areas.
- A higher percentage of rural residents live in poverty.
- A higher percentage of rural residents do not have health insurance.

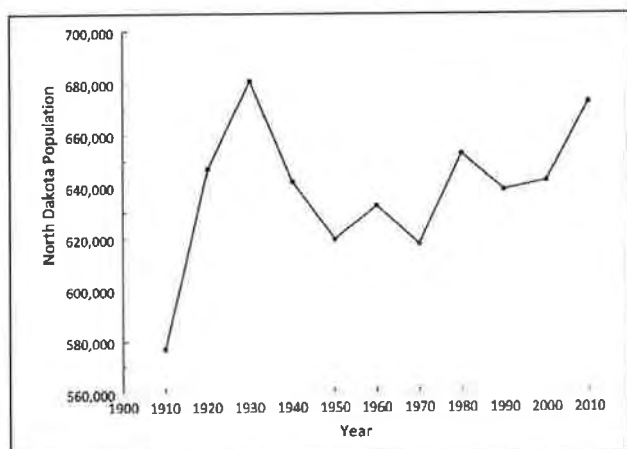


Figure 9. Population of North Dakota from 1910 to 2010.

- Population increased from 577,056 in 1910 to 680,845 in 1930. It then decreased to 617,761 in 1970 (lowest census number in this period) and then increased to 672,591 in 2010.
- North Dakota's highest population was recorded in the 1930 census; however, the U.S. Census Bureau estimated population projected for the state in 2011 was 683,932 which potentially is a state record. North Dakota has gained about 50,000 residents since 2003, when the population was 632,809. The state potentially has gained over 11,000 residents since the 2010 census (1.7%), which is approximately twice the rate of increase found for the country (0.9%).⁵

POPULATION

Historical Changes

North Dakota has been significantly influenced by its agricultural history and the role agriculture has played economically, socially, and culturally. North Dakota benefited from federal statutes such as the Homestead Act, a rich productive land base, early immigration, the proliferation of railroad expansion to move agricultural products (and move in settlers), and changes in agricultural technology. The state's population growth from 1910 to 1930 (see Figure 9) was likely influenced by the continuing development and growth in agriculture. While the Great Depression had an official beginning with the stock market crash in 1929, a depression in North Dakota started in the early 1920s following the significant decline in agricultural markets and overall U.S. economic deflation after the end of World War I. Even though land values and prices declined and farm debt increased, the number of farms and the acreage seeded in North Dakota grew during the 1920s. The full effect of the Depression in the 1930s and World War II precipitated a population decline. At one point in 1934 from one-third to one-half of North Dakotans were "on relief" and receiving government assistance. In 1939, 75% of the population in Billings County was on relief. During the 1930s, there was an outmigration of over 120,000 people. Even in this period, there was a rural-urban dichotomy with population shifts.

During the 1930s, farm and small town populations declined; however, larger, more urban areas of the state actually grew.¹⁹

From 1930 to 1950, the state's population declined from about 681,000 to 620,000, increasing by about 13,000 to 632,000 in 1960, and then dipping again by 15,000 to 618,000 in 1970. By 1980, a significant increase of roughly 35,000 people pushed the population to 653,000. The rapid increase in the 1970s has been attributed to significant energy expansion (oil and coal) during that period and a trend toward urbanization. The state's urban population grew steadily from 17% in 1930 to 49% in 1980; conversely, the rural population declined from 83% to 51%.²⁰ Following the "oil bust" in the 1980s the state's population once again declined accompanied by continuing rural depopulation. Since 2003, the population has rebounded.

Figure 10 shows the change in population by county from 1930 to 2010. The counties with the most significant increases from 1930 to 2010 were Burleigh, Cass, and Grand Forks, the metropolitan counties.

The data indicate unique trends in county population: gradual urbanization, decline in the most rural areas, growth in the American Indian population, and a resurgence of population associated with energy development.

The three most urban counties—Burleigh, Cass, and Grand Forks, home to the state's three largest cities—had consistent growth dating back to 1930. The two fastest-growing cities over the past decade—West Fargo and Horace—demonstrate that urban expansion is not solely concentrated within the geographical boundaries of the major cities. This is also an indicator that while the state may still rely economically on land-based economies (e.g., agriculture and energy) there is a more diversified economic structure under development (e.g., health infrastructure, regional service and retail, government, manufacturing, and education). The health care industry, for example, accounted for eight of the 10 largest employers in the state in 2010, and these private businesses were headquartered in the three largest cities, establishing not only the growing importance of health as a business activity, but also underscoring the diversification of the state's economy, particularly when it is associated with the continuing urbanization of the state.²¹

While the more urbanized areas continued to grow, the most rural and remote continued to decline in population. About one half of the counties—all rural—had experienced average decade population loss of 10% or greater dating to 1930. Three counties, for example (Emmons, Sheridan, and Towner), witnessed a continual population decline of over 40% in two census periods, from 1990 to 2000 and 2000 to 2010. Sheridan County, in the central part of the state, has actually lost 53% of its population since 1980.^{5,6} The changing economic face of the state has spurred on much of this change. While agriculture still dominates the state, other economic sectors have grown faster. In 1960, agriculture accounted for 17% of the state's gross domestic product (i.e., a

standard measurement of all goods and services produced in either the nation or at a state level), but now accounts for about 6%.²² This contrasts with health care which in 2010 accounted for 8.6% of the state's economic activity. In much of rural North Dakota, the health sector is a significant driver of the local economy; communities with hospitals, clinics, or nursing homes indicate that the local health industry is the largest area employer. However, while the importance of the health care sector to the rural economy increases, changes in agriculture (fewer farms but with more acreage) and other economic conditions, including the outmigration of young adults and young families, have helped to shift population to the more urban centers. The economic importance of agriculture is unquestioned; however, today it is performed with a smaller number of farmers and farm employees, which has an effect on demographic outmigration.

Growth of the American Indian population has been a positive indicator for the state, particularly during periods of slower overall population growth. For example, the 2000 census indicated that the white population of North Dakota declined by 2% from 1990 to 2000; however, the American Indian population of the state increased by about 21%. During that period, North Dakota's population increased by a trivial 0.05% and was the smallest state increase recorded for any of the 50 states.^{5, 8} The 2010 census established that the white population increased by 2% while the American Indian population grew by about 17% (nationally, the American Indian population increased by

over 18%). North Dakota's Hispanic population, while small at only about 13,400, witnessed a significant increase over the decade of about 73% (nationally, the Hispanic population increased by 43%). The state, as a whole, grew by 4.7% in contrast to U.S. population growth of 9.7%.^{5, 8}

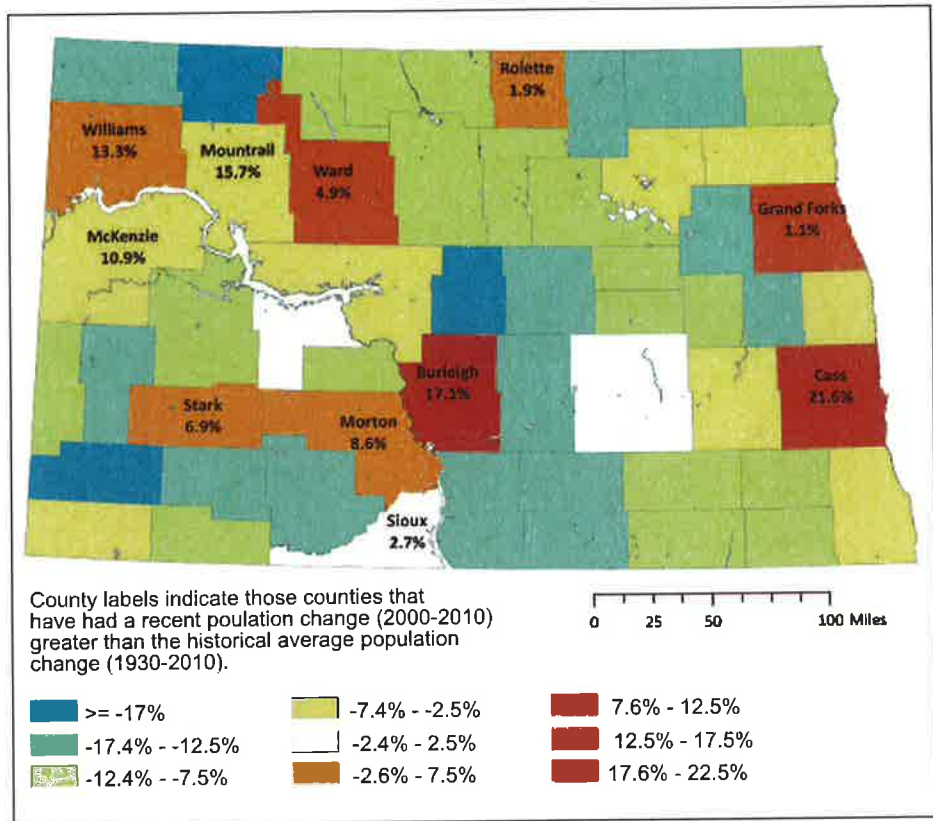


Figure 10. Percentage change in county population from 1930 to 2010.⁵ Counties with a large increase from 2000 to 2010 have the recent increases shown inside a county (e.g., Burleigh 17.1%, Williams 13.3%).

- Three counties (Grand Forks, Burleigh, and Cass) have increased their population by an average of 10% or more from 1930 to 2010.
- Five counties (Cass, Burleigh, Mountrail, Williams, and McKenzie) have increased their population by more than 10% from 2000 to 2010, and another six counties had population gains of less than 10%. In general, counties gaining population were urban/metropolitan (Cass, Burleigh, Morton, and Grand Forks), counties with a significant American Indian population (Sioux and Rolette), and counties with increased oil exploration and extraction (Mountrail, Williams, McKenzie, Stark, and Ward).
- From 1930 to 2010, 25 counties have had an average decrease in population by more than 10%.
- From 2000 to 2010, 23 counties had population losses of 10% or more. The three counties with the greatest loss in population, as a percentage, were Sheridan (-22.7%), Towner (-21.9%), and Emmons (-18%).

Change in Population by County and Age

Figures 11-14 show the progression of population change for people 65 and older at four census periods (1980, 1990, 2000, and 2010). There has been a continual increase in the proportion of older adults in the rural counties. In 2010, the seven counties with 27% or more of their population 65 or older were all rural; in fact, they are some of the most remote counties as all are classified as frontier.

North Dakota's median age has steadily increased over the past 50 years. The state's median age was 26.2 in 1960, 26.4 in 1970, 28.1 in 1980, 32.4 in 1990, 36.2 in 2000, and 37.0 in 2010. The state's median age increased by 11 years from 1960 to 2010. In 2010, the U.S. median age was 37.2.^{5,8} The median age in 40 counties exceeds the state's median age. Twelve counties have a median age of 45 and older, while McIntosh County has a median age of over 50.

In 2010, a noteworthy trend that does not necessarily conform to the common view that rural North Dakota is

aging was recorded in 41 of the state's 53 counties where the 65-and-older population actually declined numerically from 2000 to 2010. These were all rural counties. There were, however, significant increases in the metropolitan counties (e.g., Burleigh's older adult population increased by 24%, Cass by 19%, and Grand Forks by 6%).^{5,8} The significance found in the demographic shift in rural counties is that while the older adult population is shrinking, the overall older adult population is increasing as a percentage of the counties' population. The rate of overall rural population decline (in all age groups) exceeds the loss in the older adult population; thus, the rural older adult population takes on an even heightened importance in these rural counties. This has significant implications for access to health services, the payer mix for providers, tax base for health services funding, and health workforce.

There has been a significant increase in the number of the state's oldest citizens. People 85 and older constitute 2.5% of

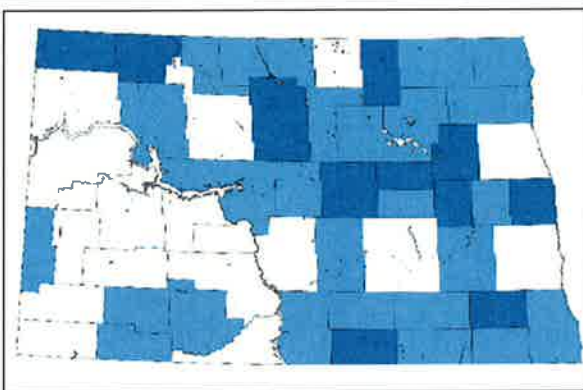


Figure 11. Percentage of 1980 population age 65 and older.

- All counties have 23% or fewer older adults.

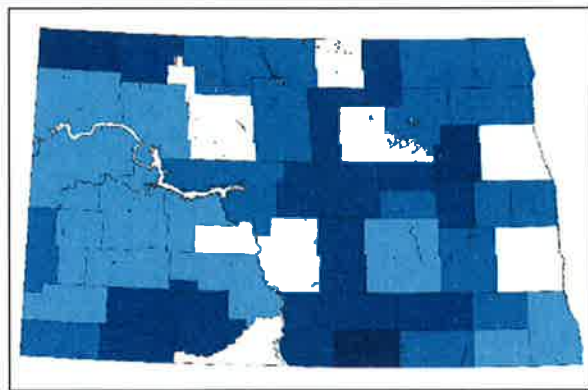


Figure 13. Percentage of 2000 population age 65 and older.

- McIntosh, Nelson, and Divide counties are over 27% older adults.

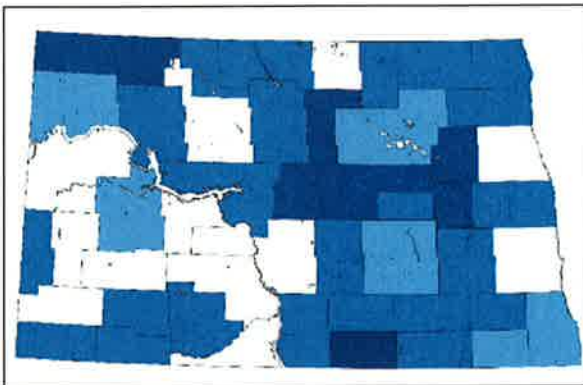


Figure 12. Percentage of 1990 population age 65 and older.

- McIntosh County is over 27% older adults.

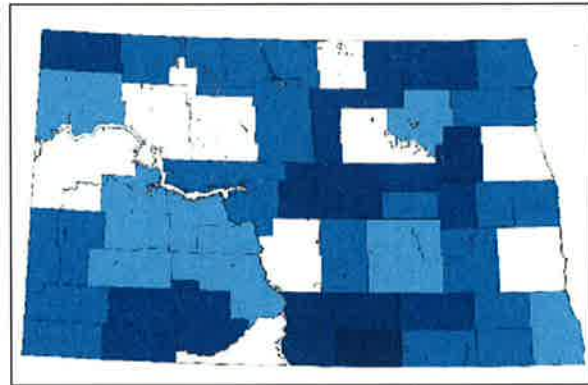


Figure 14. Percentage of 2010 population age 65 and older.

- McIntosh, Nelson, Divide, Sheridan, Wells, Logan, and Emmons counties are over 27% older adults.

— <=14.2% ■ 14.3% - 19.2% ■ 19.3% - 23.2% ■ 23.3% - 27.2% ■ 27.3% - 31.2% ■ 31.3% - 34.2%

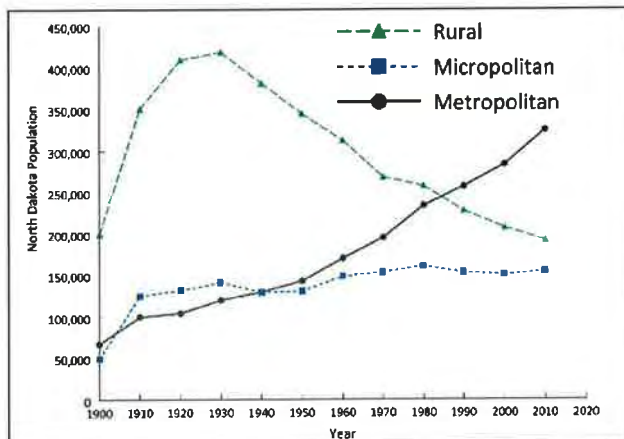


Figure 15. Population in North Dakota from 1900 to 2010 by metropolitan, micropolitan (large rural), and rural counties^{5, 8}

- Rural population has steadily decreased since 1930.
- Since 1990, metropolitan population has been higher than rural population.
- Population in rural North Dakota counties was up to three times as high as metropolitan or micropolitan populations into the 1940s. Then a sharp increase in metropolitan populations and decrease in rural populations caused the rural counties' populations to become less than metropolitan by the 1980s.

the state's population (North Dakota is second only to Rhode Island as the states with the highest percentage of older adults). Nationally, 1.8% of Americans are 85 and older.⁵ It is the state's second-fastest-growing cohort, with the most substantial growth being 28% for people 45 to 64 years old.

A final issue relates to participation in the workforce. The dependency ratio establishes a statistical framework to describe the financial responsibility of those who are economically active (i.e., working and making an income) to those who are inactive (i.e., people who are less than 16 years of age or 65 and older).⁵ The 2010 census found a dependency ratio of 53 in North Dakota, or for every 100 working-age residents, there were 53 nonworking-age residents. The projection is that by 2020 the dependency ratio will increase to 71. It is anticipated that there will be 18 counties (all rural) where there will be more people in a nonworking category than working-age residents. In 1990, a majority of nonworking-age residents were children younger than 16; however, by 2020, the majority will be people 65 and older. This is another important metric in analyzing the effect of a changing age structure. The implications for rural areas are compelling: the ability of communities to plan for and pay for services for an aging population will present challenges for community and state leaders. It will have a profound effect on health status, health care delivery structures, health care costs and payments structures, and health workforce.

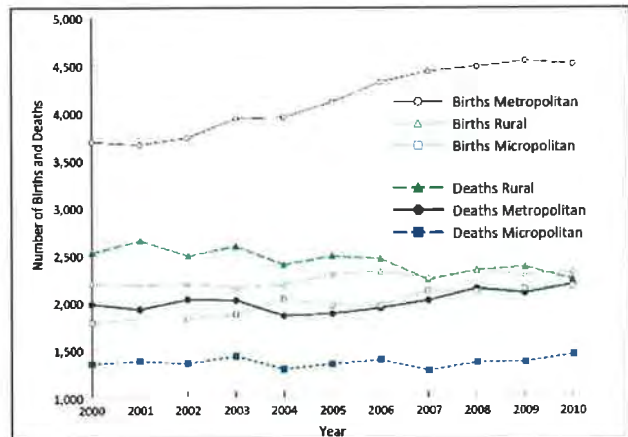


Figure 16. Number of births and deaths in North Dakota from 2000 to 2010 by metropolitan, micropolitan (large rural), and rural counties^{5, 9, 23, 24}

- Metropolitan births have been rapidly increasing.
- Rural births have been increasing slightly.
- Rural deaths have been slowly decreasing, while metropolitan and micropolitan deaths have increased.

Change in Population by Metropolitan Status

Changes in the state's economy, primarily the number engaged in agriculture, account for some of the change in rural population over the years. The number of North Dakota farms has declined by roughly 50,000 since the 1920s. At the same time, there has been the trend, as shown by Figure 15, of progressive urbanization of the state. In 1990, North Dakota became an urban state with more residents in metro areas than found in rural. The outmigration from rural to urban has resulted in a decline in younger adults and families in those rural areas. While the 18 to 24 age cohort grew overall by about 11% from 2000 to 2010, 24 counties saw this population decline. The next cohort, 25 to 44, saw a decline of 5%, with 47 counties experiencing a population loss of this economically vital age group. All of the 24 counties losing 18- to 24-year-olds were rural; all of the 47 counties losing 25- to 44-year-olds were rural with the exception of Grand Forks. Surveys conducted by the Center for Rural Health asking rural North Dakotans to assess a series of rural community issues found that a high number are concerned about their ability to retain or recruit young people and about population issues in general.

Change in Population by Births and Deaths

A large part of the increase in metropolitan population is the result of an increase in births. The number of births in North Dakota has increased from 7,676 in 2000 to 9,088 in 2010. Deaths have also increased, though more slowly, from 5,846 in 2000 to 5,913 in 2010. Metropolitan areas have experienced the sharpest increase in births and only a slight increase in deaths. Micropolitan areas have the steadiest numbers from 2000 to 2010 (see Figure 16).

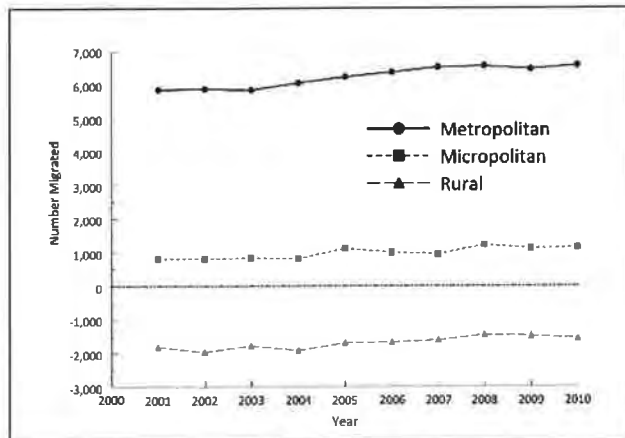


Figure 17. Net number of in- and out-migrations for metropolitan, micropolitan (large rural), and rural North Dakota.^{2, 8, 9}

- Metropolitan areas have highest in-migration, averaging 6,242 people a year.
- Rural areas out-migrate an average of 1,695 people a year.

One reason for the gradual increase in rural births despite an aging population is the high fertility rate in rural areas compared to metropolitan. In 2000, there were 54.4 births per 1,000 females of child-bearing age in metropolitan areas, and 55.9 in rural areas. In 2010, there were 75.5 births per 1,000 females of child-bearing age in rural areas, and 62.7 in metropolitan areas.

Metropolitan areas had 2,116 more births than deaths on average from 2000 to 2010. Micropolitan (large rural) areas have on average 617 more births than deaths. Rural areas have on average 186 fewer births than deaths on average. As a consequence of these two factors alone (apart from any migration effect), metropolitan population has increased more than micropolitan population has, and rural population has declined.

Another factor that affects rural North Dakota is the American Indian fertility rate. Roughly 55% to 60% of North Dakota American Indians live in rural areas. The American Indian birth rate is 1.8 times greater than the rate for the United States as a whole.²⁵ Thus some of the change in the rural fertility rate is attributable to the American Indian population, and the number of rural births to whites is much below the average for all North Dakota.

Change in Migration Patterns

Metropolitan and micropolitan (large rural) areas have been experiencing a steady in-migration over time, while rural areas have had an out-migration. Overall North Dakota has had an average in-migration of 5,526 people per year (see Figure 17).

The changing rural and urban economies (e.g., decline in the number of farms, loss of young adults and young families, increased economic opportunity in metropolitan and in micropolitan areas) play substantial roles in shaping

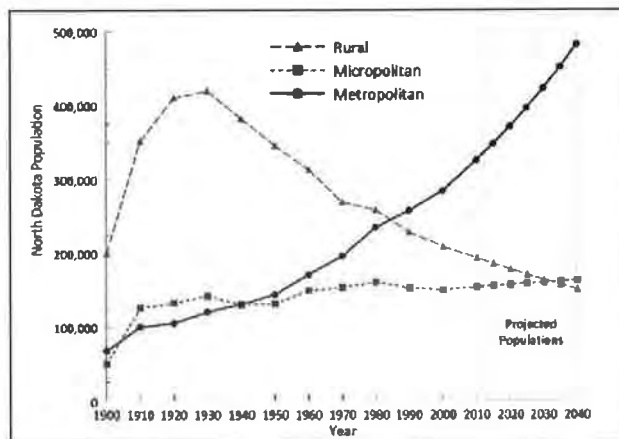


Figure 18. Projected population of North Dakota based on current trends to the year 2040 by rural, micropolitan (large rural), and metropolitan areas.⁵

- The total population in North Dakota is projected to be 705,995 by 2020, 746,971 by 2030, and 796,316 by 2040. By 2040, the metropolitan population will be 481,694, or 3.2 times higher than the rural county populations (projected to be 151,224).
- Rural population is expected to decline to 151,224 (-21.58%), micropolitan is expected to increase slightly to 163,339 (5.87%), and metropolitan is expected to increase markedly to 481,694 (48.02%) by 2040.

population. Where the jobs are, the types of jobs and career growth, and the opportunities for dual-career families are all factors.

A significant change in the economy of rural North Dakota is energy, specifically oil and natural gas. Coal and oil have played important roles in North Dakota's economy, dating back to the early 1950s, and another boom cycle began in the mid-2000s. The effect is felt most acutely in the 17 oil-producing counties. This has and will continue to change in-migration patterns for rural North Dakota. The oil industry has had an effect on metropolitan Bismarck, too, and will likely push Minot into metropolitan status by 2020 (pushing its 2011 population of around 43,000 above 50,000).^{5, 9}

PROJECTED POPULATION

Population changes in North Dakota typically are tied to economic changes. Thus, predicting future population trends and changes presumes the ability to correctly predict future economic conditions. Because the ability to predict those economic conditions has not always been particularly good, North Dakotans typically view population predictions with some skepticism. Nevertheless, there is a pressing need to have predictive models regarding state population trends so that planning for health care and other services can be accomplished.

Mindful of the skepticism regarding the reliability of economic and attendant population predictions and modeling, this *Second Biennial Report* will project future

population estimates using two general approaches—a stable-growth model that utilizes data from the past to project forward, and a rapid-growth model that places more weight on the most recent changes in the state’s population that are attributable to the current oil boom. The two prediction models can then be compared and contrasted.

In the discussion that follows, the first two sections address the stable-growth model, while the remaining sections deal with the rapid-growth model occasioned by the growth in the Oil Patch.

Projection to 2040 for Metropolitan, Micropolitan, and Rural Areas (Stable-Growth Model)

Based on historical trends from the prior century, there will be a continued loss of population in the rural areas and a major gain in the metropolitan areas over the next several decades (see Figure 18).

The population projection used in Figure 18 was based on Dr. Timothy Chapin’s five-year cohort component projection model. This model uses historic birth rates for women of child-bearing age, sex ratio of births, age-adjusted death rates, and migration rates to model future trends. The model allows growth to be projected into the future for metropolitan, micropolitan (large rural), and rural areas of the state separately.

The 2010 census pegged North Dakota’s population at about 672,000. The stable-growth model forecasts North Dakota will have a population of about 796,000 in 30 years (year 2040). The stable-growth model does indicate a significant growth in the metropolitan population of 48% with an urban population in 2040 of about 482,000. The metropolitan population under this historical growth approach would be approximately 61% of the state’s population. The rural population would decline by roughly 22% to represent about 151,000 people or 19% of the state’s population. The micropolitan population would have modest growth of about 6% to account for 163,000 people (21% of the population).

While a constrained historically based approach, the stable-growth model still forecasts a profound change in the population base, one in which the gradual urbanization of the state’s population accelerates over the next 30 years. This will have significant implications for policymakers as they analyze resource allocation, communities as they plan for growth (or in the rural areas as they adjust to continued population decline), and the people of North Dakota as they recognize that the predominance of the state’s rural orientation and culture must contend with a more urbanized composition.

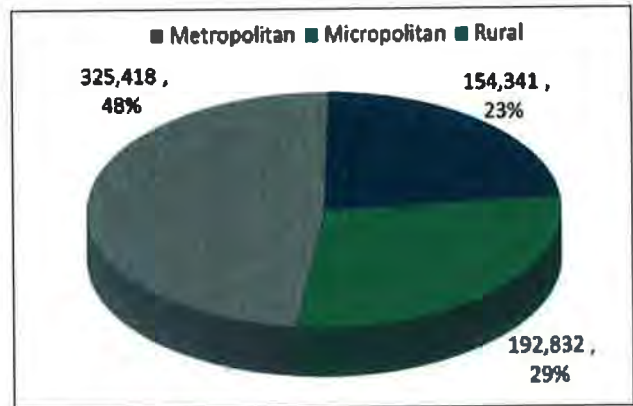


Figure 19a. Current population in 2010.^{5,9}

- Metropolitan counties are growing the most while rural counties are shrinking in the North Dakota population.
- Counties with the greatest increase in older adults are more likely to be rural, especially in the center of the state.
- Births outnumber deaths 2 to 1 in metropolitan areas, while in rural areas deaths outnumber births 11 to 10.

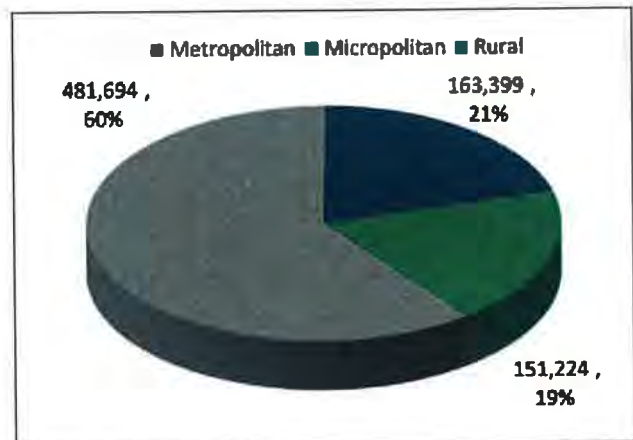


Figure 19b. Projected population in 2040.^{5,9}

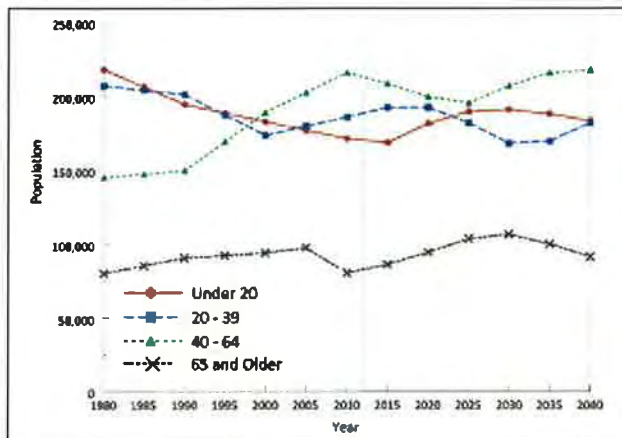


Figure 20. Projected population in North Dakota to 2040 by age groups.⁵

- The 40 to 64 age group shows the highest increase from 145,686 to 218,720.
- The decline in the 65-and-older population in 2005 and then increasing to 2030 reflects the baby boomer generation reaching retirement age and resulting in the increase in older population from 2010 to 2030.
- The 20 to 39 age group is projected to continue decreasing but then increase by 2040.

Projection to 2040 for Age Groups (Stable-Growth Model)

The gradual aging of North Dakotans will place renewed pressures on both the public and private sectors, and the corresponding institutions and organizations involved in assessing older adults' needs and allocating appropriate resources. It will not only continue to affect the response of the health care system but will also have an impact on the overall health of the population. There will be a corresponding need to control and manage chronic disease, and to identify better ways of encouraging patients to care for themselves. A number of behavioral risk factors (discussed in more detail in the following chapter) will be more closely examined. Corresponding effects include health care spending and costs, health organizations viability (particularly in the rural areas), and health system redesign.

The stable-growth projection indicates that while the 65-and-older cohort will peak by 2030 and then decline, the next oldest cohort (40 to 64) will be increasing from 2030 to 2040; thus, the effect of an aging population will continue (see Figure 20).

The population trends and projections present unique challenges to institutions and the capacity of the state and communities to respond. Regardless of community size (from a rural community to the state's largest metropolitan areas) there will be significant impacts on a range of sectors: education, health, business/economic development, housing, transportation (including roads and physical improvements), government, and social/civic organizations such as faith-

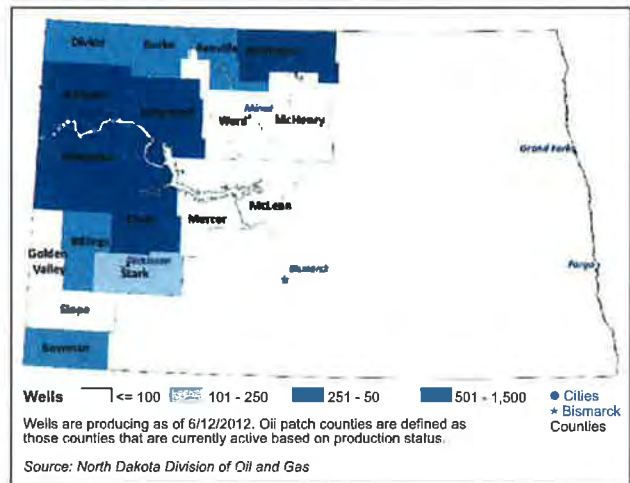


Figure 21. Oil Patch counties by number of active rigs.²⁷

- Seventeen counties in North Dakota are considered active in oil production by the North Dakota Department of Mineral Resources. These counties have had oil well production in 2012. The highest producing counties are McKenzie and Williams with a combined 38% of statewide production of oil.

based and service organizations. Even a more conservative model projects population growth that will test the ability of systems and sectors to plan for the impact of the expected change, organize resources, coordinate with others, and mobilize the citizenry to respond accordingly.

OIL PATCH IMPACT

Counties by Oil Production

The current oil boom has propelled North Dakota to being the second-largest oil-producing state; it was in ninth place in 2006. This boom has produced an economic impact of over \$13 billion and has produced roughly 30,000 jobs with expectations of adding 7,000 to 10,000 a year for about five years.²⁶ All of the oil production is focused in the western half of the state, especially the far west counties (see Figure 21).

Demographics: Age, Gender, Insurance Status, Poverty

As shown in previous sections, people in the Oil Patch are comparable to the rest of North Dakota for age, gender, uninsured and poverty status although relative to rural North Dakota, overall, the older adult population is not as large.

Based on current data, the composition of the Oil Patch has not changed dramatically. If there is a bust to the energy expansion, the 17 oil-producing counties will likely return to a past demographic: slowly developing micropolitan (large rural) areas and declining rural areas. As was stated

previously, though, if the oil boom continues unabated, then the younger working-age population moves in seeking not only energy-related jobs, but employment in supportive industry or business, along with the more traditional needs in retail, service, schools, health facilities, government, transportation, and other key sectors. The housing crunch or changes in the nature and culture of the area would likely compel some older people to move to other areas of the state.

Population and Oil Production

The economy and population of the Oil Patch counties has shown a roller-coaster pattern in the past, and fears of a repetition resonate. Figure 23 shows the boom-and-bust pattern in the past several decades. The current growth, however, dwarfs prior boom cycles, as shown in Figure 24.

The increase in population in the oil counties since 2000 is impressive, especially since about 2006. There has been an increase of about 15,000 people.

The projection for oil production is at least 15 to 20 years using current technologies with anticipation for many years after that as new extraction technologies are introduced.²⁹ Thus, the population growth and the corresponding effect on the area infrastructure, including health systems, will continue for many years. The natural challenge affords not only local western health systems, but also state government and academic health centers the opportunity to plan and develop functional policy actions.

Figures 25a and 25b show that oil production and population follow nearly identical patterns. This reinforces how closely intertwined economic activity and demographic characteristics correlate. As oil production is forecast to continue to grow over a number of years, it is expected that population will follow accordingly.

There are regions, however, where the tight relationship between oil production and population is not found (see Figure 26).

Counties such as Ward have seen a high increase in population without a high increase in oil production. This suggests the county supports oil production from nearby counties.

Counties such as Divide and McLean have dramatic increases in oil and moderate increases in population, suggesting the population is living in nearby counties.

As the largest micropolitan (large rural) community in the Oil Patch, Minot (Ward County) is emerging as a major economic hub for the region. It is the state's fourth-largest city and is benefiting from the centralization of oil-supportive business activity. Other micropolitan communities (Dickinson and Williston) are in the heart of oil country and have seen growth in their oil production, but because they are core population centers, they are experiencing even more population growth. Stanley (Mountrail County), Tioga (Williams County) and Williston (Williams County) also benefit in that they are either on or very close to the major

highway system of U.S. Highway 2 that sweeps across the northern tier of not only North Dakota out to the West Coast but also proceeds through North Dakota heading east. Watford City (county seat of McKenzie County) has also experienced growth in oil production corresponding with an even larger growth in population. Watford City is the largest rural community between the major centers of Williston and Dickinson and serves as a central point. Divide and McLean counties have seen significant increases in oil activity; however, their population growth is small. Divide County, north of Williams County and Williston, and McLean County resting between Minot and Bismarck may not have the locational value, at this time, relative to the other communities. However, as populations increase they may benefit more from the change. In addition, while the growth in oil production in Divide and McLean counties (about 5%

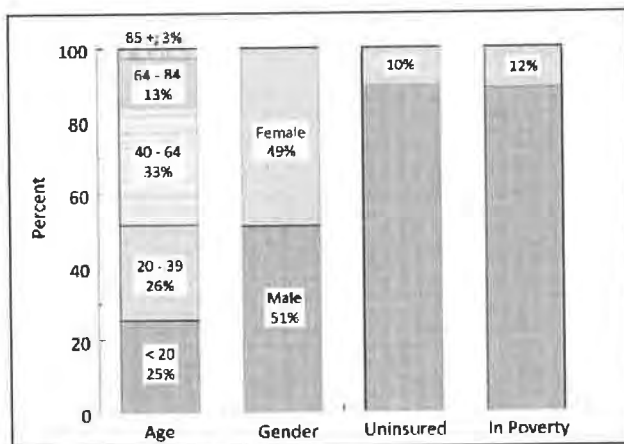


Figure 22. Age, gender, uninsured, and poverty in the Oil Patch.^{5, 15}

- With the oil boom, the Oil Patch is expected to become younger (older adults migrating out, younger workers moving in), more male, and with fewer in poverty.

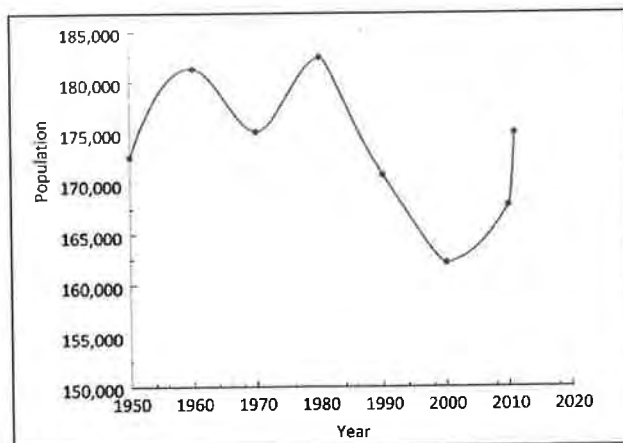


Figure 23. Change in population from 1951 to 2011.²⁸

- Population in the Oil Patch is rapidly increasing toward previous oil boom levels.

and 20%) has increased significantly, their actual oil production is lower than other counties. In May 2012, McLean ranked 11th with over 135,000 barrels of oil and Divide ranked fifth with 784,000 barrels of oil. Mountrail County ranked first with 5.6 million barrels, followed by McKenzie, 4.4 million, and Williams, 3.4 million.^{27,30}

From a health care perspective it should be pointed out that there are Critical Access Hospitals throughout this area that are affected by the population change: Bottineau (Bottineau County), Bowman (Bowman County), Crosby (Divide County), Dickinson (Stark County), Garrison (McLean County), Stanley (Mountrail County), Tioga (Williams), Watford City (McKenzie), and Williston (Williams).

Projected Population (Rapid-Growth Model)

In view of the current flurry of activity and growth in the oil boom counties, alternate growth scenarios to the stable-growth model have been developed that forecast a much more robust population growth over the next several decades. Part of the difficulty in modeling and predicting future growth is that traditional models make trend projections based on many years of past data. Since the current growth in the Oil Patch counties has occurred in such a relatively short time, the effect of dramatic growth necessarily is underestimated in a stable-growth model. Other modeling techniques arrive at much different conclusions. Thus, a stable-growth model predicts a population in North Dakota of about 725,000 people or growth of 6% by 2025, while a housing forecast from the 2012 North Dakota Statewide Housing Needs Assessment predicts about a 25% growth to 841,820.³¹

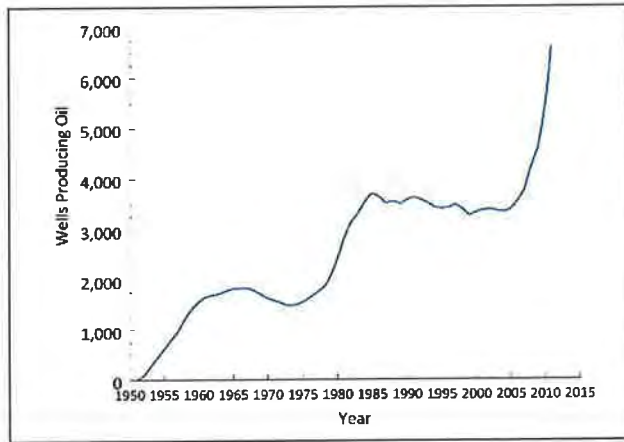


Figure 24. Number of wells producing oil in the Oil Patch since 1951.²⁷
 • The number of wells producing oil has nearly doubled since 2005.

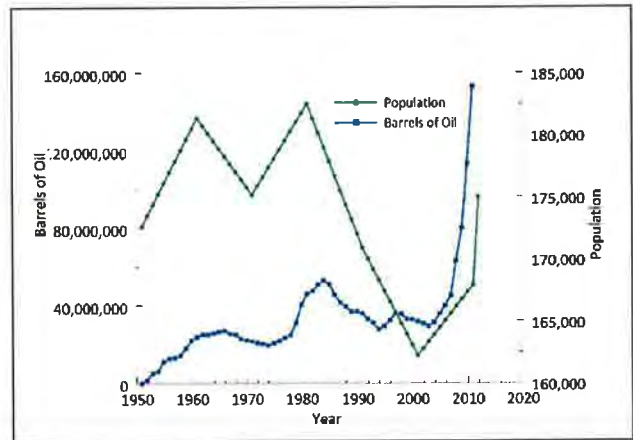


Figure 25a. Barrels of oil produced and population from 1951 to 2011 for all counties in the Oil Patch.

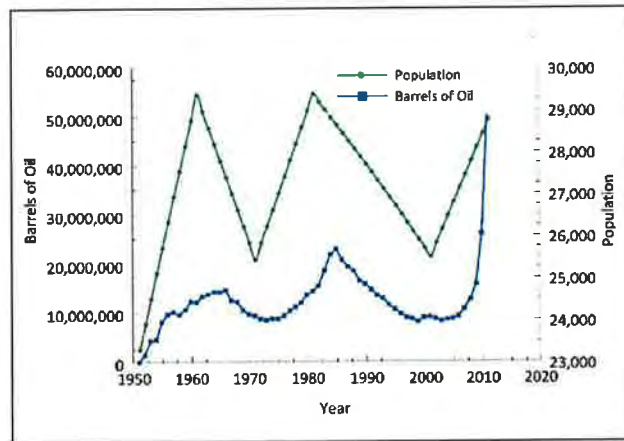


Figure 25b. Barrels of oil produced and population from 1951 to 2011 for counties with a history of high production of oil (McKenzie and Williams).²⁷

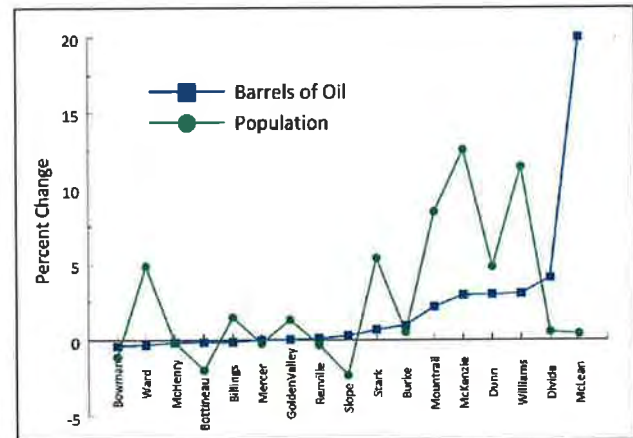


Figure 26. Percentage change in barrels of oil and population from 2008 to 2011 for counties in the Oil Patch.^{27,28}

An even more dramatic degree of growth is predicted by a different modeling method using what is called a cohort component model. As shown in Figure 27, the population in the Oil Patch counties may increase from the current level of about 160,000 to as much as 700,000. That would result in an overall North Dakota population of almost 1.2 million people by as early as 2020.

From a policy perspective, projections such as these can be used to assist in planning for future changes in needed health infrastructure. Such a population increase would significantly affect service demand, with implications for hospitals, clinics, EMS, public health, long-term care, and other health and medical providers. The health care workforce implications of population growth are enormous, as will be discussed in Chapters 3-5 and 9. But to outline the scale of provider resources required to service a significant population growth, a convenient rule of thumb to remember is that every 100,000-person population uptick will require around 219 more physicians (not to mention the multiple other required members of the health care team such as nurses, nurse practitioners, occupational therapists, etc.). Thus, an increase in population to 1.16 million in the course of one short decade would require over 1,000 more physicians above the shortfall of at least 210 that is already projected.

The cultural and social identity of a traditionally rural state will be challenged under rapid growth. Some of this will be because of the influx of people who do not have a previous connection to the state (e.g., oil, energy, and related industries will continue to import new citizens as the state's economy continues to expand). The ongoing erosion of the Scandinavian and German cultures of the original settlers of the state (with the related effect on the cultural norms of rural North Dakota) will be felt as the state gradually becomes more diversified, and much more urbanized. Political ramifications will be experienced as the state Legislature that had strong rural representation will reflect the population shifts with legislative reapportionment reflecting urban majorities.

To some extent one of the demographic changes at play is that for a number of decades there has been a fairly uniform depopulation of rural North Dakota (with the exception of counties with a significant American Indian population). In general, rural eastern, central, and western counties faced some degree of continual population loss and it was essentially uniform across the state. Today, and for the foreseeable future, there are now two rural North Dakotas. One North Dakota, because of the changes in technology that

have driven the oil expansion (and also the resultant natural gas development), will feel the effect of population gain, both the good and the bad. The second North Dakota, based more on traditional economic structures, will likely experience the continuation of population loss. Each demographic scenario will have a lingering and profound effect on the rural communities that must contend with either of these new or established forces. For some, it will be the pressure of incorporating hundreds and even thousands of new people; for others, it will be the pressure to contend with a gradual decline in population. Both scenarios place stress and pressure on housing, schools, churches, health care systems, and the physical and cultural infrastructure.

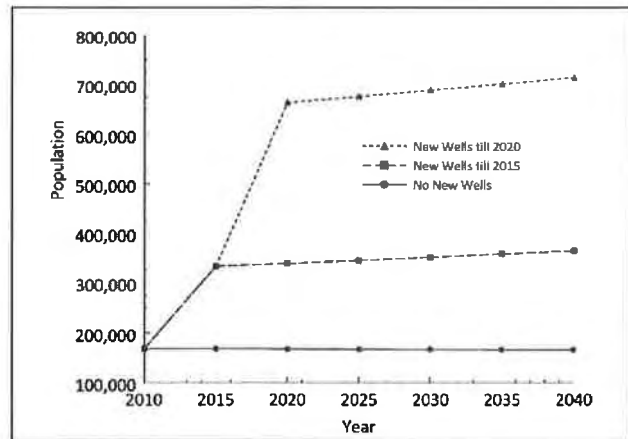


Figure 27. Oil Patch population projections using rapid-growth model.

- If no new wells were drilled, the population would stay nearly stable.
- If new wells are drilled at the current rate until 2015, the population would increase to approximately 334,000 and stabilize for the 17 oil counties. The state population would be approximately 840,000 in 2020, based on this more restrained growth projection.
- If new wells are drilled at the current rate until 2020, the population would increase to approximately 664,000 and stabilize for the 17 oil counties. The state population would be approximately 1,160,000 in 2020, based on this more optimistic growth projection.
- The population in the Oil Patch is highly related to oil production. If the current boom were to bust before any of the projected time frames, then the population likely would decline back to the stable projection.*

*A cohort component method was used to project this population. The algorithm used was provided by Dr. Tim Chapin at Florida State University. This method was modified by including population trends and county-level components of change to fit North Dakota's homogenous population and historical predictors of population change.

Figure 28 is a pyramid population graph. It is used to show how the total population of North Dakota might change over time for different age groups and gender. The oil boom would add a large number of males age 20 to 54 over time (nearly double), while females would have a lesser increase. The population of older adults would decrease through out-migration. This is based on the highest projected oil boom, where the population of North Dakota exceeds 1 million.

SUMMARY AND OBSERVATIONS

The anticipated changes in population will have a significant effect on the North Dakota health care system. Increases in urban areas will lead to a larger patient base and health systems will need to respond accordingly to meet new demands for services. This will lead to pressures on health workforce supply. Combined with new expectations from the ACA for primary care providers and the rapid development of Accountable Care Organizations (ACO) as network delivery systems to facilitate higher quality care and better medical outcomes, there will be pressure to produce more medical, nursing, and ancillary personnel, especially in the primary care specialties.

Correspondingly, the continuing decline in the rural population remote from the Oil Patch counties will also produce health system pressures. Already slim and even negative operating margins for CAHs, the ability to financially maintain federally certified rural health clinics (RHC) and federally qualified health centers (FQHC), and the complications associated with an aging population on rural emergency medical services (e.g., ability to identify volunteers) and long-term care centers will be magnified by depopulation. If more rural health systems cease operations, this will exacerbate already complicated access to care issues faced by rural North Dakotans. Workforce supply will be affected because of mounting competition for providers, particularly in primary care; maintaining competitive salary packages; and the overall issue of attracting providers willing to live and practice in declining environments. In addition, depopulation is commonly associated with economic decline because smaller populations translate into less demand for retail and other services. This in turn affects the population base for other essential community services such as the school system,

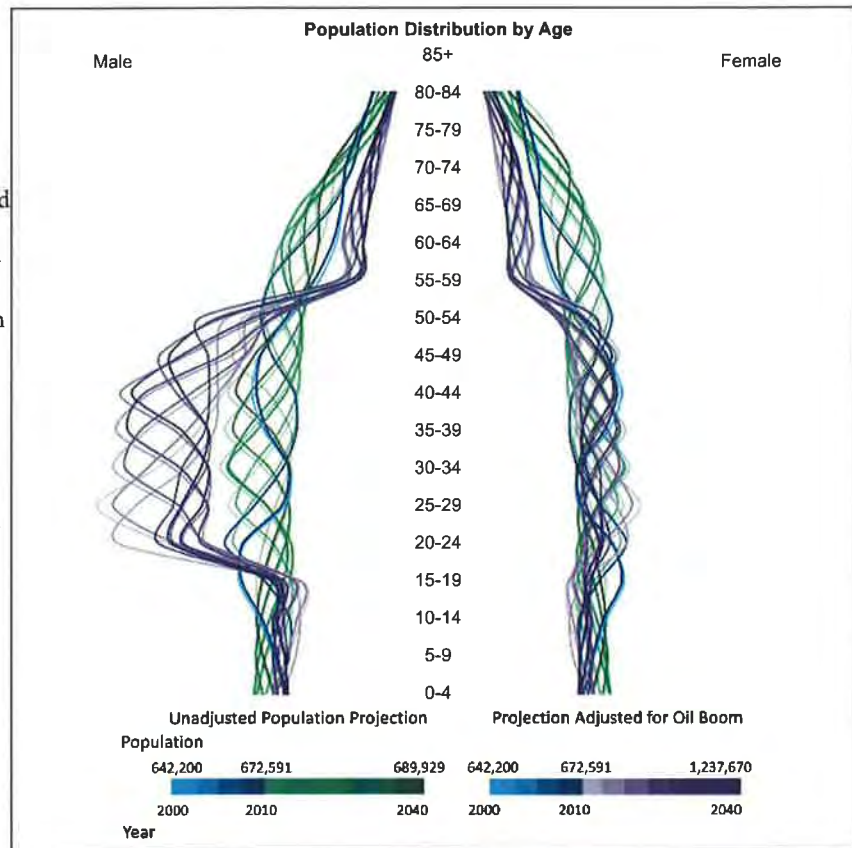


Figure 28. Population distribution by gender and age, showing the stable growth (unadjusted) distribution in green, and the rapid growth (adjusted for oil boom) demographics in purple.

- Dramatic increase in young and middle-aged males with the rapid growth model.
- Distribution of females by age is largely unaffected by the oil boom.

health system, government (e.g., lower tax base), faith community, and overall economic and community development. In rural communities, in particular, each community sector (e.g., health, education, business) is interdependent and relies heavily on the other sectors to maintain viability. As one sector declines or improves this has a residual effect on all of the other sectors.

With the population growth in the western oil impact area will be new demands on local health systems. The rapid-growth projection indicates significant population increases in the oil counties, and the overall state population could swell to almost 1.2 million. By 2020 if the oil well expansion continues at its present pace, North Dakota could see its population almost double in a decade. The ability of the current delivery system to meet this demand is already taxed. There are needs for more providers, the emergency care system including emergency rooms is overburdened, and there are serious challenges related to reimbursement and payment. As the population expansion continues this will only impact the delivery system to a higher degree.

Coincident with rural depopulation and the rapid growth in the Oil Patch, North Dakota is becoming more urbanized. The population projections have 61% of the population in a metropolitan area by 2040, if not earlier. Later chapters will show that North Dakota already has a maldistribution of direct medical care physicians. If the urbanization trend comes to fruition, state policymakers and medical educators will be challenged even more to address the allocation of providers in a manner that assures access to quality health care for rural citizens.

The projected population changes will pressure communities and health systems to respond in a proactive manner. Assessment and planning activities may consider new provider arrangements such as more comprehensive networks involving rural and urban-based providers. As has been previously stated, the 36 CAHs already work with nine networks especially on quality improvement, HIT, and staff education. The demands for those types of services and the ability to use network arrangements to meet those needs will likely only increase. As ACOs develop, combined with new payment methods based on the principles of bundled payments and value-based purchasing, they will likely affect larger more urban-based providers first; however, over time, to secure viable rural health delivery systems new urban-rural networks may be contemplated. Both formal and informal organizational connections may be considered to address health workforce issues. Currently 18 CAHs participate in some form of recruitment and retention network. The workforce supply issue will likely be affected by new provider payment structures such as bundling payments. If more networks develop that are inclusive of rural health systems and providers, there will be new opportunities for collaboration, improved patient outcomes and satisfaction, and reduced health care costs.

References

- Gould, E. (2012, July 5). Public Insurance Helps Blunt Effects of Declining Employer-Sponsored Coverage. *Economic Policy Institute*. Retrieved September 15, 2012 from <http://www.epi.org>.
- North Dakota Hospital Association. (2012). *Discussion of North Dakota Medicaid*.
- Center for Rural Health. (2012, March). *Hospital Networks* [Fact Sheet]. Retrieved from http://ruralhealth.und.edu/pdf/hospitals_2012.pdf.
- Miller, M. Gibbens, B., Lennon, C., and Wakefield, M. (2008). *Flex Program and Critical Access Hospital State Rural Health Plan*. Retrieved from http://ruralhealth.und.edu/projects/flex/pdf/state_rural_health_plan112608.pdf.
- U.S. Census Bureau. (2011). *2010 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
- U.S. Census Bureau. (2011). *1980 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
- U.S. Census Bureau. (2011). *1990 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
- U.S. Census Bureau. (2011). *2000 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
- U.S. Census Bureau. (2009). *Metropolitan and Micropolitan Statistical Areas and Definitions* [Data file]. Retrieved from <http://www.census.gov/>.
- U.S. Department of Agriculture. (2007). *2007 Agricultural Census* [Data file]. Retrieved from <http://www.agcensus.usda.gov>.
- Proser, M., Shin, P., Hawkins, D. "A Nation's Health at Risk III: Growing Uninsured, Budget Cutbacks Challenge President's Initiative to Put a Health Center in Every Poor County." GW Department of Health Policy; National Association of Community Health Centers, Washington, DC. Mar 2005.
- Schiller JS, Lucas JW, Ward BW, Peregoy JA. *Summary health statistics for U.S. adults: National Health Interview Survey, 2010*. National Center for Health Statistics. *Vital Health Stat* 10(252). 2012.
- Data Source: Urban Institute and Kaiser Commission on Medicaid and the Uninsured estimates based on the Census Bureau's March 2011 and 2012 Current Population Survey (CPS: Annual Social and Economic Supplements), accessed September 15, 2012.
- North Dakota Department of Health. (Undated). *North Dakota Five-Year Needs Assessment (2011-2015) for the Maternal and Child Health Services Title V Block Grant Program*. Retrieved from <http://www.ndhealth.gov/familyhealth/publications/NDNeedsAssessment2011-2015.pdf> on September 15, 2012.
- U.S. Census Bureau. (2010). *Small Area Income and Poverty Estimates* [Data file]. <http://www.census.gov/did/www/saiper/>.
- Cogan, J., Knudson, A., Baird, J., Muus, K., & Kruger, G. *Health Insurance Coverage in North Dakota* [Presentation Slides]. Retrieved from <http://ruralhealth.und.edu/presentations/pdf/ndha9-9-04.pdf>
- The Access Project. (2009). *2007 Health Insurance Survey of Farm and Ranch Operators* [Issue Brief]. Retrieved from http://www.accessproject.org/adobe/issue_brief_no_3.pdf.
- The Urban Institute. (2007). *Why Health Insurance is Important* [Policy Brief]. Retrieved from http://www.urban.org/UploadedPDF/411569_importance_of_insurance.pdf.
- Robinson, Elwyn B. *History of North Dakota*. Lincoln: University of Nebraska Press, 1966.
- Zimmerle, D.M., and Rathge, R. W. (Undated). *Recent Trends in North Dakota's Population*. Retrieved From http://library.ndsu.edu/tools/dspace/load/?file=/repository/bitstream/handle/10365/5921/farm_42_01_01.pdf?sequence=1.

21. United States Department of Labor Bureau of Labor Statistics. (2010). *Quarterly Census of Employment and Wages*. Retrieved from <http://www.bls.gov/eag/eag.nd/gov>.
22. North Dakota State Data Center. (2011). *North Dakota Gross Domestic Product by Industry: 2010* [Economic Brief]. Retrieved from http://www.ndsu.edu/sdc/publications/ebriefs/EB20_12Press.pdf.
23. North Dakota Department of Health, Vital Records. (2010). *Births and Birth Rates by County* [Data file]. Retrieved from <http://ndhealth.gov/vital/stats.htm>.
24. North Dakota Department of Health, Vital Records. (2010). *Deaths and Death Rates by County* [Data file]. Retrieved from <http://ndhealth.gov/vital/stats.htm>.
25. Parker, S. (2012). *Native Americans: The Facts. Health Guidance*. Retrieved from <http://www.healthguidance.org/entry/6323/1/Native-Americans-The-Facts.html>.
26. Kansas Corporation Commission. (2011). *Summary of North Dakota Fact Finding Mission*. Retrieved from <http://www.kansascommerce.com/DocumentView.aspx?DID=1057>.
27. North Dakota Department of Mineral Resources. (2012). *Historical Drilling Statistics*. <https://www.dmr.nd.gov>.
28. U.S. Census Bureau. (2010). *Historical Decennial Census* [Data file]. <http://factfinder2.census.gov>.
29. Kringstad, J. (2012, September). *North Dakota Pipeline Authority: North Dakota Petroleum Council Annual Meeting* [Presentation Slides]. Retrieved from http://www.ndoil.org/image/cache/J_Kringstad_NDPC_Sept_2012.pdf.
30. North Dakota Department of Mineral Resources, Division of Oil and Gas. (2012, May). *2012 Monthly Production Statistics*. Retrieved from https://www.dmr.nd.gov/oilgas/mpr/2012_05.pdf.
31. North Dakota Housing Finance Agency. (2012). *2012 North Dakota Statewide housing Needs Assessment: Housing Forecast*. Retrieved from http://www.ndhfa.org/Web_Images/NDSHNA_Housing-Forecast_Final.pdf.

TWO

The Health of North Dakota

INTRODUCTION

Health disparities are significant differences between one population and another, including the incidence, prevalence, mortality, and burden of disease, as well as other adverse health effects.¹ A number of determinants contributing to health disparities include individual behaviors or characteristics (e.g., smoking); biology and genetics (e.g., family history, gender, race, and high blood pressure); social environment (e.g., income, education, and discrimination); physical environment (e.g., distance to care, transportation, and weather); and the health system (e.g., access, availability, quality, and insurance).²

Health disparities are a significant public policy concern. The federal government's Healthy People initiative has for three decades created national 10-year objectives designed to improve the health of all Americans. In each of those decades, health disparities were a primary focus. For Healthy People 2020, health disparity is one of four principal health measures that serve as progress indicators in meeting the national goals. The other three are general health status, health-related quality, and determinants of health.³

The condition of individual health is of paramount concern to the individual, family, and even employers who directly pay the majority of health care costs; however, the aggregate of health concerns for individuals and families has significant implications for the overall health system and its ability to design a model of delivery to improve health status. (It should be noted in passing that although employers typically pay health insurance premiums directly, most economists consider the payment of such insurance premiums as forgone wages, and thus are actually paid indirectly by the employee.) Health policy and the health system must contend with a number of key factors associated with population health. These factors are drivers that shape and shade the environment in which health care is delivered, how it is delivered and paid for, and how it is structured for future generations. The factors driving or influencing population health and health disparities include the following: access, cost, quality and outcomes, and availability of health care and services.

Access to care refers to the ability to gain entry into the health system. This can include the availability of health professionals and institutional access points such as hospitals, public health units, clinics, and services for emergency medical care, long-term care, behavioral and mental health, oral health, pharmacy, and others. Access is a fundamental issue because it directly addresses the ability of people to maintain or improve their health status. People need to be able to meet and talk with health and medical providers and have physical access to a clinic or hospital in order to first be able to address any type of health episode. Limitations on access can lead to unmet health needs, delays in seeking appropriate care, unpreventable hospitalizations, and

excessive utilization of higher-cost access points such as an emergency room. Limiting access exacerbates impaired health status and medical outcome, and eventually adds to health care costs. A number of factors can restrict access to care, including an individual's ability to purchase health services (e.g., level of income, insurance coverage, employer-sponsored health insurance, and current health status); the supply of health professionals and the types of providers and medical specialties available; financial viability of health organizations and health systems; the location of health facilities; in North Dakota, natural barriers such as distance, weather, and road conditions; and ethnicity or race (e.g., American Indian access to care in North Dakota is hindered by income, employment, availability of services and providers, and location). All of these are important dynamics, factors to which North Dakota is not immune. Later chapters will address, in more detail, specific North Dakota access issues (i.e., health care organization and infrastructure).

The cost of care is another influence. North Dakota has been described as a low-cost, high-quality state in which the cost of care, relative to other states, is lower; importantly, the quality of care delivered is considered high. It thus is a higher-performing state.⁴ Even in a relatively low-cost state like North Dakota, cost has been and remains a dominant concern within public policy discussions, particularly within the framework of health reform. In general, health care costs in the United States are high in comparison to other countries, accounting for 17.6%⁵ of gross domestic product (GDP), which is a common and accepted measure of economic production and activity. In comparison, health care in the next most expensive countries of the Netherlands and France accounts for approximately 12% of GDP. In looking at the average for the 34 countries of the Organization for Economic Cooperation and Development (OECD), the United States is about 8 percentage points higher than the OECD average of only 9.5%. Health care spending in the United States is expected to top 20% by 2021. In terms of per capita spending, the United States spent \$8,233 in comparison to the next highest country of Norway (\$5,388) in 2010 (most recent data year).⁶ At the same time, our high costs do not necessarily translate into the best health outcomes because the United States ranked 32nd in life expectancy and 43rd in infant mortality out of 193 countries reporting to the World Health Organization.⁷ The United States is a higher user of health care services too. For example, 25% of Americans take four or more prescriptions regularly compared to a median of 17% for people in OECD countries.⁸ Thus, the subject of health care costs is germane to a general discussion of population health and health disparities. As a country, we spend a great deal that does not seem to contribute positively to key health outcomes measures.

The quality of care that is delivered in a health system relates directly to population health. According to the

Institute of Medicine, there are six principal aims to improving health that should be followed: safety, effectiveness, patient centeredness, timeliness, efficiency, and equity.⁹ In general, by making improvements within each of the six aims the health system performs better by being more responsive to the needs of the patient, improving the safety of patients, basing care on the science of best practices to be more effective, reducing delays in the delivery of care, and increasing the degree of equity to provide adequate access and improved quality to all patients regardless of socioeconomic status, geographical location, race and gender. Each of these is a challenge in the current arrangement of care access and delivery. While some health systems have national reputations (e.g., Mayo Clinic and the Geisinger Medical Center) for how they provide quality care in more seamless structures, other systems are less developed with regard to system transformation. Elements of national health reform (e.g., patient centeredness, research-driven best practices, prevention focus, and outcome driven) were based on the experiences of the more developed health systems that were motivated to restructure their delivery systems to ultimately improve performance and quality. A number of pivotal publications called attention to the need for change in the U.S. health care system. The Institute of Medicine in its seminal work, *To Err is Human: Building a Safer Health System*, found that each year somewhere between 44,000 and 98,000 people die in U.S. hospitals as a result of medical errors.¹⁰ This groundbreaking document, along with a subsequent work titled, *Quality Through Collaboration: The Future of Rural Health*, signaled a challenge to health care providers, health sector industries, and policymakers to seriously rethink the U.S. health system to address the systemic issues plaguing our country.¹¹

The fourth primary driver of health policy for improved population health is the availability of health providers. This issue is the central subject of the *Second Biennial Report* and will be discussed in more detail in Chapters 3-5. The supply and demand of health professionals and providers is fundamental to health improvement. There is a growing maldistribution of some provider disciplines, particularly in medicine, and particularly in rural areas of North Dakota. Patient-centered coordinated-care models under the Affordable Care Act (ACA) are dependent upon a well-prepared and adequate supply of health professionals to improve health. In addition, the ACA supports the training of 16,000 new primary care providers over five years and calls for a number of either new or expanded policy instruments to address the health workforce.¹² For example, there is a significant expansion of the National Health Service Corps (NHSC); creation of state health care workforce development grants and rural physician training grants; support for additional nursing training, allied health recruitment and retention, and public health training; mental and behavioral health support; and a number of other initiatives.¹³ All of

these efforts are intended to increase the availability of health providers.

The remainder of this chapter will look at specific issues associated with behavioral risk factors and population health. It is intended to help the reader to better understand the issues that affect not only the population at hand but also to serve as a general context for our discussion of access to care, availability of providers, quality of care, and cost factors.

A number of determinants contributing to health disparities include individual behaviors or characteristics

- Biology and genetics (e.g., family history, gender, race, and high blood pressure)
- Social environment (e.g., income, education, and discrimination)
- Physical environment (e.g., distance to care, transportation, and weather)
- The health system (e.g., access, availability, quality, and insurance)

Table 2

Percentage of adults reporting smoking, alcohol use, seat belt use, and physical activity categorized by gender and age for metropolitan, micropolitan (large rural), and rural areas of North Dakota.¹⁴

N = ()	Total (496,396)	Female (247,538)	Male (248,859)	18-39 (197,809)	40-64 (202,152)	65-84 (84,650)	85+ (11,785)
Smokes	17.3	16.5	18.1	22.0	16.6	10.18	2.40
Metro	14.0	11.4	16.4	17.6	13.1	8.86	2.30
Micro	19.4	20.2	18.5	25.1	18.3	9.60	6.64
Rural	19.7	19.2	20.1	25.3	19.3	11.81	0
Drinks Alcohol	58.4	53.1	63.7	61.3	64.0	43.4	23.8
Metro	57.7	54.5	60.6	53.5	67.4	47.1	29.0
Micro	61.1	54.0	69.2	69.8	63.5	38.5	27.9
Rural	57.2	51.1	63.2	63.3	60.7	42.8	15.3
Binge Drinks	15.4	8.4	22.3	22.2	14.8	3.0	0
Metro	15.1	6.4	22.8	21.5	14.6	2.4	0
Micro	14.4	9.3	20.1	20.8	13.7	2.2	0
Rural	16.7	9.8	23.5	24.8	15.9	4.2	0
Drinks & Drives	3.6	1.3	5.9	5.1	3.5	0.8	0.4
Metro	3.6	1.4	5.6	6.0	2.8	0.1	0.9
Micro	3.0	1.6	4.7	3.2	3.8	1.0	0
Rural	4.1	0.9	7.2	5.7	4.1	1.3	0
Doesn't Always Wear a Seat Belt	37.0	25.1	48.8	41.6	36.3	30.0	20.6
Metro	28.6	15.5	40.3	35.0	26.3	21.2	11.5
Micro	33.4	24.1	43.9	35.9	34.2	27.9	13.1
Rural	49.2	36.4	61.9	55.1	49.1	39.4	34.6
Doesn't Exercise Moderately	43.6	46.1	41.2	35.3	46.9	53.9	53.6
Metro	43.1	47.1	39.0	34.3	46.1	56.5	55.6
Micro	44.8	45.1	44.5	36.4	48.3	56.9	52.8
Rural	43.8	46.1	41.3	35.7	47.3	50.0	50.8

Note. Data for adults are from the CDC's 2010 Behavioral Risk Factor Surveillance System survey in North Dakota with the exception of exercise, which is from the 2009 survey.

- The prevalence of smoking in North Dakota is the same as the national prevalence (17.3%).
- Adults in North Dakota drink more on average than the nation (58.4% compared to 54.6%) and binge-drink slightly more (15.4% compared to 15.1%).

BEHAVIORAL RISKS

Table 2 shows the percentage of adults in North Dakota who have in common the behavioral risk factors of smoking, drinking alcohol, binge drinking, drinking and driving, not wearing a seatbelt, and not exercising at least moderately, categorized by age and gender for metropolitan, micropolitan (large rural), and rural areas. Note that males have worse behavior profiles than women in all domains except for lack of exercise. Especially for men but also for women to some extent, there is a general trend of worse behavior as the community size decreases, with generally the worst health behaviors in the rural areas (see Figure 29). The percentages for most adverse health behaviors tend to decrease with age, except for lack of exercise. Although trends show generally improving behavior for most, the lack of exercise and attendant obesity is an increasing problem. Further, there are

some data that suggest that North Dakota is experiencing a particular problem with alcohol use. The number of DUI arrests increased 9% from 2010 to 2011 (6,050 to 6,600), according to the North Dakota attorney general's office.

There are certain associations that portend a particularly high risk of adverse health-related behaviors, including the following:

- Drinking in younger (<65) males in micropolitan (large rural) areas
- Smoking in younger (<40) males in micropolitan (large rural) or rural areas (see Figure 30)
- Binge drinking in younger (<40) males (see Figure 29) in rural areas (see Table 2)
- Drinking and driving in younger (<40) males and those in rural areas
- Not wearing a seat belt in younger (<40) males in rural areas
- Not exercising moderately in older (>65) females in micropolitan areas

BEHAVIORAL TRENDS

Over the past decade, smoking has decreased in metropolitan populations, but has remained essentially unchanged elsewhere across North Dakota (see Figure 31).

This trend is seen in both men and women, although men continue to smoke in greater frequency than women. Nevertheless, the gap between the two groups is narrowing over time (see Figure 32).

Behavioral health is a critically important aspect of any health discussion. It has components that operate at the most basic individual level (e.g., individual decisions on health choices such as smoking and alcohol consumption); at a social level (e.g., changing attitudes and social norms toward risky health behaviors, media campaigns on the dangers of certain behaviors, and a greater recognition of both the

personal costs and financial costs for negative decisions); and at a more global, public policy level (e.g., incentives and disincentives that translate into health insurance and payment plan options, publicly funded media campaigns, and emphasis on health promotion and disease prevention strategies in local government health policy, state policy, and federal policy such as the Affordable Care Act).

According to the World Health Organization, the 10 leading behavioral causes of death worldwide (e.g., tobacco use, alcohol use, high cholesterol) account for 40% of all deaths, and global healthy life expectancy would be extended by five to 10 years if individuals, communities, health providers and health systems, and the private and public sectors initiated processes to better address, influence, and control such actions.¹⁶

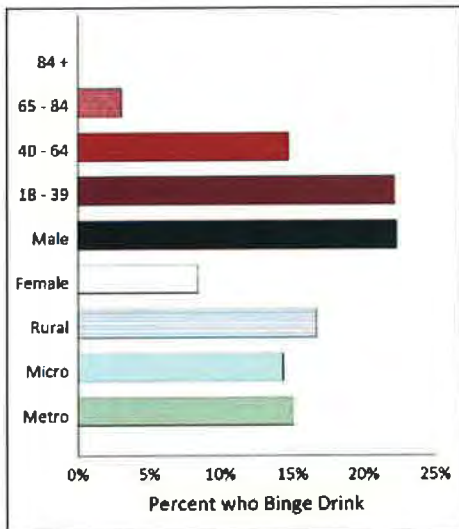


Figure 29. Binge drinking in North Dakota.¹⁴

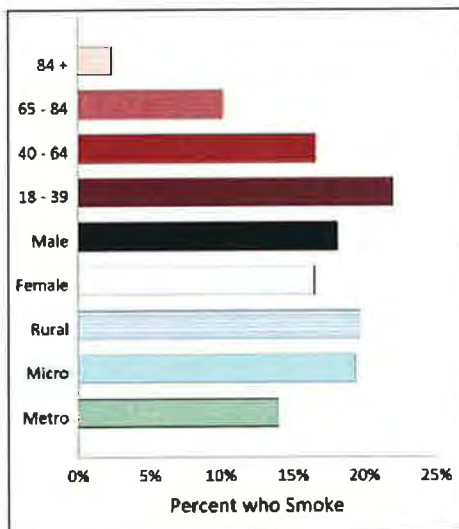


Figure 30. Smoking in North Dakota.¹⁴

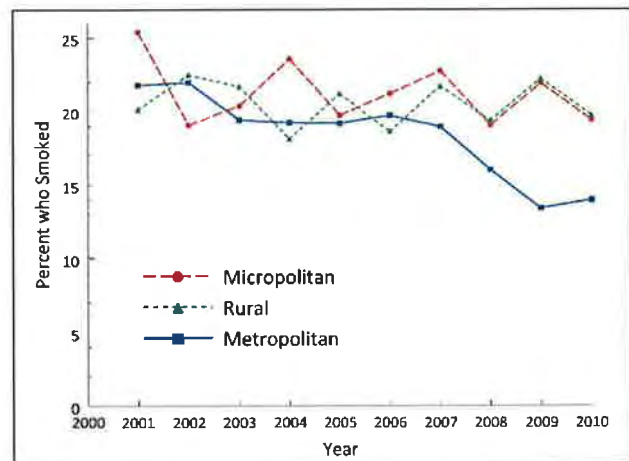


Figure 31. Prevalence of smoking by metropolitan, micropolitan (large rural), and rural areas.^{14, 15}

- People who smoke in metropolitan areas have decreased more than people who smoke in micropolitan or rural areas.

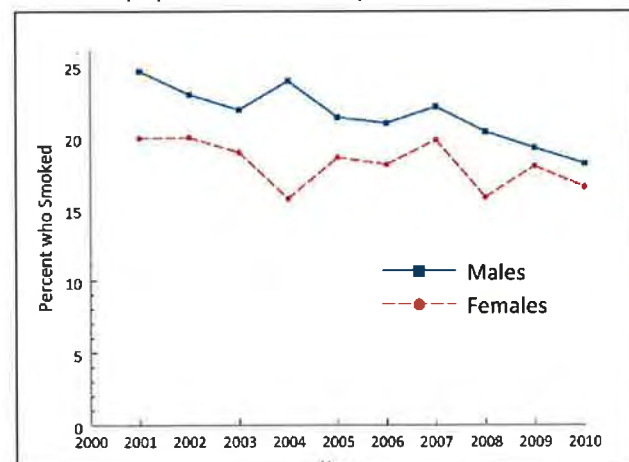


Figure 32. Prevalence of smoking by gender.¹⁴

- Males who smoke have decreased, but the percentage who smoke is higher than for females.

GENERAL HEALTH

Table 3 shows the percentage of adults in North Dakota who have common general health issues of disabilities, overweight or obesity, fair or poor general health, one or more days in the past month with poor health, poor physical health, and poor mental health by age and gender for metropolitan, micropolitan (large rural), and rural areas.

Comparison with National Benchmarks

Part of the explanation for the relative good health and health outcomes in North Dakota may relate in part to more healthful lifestyles. For example, the prevalence of overweight/obese people in North Dakota is lower than the national prevalence (62% compared to 63.7%). Additionally, North Dakotans are less likely to have fair or poor health than nationally (13.1% compared to 14.9%).

Table 3

Percentage of adults reporting disability, overweight or obesity, poor general health, and one or more days in the past month with poor general, physical, and mental health by gender and age for areas of North Dakota.¹⁴

N = ()	Total (496,396)	Female (247,538)	Male (248,859)	18-39 (197,809)	40-64 (202,152)	65-84 (84,650)	85+ (11,785)
Disabled	17.9	17.8	18.1	9.7	19.1	31.8	37.1
Metro	17.5	17.1	17.9	10.2	18.2	30.4	41.9
Micro	19.0	17.2	21.1	12.1	19.9	33.3	23.8
Rural	17.8	19.0	16.6	7.3	19.6	32.2	40.1
Overweight/ Obese	62.0	53.9	70.1	53.4	70.1	64.6	48.1
Metro	59.2	49.6	67.8	49.4	68.4	60.5	55.4
Micro	61.5	54.3	69.6	54.4	68.3	65.7	37.5
Rural	65.7	57.7	73.6	57.2	73.6	67.9	48.3
General Health Fair/Poor	13.1	14.3	11.9	6.6	13.3	24.8	34.9
Metro	12.2	13.8	9.8	6.0	12.5	19.3	43.7
Micro	12.2	12.4	11.9	5.2	13.4	25.2	21.0
Rural	15.5	16.4	14.6	8.6	14.2	29.8	34.4
1+ Days Poor Health	16.4	19.2	13.7	14.4	17.9	16.8	20.9
Metro	16.7	17.8	15.6	16.4	17.8	13.9	19.7
Micro	17.7	21.2	13.7	18.4	16.7	18.5	16.4
Rural	15.7	19.8	11.6	9.9	19.1	18.7	24.2
1+ Days Poor Phys. Health	32.1	35.8	28.4	31.2	29.9	38.0	42.0
Metro	32.8	34.3	31.5	34.6	29.5	36.2	39.1
Micro	31.6	36.8	25.7	31.0	28.3	40.0	40.5
Rural	31.5	36.3	26.8	27.2	31.3	38.7	45.7
1+ Days Poor Mental Health	28.0	33.2	22.8	32.9	27.3	19.8	17.1
Metro	28.5	34.8	22.9	34.2	27.0	19.6	16.3
Micro	29.4	34.3	23.9	36.2	27.3	19.7	16.9
Rural	27.3	32.1	22.6	30.9	27.9	20.0	17.5

Note. Data for adults are from 2010 BRFSS survey in North Dakota.

Certain populations are at high risk for a variety of adverse health conditions, including the following:

- Disability—older (> 65) males in micropolitan (large rural) areas.
- Overweight/Obese—40- to 84-year-old males (see Figure 33) in rural areas.
- Fair/Poor Health—older females in rural areas.
- Days with Poor Health—older females in rural areas (see Figure 34).
- Days with Poor Physical Health—older females in metropolitan areas.
- Days with Poor Mental Health—younger females in micropolitan areas.

It is striking that, for example, nearly three out of four males living in rural areas are overweight or obese.

Health Promotion

Although generally less of a problem in North Dakota than nationally, obesity has been increasing over time, especially in non-rural regions (see Figure 35) and in females (see Figure 36).

The primary goals of the Healthy People 2020 initiative are to (1) attain high quality, longer lives free of preventable disease, disability, injury, and premature death; (2) achieve health equity, eliminate disparities, and improve the health of all groups; (3) create social and physical environments that promote good health for all; and (4) promote quality of life, healthy development, and healthful behaviors across all life stages.³ The Centers for Disease Control and Prevention (CDC) uses health-related quality of life (HRQOL) process metrics to better determine the burden of preventable disease, injuries, and disabilities.¹⁷ This involves both self-

reported chronic diseases such as diabetes, arthritis, breast cancer, and hypertension; and risk factors such as body mass index, physical inactivity, and smoking status. According to the CDC, the measurement of HRQOL indicators can assist in establishing the relationship between the burden of preventable diseases, injuries, and disabilities with risk factors. The measurement also is part of the national process in achieving national health objectives such as those found in Healthy People 2020. A related set of measures are Healthy Days metrics, which assess an individual's perceived sense of well-being (e.g., self-rated health, number of recent days when physical health was not good, number of recent activity limitation days because of poor health). While these may be proxy measures, they are an accepted means to establish a measure of health status.

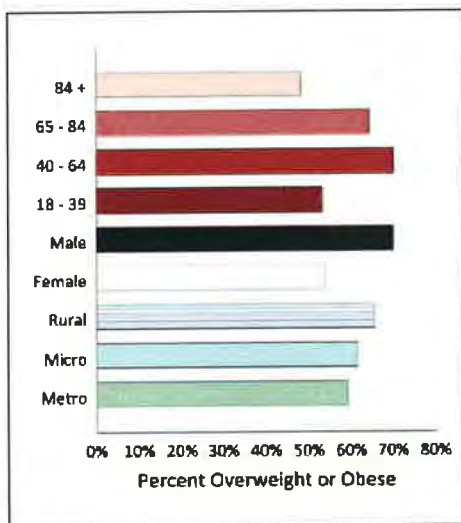


Figure 33. Overweight/Obesity in North Dakota.¹⁴

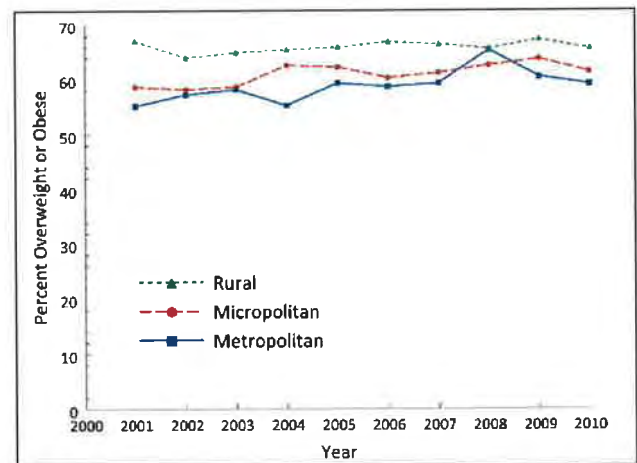


Figure 35. Prevalence of overweight and obesity by metropolitan, micropolitan (large rural), and rural areas.^{14, 15}

- Overweight/obesity consistently higher in rural areas, but is increasing in metropolitan and micropolitan areas.

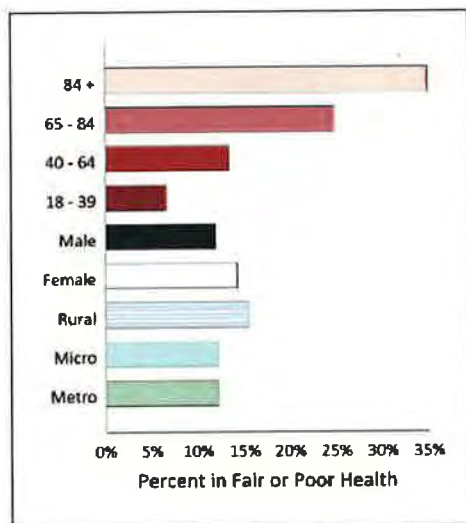


Figure 34. Fair/Poor Health in North Dakota.¹⁴

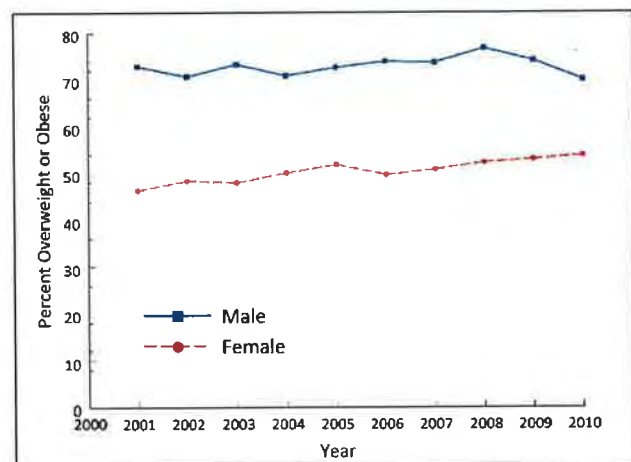


Figure 36. Prevalence of overweight and obesity by gender.¹⁴

- Obesity is consistently higher for males, but female obesity is increasing.

Health organizations and public programs use Healthy Days metrics to identify health disparities, track population trends, and build coalitions or health provider and community-based networks around ideas to solve health disparities. The analysis of HRQOL data can be used to determine public policy options for community solutions affecting both the individual level and the broader social context. The North Dakota data (in Table 3) once again indicate concern for a specific subpopulation that rests in rural areas and to some extent micropolitan areas. Age appears to be a factor (particularly being older). In some cases, being a male presents more problems, while under different measures, being female is associated with negative health factors. Geographical location (e.g., rural) is a common issue. While these data do not isolate race, considering that American Indian reservations are rural one

can assume this distinct subpopulation should be considered when evaluating policy options associated with HRQOL or Healthy Days related data.

HEALTH CONDITIONS

Health conditions that are not directly tied to behavioral issues also show gender, geographic and age gradients. It is likely that obesity is a common, but indirect, cause of many of these associations. For example, high cholesterol, high blood pressure, arthritis, and diabetes all are more common in obese patients. Thus, it should come as no surprise that many of these conditions show similar prevalence gradients as does overeating with obesity. As shown in Table 4, there are some clear associations between health conditions and various demographics.

Table 4

Percentage of adults reporting high cholesterol, blood pressure, arthritis, asthma, cardiovascular disease, or diabetes by gender and age for regions of North Dakota.^{14, 15}

N = ()	Total (493,396)	Female (247,538)	Male (248,859)	18-39 (197,809)	40-64 (202,152)	65-84 (84,650)	85+ (11,785)
High Cholesterol	26.8	27.1	26.6	8.7	34.6	50.3	29.1
Metro	26.8	27.7	25.9	9.6	34.3	51.8	29.0
Micro	26.2	28.4	24.1	7.3	36.3	50.2	30.9
Rural	27.8	26.3	29.3	9.1	33.9	48.9	28.4
High Blood Pressure	26.7	25.7	27.8	8.8	30.1	57.5	49.7
Metro	23.9	23.8	23.9	6.1	26.8	59.7	44.5
Micro	26.0	24.9	27.0	7.5	31.3	56.7	53.6
Rural	26.0	28.4	31.6	12.1	32.7	55.1	52.8
Arthritis	26.5	30.2	22.8	8.7	31.1	52.6	63.2
Metro	24.4	27.6	21.1	7.0	28.8	52.9	71.1
Micro	25.8	31.4	20.6	9.0	30.2	53.7	59.9
Rural	29.8	32.8	26.6	11.3	33.9	51.8	61.0
Asthma	10.6	11.9	9.2	12.1	9.8	9.7	5.9
Metro	9.3	10.1	8.5	9.9	9.0	8.9	6.5
Micro	12.8	14.3	11.2	16.9	10.8	8.8	3.9
Rural	10.4	12.1	8.7	11.3	9.9	10.4	6.5
CVD	7.8	5.9	9.7	0.9	6.7	22.7	36.7
Metro	7.4	5.4	9.2	0.7	6.9	21.7	33.1
Micro	6.6	5.0	8.4	0.9	4.9	20.4	40.1
Rural	9.1	7.2	11.1	1.2	7.6	24.7	39.0
Diabetes	7.4	6.2	8.6	1.8	8.6	17.3	11.6
Metro	6.8	6.8	6.7	1.3	7.9	16.7	12.0
Micro	7.5	5.7	9.6	2.3	8.8	16.7	11.7
Rural	8.2	6.1	10.3	2.0	9.3	18.0	11.3

Note. Data for adults with asthma, CVD, and diabetes are from 2010 BRFSS survey in North Dakota. Data on cholesterol, blood pressure, and arthritis are from 2009 survey.

The following list shows the associations found in North Dakota between various health conditions and certain demographic characteristics:

- High Cholesterol—older (65-84) females in rural areas
- High Blood Pressure—older (65+) males in rural areas
- Arthritis—older (65+) females in rural areas
- Asthma—younger (18-39) females in micropolitan (large rural) areas
- Cardiovascular disease—older (65+) males in rural areas
- Diabetes—older (65+) males in rural areas

Compared with national benchmarks, North Dakotans have a lower prevalence of various nonbehavioral health conditions than in other states, no doubt contributing to our better state of overall health. North Dakotans have a lower prevalence of high cholesterol (26.8% compared to 37.5%), high blood pressure (26.7% compared to 28.7%), asthma (10.6% compared to 13.8%), and diabetes (7.4% compared to 9.5%) than nationally. Nevertheless, the frequency of specific conditions (e.g., high blood pressure and asthma) varies substantially in different age groups. High blood pressure is mainly a disease of older adults, for example (see Figure 37), while asthma is somewhat more common in younger patients (see Figure 38).

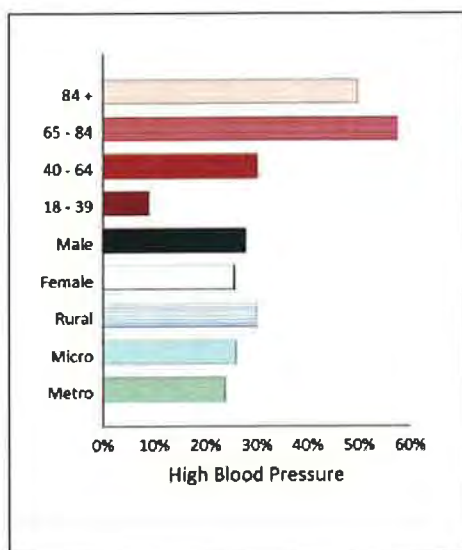


Figure 37. Prevalence of High Blood Pressure^{14, 15}

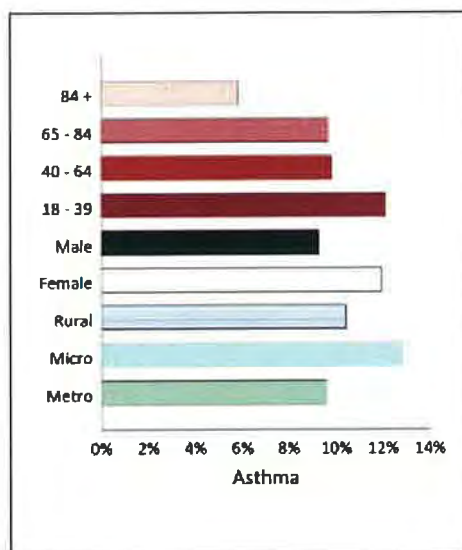


Figure 38. Prevalence of Asthma^{14, 15}

Diabetes is increasing in all areas, especially rural and metropolitan, as shown in Figure 39. It has increased in males over time, but has been generally stable in women (see Figure 40).

Chronic Disease

An important issue when examining the dynamics of health status is chronic disease. Chronic disease is commonly associated with aging, but people of all ages can experience it. Common chronic diseases include the following: cancer, heart disease, stroke, diabetes, chronic obstructive pulmonary disease (COPD), and arthritis. Significant health risk factors include smoking, lack of physical activity, and poor nutrition. Engaging in healthful behavior reduces the risk for illness. Chronic disease causes 7 in 10 deaths each year in the United States. About 133 million Americans (more than 40% of the country's population) live with at least one chronic condition. About one-fourth of the people with a

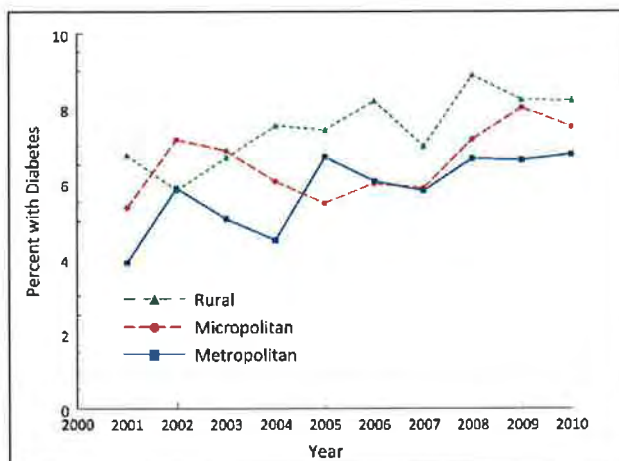


Figure 39. Prevalence of diabetes by metropolitan, micropolitan (large rural), and rural areas.^{14, 15}

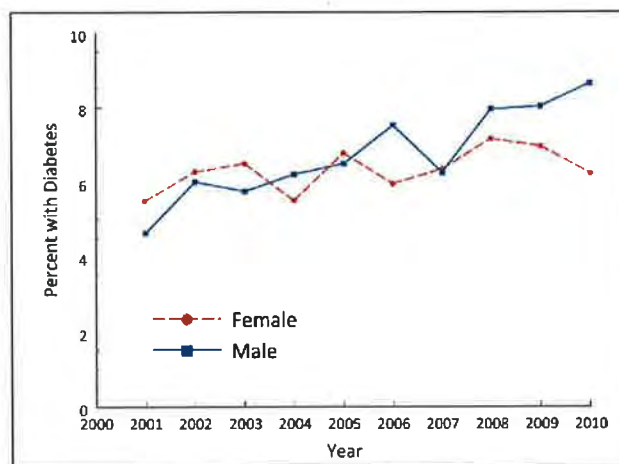


Figure 40. Prevalence of diabetes by gender.

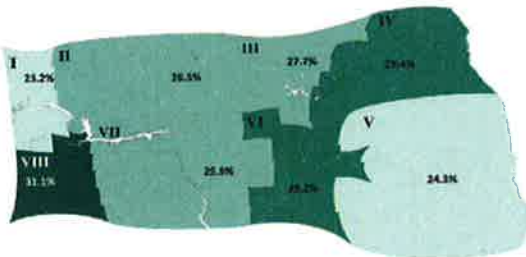
chronic disease have experienced significant limitations in daily activities. More than 75% of the cost of health care in the United States is related to chronic disease.¹⁸

High blood pressure, a risk factor for cardiovascular disease, is a highly prevalent condition that contributes to premature death, heart attack, stroke, diabetes, and renal disease.¹⁹ High cholesterol, a risk factor for cardiovascular disease, diabetes, and other diseases can be controlled to some degree by diet, exercise, and weight. High blood pressure and high cholesterol found together in the same patient create more medical problems, placing that patient at even greater risk. The Affordable Care Act will require new health plans to cover preventive services for certain populations, including testing for high blood pressure and cholesterol.²⁰ Newer concepts such as patient-centered medical homes and health system delivery channels such as Accountable Care Organizations will be used to facilitate

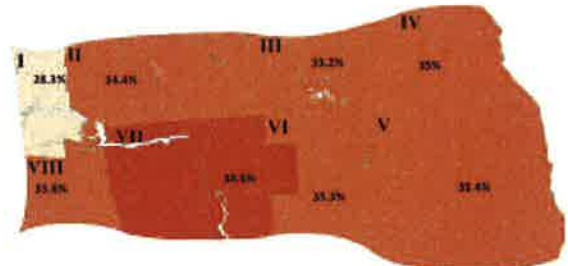
better care coordination and disease management.

The images below are cartograms of common health conditions. Regions used here are the North Dakota Department of Human Services' regions. The sizes of the regions have been adjusted according to their population. Darker regions have higher prevalence of health conditions.

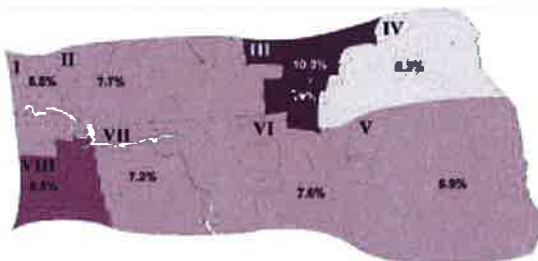
High cholesterol values are prevalent (> 30%) for all regions of the state, except region I (Northwest). High blood pressure is also more prevalent (> 25%) in the northwest and southeast parts of the state. Cardiovascular disease strikes the center of the state the hardest (> 8%). Diabetes has the lowest prevalence in the northeast part of the state (6.3%). It is most prevalent (> 8%) in the southwest and north central parts of the state. Arthritis is most prevalent (> 27%) in a band from the southwest to the central to the northeast. Asthma is focused in the west and northwest (12%).



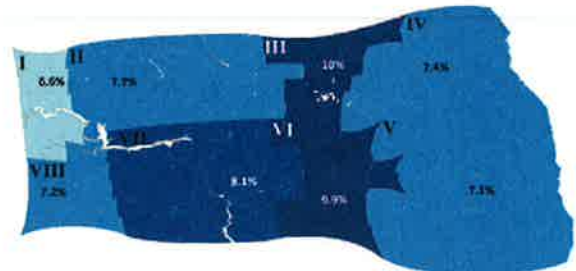
High Blood Pressure



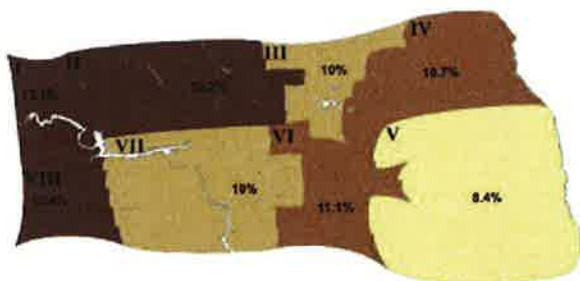
High Cholesterol



Diabetes



Cardiovascular Disease



Asthma



Arthritis

Children's Health

Children's health (birth to 18 years) is critically important because what we experience growing up can affect our health, attitudes about health, and our ability to change or manage our behavior. There are family genetic traits that can either act as barriers or serve to steer our health in positive directions; however, our attitudes and behavior as we mature are significant factors as well. Our early experiences as we mature have been shown to affect healthful development: cognitively, socially, emotionally, and physically. How a child behaves, learns, and adjusts in school and society is affected by health. How they interact with others and learn to interact relates to their health. How they move through life—education, work, having children—all have a connection to their health status when they were in early and middle childhood. This can be referred to as “pre-disease pathways,” which can manifest as medical conditions and adult health issues later.³ Healthy People 2020 developed six topic areas covering 21 adolescent health objectives. One of the topic areas is prevention of adult chronic diseases. This includes the following:³

- Reduce tobacco use by adolescents (9th- through 12th-grade students)
- Reduce the proportion of children and adolescents who are overweight or obese (12- to 19-year-olds)
- Increase the proportion of adolescents who engage in vigorous physical activity that promotes cardiorespiratory fitness three or more days per week for 20 or more minutes per occasion (9th- through 12th-grade students)

As shown in Table 5, adolescent females have a generally poorer behavioral risk profile than do adolescent males for all behaviors other than drinking.

Cancer

Cancer is the second leading cause of death among adults in the United States (second only to heart disease and stroke) and affects an estimated one in three individuals in their lifetime, either through their own diagnosis or that of a loved one. Increasing innovations in medical technology have led to earlier diagnoses and improved treatment of many cancers, resulting in more people diagnosed with cancer surviving each year. Currently, approximately 12 million Americans with a history of cancer were alive in 2008.²²

An estimate from the American Cancer Society is that in 2012 about 173,000 cancer deaths will be caused by tobacco use. Other evidence suggests that over 190,000 cancer deaths, about one-third, of the estimated 577,190 cancer deaths for 2012 will be related to overweight/obesity, physical inactivity, and poor nutrition. These deaths could be prevented. The five-year relative survival rates for cancer have improved significantly over the past 30 years: from 49% between 1975 and 1977 to 67% between 2001 and 2007.²³ This improved survival rate clearly is a consequence of earlier diagnosis. Yet

Table 5

*Behavioral risks, general health, and health conditions of children in North Dakota.*²¹

N = ()	Total (43,385)	Female (21,335)	Male (22,050)
Smokes	14.8	15.9	13.7
Drinks	23.6	19.5	28.7
Drinks & Drives	11.7	11.6	11.8
Doesn't Always Wear a Seat Belt	55.7	59.2	52.5
Doesn't Exercise Moderately	49.7	55.9	43.8
Overweight/Obese	28.2	31.5	25.0
Has Long-Term Health Problems	14.7	16.2	13.1

Note. Data for children middle school and high school age are from 2011 Youth Risk Behavior Survey in North Dakota.

- Females under 18 are more likely to smoke, not wear a seat belt, not exercise, be overweight, and have chronic health problems.
- Males under 18 are more likely to drink alcohol.

it should be noted that earlier diagnosis does not necessarily change the natural history of the disease. Thus, while the survival rate (i.e., people alive despite a diagnosis of cancer) has gone up substantially, the cancer mortality rate has only fallen a little.²³ The American Cancer Society estimates that in 2012 there will be over 1.6 million new cases of invasive cancer in the United States.²²

Age is a primary risk factor for most cancers, with about 77% of all cancers diagnosed among individuals aged 55 or older. While virtually anyone can experience cancer, some groups are more likely than others to be diagnosed with certain types of cancer; cancer incidence varies by race and ethnicity.²²

Black men and women are disproportionately affected by cancer. The five-year survival rate is lower for blacks than for whites. The incident rate for black men is 15% higher than for white men, and black males have a 33% higher death rate. Black women have a lower incidence rate (6% lower) than found in white women; however, they have a higher death rate (10%). The most precipitous decline in death rates, however, has been in black men at 2.4% per year, followed by Hispanic men, 2.3% per year.²² Available data indicate that cancer incidence for American Indians is lower than the U.S. population as a whole; however, the American Indian population is much younger (about 28 years vs. 36 years for the U.S.) and cancer tends to be more prevalent in older populations. Over the past 30 years, the incidence and death rates have been rising; cancer survival rates for American Indians are the lowest of any ethnic group.²⁴

As the second-leading cause of death in the country, cancer commands a place in U.S. health objectives. Healthy People 2020 presents 20 separate cancer-targeted objectives. For example, one objective is to reduce the overall cancer death rate by 10% (from 178.4 deaths per 100,000 to 160.6 deaths per 100,000).³

In North Dakota, females are more likely to encounter cancer than men up to the age of 55, but thereafter the incidence of cancer in men markedly increases relative to women (see Table 6 and Figure 41).

Table 6
Rate per 100,000 people and average number of cases of cancer per year in North Dakota by age and gender.^{25, 26}

Age	All North Dakota		Males		Females	
	Rate	Cases Per Year	Rate	Cases Per Year	Rate	Cases Per Year
0-4	26.1	8	28.0	5	24.1	4
5-9	10.2	4	12.7	2	7.7	1
10-14	16.2	6	12.8	3	19.6	4
15-19	25.7	13	21.4	6	30.4	7
20-24	33.6	22	29.0	10	38.9	12
25-29	80.9	33	58.1	13	107.7	20
30-34	96.6	33	78.0	14	116.8	19
35-39	149.2	53	93.5	17	208.1	36
40-44	266.3	107	183.6	37	349.3	70
45-49	402.1	187	286.3	66	517.0	121
50-54	611.5	282	577.0	135	646.9	147
55-59	909.8	354	950.1	190	867.1	164
60-64	1395.9	409	1631.1	239	1160.5	170
65-69	2017.6	462	2478.8	274	1587.8	188
70-74	2344.4	477	2897.2	270	1876.2	207
75-79	2553.7	472	3326.6	269	1955.0	204
80-84	2544.2	386	3233.5	197	2079.7	188
85+	2097.5	352	2881.3	152	1737.1	200
All ND	509.8	3,662	574.5	1,900	464.8	1,763

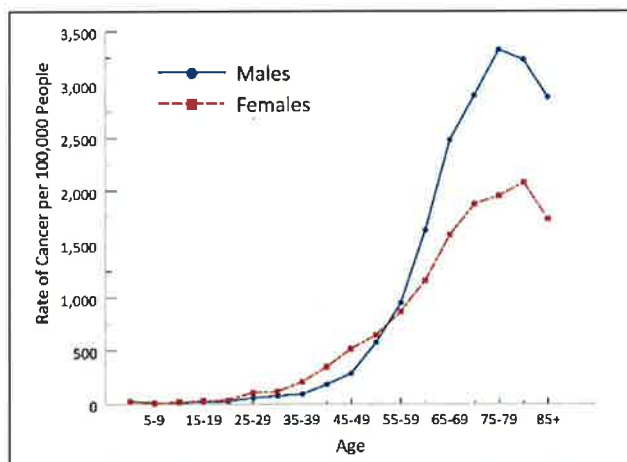


Figure 41. Rates of cancer per 100,000 people in North Dakota by age.^{25, 26}

- Females have higher rates of cancer in the 15- to 54-year-old age range. Male cancer rates are dramatically higher than females by age 65.

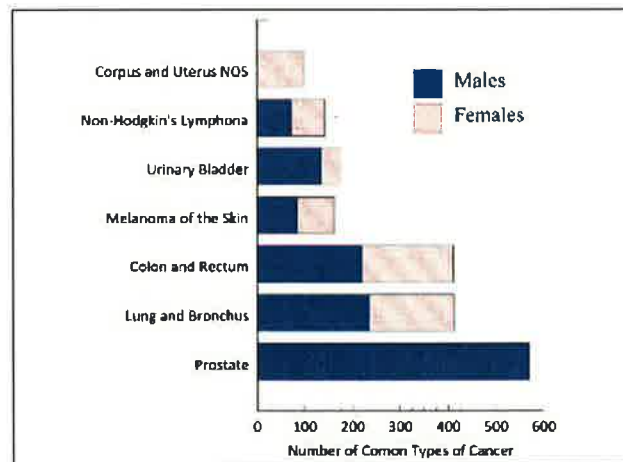


Figure 42. Incidence of most common types of cancers in North Dakota.²⁵

- Prostate cancer is the most common type in North Dakota.
- Males are more likely to have urinary or bladder cancer than females.

Prostate cancer is the most commonly diagnosed cancer in North Dakota (see Table 7 and Figure 42), followed by lung cancer. Conversely, lung cancer is the most common cause of cancer death, as in many cases, men die *with* their prostate cancer, rather than *from* it.

Importantly, the risk of cancer in North Dakota is somewhat higher than in the rest of the nation (see Figures 43 and 44).

Table 7
Rates per 100,000 people and average number of cases per year of most common cancers in North Dakota.^{25, 26}

TYPE	All North Dakota		Males		Females	
	Rate	Cases Per Year	Rate	Cases Per Year	Rate	Cases Per Year
Prostate	78.8	570	169.4	570	0	0
Lung and Bronchus	57.1	414	71.5	234	46.2	179
Colon and Rectum	54.9	411	65.7	219	45.8	192
Melanoma of the Skin	24.0	162	25.8	84	23.5	78
Urinary Bladder	23.6	177	40.9	135	10.1	42
Non-Hodgkin's Lymphoma	19.6	142	22.0	72	17.8	71
Corpus and Uterus	13.7	99	0	0	26.2	99

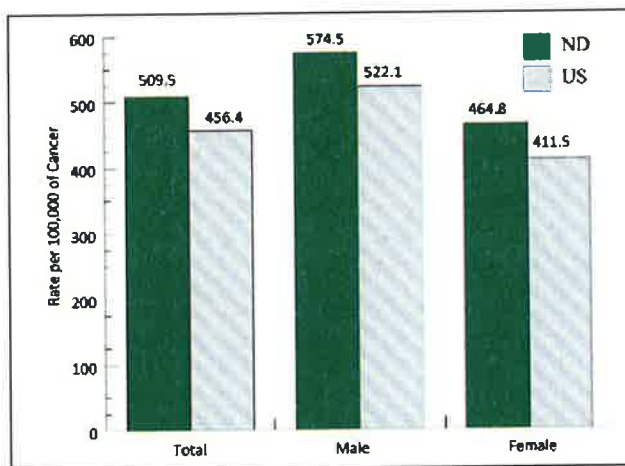


Figure 43. Rate of all cancers in North Dakota and the United States by gender.^{25, 26, 27}

- North Dakota has higher cancer rates than the United States for both males and females.

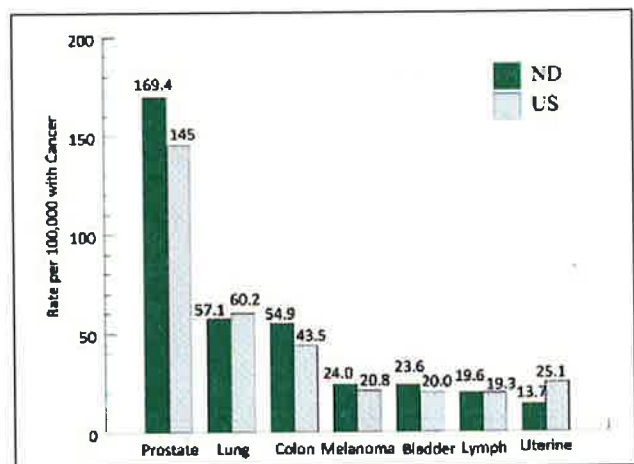


Figure 44. Rate of all cancers in North Dakota by cancer type.^{25, 26}

- North Dakota has higher cancer rates than the United States for prostate, colon, melanoma, and bladder cancer.

Screenings and Immunizations

Table 8 shows the percentage of adults in North Dakota who have had screenings for high cholesterol (past 5 years), digital rectal exam (ever), blood stool test (ever), sigmoidoscopy/colonoscopy (ever), mammogram (ever), Pap smear (ever), flu vaccine (past year), or pneumonia vaccine (ever) by age and gender for metropolitan, micropolitan (large rural), and rural areas.

Populations at risk for not testing include the following associations:

- High Cholesterol—older (65-84) females in metropolitan areas
- Digital Rectal Exam—older (65-84) males in metropolitan areas
- Blood Stool Test—older (over 65) females in metropolitan areas
- Sigmoidoscopy/Colonoscopy—older (65-84) females in metropolitan areas
- Mammogram—older (65-84) females in metropolitan areas
- Pap Smear—older (40-84) females in metropolitan areas
- Yearly Flu Vaccine—older (84+) females in metropolitan areas
- Five-Year Pneumonia Vaccine—older (84+) females in metropolitan areas
- Females and people 65-84 were more likely to have screenings and immunizations
- Screenings and immunizations were generally more prevalent in the northeast and southeast parts of North Dakota.
- People in North Dakota were more likely to have blood stool screening compared to the United States (27.4% to 17.2%) and Pap smear tests than the United States (90.8% compared to 81.3%).
- Screenings for three other conditions were lower in North Dakota than the United States: cholesterol (73.2% compared to 77.0%), sigmoidoscopy/colonoscopy (43.4% compared to 65.2%), and mammograms (61.6% compared to 75.2%). Immunizations for both flu (43.7% compared to 67.5%) and pneumonia (24.6% compared to 68.8%) were lower in North Dakota.

According to Healthy People 2020, people in the United States continue to develop diseases that are vaccine preventable. The increase in life expectancy (about 49 years in 1900 and 78 years in 2000) is the result of a significant reduction in infectious disease mortality associated with the development of immunizations.³ The development of a public health infrastructure has played a major role in improved life expectancy (e.g., focusing on water safety, infectious disease control, safer and more healthful foods, healthier mothers and babies, family planning, tobacco control, vaccinations, motor vehicle safety, more healthful and safer workplaces, and the decline in deaths from coronary heart disease and stroke).²⁸

Vaccines are among the most cost-effective clinical

preventive services and are a core component of any preventive services package. Childhood immunization programs provide a particularly high return on investment. Following a routine immunization schedule, for each birth cohort, 33,000 lives can be saved, 14 million cases of disease can be prevented, direct health care costs are reduced by \$9.9 billion, and over \$33 billion in indirect health costs are saved. The lack of access to vaccinations or decisions to not seek such services can account for approximately 42,000 adults and 300 children in the United States dying each year from vaccine-preventable diseases.²⁸

Health screenings are an important way to evaluate risk factors for disease (e.g., cancer, cardiovascular, diabetes). Baseline data are acquired that can assist physicians and other providers to measure blood pressure, cholesterol, blood sugars, weight and height, and body fat. It provides the evidence needed both for prevention and disease management. Health screenings also aid the patient to be more proactive in their own care and adequate baseline data can spur heightened interest and involvement on the part of the patient.

The importance of various health screenings is discussed in Healthy People 2020. For example, the monitoring and management of weight, blood pressure, and cholesterol can reduce adults' risk for heart disease and diabetes; routine screening can detect certain cancers (e.g., breast, colorectal, and skin) at earlier stages that are then treatable; and regular checkups for adults 65 and older can help to screen for age-related conditions such as eye disease and hearing loss.³

Under the Affordable Care Act (ACA), the idea of prevention is elevated as a means to not only advance health but also to address rising health care costs. Certain preventive services are covered (without requiring the patient or client to provide a co-payment or co-insurance):

- Sixteen preventive services for adults, including the following:²⁰
 - o Blood pressure screening
 - o Cholesterol screening
 - o Colorectal cancer screening
 - o Diet counseling and obesity screening
 - o Tobacco use screening
 - o Specific immunizations (e.g., hepatitis A and B, influenza)
- Twenty-two covered preventive services for women, including pregnant women, including the following:
 - o Breast cancer mammography screenings every one to two years for women over 40
 - o Breast cancer chemoprevention counseling for women at higher risk
 - o Cervical cancer screening
 - o Domestic and interpersonal violence screening
 - o Osteoporosis screening for women over 60
 - o Tobacco use screening
- Twenty-seven covered preventive services for children, including the following:
 - o Autism screening

Table 8

Percentage of adults with screening for high cholesterol, digital rectal exam, blood stool test, sigmoid scope, mammogram, Pap smear, flu vaccine, or pneumonia vaccine by gender and age for areas of North Dakota.^{14, 15}

N = ()	Total (493,396)	Female (247,538)	Male (248,859)	18-39 (197,809)	40-64 (202,152)	65-84 (84,650)	85+ (11,785)
Cholesterol	73.2	75.3	71.1	53.4	84.1	92.6	80.7
Metro	74.9	77.0	72.8	56.0	87.2	92.8	79.4
Micro	71.6	76.2	67.2	53.2	81.6	94.2	78.3
Rural	72.9	72.6	73.2	50.4	82.7	91.4	84.0
Dig. Rectal	73.2		73.2		66.7	90.3	83.1
Metro	77.9		77.9		73.5	89.5	85.9
Micro	72.4		72.4		66.3	89.3	87.2
Rural	68.7		68.7		59.6	91.3	73.3
Blood Stool	27.4	31.1	24.5		17.9	47.1	47.3
Metro	29.2	32.2	26.2		20.5	47.4	60.7
Micro	25.0	27.8	21.7		17.0	42.6	36.7
Rural	26.9	29.5	24.2		15.8	49.8	40.1
Sigmoid	43.4	45.4	41.3		30.3	72.7	57.8
Metro	49.7	51.2	48.2		38.5	76.9	64.9
Micro	39.6	43.7	34.7		26.4	69.8	51.8
Rural	39.2	40.8	37.4		23.9	70.7	54.5
Mammog.	61.6	61.6		13.8	89.1	94.3	83.7
Metro	64.5	64.5		15.9	89.9	96.7	87.9
Micro	60.4	60.5		13.9	90.2	95.2	83.0
Rural	61.0	61.0		12.1	87.6	91.3	80.6
Pap	90.8	90.8		84.2	96.0	94.9	77.5
Metro	90.4	90.4		81.7	96.0	96.9	75.9
Micro	90.3	90.3		84.5	96.0	93.6	68.6
Rural	92.6	92.6		88.9	96.3	94.0	82.6
Flu	43.7	49.1	38.4	36.3	40.7	64.4	72.3
Metro	48.7	53.8	44.0	39.0	49.6	67.1	71.4
Micro	40.7	45.2	35.7	37.2	34.7	60.3	66.8
Rural	40.6	47.3	34.0	32.8	34.9	64.2	76.0
Pneumonia	24.6	26.3	22.9	11.9	16.8	65.9	75.2
Metro	24.4	26.8	22.2	10.1	17.6	69.8	83.2
Micro	23.6	25.0	21.9	16.1	12.5	62.1	70.4
Rural	26.1	27.7	24.4	11.7	19.0	65.0	70.5

Note. Data for adults with screenings and immunizations are from 2010 BRFSS survey in North Dakota. Data on cholesterol are from the 2009 survey. Digital rectal screening only males 40 and older. Blood stool and sigmoid scope only people 40 and older. Mammograms and Pap smears only females.

- o Developmental screening for children under three
- o Behavioral assessments
- o Hearing screenings
- o Immunization vaccines

Mortality

Nationally, premature mortality is higher in rural areas than urban areas.²⁹ The North Dakota data indicate that the state's mortality rates exceeding national rates are more recent phenomena (about 2009). National data indicate that mortality can vary for rural and urban areas by age. For example, the age-adjusted death rates for people from age 1

to 24 indicated that rates for those living in most rural counties were 31% higher in this age cohort than for those living in most urban counties, and 65% higher than persons in suburban areas. For the 25-to-64 age cohort, age-adjusted death rates for rural exceeded suburban counties by 32% but the rate for rural and urban in this cohort was similar. The oldest age cohort, 65 and older, found the rural rate exceeded the urban death rate by about 7%.

Unintentional injuries, suicide, and chronic obstructive pulmonary disease had higher death rates in rural areas than in urbanized counties and suburban areas. The rural rate exceeded the suburban rate by 86% for unintentional injuries.

Motor vehicle crashes are a form of unintentional death and would likely be a contributing factor in geographical comparisons. The age-adjusted suicide rate for persons aged 15 and older was 37% higher in rural areas than in suburban regions. Rural males have a 47% higher mortality rate from suicide than suburban males. The chronic obstructive pulmonary disease death rate also was higher in rural areas. The rate for rural males was 32% higher than for urban males.²⁹

The rural maternal mortality rate is higher than found in urban areas. Likely contributing factors are rural women have less adequate prenatal care, are more likely to be on public health insurance or have no insurance, and have less access to adequate primary care. The latter issue is related to the general lower supply of rural-based primary care combined with less direct access to obstetricians, along with malpractice and liability concerns.³⁰

Changes in Mortality

Although U.S. mortality has shown a steady decrease since 1999, mortality rates in North Dakota have been more variable (see Figure 47). Although traditionally lower than the U.S. rates, North Dakota has experienced a progressive increase in mortality rates since 2007 and most recently (2010) exceeded the national rates for the first time in at least a decade. This increase was most prominent in the micro- and metropolitan areas and relatively stable in the rural areas (see Figure 48).

Elements of the Affordable Care Act, over time, may have some effect on mortality rates. Improved overall health status, including mortality rates, may be realized by strengthening the primary care supply; emphasizing prevention and health promotion (including more universal coverage via limitations on some co-payments and co-insurance in health plans); creating avenues for better care coordination and management (including movement toward patient-centered medical homes); taking steps to monitor and then improve quality of care; and finally focusing on evidenced-based medicine and the strategic linking of quality and medical outcomes to payment.

SUMMARY

Males have the highest at-risk behaviors, including smoking, drinking, and no seat belt use. These are most prevalent in rural areas. The rate of smoking in North Dakota is comparable to the United States, though drinking is higher. Smoking is decreasing in metropolitan areas.

Females in North Dakota tend to have poorer health in general, especially females residing in rural areas. Weight is a great problem among North Dakota males and those in rural areas. Weight is a health concern that is increasing in North Dakota. However, these aspects are generally lower than national averages.

Health conditions are more prevalent in rural areas with the exception of asthma, and are most common among North Dakotans age 65 or older. Many of these conditions are below national norms, though diabetes is rising.

In North Dakota, females under 18 are more likely to smoke, not wear a seat belt, not exercise, be overweight, and have chronic health problems while males under 18 are more likely to drink alcohol.

Cancer is higher for females in the 15- to 54-year-old age range but male cancer rates are dramatically higher than females by age 65. Prostate cancer is the most common cancer in North Dakota. Overall, North Dakota has higher cancer rates than the United States, perhaps because of a larger older adult population. A few cancers, such as lung/bronchus and corpus/uterus, are lower in North Dakota.

Females in North Dakota tend to do more screenings and have immunizations than males. People in metropolitan areas tend to do more screenings and immunizations.

Immunizations in North Dakota are below the U.S. rates.

For the first time in recent history (since 1999), age-adjusted death rates in North Dakota in 2010 are higher than the United States. Rural areas have more deaths in the 65 and older age group, while metropolitan areas have more deaths in the 40-64 age group. Central North Dakota has the highest adjusted death rates, while the southwest and eastern regions have the lowest. Mortality in rural areas has remained fairly steady, while mortality in micro- and metropolitan areas has increased recently (since 2007).

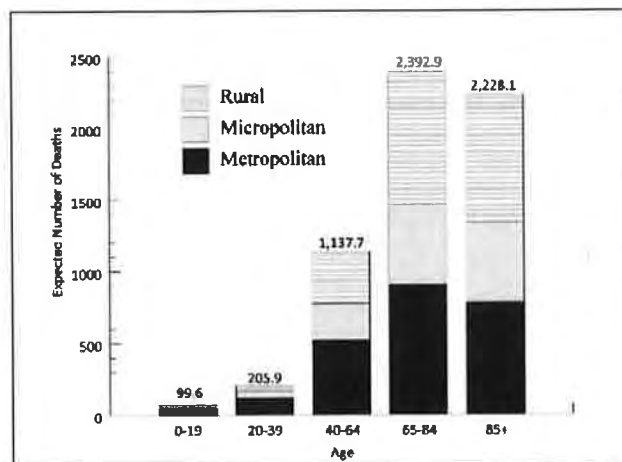


Figure 45. Expected number of deaths in North Dakota per age group after adjusting for demographic factors specific to each region.^{15, 26, 31}

- Rural North Dakota had the most deaths in the 65 and older age groups.
- Metropolitan areas had the most deaths in the 40-64 age groups.

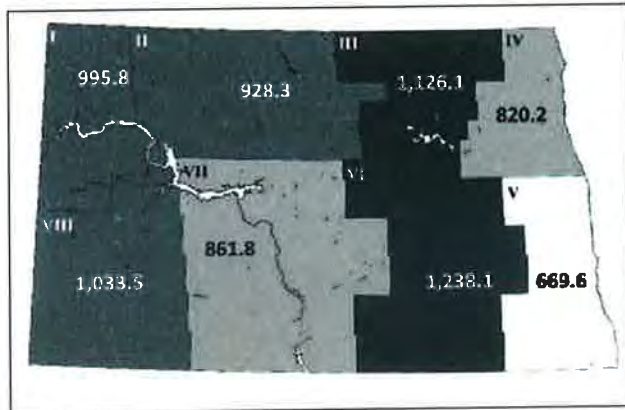


Figure 46. Mortality rate in North Dakota regions after adjusting for age.^{26, 31}

- Regions III and VI had the highest mortality rates.
- Regions IV, V, and VII had the lowest.

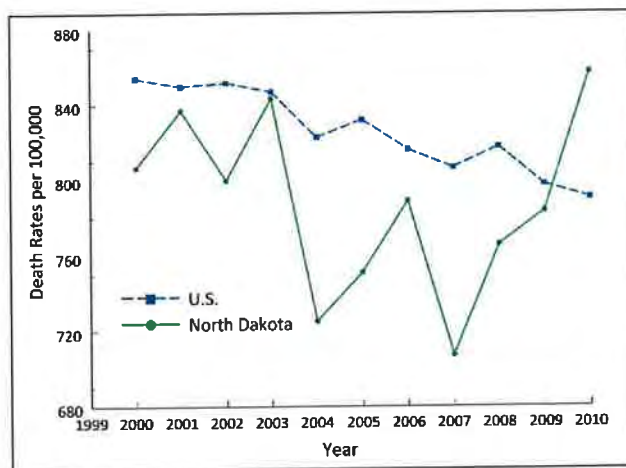


Figure 47. Changes in North Dakota mortality rates from 2000 to 2010 compared to the United States.^{26, 31, 32, 33}

- There has been an increase in death rates for North Dakota since 2007, especially in metropolitan and micropolitan (large rural) areas.
- The metropolitan adjusted rate was 635.3, for micropolitan it was 948.1, and for rural it was 1,162.4.
- The age-adjusted death rate for North Dakota in 2010 was 857.2 deaths per 100,000 people. This was higher than the national rate of 790.5 deaths per 100,000 people.

References

1. Minority Health and Health Disparities Research and Education Act; Public Law 106-525. Washington, D.C., U.S. Government Printing Office, Superintendent of Documents, 22 November 2000.

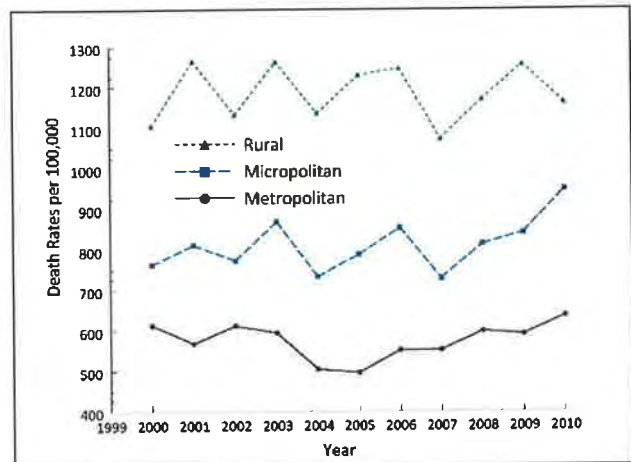


Figure 48. Changes in North Dakota mortality rates from 2000 to 2010 for metropolitan, micropolitan (large rural), and rural areas.^{15, 26, 31, 33}

- The metropolitan adjusted rate was 635.3, for micropolitan it was 948.1, and for rural it was 1,162.4.

2. U.S. Health Policy Gateway. (2012). *Health Disparities Overview*. Retrieved from <http://ushealthpolicygateway.wordpress.com/payer-trade-groups/k-barriers-to-access/racial-ethnic-and-cultural-disparities/>
3. U.S. Department of Health and Human Services. Office of Disease Prevention and Health Promotion. *Healthy People 2020*. Washington, DC. Available at [Specific URL]. Accessed 9/15/2012.
4. The Commonwealth Fund Commission on a High Performance Health System. (2009). *The Path to a High Performance U.S. Health System: A 2020 Vision and the Policies to Pave the Way*. Retrieved from http://www.commonwealthfund.org/~media/Files/Publications/Fund%20Report/2009/Feb/The%20Path%20to%20a%20High%20Performance%20US%20Health%20System/1237_Commission_path_high_perform_US_hlt_sys_WEB_rev_03052009.pdf.
5. Martin, A.B. et al. (January 2012). Growth in US health spending remained slow in 2010; Health share of gross domestic product was unchanged from 2009. *Health Affairs* 31(1): 208-219.
6. Organization for Economic Cooperation and Development. (2012). *OECD Health Data 2012 How Does the United States Compare*. Retrieved from <http://www.oecd.org/unitedstates/BriefingNoteUSA2012.pdf>
7. *World Health Organization* (2011). *World Health Statistics 2011*. Geneva: World Health Organization.
8. The United Health Foundation, American Public Health Association, and Partnership for Prevention. *America's Health Rankings*. Retrieved from <http://www.americashealthrankings.org/SiteFiles/Reports/AHR%202011edition.pdf>.

9. Institute of Medicine. (2001). *Crossing the Quality Chasm: A New Health System for the 21st Century* [Policy Brief]. Retrieved from www.nap.edu/html/quality_chasm/reportbrief.pdf.
10. Institute of Medicine (IOM). (2000). *To Err Is Human: Building a Safer Health System*. L. T. Kohn, J. M. Corrigan, and M. S. Donaldson, eds. Washington, D.C: National Academy Press.
11. Institute of Medicine. Committee on the Future of Rural Health Care. Board on Health Care Services. (2005). *Quality through collaboration: The future of rural health*. Washington, DC: National Academies Press.
12. U.S. Department of Health and Human Services. (n.d.). *Creating Jobs and Increasing the Number of Primary Care Providers* [Fact Sheet]. Retrieved from <http://www.healthreform.gov/newsroom/primarycareworkforce.html/>.
13. MacKinney, A.C., Lundblad, J.P., Coburn, A.F., McBride, T.D., Mueller, K.J. (2010). *Securing High Quality Health Care in Rural America: The Impetus for Change in the Affordable Care Act*. Retrieved from http://www.rupri.org/Forms/HealthPanel_ACA_Dec2010.pdf.
14. Centers for Disease Control and Prevention (CDC) (2010). *Behavioral Risk Factor Surveillance System Survey Data*. Atlanta, Georgia: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
15. U.S. Census Bureau. (2009). *Metropolitan and Micropolitan Statistical Areas and Definitions* [Data file]. Retrieved from <http://www.census.gov/>.
16. Murphy, E.M. (2005). *Health Bulletin 2: Promoting Healthy Behavior*. Washington, DC: Population Reference Bureau.
17. U.S. Centers for Disease Control. (n.d.). Health-Related Quality of Life Concepts. In health Related Quality of Life. Retrieved from <http://www.cdc.gov/hrqol/concept.htm>.
18. U.S. Centers for Disease Control. (2009). *Chronic Diseases: The Power to Prevent, The Call to Control*. Retrieved from <http://www.cdc.gov/chronicdisease/resources/publications/aag/pdf/chronic.pdf>.
19. Agency for Healthcare Research and Quality. (June 2009). *Cardiovascular Diseases: Patient Brochures and Clinician Fact Sheets*. Retrieved from <http://www.ahrq.gov/clinic/cvd/>.
20. U.S. Department of Health and Human Services. (2010). *Preventive Services Covered Under the Affordable Care Act* [Fact Sheet]. Retrieved from <http://www.healthcare.gov/news/factsheets/2010/07/preventive-services-list.html>.
21. Centers for Disease Control and Prevention. (2011). *Youth Risk Behavior Survey*. Available at: www.cdc.gov/yrbs. Accessed on August 1, 2012.
22. American Cancer Society. (2012). *Cancer Facts and Figures 2012*. Retrieved from http://www.cancer.org/acs/groups/content/@epidemiology_surveillance/documents/document/acspc-031941.pdf.
23. Welch H, Schwartz LM, Woloshin S. Are Increasing 5-Year Survival Rates Evidence of Success Against Cancer? *JAMA*. 2000;283(22):2975-2978.
24. Wiggins CL, Espey DK, Wingo PA, Kaur JS, Wilson RT, Swan J, Miller BA, Jim MA, Kelly JJ, Lanier AP. Cancer among American Indians and Alaska Natives in the United States, 1999–2004. *Cancer* 2008;113(S5):1142–1152.
25. North Dakota Department of Health. (2010). *North Dakota Statewide Cancer Registry*. Available at: <http://www.ndccr.net/>. Accessed on 6/1/2012.
26. U.S. Census Bureau. (2011). *2010 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
27. U.S. National Cancer Institute. (2010). *Surveillance, Epidemiology, and End Results (SEER) Program* (www.seer.cancer.gov). Available at <http://seer.cancer.gov/statistics/>. Accessed on 7/18/2012.
28. U.S. Centers for Disease Control. (2001). *Public Health Infrastructure: A Status Report*. Retrieved from http://www.phppo.cdc.gov/documents/phireport2_16.pdf.
29. Eberhardt M.S., Pamuk E.R. The importance of place of residence: Examining Health in Rural and Nonrural Areas. *Am. J. Public Health*. 2004;94:1682–1686.
30. Hart, L.G., Lishner, D.M. (2007). *Rural Maternal and Infant Health*. Retrieved from <http://ruralhealth.und.edu/pdf/hart.pdf>.
31. North Dakota Department of Health, Vital Records. (2010). *Deaths and Death Rates by County* [Data file]. Retrieved from <http://ndhealth.gov/vital/stats.htm>.
32. Centers for Disease Control and Prevention, National Center for Health Statistics (2000-2009). *Mortality Multiple Cause File* [Data File]. Available at: http://www.cdc.gov/nchs/data_access/Vitalstatsonline.htm.
33. U.S. Census Bureau. (2011). *2000 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.

THREE

Physician Workforce in North Dakota*

***Overall limitations with health workforce information**

The information used in this report has certain limitations. In some cases, provider specialty data are not available. In all cases, full-time equivalent work information is not available. In some cases, only active license data are available.

In this chapter, the composition and distribution of the physician component of the health care workforce will be described and analyzed.

PHYSICIAN DISTRIBUTION

Physician distribution in North Dakota varies dramatically by geography, with greater population per physician in rural areas than in counties with larger cities (see Figure 49). In fact, 17 of North Dakota's 53 counties have no practicing physicians (population of 34,636), or about 5% of the state's total population.

Parenthetically, many indices of physician supply consider the inverse of the data shown in Figure 49, or physicians per population. Regardless of whether the metric is population/physicians or physicians/population, rural regions of North Dakota have relatively fewer physicians than the micro- and metropolitan areas, and this is an enduring finding, extending back for decades.

Supply of Physicians Compared to the Nation

When analyzing the availability of physicians to provide health care services in North Dakota compared with regional and national benchmarks, it is important that the comparisons are of similar designations—that is, ensuring that apples are being compared with apples. Table 8a outlines the various datasets used in the comparisons to follow, with a description of the characteristics of each. Because North Dakota has the lowest number of residency slots per medical school seat in the country, we have significantly fewer residents on a proportional basis than virtually any other state. North Dakota's relative dearth of resident physicians accounts for the different assessment as to physician supply in the state compared with national benchmarks. Since residents in North Dakota perform somewhat less direct patient care activities than in other states, a comparison with them excluded probably most accurately reflects the actual situation in regard to physician supply.

Raw data from the American Medical Association (AMA) is the basis for all physician data reporting. The U.S. Department of Health and Human Services (HHS) and The

Henry J. Kaiser Family Foundation create their tables from AMA tables. They use all residents along with currently practicing physicians in their reporting (though they can exclude hospital-based residents if preferred). The Association of American Medical Colleges (AAMC) uses AMA raw data for their tables and excludes all residents from their calculations. For North Dakota, rates could be from the HHS Health Resources and Services Administration Area Resource File (ARF) or Kaiser tables, or AAMC tables. ARF, Kaiser and the AAMC also use different population estimates for each state. Table 8a shows the data source, rates of physicians, and categories available for each type of data set.

If all residents are excluded, as in the standard AAMC tables, we cannot make any comparisons based on metropolitan, micropolitan, rural, or demographics. The North Dakota rate is 21.7 physicians per 10,000 population and the national rate is 21.9 per 10,000. When excluding residents, there is only a difference of 0.2 physicians per 10,000 population between North Dakota and the United States.

If just hospital residents are excluded, we can use the ARF data which would have metropolitan, micropolitan, and rural categories, but we cannot use the AAMC. Excluding just hospital residents reduces the number of physicians in states where there are large teaching medical schools. In North

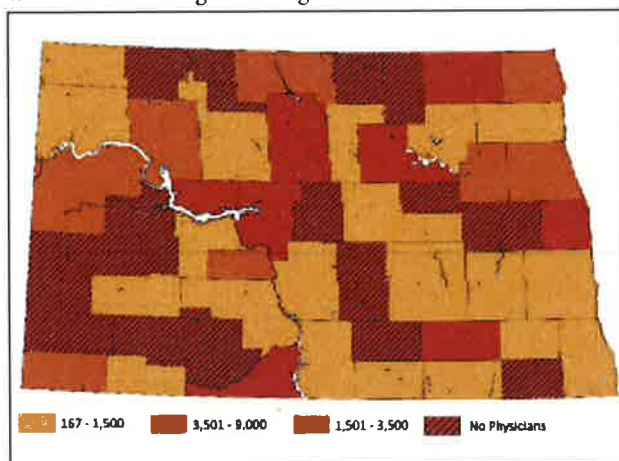


Figure 49. County population per physician for all specialties in North Dakota.^{1,2}

Table 8a

Physicians per 10,000 population in North Dakota and the United States according to datasets from the AMA, ARF, The Henry J. Kaiser Family Foundation, and the AAMC.

Source Dataset	ARF/Kaiser (AMA tables)		AAMC (AMA raw data)	
	ND	US	ND	US
All Residents Excluded	n/a	n/a	21.7	21.9
Hospital Res Excluded	24.4	23.2	n/a	n/a
No Residents Excluded	26.2	26.7	23.4	25.5

Note: ARF = Health Resources and Services Administration Area Resource File; AAMC = Association of American Medical Colleges; AMA = American Medical Association; n/a = not available

Dakota, the physician rate according to ARF data is 24.4 per 10,000 population, and the national rate is 23.2 physicians per 10,000 population, a difference of 1.2 more physicians per 10,000 population in North Dakota (a reflection of the few hospital residents in North Dakota).

If no residents are excluded, the ARF/Kaiser analysis is able to compare national data with North Dakota for all metropolitan/micropolitan/rural and demographic categories. Also the AAMC can report values for total numbers, though no categories. The ARF/Kaiser tables report a rate of 26.2 physicians per 10,000 population in North Dakota which includes residents. The national rate from these tables is 26.7 per 10,000 population. When AAMC data are used and residents are brought back into the tables, the rate in North Dakota is 23.4 per 10,000 population, and the national rate is 25.5 per 10,000 population. This leads to a difference of 0.5 to 1.1 physicians per 10,000 population.

Overall North Dakota has slightly fewer physicians per 10,000 population than the comparison groups (4% fewer than in the Midwest states and 2% fewer than in the United States; see Figure 50).

As shown in Table 9, North Dakota has more physicians per 10,000 population than the comparison groups for metropolitan and micropolitan counties. Note that *micropolitan* is a U.S. Census Bureau label that designates large nonmetropolitan areas (i.e., population less than 50,000) that are often designated as large rural and has historically been counted as rural/nonmetropolitan population. The term *micropolitan* might have more aptly been termed “macrorural.”

As for gender, North Dakota has fewer female physicians per 10,000 population than the Midwest and United States

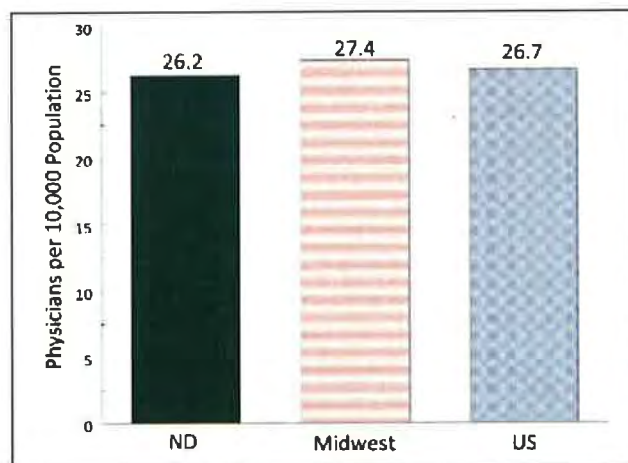


Figure 50. Number of physicians per 10,000 population for North Dakota, the upper Midwest, and the United States (includes residents).^{1, 2, 3}

- North Dakota has five fewer physicians per 100,000 population compared to the United States and 12 fewer compared to other upper Midwest states.

(see Table 9). Regarding female physicians per 10,000 population overall, North Dakota has 17% fewer female physicians than the United States and 28% fewer female physicians than for the upper Midwest. It will be interesting to observe the trend in gender of physicians in the future. The University of North Dakota School of Medicine and Health Sciences, like most medical schools in the country, currently graduates about equal numbers of men and women, so it could be anticipated that the number of female physicians in North Dakota should increase over time.

North Dakota has more male physicians per 10,000 population in metropolitan, micropolitan (large rural), and rural counties. Overall, North Dakota has 16% more male physicians per 10,000 population than for the upper Midwest and 11% more compared with the United States.

The pattern of physicians per 10,000 population in North Dakota is more complex than described for physician gender. North Dakota has relatively more physicians in metropolitan and micropolitan (large rural) hospitals than in the comparison groups, but the reverse is true for rural counties (see Table 10). Regarding hospital physicians per 10,000 population overall, North Dakota has 13% fewer hospital physicians than the United States and 4% fewer hospital physicians than for the upper Midwest.

Table 9
Male and female physicians per 10,000 population in North Dakota compared to upper Midwest states and the United States by metropolitan status.^{1, 2, 3, 4}

	ND	Midwest	US
Female	6.3	7.6	8.7
Metropolitan	10.0	10.1	9.8
Micropolitan	4.6	4.0	3.3
Rural	1.5	2.1	1.9
Male	19.9	17.1	18.0
Metropolitan	29.9	21.5	19.8
Micropolitan	15.9	12.2	10.6
Rural	6.3	6.1	5.7

Table 10
Physicians primarily in office or hospital practices per 10,000 population in North Dakota compared to upper Midwest states and the United States by metropolitan county status.^{1, 2, 3, 4}

	ND	Midwest	US
Office	17.0	17.7	18.0
Metropolitan	25.8	21.8	19.7
Micropolitan	13.2	13.6	11.3
Rural	5.2	6.9	6.2
Hospital	4.6	4.8	5.3
Metropolitan	7.4	6.6	6.1
Micropolitan	3.7	1.8	1.7
Rural	0.7	1.0	1.0

For office-based physicians per 10,000 population overall, North Dakota has 6% fewer office-based physicians than the United States and 4% fewer office-based physicians than for the upper Midwest, which are relatively small differences. The rates for metropolitan, micropolitan (large rural), and rural are higher, about the same as, and lower than the Midwest and U.S. rates. For instance, North Dakota rural areas are 25% and 16% lower than for the Midwest and the United States. Thus, North Dakota has lower office-based practice in metropolitan and rural areas compared with the comparison areas.

Overall North Dakota has significantly fewer physicians under the age of 55 per 10,000 population than does the Midwest and U.S. comparison groups, and this is especially true for the under-35 age group (see Table 11). Likewise North Dakota has relatively fewer physicians in the 65-to-74 age group. However, North Dakota has relatively more physicians per 10,000 population in metropolitan counties for all but the youngest and oldest age groups. North Dakota has relatively fewer physicians in rural counties in all age categories than the Midwest and United States.

All three types of counties (e.g., metropolitan) in North Dakota have relatively more international medical graduate (IMG) physicians per 10,000 population than does the upper Midwest and United States (e.g., 24% more in metropolitan counties than in Midwest counties).

North Dakota has a significantly lower percentage of its physicians who are female than selected upper Midwest states (Iowa, Minnesota, Montana, Nebraska, South Dakota, Wyoming and Wisconsin), and the United States as a whole

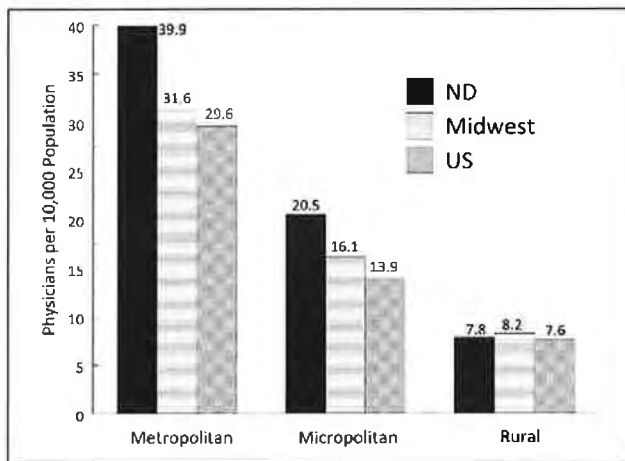


Figure 51. Physicians per 10,000 population for North Dakota, the upper Midwest, and the United States for metropolitan, micropolitan (large rural), and rural areas.^{1, 2, 3, 4}

- North Dakota is slightly higher in physicians for metro- and micropolitan areas, but lags in rural areas compared with the Midwest.

(North Dakota 24.7% versus Minnesota 30.8% and the United States 32.5%). The national trend over the past decades is for the percentage of physicians who are female across the nation to be increasing.

North Dakota physicians are less likely to be in a hospital-based practice than the comparison groups. This likely is a reflection of North Dakota's emphasis on family medicine and primary care, which are clinic and office-based practices. However, North Dakota physicians are more likely to be IMGs than in Midwestern states (23.1% versus 16.4%) and only slightly lower than the national average (23.1% versus 24.8%). Thus, for all three of the physician characteristics shown in Figure 52, North Dakota's practicing physicians tend to be different than for the Midwest comparison group and substantially different than for the United States for females and hospital-based physicians.

As shown in Figure 53, North Dakota's physicians are comparatively older than those of the Midwest states and U.S. comparison groups, with a much lower percentage of physicians less than 35 years of age. It is cause for concern as far as future physician workforce needs that the population of North Dakota physicians who are 55 to 64 years of age is significantly higher than the U.S. and Midwest comparison groups, since those physicians are likely candidates for retirement in the next decade. Since they constitute nearly 30% of the physician workforce, the potential impact of their retirement could be substantial, and likely will exacerbate any other workforce shortage otherwise anticipated.

Origin of North Dakota Physicians

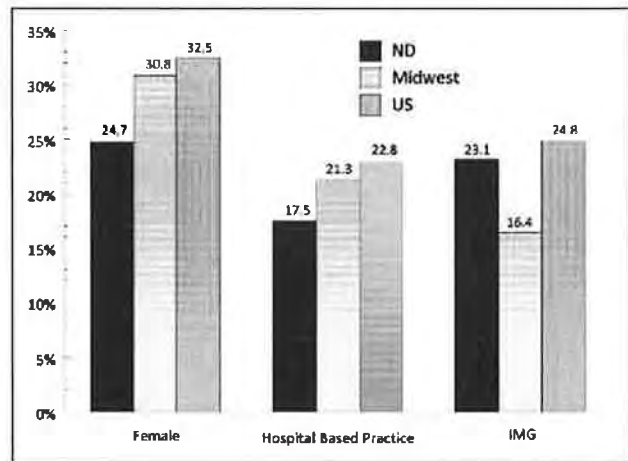


Figure 52. Percentage of physicians who are female, have primarily a hospital-based practice, and are international medical graduates (IMGs) for North Dakota, other upper Midwest states, and the United States.^{2, 3}

- North Dakota physicians are less likely to be female and to have a hospital-based practice.
- North Dakota has a similar percentage of IMG physicians compared to the United States and higher than other Midwest states.

Figure 54 shows from which state North Dakota practicing physicians graduated on the left side, and where past graduates of North Dakota's medical school now practice on the right side. This analysis permits a comparison of physician migration patterns.

The balance of migration into and out of North Dakota regarding medical school graduation varies widely with respect to where the physicians are now practicing. This can be thought of as a "balance of trade" in medical school training and practice destination. North Dakota is a net "importer" of physicians from most states except for Minnesota and "Other West" states.

The market for physicians is a national one. Medical school graduates are dispersed widely across the nation and are strongly influenced by such factors as the location of their residency training, specialty choice, opportunities, home origins and their spouse origins. The smaller or more specialized the medical residency, the more nationwide is the specialty market for graduates.

The "balance of trade" for the current practice location of graduates compared to the location of the medical school from which they graduated varies greatly. For instance, there are currently only 85 Minnesota medical school graduates practicing in North Dakota but 290 past University of North Dakota medical school graduates practicing in Minnesota. Some of the explanation for this is that graduates of the University of North Dakota who want to specialize in any given area have to go out of state for their residencies because the residency specialty they want does not exist within North Dakota (e.g., cardiology). Some other comparisons favor North Dakota. For instance, 51 medical school graduates from Missouri practice in North Dakota, while only 15

University of North Dakota graduates practice in Missouri. Of North Dakota's 1,040 physicians who graduated from a medical school in the United States in 2011, 42% graduated from medical school in North Dakota.

One important predictor of eventual practice location is where a physician did residency training, since many physicians end up practicing in the general vicinity of where they completed their post-medical school residency training.

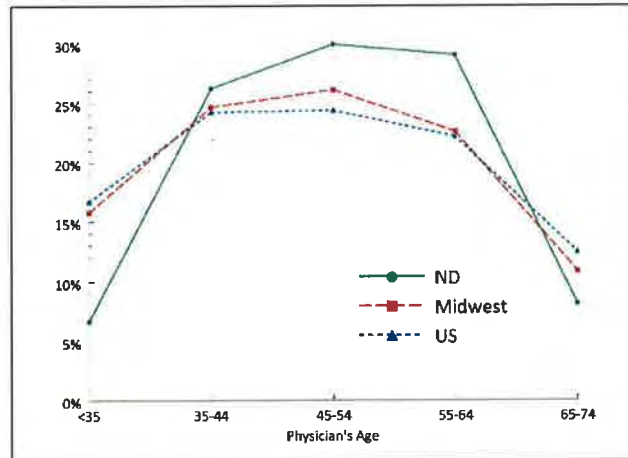


Figure 53. Percentage of physicians by age groups for North Dakota and other upper Midwest states and the United States.^{2,3}

- North Dakota physicians are less likely to be under age 35 than other states.
- North Dakota physicians are more likely to be 45- to 64-years-old.

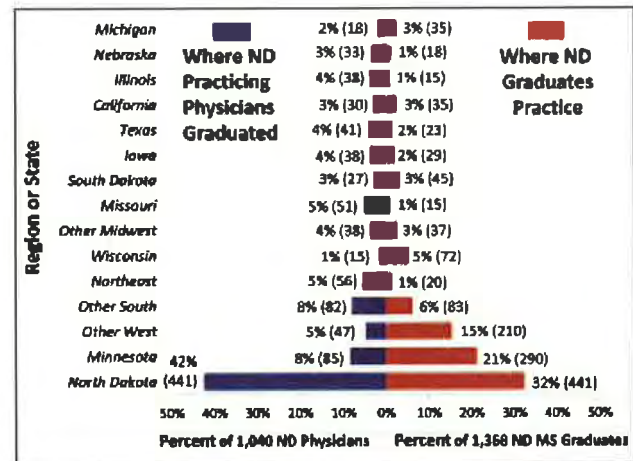


Figure 54. Percentage of North Dakota physicians who graduated from different states, and where North Dakota physicians who graduated from the UND SMHS currently are practicing.

The purple bars in this figure exclude the nearly 1 in 4 physicians who practice in North Dakota and who graduated from a medical school outside of the United States and Canada (1,432 direct patient care physicians less 331 IMGs, less 61 Canadian medical school graduates).

The orange bars in this figure include all physicians who graduated from medical school in North Dakota since 1976 (when UND first offered a four-year MD degree) and practice in the United States (1,368 = 1,370 less two physicians without a valid practice state).

Note. IMGs are not included.

Other Midwest: Illinois, Iowa, Kansas, Michigan, Nebraska, and Ohio.
 Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.
 Other South: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, and West Virginia.

Other West: Alaska, Arizona, Colorado, Hawaii, Idaho, Montana,

Figure 55 shows in which state North Dakota practicing physicians did their residency training on the left side, and where past graduates of North Dakota's residency programs now practice.

Note the impact of a North Dakota residency—nearly two-thirds of graduates from these residencies practice in North Dakota or Minnesota. Given how porous the North Dakota and Minnesota border is to health care traffic, many of the Minnesota physicians are treating North Dakota patients. For example, the Sanford Health Clinic in East Grand Forks, while located in Minnesota, caters to many patients from just across the river who live in Grand Forks and surrounding counties in North Dakota.

Residency Training in North Dakota

Before UND expanded its residency programs in the fall of 2012, there were 123 residency slots in North Dakota. The number of graduates from these residency programs was 45 per year (see Table 12). This included UND SMHS residencies throughout the state (in partnership with several hospital systems) and Altru Health System in Grand Forks, which runs its family medicine residency program separately from UND.

Figure 56 shows the location and number of students at North Dakota's physician residencies. The number of different specialties where a residency can be performed within North Dakota is limited to family medicine, internal

Table 11

Number of physicians of different age groups per 10,000 people in North Dakota compared to upper Midwest states and the United States by metropolitan status.^{1, 2, 3, 4}

	ND	Midwest	US
< 35	3.2	4.1	4.6
Metropolitan	5.3	5.8	5.3
Micropolitan	2.4	1.3	1.1
Rural	0.3	0.6	0.5
35 - 44	5.7	6.4	6.7
Metropolitan	9.2	8.4	7.5
Micropolitan	3.9	3.7	3.0
Rural	1.2	1.8	1.6
45 - 54	6.3	6.8	6.7
Metropolitan	10.0	8.5	7.4
Micropolitan	4.4	4.9	4.1
Rural	1.4	2.4	2.0
55 - 64	6.3	5.9	6.1
Metropolitan	9.2	7.0	6.6
Micropolitan	5.2	5.1	4.3
Rural	2.2	2.6	2.5
65 - 74	2.5	2.8	3.4
Metropolitan	3.4	3.3	3.7
Micropolitan	2.2	2.6	2.4
Rural	1.3	1.4	1.6

medicine, psychiatry, general surgery, and transitional.⁵ Transitional residencies are a yearlong program designed to introduce graduates to a wide range of medical and surgical specialties with the goal of building a broad foundation of clinical skills as a base for future training in a medical specialty.

As discussed in greater detail in Chapter 10, nine additional residency slots per year are being added to the available residency menu for North Dakota as of 2012, and a request is pending with the Legislature for an additional eight slots for a total of 17 additional residency slots per year. The emphasis of the added residency slots is in primary care, especially rural practice medicine.

International Medical Graduates

International medical graduates (IMGs) make up about one-fourth of the North Dakota physician workforce, which is similar to the situation across the country. They are a critically important component of the professional workforce

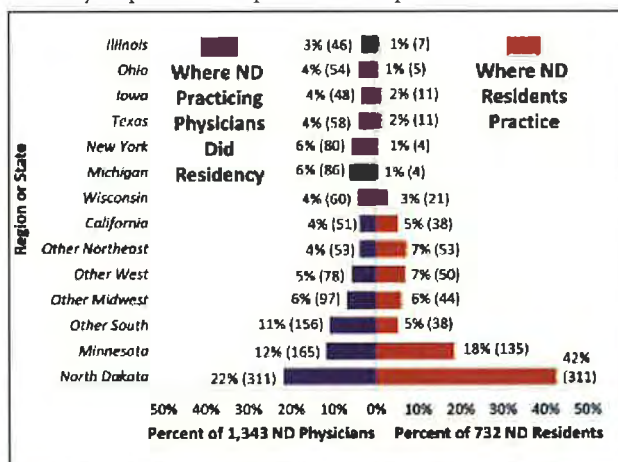


Figure 55. Percentage of North Dakota physicians who did residencies in different states, and where North Dakota physicians who did residency at UND currently are practicing.²

The purple bars in this figure exclude the physicians who practice in North Dakota in 2011 who completed residency outside of the United States (1,432 direct patient care physicians less 89 missing/non-United States residency = 1,343).

The orange bars in this figure include all physicians who completed a residency in North Dakota since 1974 and practice in the United States (1,368 = 1,370 less two physicians without a valid practice state).

Note. IMGs are not included.

Other Northeast: Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, and Rhode Island.

Other West: Alaska, Arizona, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

Other Midwest: Illinois, Iowa, Kansas, Michigan, Nebraska, and Ohio.

Other South: Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Virginia, and West Virginia.

here and throughout the country. They are defined as graduates from any country outside of the United States and Canada.

There are more IMGs practicing in North Dakota from India (7% of North Dakota's practicing physicians) than from any U.S. state other than North Dakota itself (Minnesota having the next highest percentage at 6%). The largest numbers of IMGs practicing in North Dakota come from India, Pakistan, and the Philippines.

North Dakota IMGs are more likely to practice in primary care (though less likely to practice in family medicine), the subspecialties of internal medicine, and psychiatry than other physicians (and less likely to practice surgery and other specialties).

As shown in Table 13, IMGs are somewhat more likely to practice in rural and micropolitan (large rural) areas of North Dakota than IMGs do in the upper Midwest and United States. Thus, they help reinforce the provider workforce in North Dakota's most needy regions.

PROJECTION OF PHYSICIANS IN NORTH DAKOTA

Between the aging of the population, increased health care coverage, and the increase in the Oil Patch's population, the demand for physicians will soon outpace the supply if nothing is done. If the population of North Dakota does not expand at an increased rate but at the slower historical rate, the rate of physicians will increase slightly until 2020, and then drop again as the population in North Dakota continues to gradually increase. If the Oil Patch results in a substantial population increase as projected in Chapter 1, there will be a sharp drop in the number of physicians per 10,000 population to about half of what it currently is (from 21 to 11). This is a statewide estimate, and the effect in the western part of the

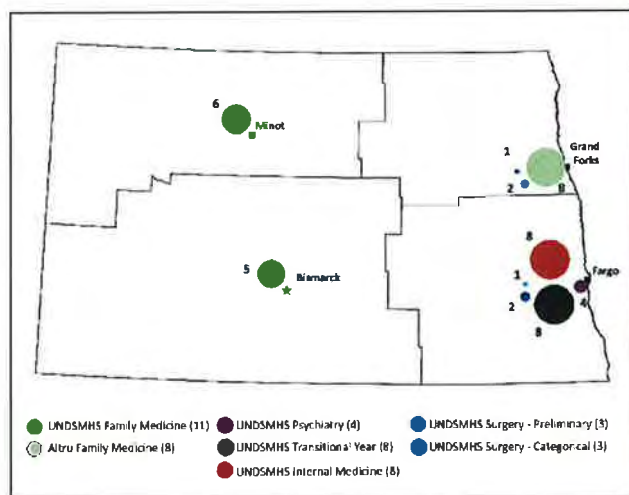


Figure 56. Number of residencies per year in North Dakota by location and type of residency prior to fall 2012.^{5,6}

state will be much more pronounced. As shown in Figure 57, the standard projection of population growth shows a relatively steady supply of physicians relative to the population but only if the Health Care Workforce Initiative (HWI) measures are adopted in full (as shown in blue). If the

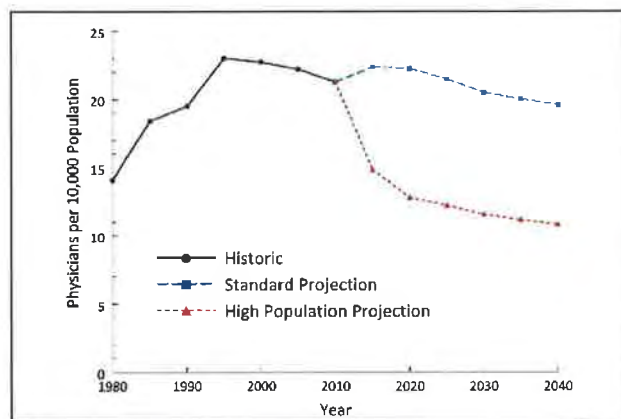


Figure 57. Projection of rate of physicians per 10,000 population for standard projection and rapid-growth projection with high Oil Patch population increase assuming implementation of the Health Care Workforce Initiative (See Chapter 10).^{1,2,7,8,9}

Table 12

Number of current North Dakota residency slots by type of residency program prior to fall 2012.⁵

Residency Type	Number in Residency	Duration	Graduates per Year
Family Medicine	57	3 Years	19
Internal Medicine	24	3 Years	8
Psychiatry	16	4 Years	4
Surgery	18	1-5 Years	6
Transitional Year	8	1 Year	8
Total	123		45

Table 13

Number of international medical graduate (IMGs) and U.S. medical graduate (USMG) physicians per 10,000 population in North Dakota compared to upper Midwest states and the United States by metropolitan status.^{2,4}

	ND	Midwest	US
IMGs	4.9	4.0	6.2
Metropolitan	7.1	5.2	7.0
Micropolitan	4.2	2.5	2.9
Rural	1.9	1.0	1.6
USMGs	16.4	20.1	18.9
Metropolitan	25.0	25.1	20.6
Micropolitan	12.6	14.4	11.7
Rural	4.8	8.0	6.8

strategies outlined in the Health Care Workforce Initiative were not fully instituted, the relative supply of physicians would decrease precipitously. Such a precipitous drop in physician supply does in fact occur with the high population projection shown in red. It is important to emphasize again that the high population projection in red, as bad as it is, assumes that there is full implementation of the HWI; were that not to occur, the relative supply of physicians would be even worse. Thus, both projection models underscore the critical importance of full implementation of the HWI strategies, especially if there is substantial population growth related to the Oil Patch. It is only through increased retention of graduates along with class size expansion that North Dakota has a foreseeable chance of dealing with its health care workforce shortage. Fortunately, full implementation of the HWI will help ensure that adequate health care delivery teams will be available throughout the state.

SUMMARY

The supply of North Dakota physicians lags behind the nation, especially in rural areas (6.6 per 10,000 compared to 8.2 in other Midwest states). Aging is a problem as half of North Dakota's physicians are 45- to 64-years-old. Though a large number of IMGs and Canadian physicians are practicing in North Dakota (27%), the state lacks large numbers of physicians from other states. Physicians who graduated from medical school or did their residency training in North Dakota supply nearly 40 percent of its practicing physicians.

As the physician population in the state continues to age, a large number will be retiring who will need to be replaced. As the North Dakota population also ages, there will be an increased need for physician care. The Oil Patch's continued growth in population has the potential to reduce the availability of physicians to serve people by nearly one-half.

The supply of physicians within North Dakota is not only influenced by the above circumstances but by others external to it. U.S. medical schools are increasing their output of graduates, which should be helpful for filling the growing need in North Dakota for more physicians. However, there are trends that are changing the national and international playing field for North Dakota regarding its ability to attract more physicians. The eventual influence of the Affordable Care Act remains uncertain. With more demand across the country, more physicians produced by medical schools and residency programs will likely remain in their training states, and North Dakota could experience fewer physicians moving from those states and programs into North Dakota to practice. Likewise, the increases in U.S. medical school graduates could reduce the numbers of IMGs from U.S. residency programs, and North Dakota may experience a reduction in the number of physicians coming to North Dakota to practice.

Thus, this is not time for a business-as-usual approach in the face of all the specifics addressed in this chapter. These influences are likely to lead to dramatically fewer physicians within North Dakota to serve its growing population and significant growing number of older adult citizens. North Dakota is vulnerable to various trends and circumstances over which it has little control. In the face of all this, it is critical that North Dakota takes control of its fate by appropriately investing in the training of health professionals, including physicians, who will practice within North Dakota.

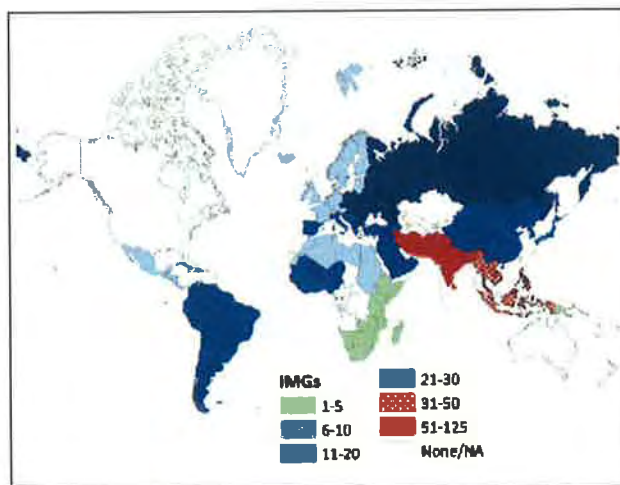


Figure 58. Country origins of North Dakota's practicing IMG physicians.²

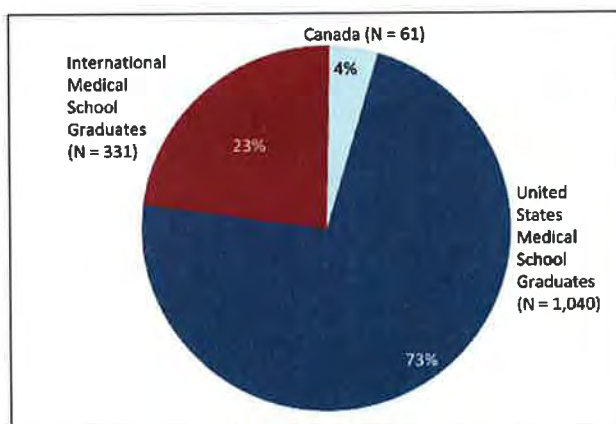


Figure 59. Location of graduation for North Dakota physicians.²

- Twenty-three percent of the currently practicing physicians in North Dakota graduated from a medical school not in the United States or Canada.
- Four percent of the state's physicians graduated from Canada.

References

1. U.S. Census Bureau. (2010). *Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
2. Medical Marketing Service. (2011). *AMA Physician Master File, 2011* [Data file]. Medical Marketing Service, Inc.
3. U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions. (2012). *Area Resource File (ARF)* [Data File]. Retrieved from <http://arf.hrsa.gov>.
4. U.S. Census Bureau. (2009). *Metropolitan and Micropolitan Statistical Areas and Definitions* [Data file]. Retrieved from <http://www.census.gov/>.
5. University of North Dakota School of Medicine and Health Sciences Office of Alumni and Community Relations. (2011). *Medical School Fact Sheet* [Fact Sheet].
6. Altru Health System. (2012). Retrieved from <http://www.altru.org/services/altru-residency/>.
7. U.S. Census Bureau. (2011). *1980 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
8. U.S. Census Bureau. (2011). *1990 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
9. U.S. Census Bureau. (2011). *2000 Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.

FOUR
Primary Care and
Specialty Physician Workforce
in North Dakota

While Chapter 3 addressed aspects of the total North Dakota physician population, this chapter concentrates on primary care physicians and specialist physicians separately. Primary care physicians are the foundation of the North Dakota health care delivery system, and access to them by all of North Dakota's population is a consensus goal. Of course, specialist physicians are critically important in their own right. In this report, primary care physicians are defined as those physicians in the specialties of family medicine, general internal medicine, and general pediatrics. Note that in some discussions, other designations of "primary care" are used, most notably the inclusion of obstetrics/gynecology (Ob-Gyn) physicians since they are an important provider of health care to women.

DEMOGRAPHICS OF PRIMARY CARE PHYSICIANS

Of the 552 primary care physicians practicing in North Dakota, 59.1% (326) are family physicians, 28.1% (155) are general internists, and 12.9% (71) are general pediatricians.¹ The North Dakota population per primary care physician is shown in Figure 60. There are no primary care physicians in 17 counties whose combined population is over 40,000 people.^{1,2} Clearly counties with greater than 2,501 people per physician may be experiencing the influences of primary care physician shortages. Even population per primary care physician rates below this level can often be characterized as having primary care shortages.

Table 14 shows the number of primary care physicians by their percentages regarding sex, hospital-based practice, and IMG status. There are 552 primary care direct patient care physicians practicing in North Dakota. Of these, 62% are located in metropolitan counties, 19.9% in micropolitan (large rural) counties, and 18.1% in other rural counties. Rural counties have a lower percentage of their physicians who are female than their more urban counterparts (28% rural versus 32.7% micropolitan, and 33% metropolitan). The differences in the percentages of hospital-based practice by metropolitan status vary little from 17.2% in metropolitan to 18.7% in rural areas. As shown in the table, the percentage of local physicians who are IMGs is highest for rural counties, but the differences are not large.

Table 14

Percentage of primary care physicians in North Dakota that are female, have hospital-based practices, or are IMGs.^{1,3}

	N	% Female	% Hospital-Based Practice	% IMG
Total	552	32.1%	17.5%	24.6%
Metropolitan	342	33.0%	17.2%	24.6%
Micropolitan	110	32.7%	17.8%	22.7%
Rural	100	28.0%	18.7%	27.0%

A comparison of the age structure of North Dakota primary care physicians compared to those of the upper Midwest states and the United States is depicted in Figure 61. North Dakota primary care physicians are older than those in the two comparison groups. The age distribution of North Dakota primary care physicians is shown by metropolitan status in Table 15. The percentage of primary care physicians for rural

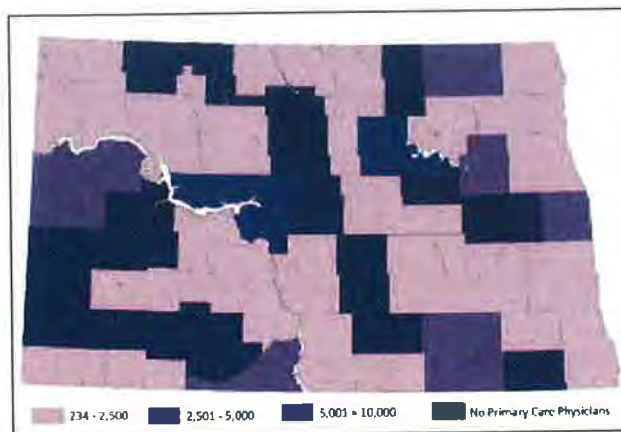


Figure 60. Population per primary care physician in North Dakota (2011).

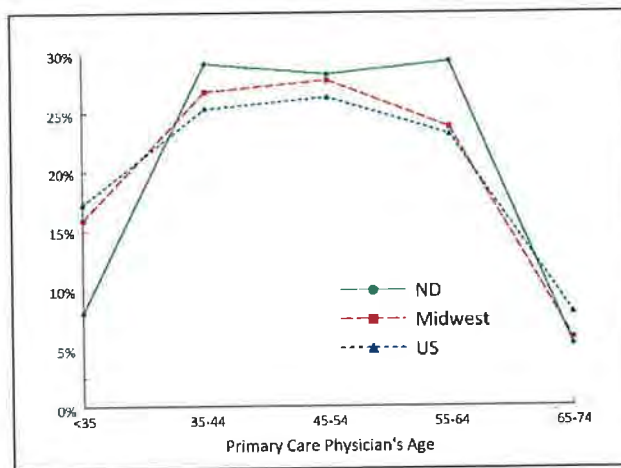


Figure 61. Percentage of primary care physicians for different age categories for North Dakota, other upper Midwest states, and the United States (2011).^{1,4}

- Primary care physicians in North Dakota are older than primary care physicians in the rest of the country.

Table 15

Percentage of primary care physicians in North Dakota by age category and area.^{1,4}

	N	< 35	35 - 44	45 - 54	55 - 64	65 - 74
Total	552	8.0%	29.2%	28.3%	29.3%	5.2%
Metropolitan	342	8.5%	31.9%	28.6%	26.9%	4.1%
Micropolitan	110	10.0%	27.3%	29.1%	30.9%	2.7%
Rural	100	4.0%	22.0%	26.0%	36.0%	12.0%

counties is dramatically higher for the 55-64 and 65-74 age categories than for the micropolitan (large rural) and metropolitan county categories (36% versus 30.9% and 26.9%; and 12.0% versus 2.7% and 4.1%). The micropolitan (large rural) and the metropolitan county categories are quite similar in their age structure. The implication of this finding is the susceptibility of the rural regions of North Dakota to the impending retirement of a large fraction of their provider workforce. Similarly, the small number of younger physicians, especially those under 35 years of age, in the rural areas indicates the difficulty of attracting recent graduates to the rural areas of the state.

Primary Care Physicians Workforce

The density of primary care physicians (with residents included) in North Dakota per 10,000 population is substantially lower than for the Midwest and the United States (20% and 18% lower).

As can be seen from Figure 63, across North Dakota, the upper Midwest, and the United States, the physician-to-population ratios are lower for large and smaller rural counties. By metropolitan status, the Midwest is higher than North Dakota and the United States in all three categories. Within North Dakota, micropolitan (large rural) and other rural counties have significantly lower ratios than metropolitan (37% lower for micropolitan counties and 52% lower for other rural counties). This difference is not as great as for the United States as a whole, though the distances involved in North Dakota make the access issues more critical in North Dakota than in many other states. Nevertheless, North Dakota has more primary care physicians in all three areas than the United States. But because North Dakota has significantly more nonmetropolitan primary care physicians than the United States, it still lags the United States when considered as a whole (as shown in Figure 62).

North Dakota has a lower percentage of its direct patient care primary care physicians practicing in office-based practice than in the upper Midwest and the United States as a whole (see Table 16). It has a higher percentage of its primary care physicians practicing in hospital-based practice than in the comparison groups. The micropolitan (large rural) and other rural counties have lower primary care per 10,000 population ratios than metropolitan for office-based metropolitan status categories. Within the hospital-based category, North Dakota has a higher ratio of primary care physicians per 10,000 population across each of the metropolitan status categories when compared to the upper Midwest and the United States.

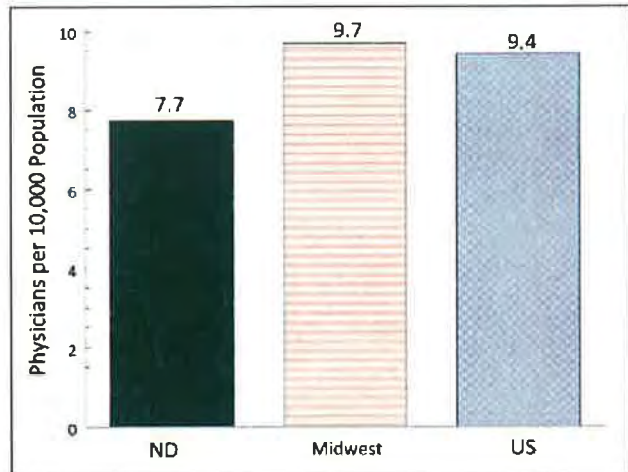


Figure 62. Primary care physicians per 10,000 population in North Dakota, the upper Midwest, and the United States.^{1,2,4}

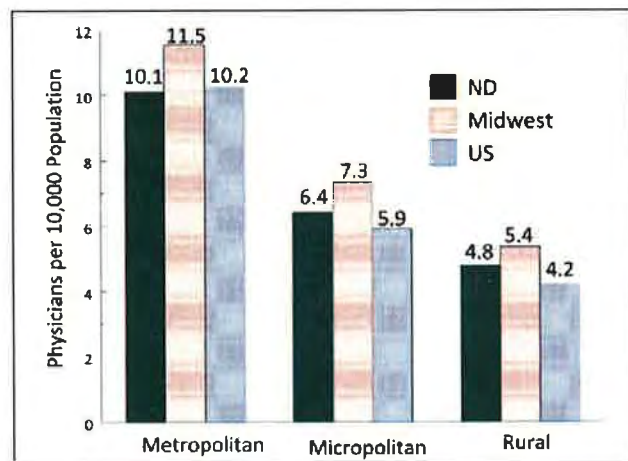


Figure 63. Primary care physicians per 10,000 population in North Dakota, the upper Midwest, and the United States by metropolitan status.^{1,2,3,4}

- North Dakota is behind other Midwest states by more than one primary care physician per 10,000 population in metropolitan areas.
- North Dakota is ahead of the United States in all areas, but especially the nonmetropolitan ones.

For example, North Dakota has a 1.56 times higher ratio than in the Midwest and a 1.74 times higher ratio than in the United States as a whole.

Table 17 shows the primary care per 10,000 population for North Dakota compared with the upper Midwest and United States by age categories. Overall North Dakota has comparatively more primary care physicians in the older age categories and fewer in the younger age categories than the United States as a whole. Likewise the results are the same for North Dakota's other rural counties when compared to the United States as a whole. Results for the micropolitan (large rural) counties vary, probably because of differences across the nation and within North Dakota in the number of such large rural counties.

Table 16

Primary care physicians primarily in office or hospital practices per 10,000 population in North Dakota compared to upper Midwest states and the United States by metropolitan status.^{1,3,4}

	ND	Midwest	US
Office	10.53	11.39	9.56
Metropolitan	13.34	12.42	10.00
Micropolitan	9.39	10.03	7.73
Rural	6.69	8.97	6.54
Hospital	1.23	0.86	0.77
Metropolitan	1.54	0.89	0.79
Micropolitan	0.91	0.74	0.63
Rural	0.99	0.85	0.64

Table 17

Primary care physicians of different age categories per 10,000 population in North Dakota compared to upper Midwest states and the United States by metropolitan status.^{1,3,4}

	ND	Midwest	US
< 35	1.65	1.26	1.25
Metropolitan	2.43	1.68	1.43
Micropolitan	1.81	0.59	0.42
Rural	0.21	0.40	0.25
35 - 44	2.33	2.55	2.33
Metropolitan	3.38	3.13	2.54
Micropolitan	1.88	1.64	1.33
Rural	0.93	1.36	0.98
45 - 54	2.22	2.60	2.19
Metropolitan	3.01	2.99	2.31
Micropolitan	2.01	2.25	1.71
Rural	1.04	1.57	1.25
55 - 64	2.13	2.38	0.90
Metropolitan	2.70	2.67	0.97
Micropolitan	1.68	2.13	0.59
Rural	1.50	1.55	0.40
65 - 74	0.33	0.71	0.31
Metropolitan	0.40	0.83	0.34
Micropolitan	0.19	0.60	0.16
Rural	0.31	0.38	0.13

Background of North Dakota Primary Care Physicians

In many ways, the background of primary care physicians is similar to that of the physician workforce overall in North Dakota, although the contribution of the UND SMHS and residencies is even more pronounced.

Almost four out of 10 primary care physicians in North Dakota graduated from its medical school (see Figure 64). Additionally, nearly half of primary care physicians obtained their residency training from a residency based in the state (see Figure 65).

Taking location of both medical school and residency training into account, more than half (55.4% or 306) of the primary care physicians currently practicing in North Dakota received one or both types of training in North Dakota.

DEMOGRAPHICS OF SPECIALTY PHYSICIANS

As can be seen in Figure 66, most of North Dakota's specialists are located in Fargo, Bismarck, Grand Forks, or Minot, and along the Interstate 94 and Highway 2 corridors. Given the specialist geographic distribution and generally low numbers per population, significant portions of North Dakota's population can be long distances from their nearest specialist physician. (Note that in this analysis, general pediatrics is considered a specialty and not part of primary care.)

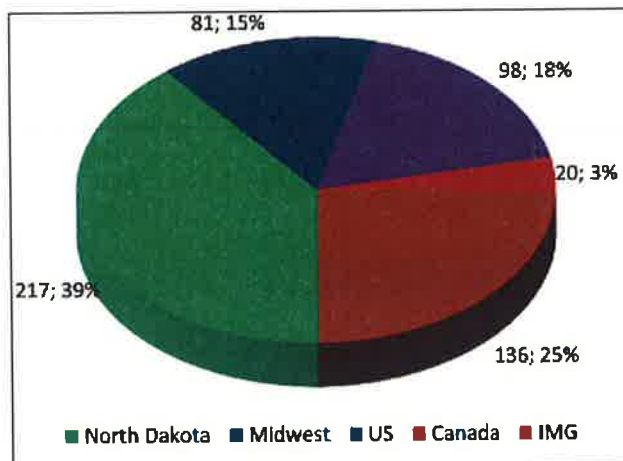


Figure 64. Locations where North Dakota primary care physicians graduated from medical school.¹

- North Dakota's primary care physicians graduated from medical schools from all over the United States and the world.
- University of North Dakota School of Medicine and Health Sciences graduates account for 39.3% of practicing primary care physicians in the state.
- IMGs account for 24.6% and Canadian medical school graduates account for 3.6% (combined 28.2%).
- The rest of the Midwest accounts for 14.7% while the rest of the United States accounts for 17.8% (combined 32.5%).

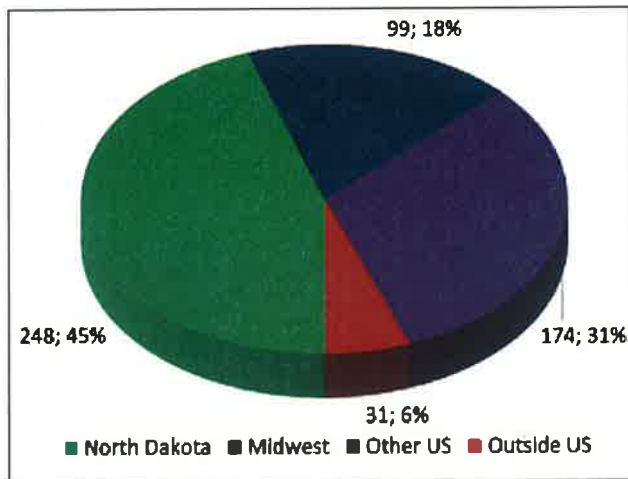


Figure 65. Locations where North Dakota primary care physicians did their residency.¹

- Nearly half (45%) of North Dakota’s currently practicing primary care physicians did their residency training in North Dakota.
- Origins of primary care physicians who graduated from residency programs outside of North Dakota are U.S. Midwest (18%), other U.S. (31%), and Canada and other foreign (6%).

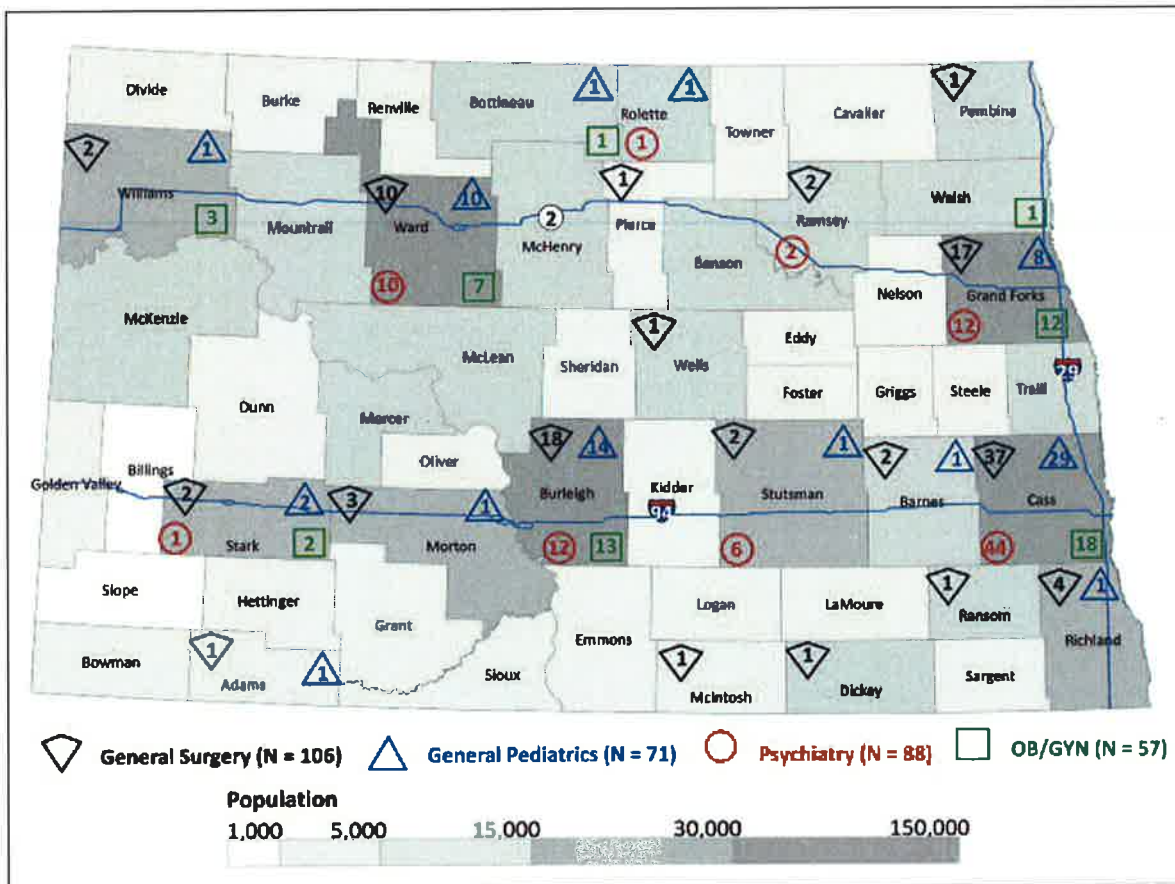


Figure 66. Location of specialty physicians in North Dakota.¹

Within North Dakota, rural counties have a lower percentage of their specialist care physicians who are female than in metropolitan counties, except for general pediatrics. However, the very small number of rural general pediatricians (4) renders any meaningful analysis suspect (Table 18). Micropolitan (large rural) counties have similar percentages of female specialists as do metropolitan counties. IMG general surgeons account for over half of rural county surgeons, which is a much higher percentage than for metropolitan and micropolitan (57% versus 6% and 20%, respectively). IMGs are unrepresented in the cohort of rural county psychiatrists and Ob-Gyns.

The percentage of specific specialty physicians by age categories is portrayed in Table 19. As has been consistently shown earlier, the rural and micropolitan (large rural) category percentages of these specialty physicians who are 55 and older is much greater than for metropolitan counties, and portends a major shortfall in the availability of specialty physicians in these areas in the future as these senior specialty physicians retire and leave direct patient care.

Specialty Physicians per 10,000 Population

North Dakota's specialist-per-10,000-population ratios for surgeons, pediatricians, and Ob-Gyns are lower than for the upper Midwest and U.S. ratios (see Figure 67). For instance, the North Dakota ratio for general surgeons is 25% lower than for the nation as a whole and its ratio for pediatricians is 35.3% lower than for the nation. Despite a perceived shortage (at least in some regions), North Dakota's ratio for psychiatrists is higher than for the comparison region of the Midwest and the United States as a whole.

The specialty-physician-per-10,000-population ratios by metropolitan status are shown in Table 20. Across North Dakota and for each specialty, the rural areas have lower ratios than the micropolitan (large rural counties) regions, which in turn have lower ratios than the metropolitan counties. For instance, for general pediatricians, rural areas have 23% of the amount of metropolitan areas and micropolitan (large rural) counties have 61% of the amount of metropolitan areas.

When North Dakota is compared to the upper Midwest and the United States as a whole, it has about the same supply of physicians for surgery, general pediatrics, and Ob-Gyns, except North Dakota rural counties have significantly lower ratios. For psychiatry, North Dakota has dramatically higher ratios for metropolitan and micropolitan (large rural) counties, while it has slightly lower ratios for the rural counties.

SUMMARY

Most (82.4%) of North Dakota's population is located within a shortage area for primary care. About 1 in 20 people live in a county that does not have primary care physicians. Primary care physicians are more likely to be female in urban areas. In rural areas, they are more likely to be in a hospital-based practice, and they are more likely to be IMGs who are age 55 or older. Currently there are 552 direct patient care primary care physicians in North Dakota (i.e., 326 family medicine, 155 general internal medicine, and 71 general pediatrics). North Dakota has a lower ratio of primary care physicians to population than other Midwest states or the United States when resident physicians are included in the comparison. Over half (55.4%) of all primary care physicians in North Dakota graduated from the University of North

Table 18

Percentage of specialist physicians in North Dakota who are female, have hospital-based practices, and are IMGs.^{1,3}

	N	% Female	% Hospital-Based Practice	% IMG
Surgery	252	18.7%	17.5%	11.9%
Metropolitan	188	20.2%	17.2%	6.4%
Micropolitan	50	16.0%	17.8%	20.0%
Rural	14	7.1%	18.7%	57.1%
Psychiatry	88	36.4%	1.1%	35.2%
Metropolitan	68	39.7%	13.8%	38.2%
Micropolitan	17	29.4%	19.0%	29.4%
Rural	3	0	13.4%	0
General Pediatrics	71	52.1%	7.2%	19.7%
Metropolitan	52	50.0%	7.5%	17.3%
Micropolitan	15	53.3%	6.0%	26.7%
Rural	4	75.0%	4.4%	25.0%
Ob-Gyn	57	54.4%	4.9%	1.7%
Metropolitan	43	55.8%	4.5%	0
Micropolitan	12	50.0%	6.1%	0
Rural	2	50.0%	7.5%	50.0%

Dakota School of Medicine and Health Sciences or completed a residency in the state.

Currently there are 252 surgeons, 88 psychiatrists, 71 pediatricians, and 57 Ob-Gyns in North Dakota. As with other physicians in North Dakota, these specialists are more likely to be older, male, IMGs, and in hospital-based practice. Compared to other Midwest states and the United States, North Dakota has a lower ratio of surgeons, pediatricians, and Ob-Gyns. However, we have higher ratio of psychiatrists than other states. (Note: Nearly two-thirds of the psychiatrists [63.6%] work in the eastern part of the state along I-29; we

are slightly behind in rural areas for the ratio of psychiatrists compared to other states). Pediatrics in North Dakota is slightly ahead in micropolitan and rural areas compared to the upper Midwest and United States.

There are many factors that are having and will have significant influences on North Dakota's supply of physicians, both primary care and specialist care physicians. Many of these changes are beyond the direct control of North Dakota. Changes in demand for physician services may disrupt historical workforce pipelines from one state's medical schools and residency programs to practice sites within other

Table 19
Percentage of specialists in North Dakota by age category and metropolitan status.^{1,3}

	N	% < 35	% 35-44	% 45-54	% 55-64	% 65-74
Surgery	252	6.9%	28.7%	41.0%	44.2%	13.3%
Metropolitan	188	5.3%	23.4%	34.0%	29.3%	8.0%
Micropolitan	50	6.0%	16.0%	22.0%	46.0%	10.0%
Rural	14	0.0%	14.3%	14.3%	35.7%	35.7%
Psychiatry	88	4.6	22.7	40.9	23.9	8.0
Metropolitan	68	5.9%	20.6%	44.1%	23.5%	5.9%
Micropolitan	17	0.0%	29.4%	23.5%	29.4%	17.6%
Rural	3	0.0%	33.3%	66.7%	0.00%	0.0%
General Pediatrics	71	8.4%	32.4%	18.3%	36.6%	4.2%
Metropolitan	52	9.6%	32.7%	17.3%	36.5%	3.8%
Micropolitan	15	6.7%	20.0%	26.7%	40.0%	6.7%
Rural	4	0	75.0%	0	25.0%	0
Ob-Gyn	57	12.3	21.0	28.1	29.8	8.8
Metropolitan	43	11.6%	23.3%	30.2%	25.6%	9.3%
Micropolitan	12	16.7%	16.7%	25.0%	33.3%	8.3%
Rural	2	0.0%	0.0%	0.0%	100.0%	0.0%

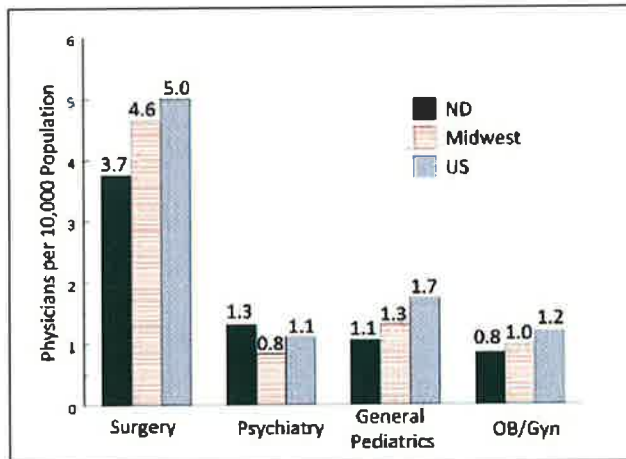


Figure 67. Surgeons, psychiatrists, general pediatricians, and Ob-Gyns per 10,000 population in North Dakota compared to other upper Midwest states and the United States.^{3,4}

Table 20
Specialty physicians per 10,000 population in North Dakota compared to upper Midwest states and the United States by metropolitan status.^{1, 2, 3, 4}

	ND	Midwest	US
Surgery			
Metropolitan	5.78	5.86	5.51
Micropolitan	3.24	3.75	3.07
Rural	0.73	1.17	1.26
Psychiatry			
Metropolitan	2.09	1.09	1.26
Micropolitan	1.10	0.53	0.43
Rural	0.16	0.20	0.18
General Pediatrics			
Metropolitan	1.60	1.73	1.94
Micropolitan	0.97	0.85	0.86
Rural	0.36	0.21	0.37
Ob-Gyn			
Metropolitan	1.32	1.21	1.30
Micropolitan	0.78	0.84	0.74
Rural	0.10	0.20	0.31

states. Factors such as where graduates grew up and which communities have the desired amenities may play a stronger role in location decisions. The aging of North Dakota's population and physicians and the population growth of the western Oil Patch are sure to play important roles. In addition, the availability of generalist physician assistants and nurse practitioners will also play an important role in North Dakota's primary care access, as will be discussed subsequently.

References

1. Medical Marketing Service. (2011). *AMA Physician Master File, 2011* [Data file]. Medical Marketing Service, Inc.
2. U.S. Census Bureau. (2010). *Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
3. U.S. Census Bureau. (2009). *Metropolitan and Micropolitan Statistical Areas and Definitions* [Data file]. Retrieved from <http://www.census.gov/>.
4. U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions. (2012). *Area Resource File (ARF)* [Data File]. Retrieved from <http://arf.hrsa.gov>.

FIVE

Other Health Care Workforce in North Dakota

Optimal care of patients depends on a team of health care providers. Although previous service delivery models typically had a physician as the focus and center of the health care effort, it is clear that better and less expensive care is provided by a robust team of professionals, with team members providing input and expertise from their disciplines.

MID-LEVEL PROVIDERS

There is a large cohort of medical providers that are positioned between doctoral-level providers (e.g., medical doctors, doctors of osteopathic medicine, dentists, PhDs) and basic providers (e.g., licensed practical nurses, registered nurses). These mid-level providers include nurse practitioners (NPs) and physician assistants (PAs).

There are about 365 practicing NPs in North Dakota. North Dakota NPs are predominantly female (> 90%) regardless of metropolitan status (see Table 21). Across the three metropolitan status categories, there are no large differences in the NP age percentages, though rural counties have higher percentages of those ages 55 to 64 and 65 to 74 (though relatively few of the total NPs are in these two age categories).

There are about 213 practicing PAs in North Dakota (see Table 22). PAs in North Dakota do not vary much by metropolitan status (ranging from 71.7% female in rural areas to 81.6% female in micropolitan areas). North Dakota PAs are older in rural and micropolitan counties (e.g., in rural counties, 37.7% of the PAs are in the 55-to-64 age group compared to 12.3% in metropolitan counties). The geographic distribution of mid-level providers across North Dakota is similar to the findings with physicians, with the highest density in the metropolitan areas. The expectation that mid-levels would compensate for the shortage of physicians in rural areas is only partially realized, although PAs are much better distributed across North Dakota than NPs, who like their physician counterparts are almost twice

as likely to be found in a metropolitan compared to a rural region.

There are about 7.1 NPs per 10,000 population for metropolitan counties compared to about 3.6 and 4.0 for micropolitan (large rural) and rural counties (e.g., about 44% fewer in rural than in metropolitan counties; see Figure 68). North Dakota's PAs per 10,000 population are about 3.8 for metropolitan counties compared to about 2.5 and 2.8 in micropolitan (large rural) and rural counties (about 27% fewer in rural than metropolitan counties). North Dakota has significantly more NPs than PAs per population in all three of the metropolitan status categories. The national ratio of NPs

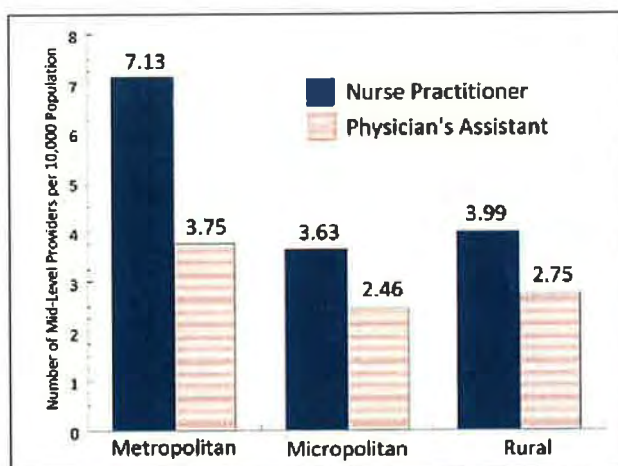


Figure 68. Mid-level providers per 10,000 population in North Dakota by metropolitan, micropolitan, and rural areas.^{1,2,3}

- There are 5.4 nurse practitioners per 10,000 people in North Dakota. This is lower than the national rate of 5.8 per 10,000 population.
- There are 3.2 physician assistants per 10,000 population in North Dakota. This is more than the national rate of 2.7 per 10,000 population.

Table 21

Percentage of nurse practitioners in North Dakota by gender, age group and area.^{1,2}

	N	Female	< 35	35-44	45-54	55-64	65-74
Total	365	92.9%	19.7%	33.7%	23.6%	21.4%	1.6%
Metropolitan	232	92.2%	21.1%	36.6%	25.0%	16.8%	0.4%
Micropolitan	56	96.4%	19.6%	30.4%	19.6%	30.4%	0
Rural	77	92.2%	15.6%	27.3%	22.1%	28.6%	6.5%

Table 22

Percentage of physician assistants in North Dakota by gender, age group and metropolitan status.^{1,2}

	N	Female	< 35	35-44	45-54	55-64	65-74
Total	213	74.6%	27.2%	24.9%	24.4%	20.7%	2.8%
Metropolitan	122	73.8%	34.4%	29.5%	21.3%	12.3%	2.5%
Micropolitan	38	81.6%	23.7%	23.7%	23.7%	23.7%	5.3%
Rural	53	71.7%	13.2%	15.1%	32.1%	37.7%	1.9%

per 10,000 population is 5.8, which is higher than the North Dakota rate of 5.4.⁴ The national ratio for PAs is 2.7 versus North Dakota's 3.2.⁵

The physician, NP, and PA ratios of providers per 10,000 population are as follows by area: 32.1, 7.1, and 3.8; micropolitan (large rural): 16.8, 3.6, and 2.5; rural: 6.6, 4.0, and 2.8. A major limitation of the data currently available is that practice specialization (i.e., primary vs. specialty care) information for mid-levels is not available. There are currently about 365 NPs in North Dakota, 213 PAs, and 1,432 physicians. These are head counts for the practicing providers and do not take into consideration how many of them are working less than full time (i.e., we do not have full-time equivalent information). The national literature shows that PAs are less likely to be full-time than physicians and that NPs are less likely to be full-time than either. However, the extent to which this is true in North Dakota is not known.

Nurses

While the ratio of licensed practical nurses (LPNs) per 10,000 has remained nearly steady during the recent past, as can be seen in Figure 69, the ratio for RNs increased by about 27 percent from 2005 through 2010. Remarkably, the North Dakota ratio is nearly double that of the United States as a whole.

Within North Dakota, the RN-to-10,000-population ratio is much higher for metropolitan counties than for micropolitan (large rural) and rural counties (more than twice as high; see Figure 70). For all three areas, the ratios

increased between 2005 and 2010.

The LPNs-per-10,000-population ratios for North Dakota from 2005 through 2010 have remained relatively steady with some growth for the rural counties (see Figure 71). There is little difference in the ratios for micropolitan (large rural) and metropolitan counties but they are about 10% lower than for rural counties.

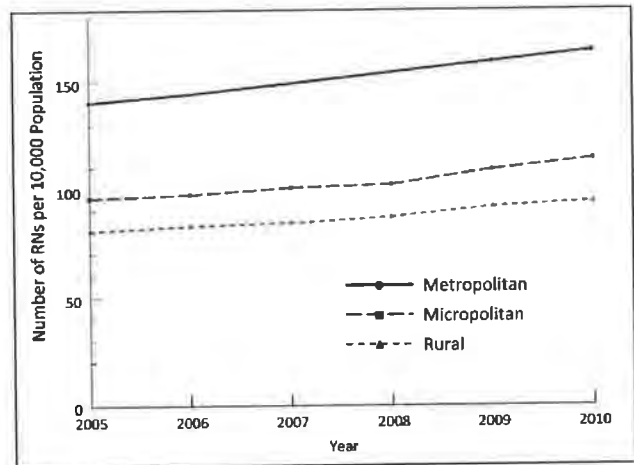


Figure 70. RNs per 10,000 population in North Dakota from 2005 to 2010 by area.^{2, 3, 6, 7}

- The number of RNs in metropolitan areas is well above the national average.
- The number of RNs in micropolitan and rural areas is about 40 fewer per 10,000.

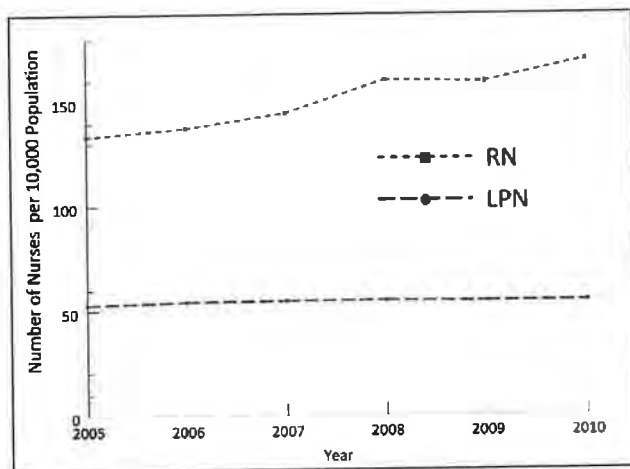


Figure 69. Registered nurses (RNs) and licensed practical nurses (LPNs) per 10,000 population in North Dakota from 2005 to 2010.^{3, 6, 7}

- Currently the rate of RNs in North Dakota (170 per 10,000 people) is higher than the national rate of 87 and has been increasing since 2005.
- The rate of LPNs was 53 per 10,000 people in 2005 and is now 55.

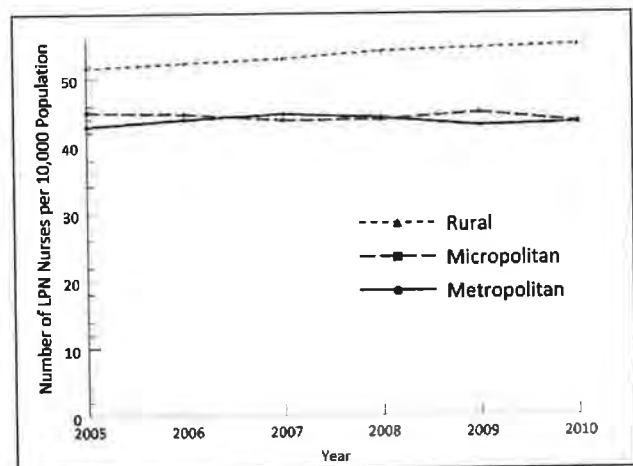


Figure 71. LPNs per 10,000 population in North Dakota from 2005 to 2010 by area.^{2, 3, 6, 7}

- The number of LPNs in rural areas is about 10 more per 10,000 than micropolitan or metropolitan areas.

Figure 72 depicts projections of RNs as a function of North Dakota population growth. Assuming a steady population increase, the ratio will increase from 170 in 2010 to 193 in 2032. If a more likely rapid population growth is assumed, the RNs-per-10,000-population ratio will decrease from 170 in 2010 to 104 in 2032 (a decrease of 39%). In addition, the aging of North Dakota's population will require significantly more RN services in 2032 than were needed in 2010. For both LPNs and RNs, the projected additional needs caused by population increases and the aging of the population will be a formidable challenge to meet.

The percentage of RNs and LPNs who are female is extremely high, with the LPNs being slightly higher at 97% (versus 94% for RNs; Figure 73). Approximately 71% of RNs work full-time while 62% of LPNs work full-time.

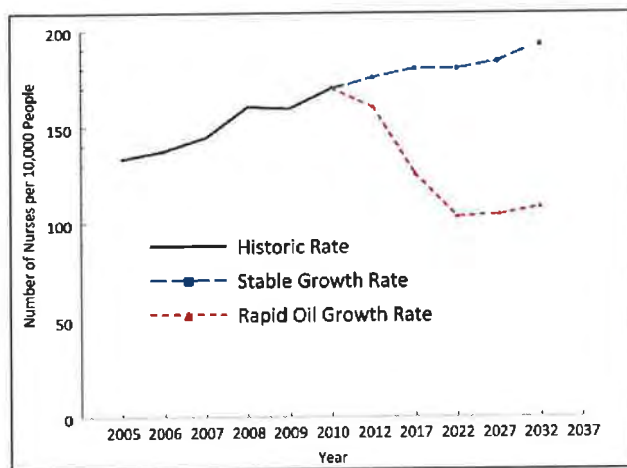


Figure 72. Projected number of RNs per 10,000 population in North Dakota assuming steady historic population increase, and rapid population increase from the oil boom.^{6,7}

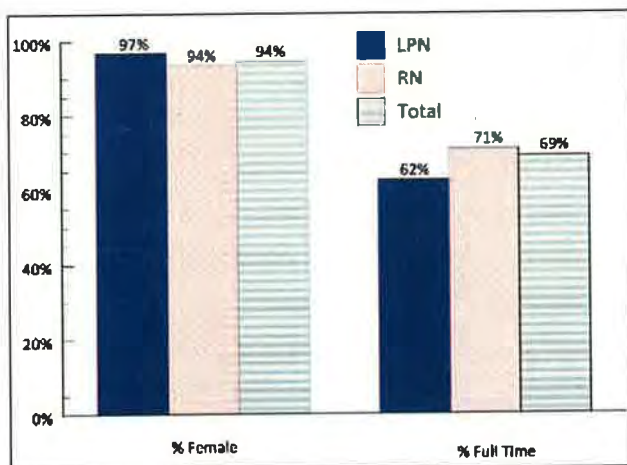


Figure 73. Percentage of LPNs and RNs who are female and who work full-time.^{5,7}

- A slightly higher percentage of LPNs are female than RNs.
- A higher percentage of RNs work full-time than do LPNs.

Figure 74 illustrates the percentages of RNs and LPNs who work in hospitals, long-term care (LTC), clinics, and other. RNs are most likely (48%) to work in hospitals, while LPNs only work in hospitals 17% of the time. LPNs are much more likely to work in LTC facilities than RNs (29% versus 9%) and in clinics (21% versus 6%).

Psychologists

The supply and distribution of psychologists is similar to that seen with physicians and many other providers (see Figure 75).

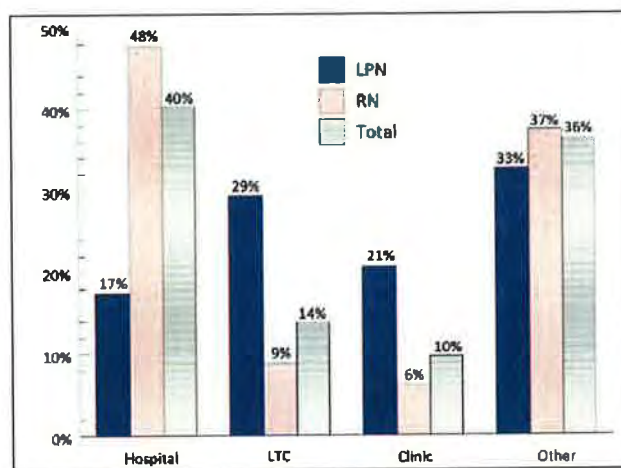


Figure 74. Percentage of LPNs and RNs that work in hospitals, long-term care facilities, clinics, or other areas of health care.^{6,7}

- LPNs are more likely to work in long-term care facilities or clinics than RNs.
- RNs are more likely to work in hospitals than LPNs.

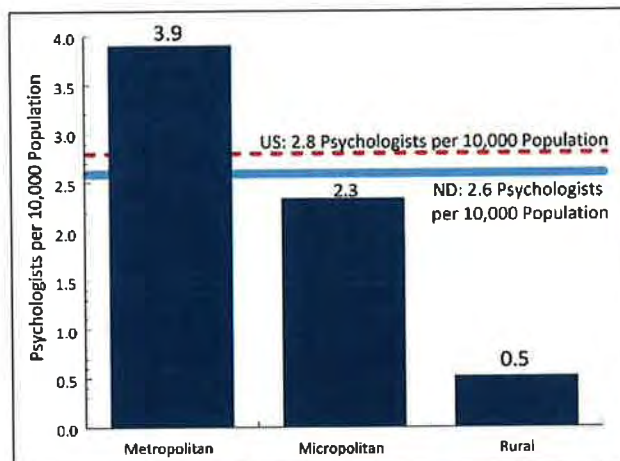


Figure 75. Psychologists per 10,000 population in North Dakota by metropolitan, micropolitan, and rural status.^{2,3,8}

- North Dakota is slightly behind the United States for psychologists.
- In rural areas, there are only 0.52 psychologists for 10,000 people.

Nationally there are 2.8 psychologists per 10,000 population, while the comparable ratio for North Dakota is 2.6. There are far more psychologists within North Dakota in metropolitan areas than in micropolitan (large rural) and rural counties (3.9 versus 2.3 and 0.5). If one compares the availability of psychologists in metropolitan compared with rural areas, there are 87% fewer psychologists in the rural areas (when corrected for population differences).

Dentists

North Dakota lags the rest of the country in the number of dentists available, regardless of region (see Figure 76).

There are six dentists per 10,000 population nationally compared with 4.5 for North Dakota (25% fewer in North Dakota). Metropolitan and micropolitan (large rural) counties have identical ratios at 5.1 per 10,000 population. However, rural counties have considerably lower rates at 3.2 per 10,000 population (37% lower). The ratios are based on total active dentists per county and do not differentiate between specialty dentists and general dentists and do not account for part-time status.

Pharmacists and Pharm Techs

North Dakota boasts significantly more pharmacists than the country as a whole (Figure 77).

There are far more pharmacists in metropolitan than in either micropolitan (large rural) or rural counties (16.4 per 10,000 population compared to 10.0 and 9.7). Overall North Dakota has 13.0 pharmacists per 10,000 population compared with a national ratio of 8.6. Thus, overall North

Dakota areas have more than the national average of pharmacists, though there are geographic differences.

However, the situation differs for pharmacy technicians, where North Dakota lags the United States and the geographic distribution is more uniform.

There is less variation across metropolitan status county categories for pharmacy techs than for pharmacists. The national average ratio of pharmacy techs per 10,000 population is 10.5, and the overall North Dakota rate is 9.5. Metropolitan North Dakota counties have a ratio of 10.1 compared to ratios in micropolitan (large rural) and rural counties of 8.8 and 9.1 per 10,000 population.

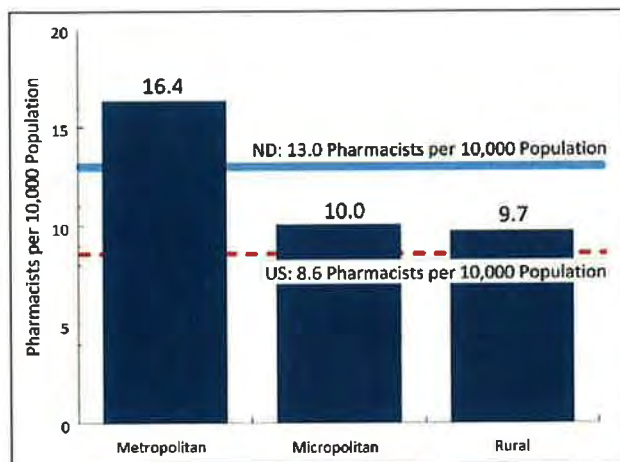


Figure 77. Pharmacists per 10,000 population in North Dakota by area.^{2,3,8,10}

- North Dakota has more pharmacists per 10,000 population (13.0) than the United States (8.6), especially in metropolitan areas.

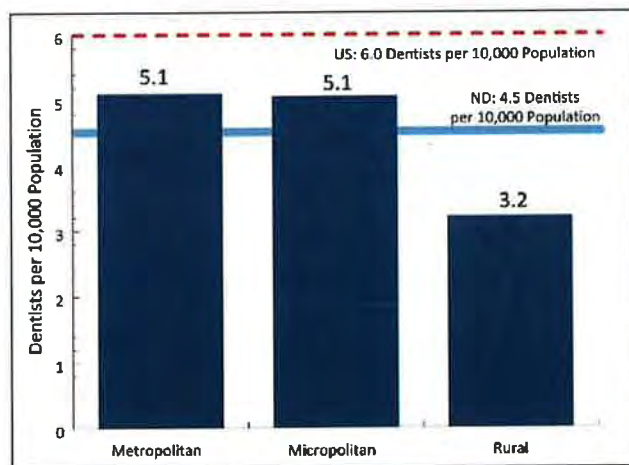


Figure 76. Dentists per 10,000 population in North Dakota by area.^{2,3,8}

- North Dakota (4.5 dentists per 10,000 people) lags behind the United States (6.0).
- Rural areas (3.2) are well behind metropolitan and micropolitan areas (both at 5.1).

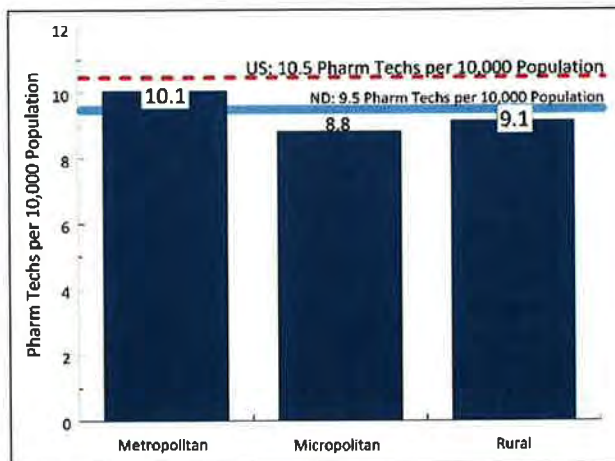


Figure 78. Pharm techs per 10,000 population in North Dakota by area.^{2,3,8,10}

- North Dakota is slightly behind the United States for pharm techs (9.5 compared to 10.5).

Physical Therapy

As with pharmacists, North Dakota has an adequate supply of physical therapists compared with the rest of the country, although they are not evenly distributed across the state (Figure 79).

The national ratio of physical therapists is 5.9 per 10,000 population. The ratio for North Dakota is 22% higher at 7.2. Metropolitan counties have a much higher rate than rural counties at 9.8 versus 5.3 per 10,000 population in micropolitan (large rural) and 4.2 per 10,000 population in rural counties.

SUMMARY

Though North Dakota has a large number of nurse practitioners in metropolitan areas (7.1 per 10,000 population), North Dakota is, overall, behind the national rate of 5.8. North Dakota is ahead of the national rate for physician assistants (3.2 vs. 2.7).

Overall North Dakota is significantly ahead of the nation for registered nurses (170 vs. 87 per 10,000 people), especially in the metropolitan areas. Rural areas have about 40 fewer RNs per 10,000 population.

North Dakota is very close to the national rate for psychologists (2.6 vs. 2.8 per 10,000); however, in rural areas there are only 0.5 psychologists for every 10,000 people.

There is a shortage of dentists in North Dakota (rate of 4.5 per 10,000 population is lower than the national rate of 6.0). This is especially true in rural areas where the rate is 3.2 per 10,000.

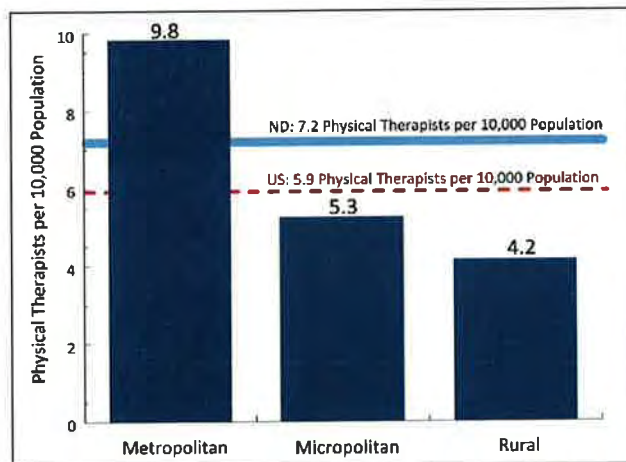


Figure 79. Physical therapists per 10,000 population in North Dakota by metropolitan status (2011).^{2, 3, 8}

- North Dakota is ahead of the nation with 7.2 physical therapists per 10,000 people compared to 5.9.
- Physical therapists are found primarily in metropolitan areas (9.8 per 10,000 people).
- Rural areas have less than half the ratio of physical therapists found in metropolitan areas (4.2).

North Dakota has more pharmacists than the national rate per 10,000 population and lags slightly in pharmacy techs when compared to the United States.

Physical therapists are primarily in metropolitan areas and the overall rate per 10,000 is 22% higher than the national rate. Both categories of rural counties lag behind the metropolitan area, and the United States as a whole.

North Dakota has relatively more nonphysician providers (e.g., PAs, RNs, and pharmacists) for some people and relatively fewer (e.g., dentists, NPs, and psychologists) for others. In addition, there are shortages by metropolitan status and other factors. As with physician specialists and primary care physicians, it is essential for policymakers and educators in North Dakota to understand the specific issues for all health care professionals, and to anticipate the consequences of an aging population and the likely great population growth in the Oil Patch.

References

1. Blue Cross Blue Shield of North Dakota. (2012). *Mid-Level Providers 2012* [Data file].
2. U.S. Census Bureau. (2009). *Metropolitan and Micropolitan Statistical Areas and Definitions* [Data file]. Retrieved from <http://www.census.gov/>.
3. U.S. Census Bureau. (2010). *Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
4. The American Journal for Nurse Practitioners, NP Communications LLC (2012). *The 2012 Pearson Report*. Retrieved from www.webnponline.com.
5. American Academy of Physician Assistants (2010). *Physician Assistant Census Report*. Available at http://www.aapa.org/uploadedFiles/content/Common/Files/2010_Census_Report_Final.pdf.
6. North Dakota Board of Nursing. (2008). *North Dakota Board of Nursing Annual Report 2007-2008*. Available at <https://www.ndbon.org/>.
7. North Dakota Board of Nursing. (2011). *North Dakota Board of Nursing Annual Report 2010-2011*. Available at <https://www.ndbon.org/>.
8. U.S. Department of Health and Human Services, Health Resources and Services Administration, Bureau of Health Professions. (2012). *Area Resource File (ARF)* [Data File]. Retrieved from <http://arf.hrsa.gov>.
9. North Dakota Board of Pharmacy (2011). *North Dakota State Board of Pharmacy Annual Report: July 1, 2010 through June 30, 2011*. Retrieved from <http://www.nodakpharmacy.com/report.asp>.
10. Department for Professional Employees, AFL-CIO. (2010). *Pharmacy Fact Sheet*. Retrieved from http://www.dpeaflcio.org/pdf/DPE-fs_2010_pharmacists.pdf.

SIX

Health Care Organization and Infrastructure in North Dakota

HOSPITALS

Figures 80 and 81 depict the distribution of North Dakota hospitals (i.e., Indian Health Service, tertiary, and critical access hospitals), the areas federally designated as health professional shortage areas (HPSAs), and the Oil Patch area. Most of North Dakota is designated as a HPSA. Nearly half of North Dakota's HPSAs are located within the Oil Patch. As is evident, the tertiary hospitals are located in the four largest cities in the state, and the critical access hospitals (CAHs) supplement the "Big Six" hospital systems (Altru Health System in Grand Forks, Trinity Health in Minot, Sanford Health in Bismarck and Fargo, St. Alexius Medical Center in Bismarck, and Essentia Health in Fargo) by providing hospital coverage elsewhere.

CAHs are rural hospitals that must meet specific federal guidelines such as the following: cap of 25 acute care beds, maintain an average length of stay of 96 hours or less, located 35 miles from another hospital, and are reimbursed on an allowable cost basis as opposed to a prospective cost as are the Big Six tertiary hospitals. Nationally, over half of all rural hospitals have converted to CAH status (1,327 out of 2,550 as of June 2012).¹ All rural hospitals in North Dakota with the exception of the two IHS hospitals are CAHs.

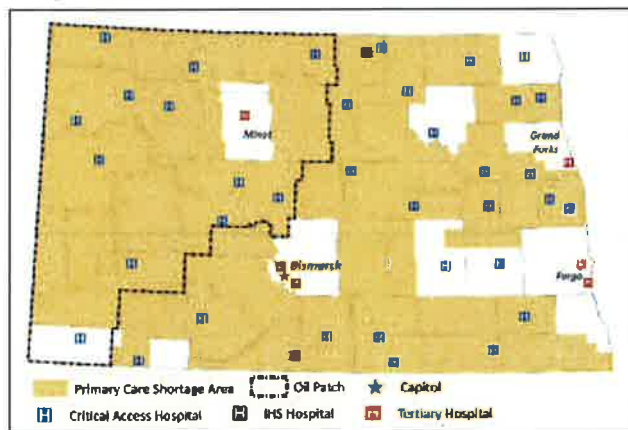


Figure 80. Hospitals in the state of North Dakota.

Table 23

Tertiary hospital geographic regions related to critical access hospitals.^{1, 2, 3}

Tertiary Hospital	Square Miles Serviced	People per Square Miles	Number of CAHs	Average Distance from CAH to Tertiary
Minot	23,836	6.0	12	87.7
Bismarck	24,613	8.2	10	101.7
Fargo	10,397	19.2	4	83.4
Grand Forks	11,117	10.7	10	63.6

- Minot and Bismarck service the largest areas, although Grand Forks and Fargo have the higher concentrations of people.
- Fargo region has the fewest CAHs.
- The distances between the CAHs and the tertiaries are greatest for Bismarck. The CAH closest to a tertiary hospital is only 37 miles away, while the CAH furthest from a tertiary hospital is 172 miles away.

All 36 CAHs have important networking relationships with the Big Six hospitals that are located in the four big cities of North Dakota. Each city thus forms a tertiary care geographic region (see Figure 81, and Tables 23 and 24). Most of the CAHs are located an hour or more by surface

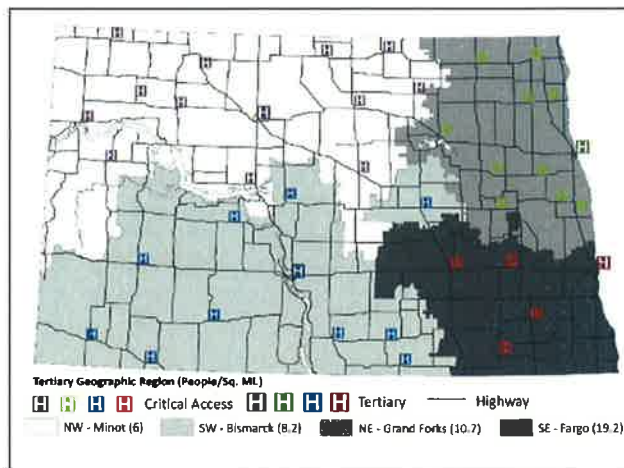


Figure 81. Critical access and tertiary hospitals by region in North Dakota with connecting highway system.^{1, 2}

- North Dakota has 50 hospitals including the following:
 - o Thirty-six critical access hospitals
 - o Six general acute hospitals (two of which are designated as transplant hospitals)
 - o Three psychiatric hospitals
 - o Two long-term acute care hospitals
 - o Two Indian Health Service hospitals
 - o One rehabilitation hospital
- There are six tertiary acute care hospitals, known as the "Big Six," located in Minot (one), Bismarck (two), Fargo (two), and Grand Forks (one).
- Thirty-six critical access hospitals (CAHs) work with these six through network agreements covering patient referral and transfer, communication, and emergency and non-emergency patient transportation.

Table 24
Tertiary hospital cities and CAH demographics.

Tertiary Hospital	Tertiary Beds	CAH Beds	Tertiary Average Age	CAH Average Age	Tertiary % Male	CAH % Male
Minot	416	227	36.1	41.2	50.7%	51.2%
Bismarck	497	302	37.6	45.3	49.4%	50.5%
Fargo	687	70	35.1	41.8	50.5%	50.2%
Grand Forks	277	196	34.5	43.2	51.4%	50.6%

- Hospitals in the Bismarck region have most beds (799 total); Fargo has 757, Minot has 693, and Grand Forks has 473.
- For all regions, the average age of people in the CAH territories is older than those in the four main cities. This would place a greater burden on the CAHs for certain types of care.

transportation from their tertiary referral center; in inclement weather, the transfer time can be substantially longer, or even impossible.

CAHs take care of an older population than the Big Six (see Table 24).

Virtually all hospitals including rural hospitals face many challenges that affect their ability to provide quality health services. Health care workforce supply, reimbursement from both public and private payers, community economic conditions and population changes, and newer pressures to implement health information technology (HIT) and to collect, monitor, and assess quality of care indicators all fashion a layer of organizational constraint creating a difficult environment for hospitals. Rural hospitals in particular, because of their small financial margins and a greater reliance on public payers such as Medicare, contend with an especially difficult environment.

Concerns over the financial viability of CAHs are heard from both from health administrators and providers, and community members. Community event and meeting surveys administered by the Center for Rural Health throughout North Dakota from 2008 to 2012 found that “financial issues facing rural hospitals” was the highest-rated concern out of nine subject areas. Forty-nine percent said this was a high concern. The actual financial condition of North Dakota’s CAHs adds credence to this general concern. Operating margin is an accepted financial measure of performance that compares revenues and expenses associated with patient care. In 2010 (most recent released data year) CAHs in North Dakota had operating margins of -0.93%, which compares to +0.75% nationally. South Dakota (+2.88%) and Minnesota (+2.42%) had positive margins. This is an improvement for the state because in the two previous years the operating margins in North Dakota were about -2.5%. However, in comparison to other states and the nation, the financial operations of North Dakota CAHs associated with patient care services are problematic. Another common performance measure is total margin, which looks at all revenue and expense sources for a hospital and is inclusive of investments, donations, tax revenue, grants

and other revenue sources. Statewide in 2010, CAHs had a positive total margin of +0.15. Nationally, total margins were +1.94%, and in South Dakota total margins were +1.80% and Minnesota +2.84%.⁴ Under this broader measure, North Dakota’s CAHs show financial stress; however, this reflects improvement. By comparison from 2004 to 2009, CAH total margins were negative in the state, ranging from a low of -2.14% in 2009 to a high of -0.06% in 2005.⁴ Rural communities have made significant commitments to their hospitals throughout the state, which can have an impact on the total margin rates. In 2005, only four CAHs had some level of local tax support (e.g., mill levy, sales tax), but by 2011 this had increased to 13 CAHs or 38% of all CAHs. In a similar fashion in 2005, 18 CAHs had the support of a local hospital foundation; this increased to 26 CAHs (76%) in 2011.⁵ While CAHs experience financial stress in many rural communities, local citizens are showing their support through their willingness to tax themselves or to make financial contributions to maintain local access to care.

North Dakota CAHs are complex organizational structures. In most rural communities with a hospital, the CAH is a “hub” of health services that goes well beyond acute care by offering primary care, long-term care, basic care, assisted living, health promotion and disease prevention services, and other services that are important to the community. Only five of the 36 CAHs are “stand-alone,” sole entity hospitals offering exclusively traditional hospital services. Most CAHs own and operate a primary care clinic (usually organized as a provider-based, federally certified rural health clinic, RHC) and/or a nursing home, and many offer additional services. CAHs are a central access point to primary care services because the 27 CAHs operate 60 primary care clinics, with 47 of them being RHCs. In addition, 14 CAHs operate nursing homes, nine operate ambulances, nine own senior apartments, seven offer assisted living, six operate basic care centers, and five provide home care services.⁶ These integrated health delivery systems are a common and accepted organizational arrangement in North Dakota.

CAHs work within health networks to provide more and better access to essential health services. They use networks

to gain greater efficiency and effectiveness, provide cost savings, share services or personnel, build capacity, and achieve a higher level of organizational performance. The Center for Rural Health 2011 CAH survey found that the areas that ND CAHs network around included the following: quality improvement, HIT, staff education, staff and board development, medical education, medical coverage and support, health professional recruitment and retention, and supply management. The tertiary hospitals have forged strong networks with the rural hospitals, particularly in the areas of quality and HIT; however, it is important to understand that North Dakota CAHs also work in a number of CAH-exclusive networks. In many respects, the rural hospitals are using networks as a means to also address federal health policy. Quality improvement and HIT development, for example, are significant national health objectives with corresponding federal policy directives and requirements.⁷

AMBULATORY CARE

There are approximately 300 primary care and specialty clinics in the state (see Figure 82). Rural and urban hospitals or health systems account for over 55% of these clinics.⁸

There are 57 federally certified rural health clinics (RHC) in the state. These are primary care clinics. CAHs own and operate 47 of the RHCs (82%) in the state as provider-based RHCs with the remaining RHCs being independent clinics generally owned by a physician or group practice. All the North Dakota provider-based clinics are owned by CAHs, which are non-profit entities in this state; therefore, the provider-based RHCs are non-profit. RHCs, both provider-based and independent RHCs, can be for-profit or not-for-profit, public or private.⁹

There are five federally qualified health centers (FQHC) in North Dakota with the most common type being the community health center (CHC) model. The five centers (four CHCs and one migrant health center) operate in 12 communities. Ten of the communities are rural and two are urban (Fargo has a CHC, and Grand Forks has a dental clinic that is operated by a rural CHC in Northwood).

The RHC program was created in 1977 by Congress to help address rural health provider shortages; thus, the program requires that the RHC employ a nurse practitioner, physician assistant, or a certified nurse midwife for at least 50% of the time the clinic is open. The 50% rule allows a hub clinic to operate satellites because it can move nonphysician providers from site to site more efficiently. The nonphysician providers are supervised by a physician in a manner consistent with state and federal laws. As the title implies, an RHC can only operate in a federally recognized rural area that is a federally designated health professional shortage area, medically underserved area, or governor-designated area.

The development of RHCs was slow, both nationally and in North Dakota; as recently as 1989, there were no RHCs in existence in North Dakota. Throughout the 1990s the

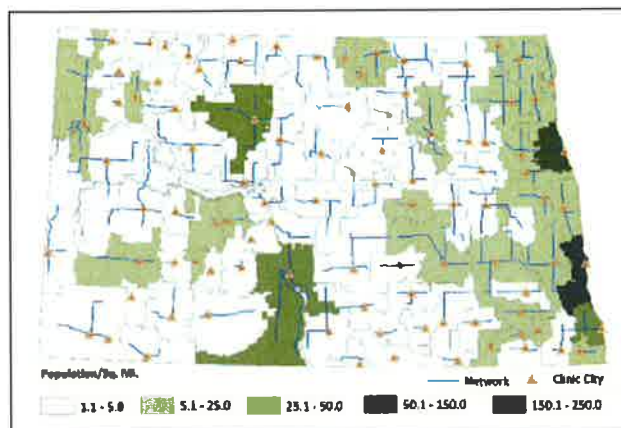


Figure 82. Service areas and networks for clinics in North Dakota.²

program expanded rapidly. At one point, there were about 90 RHCs in North Dakota. Since then the number of RHCs has declined in the state in part because of changes in reimbursement structure and rates. RHCs receive special Medicare and Medicaid reimbursement. Medicare visits are reimbursed based on allowable costs, and Medicaid visits are reimbursed under the cost-based method or an alternative prospective payment system (PPS). RHCs can be for-profit or not-for-profit, public or private.

The federally qualified health center (FQHC) model dates back to the Johnson administration's War on Poverty, having been created in the mid-1960s as an effort to increase access to care, particularly for lower income groups (although all income groups can avail themselves of FQHC services). FQHC is a generic category of provider groups that can be organized as community health centers, migrant health centers, or health care for the homeless centers. FQHCs receive an annual federal grant to assist them in providing services to low income groups. RHCs do not have a similar federal appropriation. As such, FQHCs offer services based on a sliding fee scale, so if a client's income is low enough, there are no out-of-pocket costs. In essence, the federal grant can offset clinic costs in providing care to lower income clients; this is the FQHC feature that addresses income access to services. To illustrate the role FQHCs play in providing access to care for lower income groups, nationally, in 2011, about 15% of the U.S. population was at or below the federal poverty level. The patient base for FQHCs showed that about 72% of their client base was at or below the poverty level. RHCs, in contrast, do not have to offer a sliding fee scale. In addition, FQHCs can be located in urban as well as rural areas, whereas RHCs are only located in accepted rural designations. Like RHCs, FQHCs can be a private or public non-profit organization. An FQHC is reimbursed from Medicare and Medicaid based on a cost model that uses an all-inclusive reimbursement rate. FQHCs are required to offer a wider scope of services than are RHCs. These more comprehensive services include the following: diagnostic and

lab, pharmaceutical, behavioral and oral, hospital and specialty, after-hours care, case management, transportation, and interpretative services. RHCs are only required to address outpatient, emergency, and lab; however, they are not precluded from offering a wider array of services.^{10, 11, 12}

EMERGENCY MEDICAL SERVICES

Emergency medical services (EMS) are an essential and fundamental service or health delivery function in the overall U.S. health system. EMS commonly refers to out-of-hospital acute medical care or transport to definitive care, for patients with illnesses and injuries that the patient, or the medical practitioner, believes constitutes a medical emergency.¹³ EMS can be viewed as a pre-hospital service, but as EMS continues to develop, it is also seen as a vital element in an overall integrated health delivery system where even the role and function of emergency care personnel (generally emergency medical technicians [EMTs] who can be licensed at a basic, intermediate, or paramedic level) are expanding to include more and different skill sets (e.g., community paramedic where the paramedic is used in a fully integrated model with an expanded scope to address health or medical functions beyond traditional paramedic levels).

In North Dakota there are 5,627 licensed EMS providers (54% are first responders or drivers; 34%, EMT-Basic; 7%, EMT-Paramedic; and 5%, EMT-Intermediate).¹⁴ Over 90% of the EMTs in North Dakota are volunteers. The EMS system in rural areas is heavily dependent on a volunteer model that is seriously strained because of an aging volunteer base, changes in family dynamics and culture, local economics, and even how people value personal time vs. civic commitment. While the number of paramedics is relatively small (about 410) and they tend to be concentrated in urban areas, the number of rural paramedics has increased (advanced life support [ALS] systems must be staffed by paramedics, and 12 of the state's 23 ALS units are in rural areas).

Advanced EMS support is available principally around the four major cities and in the Oil Patch (see Figure 83).

Most of the EMS support throughout the state is ground-

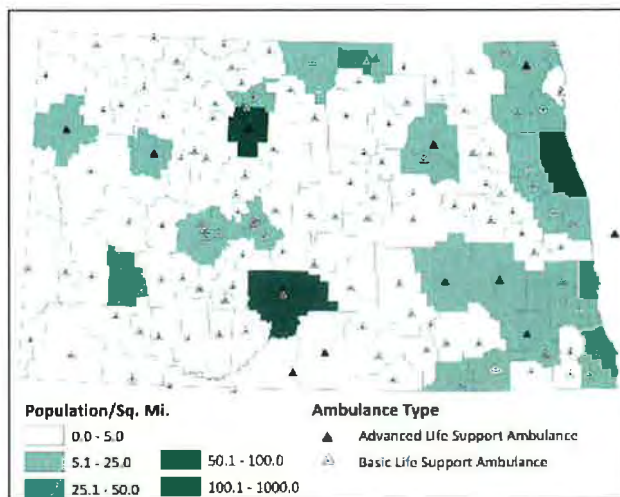


Figure 83. Areas served by EMS units in North Dakota.¹⁵

- There are 130 EMS areas in North Dakota—16 areas (12%) are advanced life support (ALS), 110 areas (85%) are basic life support (BLS), and four areas (3%) are undefined or unspecified.
- There are 146 EMS units in these areas; 23 are ALS (16%), 121 are BLS (83%).
- Twelve of the 23 ALS units are in rural areas. However, most of rural North Dakota is served directly by BLS units.

based and provides basic services (see Table 25).

The average population served by an EMS unit is 5,212 people, with a median of 1,459 (range 124 to 138,538 people). Eighty percent (116) of the EMS units serve fewer than 5,000 people, but cover an average of 524 square miles.

EMS faces many challenges in the state. These obstacles were documented in a recent report, *A Crisis and Crossroad in Rural North Dakota Emergency Medical Services*, which was completed for the State of North Dakota in 2011. The following were primary challenges identified from the research:

- Recruitment of volunteers was significantly more difficult than a decade before.

Table 25
Number and type of 146 EMS units in North Dakota.¹⁵

	Air	Ground	Substation	Total
Advanced Life Support	3	20	—	23
Basic Life Support	1	115	5	121
Critical Care	2	—	—	2

- The average EMS area is 544 square miles (range four to 2,016 miles).
- The average distance traveled within an area is 11.6 miles (minimum distance, one mile; maximum distance, 22.4 miles).
- The average distance from an EMS unit to a CAH is 22 miles (minimum distance, 0.1 miles; maximum distance, 77 miles).
- The average distance from an EMS unit to a tertiary hospital is 94 miles (minimum distance, 1.8 miles; maximum distance, 192 miles).

- An aging volunteer base without an adequate supply of generational replacements.
- Almost half (46%) of the volunteers listed on local service rosters were inactive.
- Need to provide some level of financial incentives for volunteers was increasing.
- A small number (35%) of ambulance members frequently take call.
- Some EMS volunteers reported taking more than 120 hours a week for call time.
- Thirty-five percent of ambulance squads had difficulty in filling schedules during specific times of day or the week.
- Some services reported that they expect to close within the next five years.¹⁶

The report also found that some of the issues have a social, cultural, and political orientation. For example, the authors discuss a finding that “EMS is often not seen as a vital component of community infrastructure worthy of the same funding as law enforcement, public health, road maintenance, water, sewer, and waste removal” (p. 23). In addition, it is common for people, including some public officials, to not understand how EMS is funded; there is some level of resistance to more state involvement because of concerns over loss of local autonomy and control; and local political subdivisions such as cities, townships, and counties are generally not open or ready to assume more responsibility for the direct funding or operations of EMS.

Public policy, at the state level, has significantly taken on more responsibility for putting forth state monies to assess and plan for rural EMS change, and to address through state grants the need to better educate and train an adequate EMS personnel base. During 2011-2012, North Dakota will have supported \$900,000 in training grants, and in 2012, the state supported \$1.25 million in staffing grants. Over \$3 million during the biennium has been targeted to the Rural EMS Assistance Fund, which is focused on staffing, structural development, assessment/planning, and other activities to realign and restructure the rural EMS system. While the last two legislative sessions (2009 and 2011) have been supportive to rural EMS, public policy in North Dakota tends to favor a higher degree of restraint and to not seek to take on additional public functions. In the *Crisis and Crossroad* report, one legislator commented: “We don’t want to be in the ambulance business.” Although improvements have and are being made in rural EMS and while there is a growing recognition of the serious problems facing rural EMS, the future of EMS must contend with the cultural and political norms of state public policy—one where the state has significantly increased financial resources and commitments, but does not want to take on full responsibility, and one where political subdivisions have not fully recognized their heightened responsibility or realized their more comprehensive role in the EMS system. North Dakotans may find that the time is close at hand to examine who is

responsible for “owning” the EMS challenge; where is the locus of control, decision-making, and funding; and what is the level of balance between a traditional volunteer system (that may be antiquated) and one based on a more highly trained and professional model.

TRAUMA CENTERS

Falls and motor vehicle crashes account for the majority of trauma in North Dakota. In 2011, employment in an industry related to the harvesting of natural resources replaced agriculture as the No. 1 work setting for trauma events. Agriculture had been the traditional location for such events. In that year, natural resources employment accounted for 125 incidents of trauma, in comparison to 102 in agriculture. Likely because of the rapid expansion in oil and other energy development resources, the incidence of natural resources employment-related trauma increased by 291% from 2009 to 2011 (from 32 incidents in 2009 to 125 in 2011). In the 17 oil-producing counties, from 2006 to 2011, the trauma volume (i.e., the increase in the number of people in hospitals meeting trauma registry admission criteria) increased by 129%. One rural hospital in the oil region saw its number of yearly trauma events over the five-year period increase from two to 41.¹⁷

Forty-three of North Dakota’s 44 acute and critical access hospitals are designated as trauma centers (see Figure 84). Verification of trauma centers has been based upon nationally recognized standards by the American College of Surgeons Committee on Trauma. The standards address hospital organization, clinical capabilities, facility and equipment availability, quality improvement processes, prevention and public education, trauma research, continuing education, trauma service support personnel, and transfer agreements. The North Dakota process uses teams from the American College of Surgeons for verification of Level I, II and III trauma centers and utilizes state teams for designation of Level IV and V trauma centers. The process for Level I, II and III trauma centers to receive verification is accomplished through an application process, site visit and review by a verification team from the American College of Surgeons (ACS). The Department of Health will issue a state designation to coincide with the dates of the verification from the ACS.¹⁹ A Level I trauma center provides the highest level of surgical care to trauma patients. From 2007-2011 the North Dakota Flex program made funds available to CAHs to complete the process to be designated either as Level IV or Level V trauma centers. About nine CAHs made use of the grants. In addition, two rural hospitals in Minnesota and South Dakota that lie on the border with North Dakota are part of the North Dakota Trauma system. The state’s six largest hospitals and tertiary centers are all designated as Level II trauma centers. North Dakota does not have a Level I trauma hospital.¹⁷

Studies have found a number of factors that are advantages and assets to the North Dakota trauma system. Common advantages include the following:

- Inclusive system with excellent participation
- Good EMS coverage despite geographic challenges
- Strong enabling legislation
- Good working relationship between EMS and trauma systems
- Strong cooperation among hospitals
- Rural Hospital Flexibility (Flex) program collaboration
- State radio communication system
- Budget surplus
- State Legislature is engaged

Challenges and vulnerabilities include the following:¹⁹

- Large geographic area with a scattered (low density) population
- Difficulty in recruiting providers
- High reliance on volunteers, particularly in rural areas
- No statewide trauma registry data and little use of existing data collected by trauma centers
- No hospital discharge data
- Lack of specific pediatric protocols and practices
- Relative shortage of air ambulance services
- Poor coordination with existing injury prevention program
- An aging population

ELECTRONIC HEALTH RECORDS AND HEALTH INFORMATION TECHNOLOGY

Health information technology (HIT) is a relatively new entry into the health lexicon (see Figure 85). The focus began in the early 2000s and in some respects, HIT is an outgrowth of slightly older concepts called telemedicine and telehealth. The term *telemedicine* refers specifically to patient and health care provider encounters for diagnosis and treatment. The term *telehealth* is a broader term that includes telemedicine but also includes using the technology for preventive, educational, and health-related administrative activities. Both telemedicine and telehealth involve interactive medical equipment, computer technology, and telecommunications technology.²⁰

It may be helpful to think of telemedicine as the use of technology directed at clinical services and care over distance at different sites: it is a method of delivering health care. Within that delivery structure, which employs technology including telecommunications, HIT focuses more on enabling the transfer of patient information and data over distance. HIT is critical in an overall effort to improve patient care quality, safety, and outcomes. It can serve as a vehicle to move critical information quickly and efficiently thus improving organizational performance. It may involve

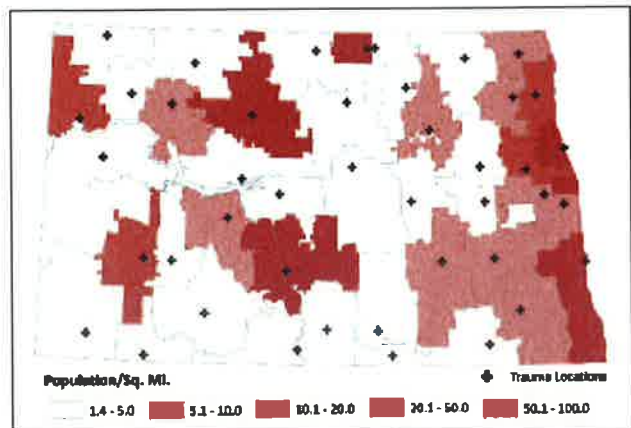


Figure 84. Areas served by 43 trauma centers in North Dakota.¹⁸

- The average population served by a trauma center is 15,462 people (range 1,408 to 157,454 people).
- Thirty-one percent of trauma centers serve fewer than 10,000 people, but cover an average of 1,562 square miles.
- The average trauma center area is 1,627 square miles.
- The average travel distance to a trauma center is 20 miles.

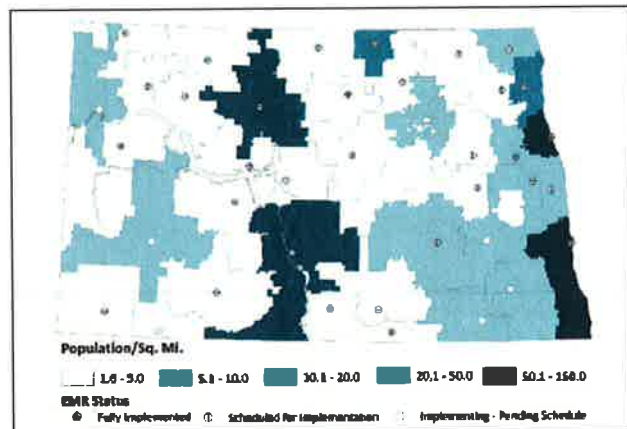


Figure 85. Areas served by 40 EMR/HIT locations in North Dakota.⁸

- Currently there are 31 fully implemented EMR locations, two scheduled for implementation, and seven that are planning implementation.
- The average area served is 1,749 square miles, ranging from 494 to 5,043 square miles.
- There are on average 10.7 people per square mile in an EMR/HIT service area.

electronic health records (EHR), electronic clinical systems such as computed radiography, computerized provider-order entry, picture archiving and communication systems, and clinical decision support systems; and the overall management of health and medical information.^{21, 22}

The HIT movement received an important boost in January 2004 when President George W. Bush called for the widespread adoption of electronic health records (EHR) within 10 years.²¹ Since then, there has been significant

growth throughout the country, although it has been harder in rural areas because of cost, staffing issues, technology access, and other concerns. Both federal and state policies have been engaged.

At the federal level, the Office of the National Coordinator (ONC) for Health Information Technology was established in the U.S. Department of Health and Human Services. The American Recovery and Reinvestment Act (ARRA) provided over \$30 billion in investments to hospitals, clinics, and physicians to develop HIT systems through the Health Information Technology for Economic and Clinical Health (HITECH) Act. HITECH also provided incentive payments and funding to assist health organizations and professionals to meet “meaningful use” objectives for electronic health records; created the HIT Extension program that supports state-based HIT Extension Centers that provide technical assistance, including HIT staff development to providers and health organizations; and provided federal funding in the form of grants and loans.^{23, 24, 25}

North Dakota has also developed state policy to support HIT development. In 2006, the first statewide HIT summit was held, which provided an opportunity for health providers, policymakers, state associations, educators and researchers, and others to gather to better understand key concepts and statewide needs. Following this, the North Dakota HIT Steering Committee (22 private and public entities) was created by the Legislature in 2007 to establish a more formalized process for the state, assess needs, and develop operational plans. One of the steps supported was a provider needs survey in 2008 administered by the Center for Rural Health. In 2009, Senate Bill 2332 was enacted that, in part, changed the Steering Committee into the Governor’s HIT Advisory Committee (HITAC). The law also established a formal place for HIT development in state government with the hiring of a North Dakota HIT director, establishing a state HIT office in the North Dakota Information Technology Department, created a \$5 million loan program, and provided an additional \$8 million to support the state match for federal dollars to develop and operate a health information exchange (HIE). The federal–state partnership saw North Dakota receive \$5.4 million (over five years) in federal funds to plan and implement a state HIE. The 2011 Legislature continued its support for HIT development by renewing the state loan program with a new appropriation for \$5 million, continuing to provide up to \$8 million in state money for federal match purposes, and expanded the state HIT office with three additional staff. In 2012, the HITAC supported a second statewide survey of providers, which again was administered and implemented through the Center for Rural Health.²⁶

In the *First Biennial Report on Health Issues for the State of North Dakota 2011*, it was discussed that the adoption of HIT in rural and underserved areas of North Dakota had been “particularly slow.” This was because of cost considerations,

the availability of funding, reimbursement, staff development, and other factors. The HITAC survey of 2012 indicates strong progress and improvement at least with regard to the hospital community. Having an effect have been the availability of state loan dollars; support from the Blue Cross Blue Shield of North Dakota Rural HIT Grant program (administered through the Center for Rural Health); and development of the Regional Extension Assistance Center for HIT (REACH), which serves both North Dakota and Minnesota in providing technical assistance in the form of readiness and meaningful-use assessments, organization and workflow redesign, vendor contracting, functional interoperability assessments, physician engagement and clinical design support, and other services. A statewide infrastructure involving resources and efforts from both the private and public sectors has been developed. REACH works closely with the North Dakota Rural Hospital Flexibility program and the North Dakota State Office of Rural Health (located at the Center for Rural Health).²⁷

The 2012 statewide survey found the following:

- Twenty rural hospitals indicated that they had gone live with a certified electronic medical record.
- Twelve of the remaining rural hospitals anticipate going live over the next year.
- The perceived most significant drivers for the change since 2008 were the recognition of the need to improve quality of health care, the advent of Medicare/Medicaid incentives and loan funds, the need to improve patient safety, and administrators more willing to advocate for EHR.
- The most significant barriers in 2012 to developing HIT were lack of financial resources (e.g., the initial cost of IT investment), ongoing cost of hardware and software, developing a sustainable business model, difficulty in justifying the expense or a low return on investment, and difficulty in changing workflow patterns.
- In 2008, strategic plans for HIT in rural sites were either not developed or were in very early stages, but by 2012, 70% of the rural respondents said they had an HIT plan in place.
- The most common forms of electronic clinical systems were the following:
 - o Picture archiving and communication systems (PACS)—24 rural hospitals
 - o Computed radiography (CR)—23 rural hospitals
 - o Pharmacy information systems—18 rural hospitals
 - o Nursing and ancillary documentation—17 rural hospitals
 - o Physician documentation—17 rural hospitals
 - o Computerized provider-order entry (CPOE)—15 rural hospitals
 - o Integrated laboratory information systems (LIS)—14 rural hospitals
 - o Electronic signature—14 rural hospitals

- Seventeen of the 36 CAHs were using e-Emergency through the Avera Health System of Sioux Falls, SD, supported in part by grants from the Leona M. and Harry B. Helmsley Charitable Trust and the BCBSND Rural HIT grant program. The e-Emergency system provides two-way visual and audio connections between rural emergency departments and emergency care physicians at Avera Health System.⁸

The 2012 HIT survey process was also used with clinics, pharmacies, and long-term care facilities. However, the response rates for clinics and pharmacies were deemed low, and the HITAC efforts will continue to work with those health providers to better understand their status within HIT. The response rates for long-term care facilities were higher, and there were some promising results. For example, the survey found that 42% of nursing homes had an EHR system implemented; 26% of assisted living facilities had an EHR; and less than 10% of basic care facilities had one. Another 21% of nursing homes said they had been selected or have begun to implement an EHR system but are not set to use it. This was true in 30% of the basic care facilities and 15% of the assisted living facilities. Another 15% of nursing homes, 7% of assisted living, and 6% of basic care facilities said they were assessing or planning for EHR adoption. All in all, long-term care facilities were also making strides to address HIT.⁸

LONG-TERM CARE

As was discussed in Chapter 1, North Dakota must contend with an aging population that has a corresponding effect on policy decisions (federal and state) as it relates to health infrastructure, health status, education, housing, transportation, economic development, and other sectors. Long-term care or aging services are a function of health care that is directly affected by population factors, particularly the aging of the population.

According to the North Dakota Long Term Care Association, two out of every five North Dakotans will require some type of long-term care (LTC) service during their lives. The need for personal assistance with everyday activities increases with age. The top three factors affecting the need for nursing home care are (1) being female, (2) being 80 or older, and (3) living alone. By age 75, 60% of individuals are living alone. The association also found that the most common reasons provided for nursing home placement include (1) the need for assistance with daily care throughout the day, (2) complex medical needs, and (3) the need for continuous supervision.²⁸

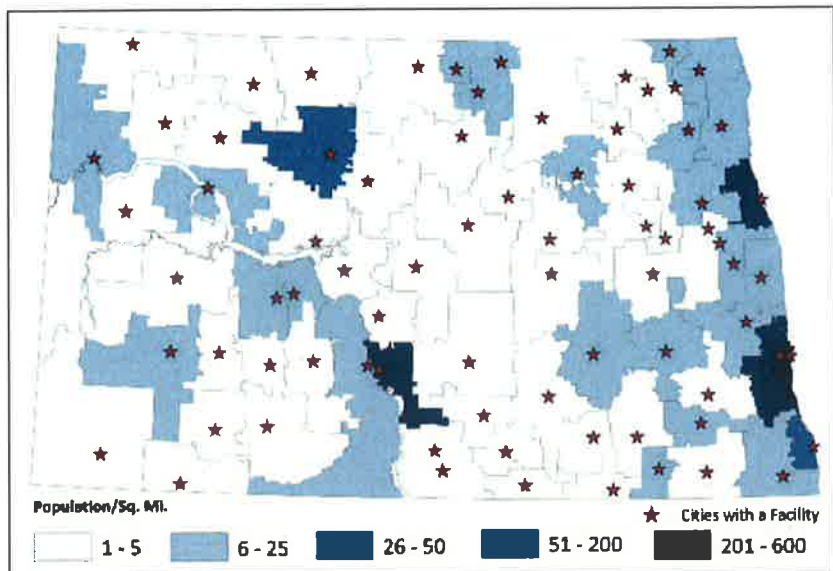


Figure 86. Location and service area of long-term care facilities in North Dakota.²⁹

- Seventy-five cities have at least one LTC facility (40 of these cities also have an assisted living facility).
- Forty-five LTC facilities are located in areas with fewer than five people per square mile. Only six locations have 40 or more people per square mile, from Wahpeton (40) to Fargo (582).
- Fifteen areas have an average age of 40 or less, and 23 an average age of over 45.
- The average distance to travel to an LTC is 15 miles.

Currently there are 84 skilled nursing facilities (with 66 or 79% located in rural areas). Ninety-three percent are non-profit. There are 68 basic care facilities in North Dakota (with 47 or 69% located in rural areas). Seventy percent are non-profit. North Dakota has 73 assisted living facilities (with 51 or 70% located in rural areas). Seventy-four percent are non-profit.

Long-term care faces many challenges. Similar to hospitals, clinics, EMS, and public health, one of the primary obstacles is workforce. The annual turnover rate for certified nursing assistants (CNA), who are in many ways the backbone of the LTC system, is 62%. The CNA turnover rate has increased over the past few years: 43%, 2002; 35%, 2003; 53%, 2006; and 53%, 2008.²⁸ The nursing turnover rate has increased significantly with the licensed practical nurse (LPN) turnover being 33% and the rate for RNs standing at 40%. A large number of caregivers in long-term care are age 50 or older (34%). The oldest caregiver working in LTC is a 97-year-old dietary aide. The workforce situation is challenging enough that in 2010, 11% of nursing facilities stopped admissions because of insufficient staffing. In 2010, almost two out of five nursing facilities contracted with private agencies to deliver daily resident care. Finally, 14% of the long-term care staff in North Dakota are at or over retirement age. Many nursing facilities residents are served by a workforce who are their peers.²⁸

PHARMACIES

Rural pharmacies, like other rural health providers, have felt the pressure of reimbursement and workforce issues. Rural pharmacies typically pay more to drug manufacturers per prescription and sell a relatively low volume of medications, so the resulting profit can be very low. There is increasing competition from mail-order and Internet suppliers, who are able to sell at large volume and negotiate lower prices from drug manufacturers, and may pass part of these savings on to customers.

Some third-party payers have low payment rates for prescription drugs, so pharmacies may actually lose money supplying medications paid for by these programs. Independent pharmacies tend to be more dependent on revenue from prescription medication sales, making them more vulnerable to increased competition and to decreases in reimbursement. Rural pharmacists tend to work longer hours than their urban counterparts. Relief coverage for vacation and illness is often difficult for rural pharmacists to find, which can result in overwork or temporary pharmacy closings. This combination of lower wages and longer hours can make it more difficult for rural areas to recruit and retain pharmacists. In addition, rural pharmacies face the same issues as do other rural providers from declining population bases, volatile economic conditions, and changes in technology. Nationally, from May 2006 to 2008, there was a net closure of over 500 rural pharmacies.³¹

Over the past 20 or so years, over 25 rural pharmacies closed in North Dakota and a number of others were at risk of closing. 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 because one pharmacy may serve an expanding geographic area. In response to increasing challenges with maintaining access to pharmacy services, a telepharmacy pilot project was initiated in 2001. Now a national model, this has helped to maintain services at retail businesses, nursing homes, and rural hospitals across the state. This is discussed in detail in the following section.

A final area of interest is a federal discount drug program called the 340B program (named after the section in the Public Health Service Act of 1992 that created the discount). The purpose of the discount was to expand access to affordable medications to low income populations and support the operations of health care safety net organizations such as FQHCs, disproportionate share hospitals, family planning programs, homeless programs, and other organizations that meet federal goals in maintaining access for vulnerable populations such as Medicaid and Medicare recipients, populations in underserved areas, or who have economic or health disparities. Pharmaceutical manufacturers whose drugs are covered by Medicaid are required to sell drugs to covered entities at 340B discounts. As of March 2012, over 17,000 health provider sites and over

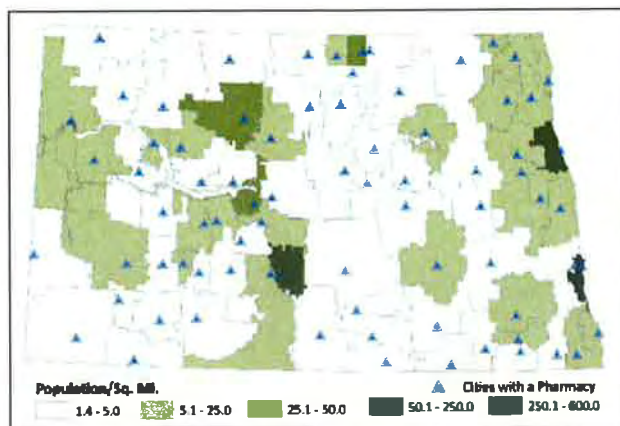


Figure 87. Location of pharmacies in North Dakota.³⁰

- North Dakota currently has 241 pharmacies.
- 168 (70%) are rural or located outside of the metropolitan areas.
- There are 79 towns with at least one pharmacy.
- Six rural counties have no pharmacies.

1,000 pharmaceutical companies were involved with the 340B program. The number had increased significantly as the Affordable Care Act expanded the number of approved safety net providers to include critical access hospitals, sole community hospitals, rural referral centers, freestanding children's hospitals, and some cancer hospitals. Rural health clinics still do not qualify, however.³² By lowering the cost to the health provider, costs can be lowered for the patient or client and health facilities can use the cost savings to make other important adjustments. From a rural perspective, the 340B drug program has been generally viewed as a positive federal effort.

Telepharmacies

The development of telepharmacies throughout the country owes its start to the efforts of North Dakota in 2001 (please see previous section on Pharmacies). North Dakota was the first state to pass administrative rules allowing retail pharmacies to operate in certain remote areas. In 2012, there are 10 states with laws governing telepharmacies.³³

Telepharmacies have become a practical means to keep access to medications available in a growing number of rural locations (see Figure 88). A telepharmacy benefits the patient and the pharmacist, creates employment opportunities for health workers, supports local business and economic development, and supports local health providers and organizations such as CAHs, clinics, long-term care facilities, public health, and others.

How does telepharmacy work? A licensed pharmacist at a central pharmacy site supervises a registered pharmacy technician at a remote telepharmacy site through the use of videoconferencing technology. The technician prepares the prescription drug for dispensing by the pharmacist. The

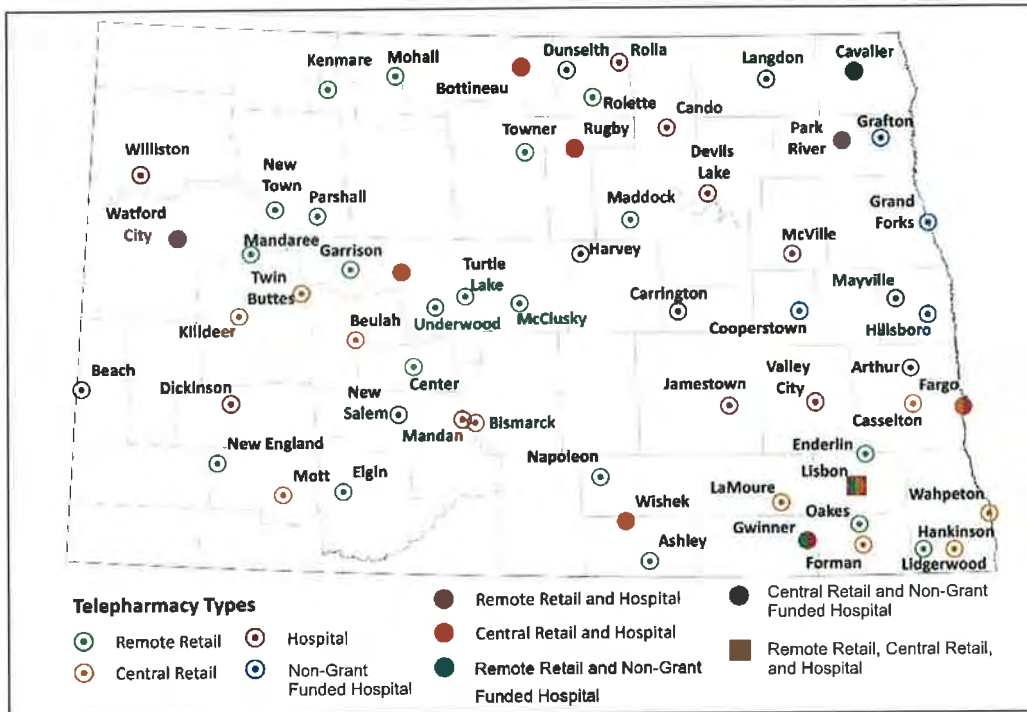


Figure 88. Telepharmacies in North Dakota.³⁴

- North Dakota currently has 61 telepharmacies.
- Twenty-three are remote retail, 11 are central retail, 11 are hospital, six are non-grant funded hospitals (all in the east), one is remote retail and hospital, five are central retail and hospital, one is remote retail and non-grant funded hospital, two are central retail and non-grant hospital, and one is remote central hospital.
- Nine counties have no telepharmacies.

pharmacist communicates face-to-face in real time with the technician and the patient through audio and video computer links.³⁵

Rural North Dakota has felt the positive effect of telepharmacy. Thirty-four (64%) of North Dakota's 53 counties are involved with the telepharmacy project. Approximately 40,000 rural citizens have had pharmacy services restored, retained, or established through the North Dakota Telepharmacy project (a collaboration of the North Dakota State University College of Pharmacy, Nursing, and Allied Sciences, the North Dakota Board of Pharmacy, and the North Dakota Pharmacists Association.) The effort has restored valuable access to health care in rural and frontier areas of the state and has added approximately \$12 million in economic development to local rural economies.³⁵

PUBLIC HEALTH

Public health is an important and fundamental set of health services that 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 North Dakota public health director once remarked, "If I am doing my job well, you don't even know I'm here." While acute care, long-term care, primary care, and EMS 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 improved sanitation), fluoridation of drinking water, provision of safer and more healthful foods, access to family planning, increased motor vehicle safety, and tobacco control. Disease prevention and health promotion are highly associated with public health.

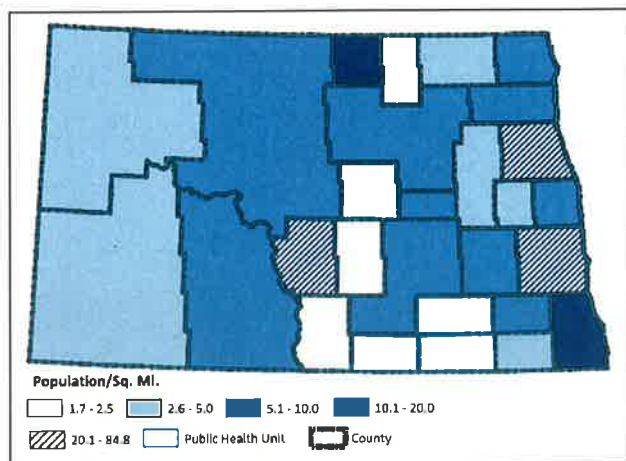


Figure 89. Location of public health units in North Dakota.³⁶

- There are 28 public health units in North Dakota, with 22 in the eastern half of the state.
- Twenty-one cover a single county, and seven cover multiple counties.
- The average area covered by a unit is 5,525 square miles.
- Only three (Bismarck, Grand Forks, and Fargo) have a population density of over 40 people per square mile. Fourteen (half) have under five people.
- The average age of population for 20 public health units is over 40.

While each public health unit can organizationally determine its own mission and primary focus, there are some common services provided. All North Dakota public health districts 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 B₁₂ 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.

North Dakota's public health system is decentralized with 28 independent local public health units working in

Table 26
Public health unit by type and number of counties.³⁶

Type	Counties
City/County Health Department	3
City/County Health District	1
Multicounty Health District	32
Single County Health Department	6
Single County Health District	11

partnership with the North Dakota Department of Health (see Table 26). The 28 local public health units are organized into single or multicounty health districts, city/county health departments, or city/county health districts. Seventy-five percent of the local health units serve single county, city or combined city/county jurisdictions, while the other 25% serve multicounty jurisdictions. The majority of the multicounty jurisdictions are located in the western part of the state. In this decentralized approach, the units are required to meet state standards and follow state laws and regulations, but they can exercise their own powers and have administrative authority to make decisions to meet their local needs.

Some rural public health units, like rural hospitals, have used special federal rural health grants to address broader community needs. Southwestern District Health Unit, Dickinson, which serves a large eight-county region has used multiple federal Rural Health Outreach grants to create a health screening (e.g., various cancers and cardiovascular conditions) and education model that has been operating for over 12 years. It is a strong community engagement model in which the public health unit, the local Dickinson hospital, and the community action agency work as a network along with many other area groups to plan and develop services. The program *Pathways to Healthy Lives* is a model program both in terms of its community focus and network orientation, but also in its ability to bring services into some of the most remote areas of the state, including parts of an American Indian reservation. The program began through a multi-organizational planning process about a dozen years ago with strong public involvement and awareness. Tri-County Chronic Disease Management Program is also a Rural Health Outreach grant product. Developed and administered by City-County Health Department in Valley City, Tri-County is a network-focused effort involving City-County, Central Valley Health Unit in Jamestown (serving Stutsman and Logan counties) and South Central Senior Services in Logan County. The program places a strong focus

on self-management and teaching clients how to learn more about their chronic disease, how to self-monitor and manage it, while working closely with their primary care providers. Clients gain awareness and more self-confidence. To date, evaluation data indicate that the program has had a positive effect and is a model program for rural health providers. Public health in North Dakota, and certainly in the rural corners, is taking a serious look at the challenges and limitations it faces, forging new partnerships and networks, and working to meet local health needs.

MENTAL HEALTH

The prevalence of mental illness in rural areas is equal to or greater than in urban populations, with rural residents reporting greater rates of depression than those in metropolitan areas. Across all four regions of the country, suicide rates are higher among men in rural areas than among men in urban areas. Untreated depression is a chronic issue. Rural access difficulties result in many rural residents forgoing treatment altogether or obtaining care from nonspecialists for mental health problems. The issues in rural mental health include disparities in access, availability of and culturally appropriate treatment, quality, mental health disparities in rural areas, and special populations.^{37, 38}

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.

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. The 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 support, vocational and educational services, and supportive employment. The state hospital provides physical, medical, psychological, and other services and is accredited and Medicare certified.³⁹

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.³⁹

Rural health providers have been active in developing community-focused solutions to address mental health. The 2011 CAH administrator survey found that "access to mental health services" was singled out as a severe problem by 44% of the hospital CEOs; this placed it third behind more commonly recognized issues such as physician workforce supply (62%) and hospital reimbursement from private third-party payers (56%).⁴⁰ This is evidence that the issue and its effect not only on patients and families but also on the overall delivery system is recognized as a serious rural problem. Since the mid-1990s, there have been four Rural Health Outreach grants in North Dakota that addressed some facet of mental or behavioral health. The Rural Mental Health Consortium in central North Dakota has involved four CAHs working together since 1994. The network employs advanced practice nurses trained specifically in mental health to serve the population. As an outreach grant, the four CAHs had only three years of federal funds to develop and operate the program. With the federal funds ending about 1997, the program has been successfully maintained by the network and is still in operation. The Wellness in the Valley Suicide Prevention program operated in the Valley City area created a county-wide suicide prevention effort involving 18 agencies. The network was led by the CAH, public health agency, and a primary care clinic. In 2011, Mental Health of America North Dakota received a federal Rural Health Network Development award to develop a regional network of behavioral health (mental health and substance use) entities to improve access to behavioral health care and reduce behavioral health disparities. This network also involves the Elbowoods Memorial Health Center, Sakakawea Health Center (a CAH), the North Dakota Federation of Families for Children's Mental Health, the Area Health Education Center, and the Coal Country Community Health Center.

ORAL HEALTH

Access to oral health care is problematic for millions of Americans because of a variety of factors, including financial barriers, transportation difficulties, problems with navigating government assistance programs, and the funding of those programs. Rural residents, for example, report poorer oral health (i.e., higher rates of permanent tooth loss) than people in urban areas. Dental concerns are also issues for rural populations.⁴¹

In North Dakota, 20 (38%) of 53 counties have been designated by the federal government as dental provider shortage areas.¹ Data from the 2006 Behavioral Risk Factor Surveillance System (BRFSS) showed that 30% of adults had not visited a dentist or dental clinic within the past year. In

2007, the North Dakota Medicaid Program reported that only 28% of Medicaid-eligible adults and only 25% of Medicaid-eligible children had a dental visit during the past year. Adults with lower income and lower educational levels and those belonging to racial and ethnic minorities are less likely to have had a dental visit in the past year. The 2006 BRFSS showed that 38% of individuals with a disability indicated they had not had a dental visit within the last year, compared to 28% of those with no disability.

As is common in other health professions, there is a shortage in dental care as well. A real concern in North Dakota is the chronic shortage of dental professionals in rural areas. Seventeen of the state's 53 counties have no dentists, 11 counties have only one dentist, and 10 counties have only two dentists. With the lack of access to rural dental care, rural residents (especially older adults) may not be willing or able to travel to acquire dental care. The average age of North Dakota dentists is 51. State policy channels have been used in the creation of a dental loan repayment program which is a state-financed and administered program designed to attract dentists to North Dakota to practice in areas of need.⁴²

SUMMARY

Health care in North Dakota is delivered through more than 300 ambulatory care clinics, 52 hospitals, 84 skilled-nursing facilities, 63 basic-care facilities, and 73 assisted-living facilities, supported by an array of EMS providers, trauma centers, public health units, and pharmacies. As a general rule, the more remote the facility is from a metropolitan area, the more its operation is threatened by financial and other pressures (including staff recruitment and retention). Fortunately, there are a wide variety of local, regional, state, and federal resources that support and sustain the most vulnerable of the rural operations.

References

1. Health Resources and Services Administration, Bureau of Primary Health Care. (2012). *HRSA Geospatial Data Warehouse*. Retrieved from <http://datawarehouse.hrsa.gov/>.
2. North Dakota Department of Transportation. (2012). *State and Federal Highway Shapefile*. Retrieved from <http://web.apps.state.nd.us/hubdataportal/srv/en/main.home>.
3. U.S. Census Bureau. (2010). *Decennial Census* [Data file]. Retrieved from <http://factfinder2.census.gov>.
4. Flex Monitoring Team. (2012). *CAH Financial Indicators Report: Summary of Indicator Medians by State*. Retrieved from http://www.flexmonitoring.org/documents/DataSummaryReportNo10_StateMedians2012.pdf.
5. Center for Rural Health. (2012). *CAH Financial Conditions and Concerns* [Fact Sheet]. Retrieved from http://ruralhealth.und.edu/pdf/cah_financial_2012.pdf.
6. Center for Rural Health. (2012). *Critical Access Hospital Organizational Conditions* [Fact Sheet]. Retrieved from http://ruralhealth.und.edu/pdf/cah_financial_2012.pdf.
7. Center for Rural Health. (2012). *Hospital Networks* [Fact Sheet]. Retrieved from http://ruralhealth.und.edu/pdf/hospitals_2012.pdf.
8. Center for Rural Health. (2012). *Environmental Scan of Health Information Technology Adoption Amongst North Dakota Health Care Entities*. Retrieved from <http://www.healthit.nd.gov/files/2010/07/HIT-Environmental-Scan-FINAL-REPORT-2012.pdf>.
9. Rural Assistance Center. (n.d.). *What is a Rural Health Clinic?* Retrieved from <http://www.raconline.org/topics/clinics/rhcfaq.php#whatis>.
10. Health Resources Services Administration. (2006). *Comparison of the Rural Health Clinic and Federally Qualified Health Center Programs*. Retrieved from <http://www.ask.hrsa.gov/downloads/fqhc-rhccomparison.pdf>.
11. Healthcare Economist. (n.d.). *Providers for Underserved Populations: RHC and FQHC*. Retrieved from <http://healthcare-economist.com/2012/04/16/providers-for-underserved-populations-rhc-and-fqhc/>.
12. Health Resources Services Administration. (2011). *2011 Data Snapshot*. Retrieved from <http://bphc.hrsa.gov/uds/view.aspx?q=s&year=2011>.
13. The Free Dictionary. (n.d.). *Emergency Medical Services*. Retrieved from <http://encyclopedia.thefreedictionary.com/Emergency+Medical+Service>.
14. Center for Rural Health. (2012). *North Dakota Rural Hospitals and Emergency Medical Services Collaboration* [Fact Sheet]. Retrieved from http://ruralhealth.und.edu/pdf/ems_2012.pdf.
15. North Dakota Department of Health, Emergency Services. (2012). *Ambulance Service Areas*. Retrieved from <http://web.apps.state.nd.us/hubdataportal/srv/en/main.home>.
16. SafeTech Solutions, LLP. (2011). *A Crisis and Crossroad in Rural North Dakota Emergency Medical Services*. Retrieved from http://ndhealth.gov/EMS////pdfs/NDREMSIP_final_report.pdf.
17. North Dakota Department of Health. (2011). *2011 North Dakota Trauma Data Report*. Retrieved from <http://ndhealth.gov/trauma/uploads/resources/503/2011-trauma-data-report.pdf>.
18. North Dakota Department of Health, Emergency Services. (2012). *Trauma Centers*. Retrieved from <http://web.apps.state.nd.us/hubdataportal/srv/en/main.home>.
19. American College of Surgeons Committee on Trauma. (2008). *Trauma System Consultation State of North Dakota*. Retrieved from http://ndhealth.gov/trauma/uploads/resources/453/nd-acs-trauma-system-report_final.pdf.

20. State of Alaska Health and Social Services. (n.d.). *Health Planning and Systems Development*. Retrieved from <http://www.hss.state.ak.us/dph/healthplanning/telehealth/faq.htm>.
21. American Telemedicine Association. (2006). *Telemedicine, Telehealth, and Health Information Technology*. Retrieved from http://www.americantelemed.org/files/public/policy/hit_paper.pdf.
22. Alliance for Health Reform. (n.d.). *A Reporter's Toolkit: Health Information Technology*. Retrieved from http://www.allhealth.org/publications/health_information_technology/health_information_technology_bb.asp.
23. U.S. Department of Health and Human Services. (2011). *Office of the National Coordinator for Health Information Technology: Health Information Technology: A Funding Table*. Retrieved from http://www.hhs.gov/recovery/reports/plans/onc_hit.pdf.
24. Cisco. (n.d.). FAQ for Healthcare ARRA: HIT Stimulus. Retrieved from http://www.cisco.com/web/strategy/docs/healthcare/09CS2146_FAQ_ARRA_HIT_Stim_r1_052709.pdf.
25. U.S. Department of Health and Human Services. (n.d.). *Health Information Technology Extension Program*. Retrieved from http://healthit.hhs.gov/portal/server.pt/community/hit_extension_program_-_regional_centers_cooperative_agreement_program/1335/home/16374.
26. Gibbens, B. (2012, August) *Community Based Solutions to Address Our Rural Health Issues* [Presentation].
27. Key Alliance Health. (n.d.). *Regional Extension Assistance Center for HIT*. Retrieved from <http://www.khareach.org/>.
28. North Dakota Long Term Care Association. (2011). *Long Term Care in North Dakota*. Retrieved from <http://www.ndltca.org/documents/report.pdf>.
29. North Dakota Department of Health. (2012). *List of Nursing Home Facilities in North Dakota*. Retrieved from http://www.ndhealth.gov/HF/PDF_files/Nursing%20Home/nursing_home_july_2012_with_total_beds.pdf.
30. North Dakota Board of Pharmacy. (2012). *North Dakota Board of Pharmacy Annual Report*. Retrieved from <http://www.nodakpharmacy.com/pdfs/allPharmacies.pdf>.
31. Rural Assistance Center. (n.d.). Pharmacy and Prescription Drugs Frequently Asked Questions. Retrieved from <http://www.raconline.org/topics/pharmacy/pharmacyfaq.php>.
32. Oehsen, W., Doggett, G., and Davis, J. (2012). *The 340B Drug Discount Program: A New Era of Enforcement and Oversight*. *Journal of Health & Life Sciences Law*, 5, 72-123. Retrieved from http://bcs.bedfordstmartins.com/resdoc5e/RES5e_ch09_s1-0002.html#RES5e_ch09_p0248.
33. Pharmacy Technician Certification Board. (n.d.). *Rural Health-Systems Benefit from Remote Pharmacy Technician Supervision: Leveraging technology to improve medication safety and access to patient care*. Retrieved from https://www.ptcb.org/AM/Template.cfm?Section=Press_Releases_Post&Template=/CM/HTMLDisplay.cfm&ContentID=4801.
34. North Dakota Telepharmacy Project. (n.d.). *North Dakota Telepharmacy Locations*. Retrieved from http://www.ndsu.edu/telepharmacy/telepharmacy_map/.
35. North Dakota Telepharmacy Project. (n.d.). *NDSU Telepharmacy Program*. Retrieved from <http://www.ndsu.edu/telepharmacy/>.
36. North Dakota Department of Health. (2012). *Public Health Units*. Retrieved from <http://web.apps.state.nd.us/hubdataportal/srv/en/main/home>.
37. United Health Center for Health Reform and Modernization. (2011). *Modernizing Rural Health Care: Coverage, Quality, and Innovation*. Retrieved from http://www.unitedhealthgroup.com/hrm/unh_workingpaper6.pdf.
38. Gray, J. (2011). *Rural Mental Health Research White Paper*. Retrieved from http://ruralhealth.und.edu/pdf/j_gray_nimh_white_paper.pdf.
39. North Dakota Department of Human Services. (n.d.). *North Dakota Department of Human Services Programs, News, and Public Notices*. Retrieved from <http://www.nd.gov/dhs/>.
40. Center for Rural Health. (2012). *North Dakota CAH Administrator's Attitude Towards Issues Facing Rural Hospitals* [Fact Sheet]. Retrieved from http://ruralhealth.und.edu/pdf/attitudes_2012.pdf.
41. American Dental Association. (n.d.). *Access to Dental/Oral Health Care*. Retrieved from <http://www.ada.org/2574.aspx>.
42. North Dakota Department of Health. (2009). *Oral Health Facts Summary*. Retrieved from <http://www.ndhealth.gov/oralhealth/Publications/Oral%20Health%20Facts%20Summary.pdf>.

SEVEN

Quality and Value of Health Care

NATIONAL OVERVIEW

As was discussed in Chapter 2, “The Health of North Dakota,” which focused on the issues of health status and population health, the quality and safety of care that is delivered in a health system is directly associated with improving and maintaining overall health status. In a complex health system, there are a number of concerns, such as the availability of providers, access to care and health services, technology and treatment advancement, and the financial dimensions of affordability and payment. Each of these is a contributing factor in the overall strategy to reform or redesign the health system. In addition, the quality of the care that is provided to the population and the patient outcomes produced are equally important facets of reform. The issue of care quality is the focus of this chapter.

The Institute of Medicine’s (IOM) six principal aims to improving health (i.e., safety, effectiveness, patient centeredness, timeliness, efficiency, and equity) are the cornerstones for improving health status and system performance in a period of transformative change.¹ The IOM has been central in identifying the elements in the U.S. health system that have contributed to the systemic dysfunction associated with cost, performance, access, quality and other facets, and has offered insights and articulated critical reform elements. Be it formalized health reform as envisioned through public policy instruments or restructuring and providing incentives through market conditions compelled by an adaptive private health system, the configuration of health care must contend with systemic, societal, and policy change. The IOM, along with others, calls for a modernized or modified health system predicated on openness, responsiveness, and shared responsibility. The federal Agency for Healthcare Research and Quality (AHRQ) applies the six aims in its nationwide analysis and assessment of health quality.

The IOM work influenced the development of the Affordable Care Act (ACA), which calls for a National Quality Strategy to “improve the delivery of health care services, patient health outcomes, and population health.” After engaging both public and private stakeholders and collecting input, the National Quality Strategy was released in March 2011. Better care, better health, and affordable care were identified as the primary aims of the National Quality Strategy and represent essential elements for a transformative health system.^{2, 3}

Better care is achieved by improving the overall quality of care. This element of the quality strategy employs the IOM’s thrust to be more patient-centered, employing evidenced-based science, addressing safety, and targeting effectiveness and efficiency to improve access and achieve greater equity. *Better health* of the population is attained by promoting effective communication; improving care coordination; engaging communities, employers, payers, and providers as partners; and promoting the most effective prevention and treatment approaches. *Affordable care* focuses on the need to

simultaneously produce better care and better health and to do so in a manner that reduces the high and rising cost of health care for individuals, families, employers, and the public sector. The emphasis in health reform on new health care delivery models, reforming payment structures by rewarding improved outcomes, focusing on patient-centeredness and evidenced-based treatments, and accentuating disease prevention are all efforts to improve health status and to lower the growth in health care costs.

To help achieve these aims, the strategy also established six priorities to help focus efforts by public and private partners. Those priorities are as follows:

- Making care safer by reducing harm caused in the delivery of care.
- Ensuring that each person and family is engaged as partners in their care.
- Promoting effective communication and coordination of care.
- Promoting the most effective prevention and treatment practices for the leading causes of mortality, starting with cardiovascular disease.
- Working with communities to promote wide use of best practices to enable healthful living.
- Making quality care more affordable for individuals, families, employers, and governments by developing and spreading new health care delivery models.⁴

The six National Quality Strategy priorities show the continuing development of thought relative to a transformative approach to the health delivery system. The six IOM principles (safety, patient-centeredness, effectiveness, efficiency, timeliness, and equity) are similar to those expressed through health reform and have served as guiding pillars for reform. There is a continuing movement to foster greater transparency, inclusion, patient-centeredness, and communication; to call for enhanced accountability from providers and the overall health system to individuals, families, payers, employers, and communities; to focus on prevention, health promotion, care coordination, and greater patient knowledge and involvement; to emphasize that better health and better care can arise from a responsive health system that recognizes that efficiency in organizational performance can produce better health and medical outcomes; and to initiate new health care delivery approaches to associate patient outcomes with provider payment structures in order to ensure a more equitable distribution of health services. This represents a national pursuit for a more equitable and responsive system and one, admittedly, that has eluded our collective ability; however, it is a goal that compels our shared talents, skills, and aspirations. Yet, the ability to realize constructive and ideally practical ideas for reform can, and frequently does, encounter the reality of resistance and trepidation. New work put forth in 2012 by the IOM addresses both the need for change and identifies some of the cost associated with the resistance to change.

In a recent IOM report, *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America*,⁵ the argument is made that the pace of change is still too slow in implementing appropriate steps to improve the performance, quality, cost, and equity dimensions of the U.S. health system, and the adoption of evidence-based practice is inconsistent. The IOM finds that the health delivery structure is still too complex; costs are too high and efficiency is sacrificed; unacceptable outcomes are present in the form of shortfalls in patient safety, care coordination, access to care, limited clinical evidence guiding patient care, and health disparities; and that an intrinsic need to grow, adapt, and to learn is hindered. If the commitment to change, the pace of change, and the instruments for change are not secured and applied, then the health system will continue to decline as stated in the IOM report:

If unaddressed, the current shortfalls in the performance of the nation's health care system will deepen on both quality and cost dimensions, challenging the well-being with respect to its ability to meet patients' specific needs, to offer choice, to adapt, to become more affordable, to improve—in short, to learn. Americans should be served by a health care system that consistently delivers reliable performance and constantly improves, systematically and seamlessly, with each care experience and transition.⁵

To achieve greater value through a more optimally performing health system, the IOM supports strategies to (1) capture the opportunities present in technology, industry, and policy; (2) develop pathways to a continuously learning health care system; (3) engage patients, families, and communities; (4) achieve and reward high value care; and (5) create a new culture for care.

ASSESSMENT OF HEALTH QUALITY IN NORTH DAKOTA

There are different public and private organizations that analyze state-specific quality data. Such analysis can be instructive for state and local officials, providers, employers, payers, and individuals who are interested in understanding effective interventions and health care status. Such data can serve to guide both public policy and local programs' responses. The amount of quality-relevant data, the number and type of measures, and the number of health organizations and providers collecting and using quality-related measures grows each year. Both the scientific knowledge and the policy directives that guide and shape the incorporation of data metrics and evidence-based principles become more and more refined and pronounced over time. The recognition on the part of policymakers and health advocates of the importance in understanding how health systems and providers intervene to promote optimal health and the actual collection and analysis of health outcome data are fundamental factors in a transformative U.S. health system. To assist in

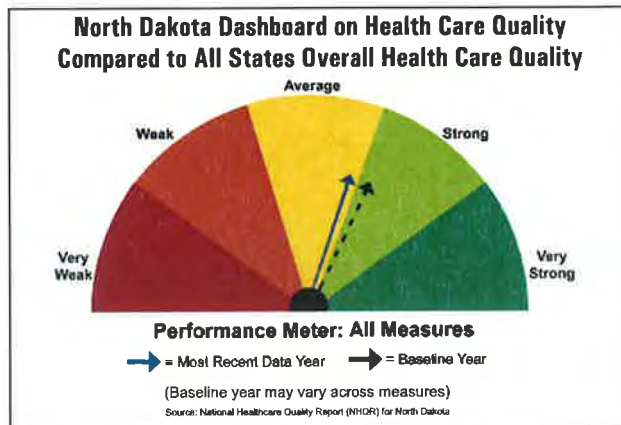


Figure 90.⁷

our understanding of performance and quality in North Dakota, three sources will be used: the federal Agency for Healthcare Research and Quality (AHRQ), which is housed in the U.S. Department of Health and Human Services and serves as a major research arm for the federal government; the Commonwealth Fund which is a national private foundation; and the North Dakota Health Care Review, Inc., the state's Medicare Quality Improvement Organization.

In the *2012 State Snapshot* report, the Agency for Healthcare Research and Quality rated North Dakota as "average" in comparison to other states, in regard to overall health care quality as documented in the *2012 National Health Care Quality Report* (see Figure 90). In the baseline year (2007), North Dakota had a strong rating. Measurement follows a five-level continuum from very weak to very strong. Twelve metric areas are used to measure three categories: types of care, settings of care, and care by clinical area.

Within the types of care grouping, North Dakota was rated strong on preventive measures and chronic care measures; however, for acute care measures, it was rated weak. The latter is a significant decline from North Dakota's base-year rating of strong. In comparison to the base year, preventive measures improved from average to strong, chronic care remained the same, strong, and acute care was downgraded from strong to weak.

The second category, settings of care, had four metric areas: home health care, hospital, nursing home, and ambulatory care. North Dakota's highest-rated area was home health care, which garnered a very strong rating. For the 12 measurement areas across the three categories, home health care was the only one to be rated very strong. Home health care scored a strong rating in the 2007 base year. The next-highest setting of care rating was nursing home measures which were rated strong in both 2010 and 2007. Ambulatory care measures, were rated average in both the current year and the base year. Hospital care was the lowest-rated setting of care at the lower end of the average continuum. This had been rated strong in the base year.

Care by clinical area is the third category. Diabetes care process and outcome measures and maternal and child health measures were both rated strong. Diabetes was also strong in 2007, but maternal and child health improved from average. Cancer measures were scored as average, whereas heart disease and respiratory disease were marked lower at weak. The latter, respiratory disease, was significantly downgraded from strong in the base year to weak.

The overall AHRQ state score, looking at all measures, for North Dakota in the 2012 report was 57.89. This compares favorably to neighboring states such as South Dakota, 56.39, and Montana, 50.00. Minnesota was the highest rated state in the country with a final score of 67.31.⁶

In *The Commonwealth Fund State Scorecard—2009*, North Dakota was ranked 9th overall. The Commonwealth Fund also used subcategories to analyze quality and performance: access, prevention and treatment, avoidable hospital use and costs, equity, and healthy lives. The rankings associated with each measure are presented below:

- Access 15th
- Prevention and treatment 14th
- Avoidable hospital use and costs 4th
- Equity 13th
- Healthy lives 10th

According to the Commonwealth Fund, North Dakota was ranked 1st on two measures within the above categories. Within the prevention and treatment band, the measure of “percent of hospitalized patients who received recommended care for heart attack, heart failure, and pneumonia,” North Dakota was ranked 1st. Within the avoidable hospital use and cost band, “the measure of total single premium per enrolled employee at private sector establishments that offer health insurance,” North Dakota was also ranked No. 1. Conversely, North Dakota ranked 49th on a prevention and treatment measure—percentage of children with both a medical and dental preventive care visit in the past year.

The Commonwealth Fund report stated that several states in the Upper Midwest—Iowa, Minnesota, Nebraska, North Dakota, and South Dakota—were all providing high-quality care at lower cost. According to the Commonwealth Fund, these examples suggest that “better coordinated care” and “more efficient use of resources” could improve the quality of care people receive while keeping cost in check.⁷

The North Dakota Health Care Review, Inc. (NDHCRI) works with a number of provider groups. Information is available on both hospitals and nursing homes.

According to the NDHCRI, in analyzing the *Hospital Consumer Assessment of Healthcare Providers and Systems* (HCAHPS) data for North Dakota, North Dakota’s critical access hospitals (CAHs) tend to have higher overall scores than do the larger, tertiary hospitals. HCAHPS data are now being collected, as directed under the Affordable Care Act, from all non-profit hospitals. These are consumer-driven assessments of the hospital inpatient experience. The HCAHPS data also

indicate that both hospital categories (i.e., CAH and prospective payment systems [PPS]) tend to have slightly lower scores in North Dakota when compared to national averages.⁷

Another important subject is that of readmission rates (i.e., patients discharged from a hospital setting but then readmitted later). Readmission rates are viewed as a measure of the local health system’s ability to coordinate the care of patients over the full continuum of care offered. There is evidence that North Dakota has a lower readmission rate. North Dakota ranked 17th out of 53 states and territories. The North Dakota CAH 30-day-readmission rate (15.7%) is lower than the North Dakota PPS rate (16.1%). According to the quality improvement organization, this may mean that North Dakota does better at coordinating patient care; however, there are other variables (e.g., type and degree of illness) that need to be analyzed in more detail.

The NDHCRI provides assistance to hospitals on key measures for heart failure, pneumonia, acute myocardial infarction, and other conditions. Overall, in comparing North Dakota PPS hospitals with CAHs, the PPS hospitals since 2005 have had better or higher measures. For example, in the fourth quarter of 2011, about 97% of heart failure patients received the correct care in PPS hospitals as opposed to 87% in CAHs. However, when PPS hospitals are compared to CAHs—whether large or small—there are some differences. For heart failure, at three separate times from 2005 to 2011, large CAHs had higher levels of the correct care being provided than for either PPS hospitals or small CAHs. For pneumonia, during this time frame, PPS hospitals generally outperformed the CAHs. There were two points in time (in 2006 and 2009) where all CAHs had better scores than the PPS hospitals. While, overall, the PPS hospitals in the state outperform the CAHs, when North Dakota CAHs are compared nationally with other CAHs, there is no significant difference.⁸

The NDHCRI is also working with North Dakota nursing homes in reviewing data on antipsychotic drug use, falls, urinary tract infections, and pressure ulcers. In comparison to national nursing home data, North Dakota’s measures are in a positive direction for antipsychotic drug use, pressure ulcer, and urinary tract infections; however, for falls and falls with a major injury, North Dakota’s metrics show a downward trend.⁹

NORTH DAKOTA QUALITY-FOCUSED ORGANIZATIONS, NETWORKS, AND PROGRAMS

The following efforts indicate that North Dakota has invested a significant level of resources into building a culture of support and organizational design to improve health quality.

Medicare Quality Improvement Organization (QIO) Program

The national QIO network comprises organizations operating in each state, the District of Columbia, Puerto Rico, and the U.S. Virgin Islands, whose mission is to monitor and analyze the quality of care provided to Medicare and Medicaid recipients. In North Dakota, the QIO is the North Dakota Health Care Review, Inc. (NDHCRI), a private, non-profit organization located in Minot. NDHCRI has expertise in quality improvement, data analysis, quality and utilization review, and HIT. It operates, as do other QIOs, under a contract with the Centers for Medicare and Medicaid Services (CMS). QIOs are essential instruments within the ACA as health reform is implemented. The NDHCRI has worked collaboratively with a number of health entities in North Dakota, including the Center for Rural Health, North Dakota Department of Health, and the North Dakota Hospital Association, along with others. It serves as a partner organization on the North Dakota Rural Hospital Flexibility (Flex) program as a Steering Committee member and as a member on the CAH Quality Network Advisory Committee.

In a predominantly rural state like North Dakota, the NDHCRI has placed significant emphasis on working to advance quality of care for rural citizens. The NDHCRI has actively participated with the North Dakota CAH Quality Network by sponsoring Team-STEPPS (Team Strategies and Tools to Enhance Performance and Patient Safety) training for North Dakota critical access hospitals (in person and via the Internet). A session was provided to fourth-year medical students at the UND School of Medicine and Health Sciences. Team-STEPPS is an evidence-based method for improving patient safety. In collaboration with the Center for Rural Health and the Flex program, the NDHCRI formed the ND Patient Centered Medical Home Coalition.

The NDHCRI provides technical assistance to all CAHs for collecting and reporting inpatient and outpatient CMS quality measures in the areas of congestive heart failure, pneumonia, acute myocardial infarction, and the Surgical Care Improvement Program (SCIP). The NDHCRI's work with CAHs includes helping them install the CMS Abstraction and Reporting Tool and all updates; encouraging participation in Hospital Compare (a national quality measurement database); providing training on the quality measures and abstraction specifics; providing hospital-specific quarterly reports on their performance; disseminating updates; providing phone support for any issues; and on-site visits as needed. The QIO offers training and assistance for CAH quality improvement efforts relative to hospital-acquired infection prevention, improving care transitions and reducing avoidable readmissions.

North Dakota CAH Quality Network

The mission of the CAH Quality Network (composed of all 36 CAHs) is to support ongoing performance improvement of North Dakota's critical access hospitals. The network

serves as a common place for North Dakota's critical access hospitals to share best practices, tools, and resources related to providing quality of care. The network staff support quality improvement activities of the network members and assists them with the Medicare Conditions of Participation (CoP), benchmarking data, analyzing data, administering an active e-mail list, providing connection with statewide and national quality-of-care-oriented committees and taskforces to facilitate communication, lessen duplication, and provide general technical assistance to the CAHs.

CMS CoP are essential for all hospitals, including CAHs. The CAH Quality Network has emphasized assistance to the CAHs by offering a number of services including the following:

- The network has developed an easy-to-follow checklist that assists CAHs in tracking their efforts to meet these standards. Network staff update the document for the CAHs when the CMS releases changes to the CoP.
- The network works closely and collaboratively with the ND Department of Health serving as a liaison to share ND CAH common deficiencies. The CAHs learn from each other by reviewing the deficiencies and determining how to make corrections.
- The network hosts quarterly CoP calls to facilitate sharing of resources and discussion around CAH regulation; 22 of 36 CAHs participated in the July 2012 call.
- The network developed a state-shared uniform credentialing form. The collaboration was statewide with stakeholders such as: Blue Cross Blue Shield of North Dakota; Medicaid; Medica; Tri-West (an insurance company); North Dakota Hospital Association; North Dakota Department of Health; all North Dakota tertiary hospitals; and one CAH representative from each of the four state regions.

A goal of the network is to improve information sharing and networking at the regional and state level among tertiary facilities and stakeholders to prevent duplication of efforts. The CAH Quality Network contributes not only to the development of rural-based solutions and systems but also to health professional staff skills and resources. Only CAHs belong to this network, although it does coordinate closely with the six PPS hospitals. These tertiary hospitals have quality improvement agreements, and services are provided to the CAHs. The CAH Quality Network is staffed by Center for Rural Health personnel and supported with Flex program funding. Oversight and direction are provided by an eight-member advisory board, composed of representatives from CAHs (hospital CEOs, directors of nursing, and quality coordinators or directors).

Currently there are six quality improvement efforts or programs in which North Dakota CAHs participate. The six are administered through the North Dakota CAH Quality Network and have the organizational support of the Center for Rural Health Flex program, including staff support. Each of the following quality improvement efforts or programs will be addressed in turn.

1. Medicare Beneficiary Quality Improvement Program (MBQIP)
2. Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)
3. State Stroke Program
4. Electronic Patient Registry for Diabetes and Cardiovascular Disease (EPR-DM/CAD; HRSA Small Health Care Provider Grant Program)
5. Health Care SafetyZone Portal (HCSZ) and the Benchmark for Excellence in Patient Safety (BFEPS)
6. Kognito training

Medicare Beneficiary Quality Improvement Program (MBQIP). MBQIP is funded by the Office of Rural Health Policy of the Health Resources and Services Administration (HRSA), U.S. Department of Health and Human Services. It is a Rural Hospital Flexibility (Flex) Program initiative charged with increasing CAH Hospital Compare participation rates and CAH dedication to quality-improvement initiatives. Hospital Compare is a CMS initiative that collects quality-related data on over 4,000 CMS-certified hospitals. An active website allows hospital users to review quality-related data to help inform their decision-making. While participation in the project is voluntary, the MBQIP seeks to increase attention on quality health care to all CAH Medicare beneficiaries, both inpatient and outpatient. The two ND CAH Quality Network coordinators work with CAHs to increase data submission on all measures and assist CAHs and regional CAH groups with data and identifying quality-improvement projects. The North Dakota Flex Program in partnership with the ND CAH Quality Network and the ND Health Care Review, Inc. provided the following technical assistance: (1) support CAHs with technical assistance to improve health care outcomes on Hospital Compare and other national benchmarks; (2) assist CAHs in accessing needed technical assistance around data collection and reporting; (3) assist CAHs in analyzing their own and comparative data via Hospital Compare; and (4) work collaboratively to assist CAHs with quality improvement.

All 36 of the North Dakota CAHs are participating in MBQIP. Forty-four of 45 Flex states are participating. North Dakota is one of only 15 participating states to have 100% of critical access hospitals participating in this nationwide effort to improve hospital quality of care. Phase 2 of the MBQIP program, which began September 1, 2012, works with all participating CAHs to collect HCAHPS data. HCAHPS is the Hospital Consumer Assessment of Healthcare Providers and Systems and is a CMS standardized survey instrument and data collection method for measuring patients' perspectives on hospital care. Fully 100% of ND CAHs (36) are publicly

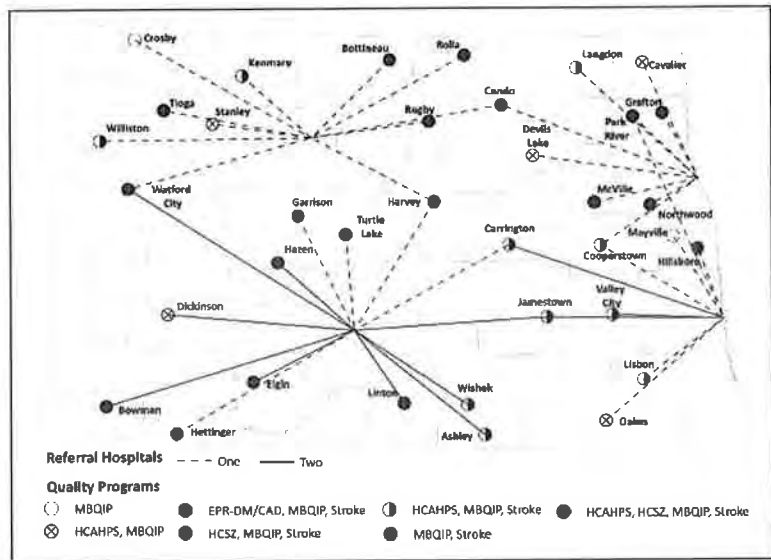


Figure 91. Referral network for CAH quality programs.¹⁰

- Thirty-four North Dakota CAHs participate in multiple quality improvement efforts, and two CAHs, as of 2012, were only participating in one (MBQIP).
- All 36 CAHs have participated in the federal Medicare Beneficiary Quality Improvement Program (MBQIP).
- Fifteen CAHs are participating in four quality-improvement efforts (HCAHPS, HCSZ, MBQIP, and Stroke).
- Ten CAHs are participating in three quality-improvement efforts (HCAHPS, MBQIP, and Stroke).
- Two CAHs are participating in three quality-improvement efforts (HCSZ, MBQIP, and Stroke).
- One CAH is participating in three quality-improvement efforts (EPR-DM/CAD, MBQIP, Stroke).
- Five CAHs are participating in two quality-improvement efforts (HCAHPS and MBQIP).
- One CAH is participating in two quality-improvement efforts (MBQIP and Stroke).
- Two CAHs are participating in one quality-improvement effort (MBQIP).
- All CAHs work together within the CAH Quality Network and with tertiary hospital partners.

reporting to Hospital Compare for CMS and MBQIP inpatient (heart failure and pneumonia) and outpatient (ER-heart attack and chest pain) clinical topics.

Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS). HCAHPS is a requirement under the Affordable Care Act. The purpose of such a stipulation is to formally incorporate patient assessments of their inpatient hospital experience into the overall measure of hospital performance. It is part of the overall change in health care to be more inclusive and responsive to the consumer, to incorporate their perspective on the quality of care into determinants of organizational performance. While many hospitals had collected information on patients' satisfaction with care, over the years there had previously been no national standard for collecting this information that would yield valid compar-

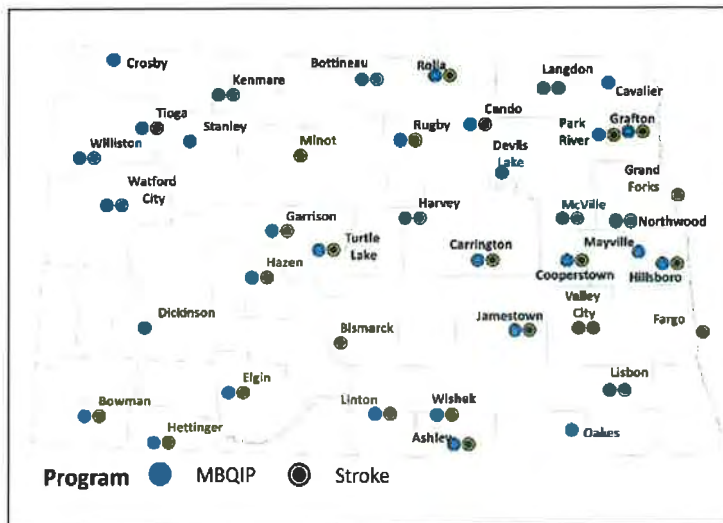


Figure 92. Hospitals participating in MBQIP and Stroke programs.¹⁰

isons across all hospitals. The intent of the HCAHPS initiative is to provide a standardized survey instrument and data collection method for measuring patients' perspectives on hospital care. HCAHPS is a core set of questions that can be combined with a broader, customized set of hospital-specific items. HCAHPS survey items complement the data hospitals currently collect to support improvements in internal customer services and quality-related activities. The HCAHPS survey contains 18 patient perspectives on care and patient-rating items that encompass eight key topics: communication with doctors, communication with nurses, responsiveness of hospital staff, pain management, communication about medicines, discharge information, cleanliness of the hospital environment, and quietness of the hospital environment. The survey also includes four screener questions and five demographic items, which are used for adjusting the mix of patients across hospitals and for analytical purposes. The survey is 27 questions in length. The ND CAH Quality Network coordinator helps CAHs to understand the HCAHPS process, complete contracts, submit data, review reports, and review data regionally to identify areas for quality improvement as well as best practices.

HCAHPS is funded through the Flex Program and as of October 1, 2012, 32 of 36 CAHs had identified a vendor; 30 of the 36 had a contract in place with the vendor to initiate data collection on October 1, 2012.

State Stroke Program. The CAH Quality Network works collaboratively with other stakeholders to reduce the death and disability associated with heart disease. The network has been a key entity in the development of resources that help guide health care providers in the care of stroke patients. To do so, the network secured a subcontract under the North Dakota Department of Health, Heart Disease and Stroke Program. The State Stroke Program facilitates the on-boarding of North Dakota critical access hospitals to the project and pro-

vides ongoing assistance and support to registry participants. The Center for Rural Health and the network collaboratively work with the American Heart Association and the North Dakota Department of Health to establish contracts for State Stroke Program participation. Under the stroke program the network does the following: (1) assists critical access hospitals to establish use of the State Stroke Program, (2) facilitates sharing between State Stroke Program participants, (3) establishes ongoing communication with State Stroke Program participants, and (4) facilitates regional discussions on stroke system opportunities, tools, and trainings. Twenty-nine of the 36 CAHs participate.

Electronic Patient Registry for Diabetes and Cardiovascular Disease. This federally supported HRSA grant (the Small Health Care Provider Quality Grant Program) was developed to improve patient care and chronic disease outcomes by assisting rural primary

care providers with the implementation of quality improvement initiatives using the Chronic Care Model and electronic patient registries (EPR). The grant facilitates the incorporation of appropriate health information technology (HIT) into the quality improvement process. The CAH Quality Network is working with one North Dakota clinic (Garrison Clinic) to build their EPR to meet the diabetes and cardiovascular disease measures.

Health Care SafetyZone Portal-Clarity Group. The Health Care SafetyZone® (HCSZ) Portal is a browser-based data collection and communication tool to address adverse-events management. It is used among North Dakota CAHs to track and analyze Infection reports, medication events, equipment, employee incidents, facility and security events, falls, procedural and clinical events, patient and family concerns, HIPAA violations, and other measures. The ND CAH Quality Network, through financial support from the Flex program, hosts monthly user group meetings, helps identify areas for improvement in the data, and assists in information sharing and identification of best practices. Participating hospitals now cover the expense of the tool; however, when the effort began in 2008, Flex funds supported the access cost to the Clarity Group platform. Clarity Group is a national organization that provides management assistance, including technology, to health organizations. Clarity Group worked with the North Dakota Flex program to initiate a demonstration project to address CAH needs to collect and analyze quality and patient-event data. Since then other states have joined and the CAHs can benchmark their data with that of other CAHs (see BFEPS description on page 88). Currently, 17 of the 36 CAHs use the Health Care SafetyZone Portal, though Sanford Health System CAHs use a similar event-reporting tool (Midas) and Catholic Health Initiatives (CHI) facilities all use IRIS. The network coordinator works to identify shared event measures across different systems and tools or data platforms to develop a more comprehensive understanding of quality measure across North Dakota.

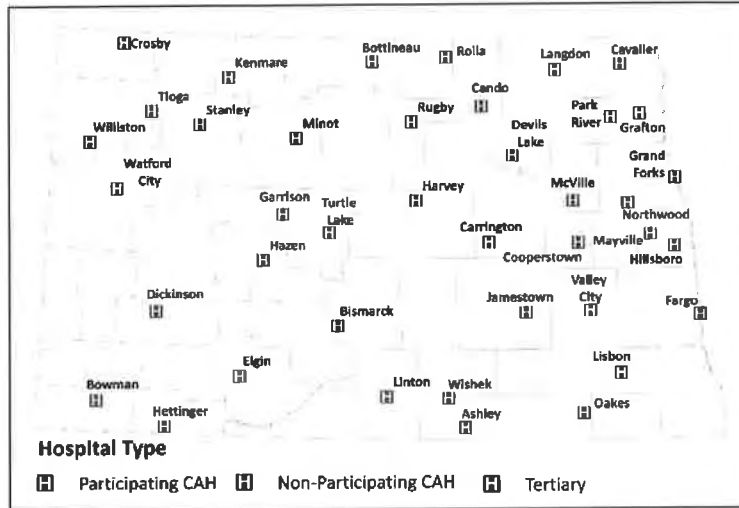


Figure 93. Hospitals participating in Health Care SafetyZone Portal.¹⁰

Benchmark for Excellence in Patient Safety (BFEPS). This is a program within the Health Care SafetyZone Portal through the Clarity Group; North Dakota CAHs can elect to participate in benchmarking and data sharing with all CAHs in the nation that use the event-reporting system. In North Dakota, 15 of the 17 CAHs using the Portal are participating in this program. Meetings are hosted by Clarity Group.

Kognito Training. This is a free, online, interactive training opportunity offered to all North Dakota hospital staff and providers to improve the quality of risk assessments in the emergency department. Kognito provides training for emergency department staff to screen patients for suicide risk and substance abuse. Kognito training is open for all health care professionals in North Dakota. It is funded by the North Dakota Department of Health Suicide Prevention Program.

North Dakota Hospital Engagement Network (NDHEN)
The North Dakota Hospital Engagement Network is a collaboration of the North Dakota Hospital Association (NDHA), North Dakota Health Care Review, Inc. (NDHCRI), and the Health Research & Education Trust (HRET) of the American Hospital Association. North Dakota's HEN currently has 28 facilities enrolled with participation continuing through December 2013. HRET was awarded a CMS contract to support the Partnership for Patients initiative.

The Partnership for Patients effort focuses on 10 areas for quality improvement; participating hospitals are instructed on how to implement best practices and lessons learned through the use of webinars and educational sessions. Within the NDHEN, the NDHCRI will support local education and training. Some of the targeted areas include the following: adverse drug events, central line associated blood stream infections, surgical site infections, pressure ulcers, and preventable readmissions.

Nationally, over 2,000 hospitals are involved. CMS estimates that the nationwide initiative will help to save 60,000 lives by stopping preventable injuries and complications. As was previously noted, the IOM has estimated that approximately 50,000-100,000 needless deaths happen every year in hospital settings because of mistakes. Nationally, the goal is to reduce unnecessary readmissions by 20% and avoidable harm by 40%.¹¹

Meaningful Use of Electronic Medical Records Clinical Quality Measures (CQM)

This national effort, through the federal Office of the National Coordinator for Health Information Technology (ONC), is administered in the North Dakota Health Information Technology office. The concept of meaningful use was discussed

to some degree under the HIT section in Chapter 6 on health infrastructure. Here the linkage of HIT with clinical quality measures is another significant step in the transformative process, whereby technology is a tool to facilitate not only quality measurement and improvement but also to apply the elements of pay for performance and value-based purchasing. By defining a set of measures for meaningful use, federal policy is attempting to determine the overall set of metrics that will be used. Providers who reach meaningful use objectives receive incentive payments and the CQM are the outcome measures.¹⁰

North Dakota STEMI Program

The Midwest Affiliate of the American Heart Association secured \$7.1 million in funding to implement *Mission: Lifeline*, a community-based initiative aimed at improving the system of care for heart attack patients throughout North Dakota. The three-year initiative was launched in September 2011 with The Leona M. and Harry B. Helmsley Charitable Trust as the lead funder. The state Legislature provided \$600,000 of matching funding for the project. A *Mission: Lifeline* funding grant is available to every North Dakota hospital.

Mission: Lifeline is a strategic initiative to save lives and reduce disability by improving emergency readiness and response to all heart attack patients while focusing on ST-elevation myocardial infarctions (STEMIs). A STEMI is caused by the sudden, total blockage of a coronary artery—the most deadly type of myocardial infarction. North Dakota ranks among the top 10 states with the highest STEMI death rate. Unless the blockage is eliminated quickly to restore blood flow, the patient risks death or long-term disability. Approximately 30% of STEMI patients do not receive treatment to restore blood flow, whether clot-busting drugs (fibrinolytics), or the preferred therapy of percutaneous coronary intervention (PCI), also referred to as angioplasty.¹¹

MediQHome

MediQHome is based on the Joint Principles of the Patient Centered Medical Home (PCMH). The overriding goal of MediQHome is to provide the right care at the right time for the right reason, resulting in a healthier North Dakota.

Specifically, it works to accomplish the following:

- Improve the quality of patient care
- Promote collaborative decision-making between patients and doctors
- Create better doctor-patient relationships
- Provide clear treatment plans for patients to follow
- Enable a better quality of life
- Create more cost-effective care

PCMH is a model of a physician practice that emphasizes readily accessible, comprehensive, coordinated care and active involvement of the member and family in health care access and outcomes. Each member has an ongoing relationship with a personal physician trained to provide first contact and continuous, comprehensive care. This personal physician leads a team at the practice level to take responsibility for the ongoing care of patients. This physician is responsible for providing all the member's health care needs or arranges care with other qualified professionals. This includes care for all stages of life, acute care, chronic care, preventive services and end-of-life care. Payment appropriately recognizes the added value provided to patients who have a patient-centered medical home.

MediQHome allows providers to focus on their patients' health outcomes through the use of MDinsight, an interactive decision support tool. MDinsight helps the provider identify care opportunities by organizing all available patient clinical data to create patient-specific clinical summaries and quality reports. Having this information allows the provider to identify current and missed care opportunities in individual patients or groups of patients with specific chronic conditions.

Physicians, clinics and networks use the quality program's reporting capability to design and implement care processes that lead to improved care for all patients. BCBSND analyzes the data within the database, and when appropriate, provides comparative clinical, outcome, and economic reporting of the MediQHome quality program.¹²

Healthy Steps

Healthy Steps is a children's health insurance plan that BCBSND administers for North Dakota. The North Dakota Department of Human Services (NDDHS) has the responsibility to monitor, evaluate, and improve the quality of care delivered to the members. There are three Quality Improvement Projects in place for Healthy Steps members that were mandated by the NDDHS. BCBSND works closely with the NDDHS in the management of this program. The Quality Improvement Projects are as follows:

Adolescent Immunizations. The Centers for Disease Control and Prevention recommends vaccinations for the adoles-

cent population as an important part of preventive care. This project focuses on the following immunizations:

- Tdap—booster against tetanus, diphtheria, and pertussis
- Meningococcal conjugate vaccine (MCV4)—protects against meningococcal disease

Data from 2009 demonstrated that there were opportunities for improvement. An educational outreach campaign was established that consists of semiannual postcard reminders from the state of North Dakota to members identified as being deficient in a minimum of one of the immunization recommendations. The postcards also remind the members of the benefits available under Healthy Steps.

The goal is to improve compliance by 2% each year through 2013. This goal is currently being met with steady improvement noted.¹²

Preventive Dental Services. The American Academy of Pediatric Dentistry has guidelines regarding preventive dental care. This project focuses on eligible members receiving preventive dental services.

Baseline data for 2010 demonstrated that there were opportunities for improvement. Similar to the adolescent immunizations, an educational outreach campaign was established that consists of semiannual postcard reminders to those patients identified as being deficient in a preventive dental exam. The postcards include education on the value of preventive dental care as well as the benefits available under Healthy Steps.

The goal is to improve compliance by 2% each year through 2013. Progress has been made but there is opportunity to continue to improve compliance.¹²

Well-Child Visits in the 3rd, 4th, 5th, and 6th Years of Life. The National Institutes of Health (NIH) and the American Academy of Pediatrics supports well-child visits. Each visit includes a complete physical examination and development, behavioral, and learning assessments. This will assess the child's growth and development and identify problems early. The project focuses on identifying children that are deficient in well-child visits in the 3rd, 4th, 5th, and 6th years of life.

Baseline data for 2010 demonstrated that there were opportunities for improvement. An educational campaign was put in place that consists of semiannual postcard reminders to patients identified as being deficient in their well-child visits. The postcards include education on the value of well-child visits as well as remind the patient of their benefits through Healthy Steps.

The goal is to improve compliance by 2% each year through 2013. This goal is currently being met with steady improvement noted.¹²

Rare Disease Management

Accordant Health Services is a company that provides disease management services for complex and rare conditions. Currently it works with BCBSND. The 16 diseases managed are amyotrophic lateral sclerosis (ALS), chronic inflammatory demyelinating polyradiculoneuropathy (CIDP), Crohn's disease, cystic fibrosis, dermatomyositis, Gaucher disease, hemophilia, lupus, multiple sclerosis, myasthenia gravis, Parkinson's disease, polymyositis, rheumatoid arthritis, scleroderma, seizure disorders, and sickle cell anemia.

Accordant offers personalized counseling and health evaluation to identify potential complications, 24/7 nurse line, member education and self-management techniques, and guidance-finding resources. The company focuses on proactive care to avoid hospital admissions, emergency room visits and crisis. Accordant nurses and social workers encourage BCBSND member self-monitoring and management of disease-related symptoms and monitor compliance with current standards of care for the condition. Quality of life indicators show positive improvement and a decline in admissions and emergency room visits.¹²

Prime Therapeutics

BCBSND works with Prime on quarterly Retrospective Drug Utilization (RDUR) programs. Initiatives and interventions are established based on RDUR findings. The following RDUR programs were scheduled for 2012.

- Statin Prescriber Profiling: Increase the use of generics by prescribers who predominantly use brand statins.
- Angiotensin Receptor Blocker (ARB) Prescriber Profiling: Increase the use of generics by prescribers who predominantly use brand ARBs.
- ARB generic opportunity member mailing: Increase the use of generics by members on brand-name ARB medications.
- Proton Pump Inhibitor (PPI) generic opportunity member mailing: Increase the use of generics by members of brand-name PPIs.

Not all programs have been implemented to date in 2012. The Statins Prescriber Profiling program was implemented and generic utilization in the intervention group increased 23.8 percentage points in the post-mailing period. This was also associated with an overall reduction in the average cost per prescription from \$78 pre-program to \$60 post-mailing.¹²

Hypertension Quality Improvement Program

An innovative new program from BCBSND is taking aim at a health condition that affects over one-quarter of North Dakota adults. The Hypertension Quality Improvement Program is engaging BCBSND members to raise awareness of the dangers of high blood pressure and what individuals can do to stay heart-healthy.

The Hypertension Quality Improvement Program is part of BCBSND's MediQHome Program. A collaborative rela-

tionship between the American Heart Association (AHA), the American Stroke Association (ASA), and BCBSND, along with support funding from the North Dakota Department of Health, has allowed for this initial hypertension outreach effort between the four partners.

A four-phase approach is currently being implemented. This involves defining uncontrolled hypertensives using MediQHome; providing outreach and educational support with an emphasis on self-management; tracking the rate of blood pressure; providing patients with a tool kit that contains scales, blood pressure cuffs, American Heart Association cookbooks, and hypertension brochures; and the MediQHome care coordinators receive monthly files of hypertensive patients to assist in the management of their population and a detailed file quarterly that includes medication usage.¹²

Wellness Quality Program

Selected self-funded employer groups have participated in a Wellness Quality Program, consisting of providing individual report cards to members. This is usually done in conjunction with an incentive plan established by the group to improve the health of their employees. This type of program is an opportunity for the employers, patients, physicians, and payers to work together to promote early detection and treatment of disease and provide more healthful lifestyles. By treating health risks early, the goal is to avoid health complications, and reduce out-of-pocket expenses and unnecessary health care costs later. The program consists of the following components:

- Completion of a Health Risk Assessment annually
- Biometric Screens every two years
- Periodic advanced medical screens, based on age and gender
- Incentives (variable depending on employer group)

BCBSND's role is to collect and report compliance rates for the following advanced medical screens:

- Mammography
- Cervical cancer screen
- Total cholesterol with a LDL-C screen
- Colorectal cancer screen

BCBSND provides a report card twice a year and appropriate reminders to participants of the program to show compliance with the above measures. Groups receive a comprehensive annual report evaluating the effectiveness of the program. This report covers participation (how many completed the recommended screenings), comparison of screenings before and after implementation of the program, monthly activity trends, and cumulative cost trends. This allows the group to evaluate the impact of the program each year.

The programs (incentives plus reports) have demonstrated dramatic increases in compliance with the targeted services.¹²

Blue Distinction Centers

Blue Distinction is a designation that is awarded by the Blue Cross Blue Shield Association (BCBSA) to medical facilities that have demonstrated expertise in delivering quality health care. The Blue Distinction program historically focused on quality only. In 2012, the program was enhanced to not only focus on quality but also meet cost measures to address the market demand for affordable health care for a total value program.

The first programs to use the value-based criteria are the Spine Surgery and the Knee and Hip Replacement Program. Facilities are evaluated for these designations based on national selection criteria reviewing quality and outcomes, patient safety, and cost of care measures. Other designations BCBSND considers for North Dakota facilities are cardiac care and bariatric surgery. Facilities meeting the eligibility requirements and completing the designation process will be listed as a Blue Distinction Center on the Blue Cross Blue Shield Association National Doctor and Hospital Finder website.¹²

References

1. Institute of Medicine. (2001). *Crossing the Quality Chasm: A New Health System for the 21st Century*. Retrieved from <http://www.iom.edu/~media/Files/Report%20Files/2001/Crossing-the-QualityChasm/Quality%20Chasm%202001%20%20report%20brief.pdf>.
2. U.S. Department of Health and Human Services. (2011). *National Quality Strategy Will Promote Better Health, Quality of Care for Americans*. Retrieved from <http://www.hhs.gov/news/press/2011pres/03/20110321a.html>.
3. U.S. Department of Health and Human Services. (2011). *Better Health, Better Care, Lower Costs: Reforming Health Care Delivery*. Retrieved from <http://www.healthcare.gov/news/factsheets/2011/07/deliverysystem07272011a.html>.
4. U.S. Department of Health and Human Services. (2012). *National Quality Strategy: 2012 Annual Progress Report*. Retrieved from <http://www.healthcare.gov/news/factsheets/2012/04/national-quality-strategy04302012a.html>.
5. Institute of Medicine. (2012). *Best Care at Lower Cost: The Path to Continuously Learning Health Care in America*. Retrieved from <http://www.iom.edu/Reports/2012/Best-Care-at-Lower-Cost-The-Path-to-Continuously-Learning-Health-Care-in-America.aspx>.
6. U.S. Department of Health and Human Services. (2012). *AHRQ State Snapshots*. Retrieved from <http://statesnapshots.ahrq.gov/snaps11/dashboard.jsp?menuId=4&state=ND&level=0>.
7. The Commonwealth Fund. (n.d.). *Health System Data Center North Dakota Scorecard*. Retrieved from <http://www.commonwealthfund.org/Maps-and-Data/State-Data-Center/State-Scorecard/DataByState/State.aspx?state=ND>.
8. North Dakota Health Care Review. (2012). *Discussion of Hospital Quality*.
9. Center for Rural Health. (2012, October). *National CAH Quality Initiatives* [Unreleased document draft].
10. Center for Rural Health. (2012). *CRH Assisted Quality Initiatives*. Retrieved from <http://ruralhealth.und.edu/>.
11. American Heart Association. (2012). *Mission: Lifeline - \$7.1 Million Program to Improve Heart Attack Care in ND*. Retrieved from http://www.ndha.org/image/cache/Mission_Lifeline.pdf.
12. Blue Cross Blue Shield of North Dakota. (2012). *BCBSND Legislative Summary, October 12, 2012*.

EIGHT

Conclusion

It is clear from the foregoing analysis that North Dakota faces a major gap now and increasingly in the future between the societal demands for health care and the capacity of the health care system to deliver that care. As Chapter 2 demonstrates, the general level of health in North Dakota is reasonably good, although it has declined relative to the other states over the recent past, for unclear reasons. As was found in the *First Biennial Report on Health Issues for the State of North Dakota* that was released in 2011, rural depopulation, out-migration of the young from the state, an increasingly older adult population, low population density and localized population growth in the major cities and in the Oil Patch are exacerbating the imbalance between a rising demand for health care and the available supply of providers. The imbalance between supply and need for health care resources is both quantitative and distributional, in that North Dakota is and will be short of providers overall, while the providers we do have are distributed disproportionately in the metropolitan areas in excess of what the population demands would otherwise require. Some of the apparent maldistribution is entirely appropriate, since it is desirable to have specialists regionalized in more urban areas to maximize the efficient delivery of health care services. Since even family physicians—the bulwark providers of care in rural areas—are disproportionately found in metropolitan areas, this demonstrates the challenges of recruiting and retaining providers in more remote areas. And family physicians are the group whose geographic distribution is the most optimal compared with all other physician provider groups. The same is true for other nonphysician advanced practice providers like physician assistants and nurse practitioners—they too are disproportionately distributed in the metropolitan areas of North Dakota, although least of all for physician assistants.

The *First Biennial Report* concluded that North Dakota had a paradox regarding its health care workforce, characterized as shortages in the midst of plenty. The size of the physician workforce in North Dakota in 2011 was found to be at or better than national norms for many specialties, but with maldistribution of providers resulting in shortages especially in micropolitan and rural areas. Our updated analysis in this current report shows that North Dakota has slipped in the size of its physician workforce, and now lags the rest of the United States in the number of physicians for its population. Thus, the baseline shortage of 50 physicians estimated in the *First Biennial Report* likely has grown to somewhere between 100 and 200 physicians currently. One important reason for the increase in the shortfall has been the somewhat unanticipated population growth in western North Dakota as a consequence of the phenomenal development in the Oil Patch.

The continued population growth associated with the

Oil Patch predicted for the future has major implications for workforce planning. As we found in the *First Biennial Report*, the current shortage of physicians is only going to increase as the population grows and ages in the future. And the shortage of workers in the health care field over the next 15 years will not be limited to physicians. An entire cadre of additional health care providers—from nurses to physician assistants to occupational and physical therapists to medical laboratory specialists and others—will be needed to ensure that effective, efficient, and appropriate health care is available to all North Dakotans.

But the projection model used in the *First Biennial Report* was predicated on an assumption of modest population growth based on forward trending of historical patterns, and a major influence from the aging of our current population. In our *First Biennial Report*, we underweighted (relative to national projections) the effect of population growth, since we assumed (as others did at the time) that the stable-growth model would continue to apply in the future. As discussed in detail in Chapter 1, the stable-growth model that we utilized currently predicts a population increase to only 796,000 people by 2040, which is lower growth than the country as a whole. The workforce projections that we utilized in the initial report were based on that stable- (and slow) growth model. **Any significant population growth in excess of that previously projected will necessitate even larger growth in the health workforce than previously anticipated.**

We were quite conservative in estimating physician needs in our initial report—in retrospect, probably too conservative. We adapted and applied national workforce predictions to North Dakota, but intentionally adjusted the calculations downward so as to not overestimate need. The national workforce predictions anticipate that future workforce needs will be driven primarily by population growth (about two-thirds of the effect in the model) and less so by the aging of the population (about one-third of the effect). Since North Dakota has such a proportionately large older adult population (more than the national average), we overweighted the effect of aging at the same time that we underweighted the effect of population growth. Thus, we used a model that applied national estimates to the North Dakota population, and then we reduced the predicted shortage by 50% to account for lower anticipated population growth. The *First Biennial Report* estimated that the physician shortage by 2025 would be 210 physicians—50 short as of the 2011 baseline, and 160 more needed by 2025, for a total shortage of at least 210 by 2025.

Updating those numbers now, our current shortage likely has grown to between 100 and 200 (as discussed above). Thus, using our old estimates of future population growth, the revised prediction would be that 260 to 360 more physicians will be needed by 2025 (i.e., 100 to 200

needed now plus 160 needed by 2025). Additionally, the effect of rapid population growth needs to be added to that total. The magnitude of the additional physician workforce required to meet various levels of future population growth is shown in Table 27, which shows various levels of the future population of North Dakota and the associated additional physician resources required.

The *First Biennial Report* concluded with a proposal for a multifaceted plan to address the health care needs of North Dakota, emphasizing necessary steps to reduce disease burden, increase the health care workforce through enhanced retention of graduates as well as expansion of class sizes, and a call for a better-functioning health care delivery system through more cooperation and coordination of the various health care delivery systems. **In view of the realization that the workforce needs likely are significantly larger than initially estimated, those recommendations are reinforced in this *Second Biennial Report* with added emphasis on the imperative to move forward with full implementation of the Health Care Workforce Initiative immediately.**

Table 27
Required additional North Dakota physicians by 2025 related to population growth.

Population	Additional Physicians Needed
684,000 (Updated baseline prediction from <i>First Biennial Report</i>)	260-360
800,000	514
900,000	733
1,000,000	952

NINE
Workforce Development

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

This report evaluates three possible approaches to fill the current and future workforce gap: (1) recruit needed physicians and other health care professionals from outside 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 assess their likelihood of producing the desired results.

OPTION 1: RECRUIT FROM OUTSIDE

One approach to meet workforce needs is to recruit physicians and other health professionals from training programs or employed positions outside of North Dakota. Indeed, this approach has always played a part in filling the state's workforce complement, and it is assumed will 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, about 1 in 4 physicians practicing in the United States as well as in North Dakota are IMGs.¹ Some but not all studies have suggested 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. A state comparison of the percentages of generalist IMGs and USMGs shows that North Dakota has significantly fewer physicians in metropolitan, relatively more IMGs in micropolitan, and significantly more IMGs in rural areas.¹

IMGs have filled an important and essential role in providing primary care to North Dakota rural communities for many years. However, relying on an increased effort to recruit additional IMGs to meet current and future needs may be difficult for several reasons. First, there is no reason to assume that the trend for IMGs will be dissimilar to USMGs, whose career choices do not typically gravitate toward primary care and especially rural primary care practice. Rules regarding J-1 visa waivers may change and have an effect on the availability of IMGs. IMGs often come from developing nations, and there is a continuing debate over the effect of retaining IMGs for service in the United States, rather than encouraging service to their own countries of origin;¹ put another way, is it proper and ethical to encourage a "brain drain" whereby the best and brightest physicians from devel-

oping countries come to the United States rather than remain home and help to provide for even more pressing medical needs there?

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 health care 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.

There are additional considerations that bear analysis. Anecdotal data suggest that the turnover rate of physicians recruited from out of state is about double that of locally produced physicians. Given the substantial expense of physician recruitment, the need to re-recruit twice as often will add considerable financial pressure to the already constrained financial resources of hospitals operating on slim operating margins. Additionally, it takes a while for nonresident physicians to acculturate to the North Dakota experience, and the longer that this process takes, the more likely that there will be turnover of the position.

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 health care marketplace.

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

Under its baseline scenario, 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 94). Some key findings of the analysis are the following:

- The U.S. Census Bureau projects that the U.S. 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 unlikely to be the same as today (as assumed in the baseline projection), the AAMC did a further analysis of additional factors that were likely to affect workforce requirements, such as likely continued increase 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, the increase in female physicians, and productivity improvements. Under this scenario there would be a projected shortage of 159,300 physicians by 2025, or 35,000 more than the baseline shortage (Figure 95). Some key findings of the updated analysis 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%).
- Any future shortages are likely to have an uneven effect, with some geographical 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.²

Affordable Care Act Effects

Health care insurance reform associated with the Affordable Care Act likely will increase the shortage of health care workers as a consequence of improved access to health care providers. In 2010, the AAMC released new physician shortage estimates based on projections by the Center for Workforce Studies that are 50% worse than originally anticipated. This newer model emphasizes the critical shortfall in the number of all physician specialties that care for older adults.

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 health care need is driven to a larger degree by population growth than North Dakota (which is affected more by aging), the relative workforce gap is similar. And considering plausible projections of poten-

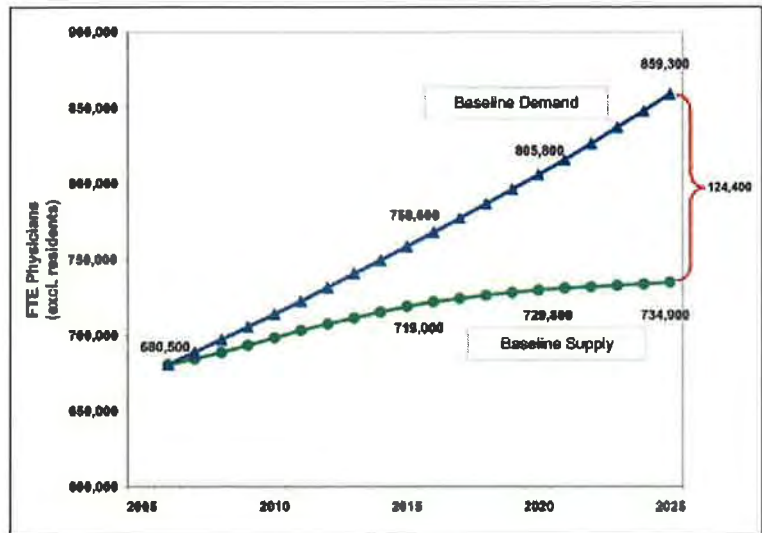


Figure 94. Baseline projection of physician supply and demand.²

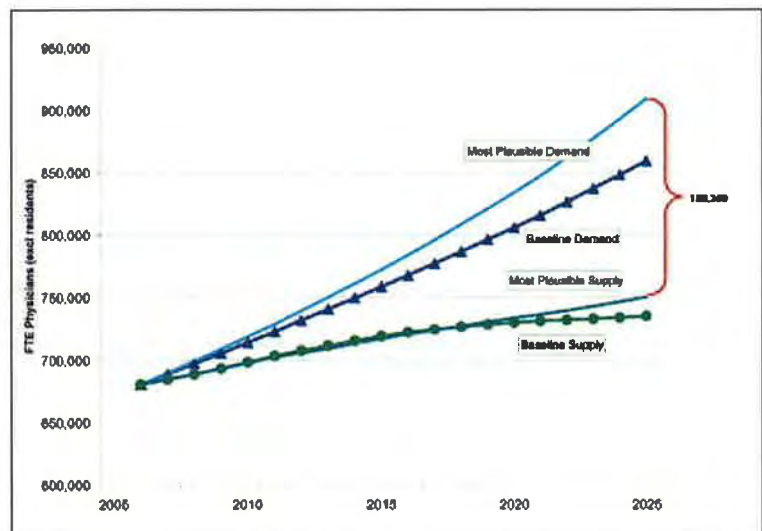


Figure 95. Plausible updated scenarios of physician supply and demand.²

tially substantial population growth related to the Oil Patch, we may well face even greater provider shortfalls than previously anticipated.

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.*

Conclusion

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

OPTION 2: INCREASE THE NUMBER OF HEALTH CARE 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 of a minimum of seven years for physicians to complete education and training, and a somewhat shorter time frame for other health professionals. Also, the educational process does not necessarily guarantee a specific number or type of physicians or health professionals 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 health care workforce in comparison to the national situation. In North Dakota, the current number of active patient care physicians is 1,765 or 262 per 100,000 population. This compares with the U.S. average of 267. The current number of active patient care physicians in North Dakota in primary care is 520 or 77 per 100,000 population (compared with U.S. rate of 94).³ While this might indicate that North Dakota is doing reasonably well, the United States is currently experiencing a decreasing and aging workforce with a geographic maldistribution 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 in primary care (mostly family physicians) are in rural communities.⁴ 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 address the health care needs of our rural and remote communities.

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 health care workforce is aging and younger health professionals typically 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 are available 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% 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 United States, increasing the number of medical students without assuring a commensurate number of residency training positions will not address the need. However, the number of federally sponsored GME positions was frozen by the Balanced Budget Act of 1997, and the growth of GME slots since then has been slow.

Many experts have reviewed the background for this recommendation for an increase of 30%. 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:²

- 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 effect is difficult to predict.
- Effect of shortage will include longer wait times, increased travel distances, shorter visit times, expanded use of nonphysicians, higher prices, and possible loss of access.
- Shortages are expected to continue to be especially problematic in poor rural and urban communities.
- A 30% increase in medical students and increase in GME positions will not eliminate but 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 per 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% 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 50.³ Compared with the national benchmark, the UND 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. The UND SMHS has consistently ranked in the top five schools in the country for the percentage 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 Health Professional Shortage Area (HPSA) communities, and students from underrepresented minorities, the UND SMHS ranked in the top 20% of schools. The School has done very well in producing primary care physicians and educating students from underrepresented minorities. The diversity of our students is primarily a result of our excellent Indians into Medicine (INMED) program that ranks first in the United States in graduating students from federally recognized tribes. Public schools and community-based medical schools such as the 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.⁵ Schools with smaller research portfolios are also more likely to train physicians for community and population needs. These statistics are positive for the UND SMHS 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 and percentage of residents who are IMGs is 74 and 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.⁶ As IMGs become settled in the United States, 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 in the United States.⁷

Factors affecting 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 affect 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 configurations or organizations 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 the following:⁸

- 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 helps us understand the potential influences on choices and may help in addressing these factors through the recruitment and admissions process. Educational experience throughout medical education and residency can be designed to assure quality experiences in primary care and at 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.⁹ The most successful outcomes for addressing the rural physician shortage have been the employment of 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 the primary purpose of increasing the supply of rural physicians: having a defined cohort of students, having a focused admissions process, and having a specific rural curriculum 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 53% to 64% of their graduates in practice in rural communities. This compares to the national rate of 3% for recent medical school graduates planning on rural practice or the 9% of physicians currently practicing in rural communities.¹⁰

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:¹¹

- 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 the National Health Service Corps (NHSC).

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. Note that all of these factors are identifiable at the time of admis-

sion to medical school, and thus could be influenced by admission criteria.¹²

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 are more complicated and time consuming. Why is that comprehensive effort necessary? With the downward trend 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 number of health professionals who are able to provide the full spectrum of services to a 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. 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 socio-demographic measures that can be related to poorer health (such as age, education, income, unemployment) and lifestyle factors (seat belt use, obesity, and 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 effect of primary care on population health:¹³

- 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 United States ranks behind other developed countries in health and health system performance, partly because of a long decline in the interest and vitality of primary care. The suggestion has been made that the United States should move toward having 50% of active patient care clinicians (physicians, nurse practitioners, and physician assistants) in pri-

mary care practice.¹⁴ A recent comparison of health and health care systems in the United States and Canada demonstrates these differences. In the United States, there are 50% more specialists than primary care physicians, compared with 10% more specialists in Canada. Costs have been approximately \$2,500 less per person per year in Canada than in the United States. Canada ranks significantly higher in most measures of health outcomes than the United States and has fewer social disparities in health care and health outcomes. This is attributed to specific health care system characteristics and the strong primary care infrastructure in Canada.¹⁵

Challenges to addressing the health workforce 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 health care workforce needs. 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 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, that studies have shown no significant academic performance differences between students from rural or urban backgrounds.¹⁶

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 and others.

Increasing the numbers of health professions students and residents

Recognizing the health workforce needs in North Dakota and the nation, the UND SMHS has proposed an increase in the number of its health professions students and residents by around 25%. This increase in students is realistic in the long run at the 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. A major requirement will be for additional instructional space, requiring further capital construction.

Assuring an increase in the number of students interested in primary care and rural practice will also require some additional operational changes. These will require ongoing revision of the School's 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 educating and attracting students interested in addressing the 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 more students 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 and 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. 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. The 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, help to control costs, and improve 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 rural and primary care recruitment. We can best meet the needs by partnering with ND Area Health Education Centers and others to address the resources and opportunities required 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). The UND SMHS has modified 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 UND SMHS is revising the curriculum to assure the development of primary care competencies and to increase the experience in longitudinal clinical care in rural communities. The UND SMHS has increased the number of residents in primary care and is of-

fering additional training in the needed areas of geriatrics, public health, surgical skills, obstetrics, and mental health.

OPTION 3: INCREASING THE RETENTION OF HEALTH CARE PROFESSIONALS TRAINED

Successful recruiting of students 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 affecting retention

The first, and necessary, step in addressing the health care 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 and practice in those communities, we will not be effectively meeting the needs of those communities. Factors that affect student specialty selection¹⁶ also may impact retention:

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

Very few studies have been done regarding retention of physicians in communities beyond the study of the effects on physicians of mandatory service for the National Health Service Corps (NHSC) 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.¹⁷

Approaches to improving retention

Using repeated surveys, a study by Pathman and colleagues¹⁷ compared the retention of physicians in rural HPSA communities with rural non-HPSA communities and found no significant difference between the two. 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 in the first place, and not that there are exaggerated retention problems with those successfully recruited. There were two characteristics of the physicians who remained in rural practice longer—owning their practice and being on-call fewer than two times a week. Even though recruitment may be the primary factor, these is-

sues affecting retention are more modifiable than many of the issues affecting recruitment. Suggestions to improve retention include the following:

- 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 affect 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.¹⁸

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. 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.¹⁹

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 or industrial areas, specific cultural groups, 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 retraining 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.²⁰

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 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, addresses one issue that may affect 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 health care 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 health care 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 scholarships or 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. The 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.

OTHER OPTIONS

We believe that the three forgoing 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 detail in future editions of this report.

References

1. Thompson, M.J., Hagopian, A., Fordyce, M., Hart, L.G. (2009). Do International Medical Graduates (IMGs) "Fill the Gap" in Rural Primary Care in the United States? A National Study. *The Journal of Rural Health*, 25:2, 124-134.
2. Association of American Medical Colleges. (2008). *The Complexities of Physician Supply and Demand: Projections Through 2025*. Retrieved from <https://members.aamc.org/eweb/upload/The%20Complexities%20of%20Physician%20Supply.pdf>.
3. Association of American Medical Colleges. (2011). *2011 State Physician Workforce Data Book*. Retrieved from <https://www.aamc.org/download/263512/data/statedata2011.pdf>.
4. Fordyce, M.A., Chen, F. M., Doescher, M.P. Hart, L.G. (2007). *2005 Physician Supply and Distribution in Rural Areas of the United States*. Retrieved from <http://depts.washington.edu/uwrhrc/uploads/RHRC%20FR116%20Fordyce.pdf>.
5. Mullan, F., Chen, C., Petterson, S., Kolshy, G., & Spanola, M. (2010). The Social Mission of Medical Education: Ranking the Schools. *Annals of Internal Medicine*, 152(12), 804-11.
6. Hart, L. G., Skillman, S. M., Fordyce, M., Thompson, M., Hagopian, A., & Konrad, T. R. (2007). International Medical Graduate Physicians in the United States: Changes Since 1981. *Health Affairs*, 26(4), 1159-1169.
7. Akl, E. A., Mustafa, R., Bdair, F., & Schunemann, H. J. (2007). The United States Physician Workforce and International Medical Graduates: Trends and Characteristics. *Journal of General Internal Medicine*, 22(2), 264-268.
8. Robert Graham Center. (2009). *What Influences medical Student and Resident Choices?* Retrieved from <http://www.graham-center.org/online/etc/medialib/graham/documents/publications/mongraphs-books/2009/rgcmo-specialty-geographic.Par.0001.File.tmp/Specialty-geography-compressed.pdf>.
9. Barrett, F.A., Lipsky, M.S., Lutfiyya, M.N. (2011). The Impact of Rural Training Experiences on Medical Students: A Critical Review. *Academic Medicine*, 86(2), 259-263.
10. Rabinowitz, H.K., Petterson, S., Boulger, J.G., Hunsaker, M.L., Diamond, J.I., Markham, F.W., Bazemore, A., Phillips, R.L. (2008). Medical School Programs to Increase the Rural Physician Supply: a Systematic Review and Projected Impact of Widespread Replication. *Academic Medicine*, 83(3), 235-243.
11. Rabinowitz, H.K., Paynter, N.P. (2000). The Role of the Medical School in Rural Graduate Medical Education: Pipeline or Control Valve? *Journal of Rural Health*, 16(3), 249-253.
12. Wayne, S.J, Kalishman, S., Jerabek, R.N., Timm, C., Cosgrove, E. (2010). Early Predictors of Physicians' Practice in Medically Underserved Communities: A 12-Year Follow-up Study of University of New Mexico School of Medicine Graduates. *Academic Medicine*, 85(10, supplement), S13-16.
13. Starfield, B., Shi, L., Macinko, J. (2005). Contribution of Primary Care to Health Systems and Health. *Milbank Quarterly*, 83(3), 457-502.
14. Sandy, L.G., Bodenheimer, T., Pawlson, L.G., Starfield, B. (2009). The Political Economy of U.S. Primary Care. *Health Affairs*, 28(4), 1136-1145.
15. Starfield, B. (2010). Reinventing Primary Care: Lessons from Canada for the United States. *Health Affairs*, 29(5), 1030-1036.
16. Rosenblatt, R. A. (2010). Commentary: Do Medical Schools Have a Responsibility to Train Physicians to Meet the Needs of the Public? The Case of Persistent Rural Physician Shortages. *Academic Medicine*, 85(4), 572-574.
17. Pathman, D.E., Konrad, T.R., Dann, R., Kock, G. (2004). Retention of Primary Care Physicians in Rural Health Professional Shortage Areas. *American Journal of Public Health*, 94(10) 1723-1729.
18. Dolea, C., Stormont, L. and Braichet, J.-M. (2010) Evaluated Strategies to Increase Attraction and Retention of Health Workers in Remote and Rural Areas. *Bulletin of the World Health Organization*, 88(5), 379-385.
19. Frehywot, S., Mullan, F., Payne, P.W., Ross, H. (2010). Compulsory Service Programmes for Recruiting Health Workers in Remote and Rural Areas: Do They Work? *Bulletin of the World Health Organization*, 88(5), 364-370.
20. Curran, V., Rourke, L., Snow, P. (2010). A Framework for Enhancing Continuing Medical Education for Rural Physicians: A Summary of the Literature. *Medical Teacher*, 32(11), 501-508.

TEN

Recommendations: Health Care Planning for North Dakota

The foregoing analysis leads to the inevitable conclusion that the increasingly large gap between the demand for health care services and the supply of physicians and other health care providers will grow substantially over the next 15 years. To bridge this gap, we re-endorse the approach initially outlined in the *First Biennial Report*, a four-pronged approach to ensure effective, efficient, timely, and affordable health care for all North Dakotans:

- Reduce disease burden, thus lowering the demand for health care services and the related costs.
- Augment the physician and other health care provider workforce through increased retention of graduates.
- Augment the physician and other health care provider workforce by increasing the medical, health sciences, and resident class sizes.
- Improve the health care delivery system in North Dakota.

This combination of reduced demand and increased supply of health care resources, along with necessary improvements in the health care delivery system, should bring the demand and supply equation into better balance over the next 15 years. We emphasize that it is only through the combination of all four approaches that ultimate success is 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.

REDUCE 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 that can be taken to begin the process to further disease prevention and reduction. These include strategies to reduce chronic and acute disease by the following:

- Positively affecting the health-related behaviors of North Dakotans
- Establishing a Master of Public Health Program
- 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 inactivity, and other considerations.¹ In fact, these health-related behaviors account for nearly 40% of all deaths in the United States.²

As an example, chronic diseases such as heart disease, Type 2 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. Centers for Disease Control and Prevention (CDC) estimates that if tobacco use, poor diet, and physical inactivity were eliminated in the United States, it would prevent 80% of heart disease and stroke, 80% of Type 2 diabetes, and 40% of cancer.³

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 2005.⁴

Successful improvement of health-related behaviors can avoid not only an enormous toll of suffering and death from disease, but it can be accomplished at far less expense than treating the disease.¹

Based on the foregoing factors, we conclude and recommend that public education and other efforts to positively affect 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 of Public Health 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's in public health) can augment capacity and reduce disease burden.

There is not currently another Master of Public Health (MPH) 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 or education, nursing and premedical) that would allow students to use the MPH 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 both in person and via 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. Twenty-seven students compose the inaugural class starting in 2012, and further growth in class size is anticipated.

Geriatrics training program

As has been outlined previously, the population of North Dakota is going to age markedly in the next decade. To provide for this increasingly older population, it will be essential to greatly expand training in the field of geriatrics. To accomplish this, the SMHS is actively recruiting a candidate to lead the School's geriatrics program, which will include a variety of programs to assist practitioners throughout North Dakota to optimize their care of seniors.

INCREASE 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 the following:

- 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:

- 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 a 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

INCREASE CLASS SIZE

Increasing retention efforts is a necessary but not sufficient approach to meeting the workforce shortage. Accordingly, we believe that an essential component of meeting the health care 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 U.S. medical school class size by

30%. An increase in the medical 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 eight additional students (in addition to the ongoing increase of eight students) for a total of 16 additional students, or a 29% increase. The SMHS has admitted the first expanded class with eight additional students in the summer of 2012. The first class will therefore graduate in 2016, and will 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. First, can the School find 16 truly qualified additional candidates to accept without diluting the high 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. In reviewing the list of alternate medical school applicants from prior years who were acceptable for admission but were unable to be accepted because of 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 with 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 eight additional new residency slots (in addition to the current*

addition of nine more slots per year) for a total of 17 new slots per year to offer to the larger medical school class cohort.

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

The workforce shortage will not be limited to physicians. Accordingly, we are proposing an analogous increase of 15 additional students (in addition to the ongoing class size expansion of 15 students) for a total of 30 students per year (or an increase of about 15%) for the health sciences students trained by the SMHS. Why 15% for the health sciences students and 29% for the medical students? Because most surveys have suggested that the health sciences 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.

IMPROVE 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 health care delivery system are necessary and important. Notwithstanding antitrust issues, it will be important for the "Big Six" 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 health care delivery models, including enhanced use of nonphysician providers, telemedicine, home care, and med-

ical 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 HEALTH CARE WORKFORCE NEEDS

The UND School of Medicine and Health Sciences has widely vetted the proposed Health Care Workforce Initiative (HWI). 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. Phase I of the HWI has been implemented; Phase 2 is pending and will be considered by the 2013 Legislative Assembly (see Table 28). Phase 2, if and when implemented, will complete the expansion of class size initially envisioned four years ago. It calls for eight additional medical students (total of 16 additional), 15 additional health sciences students (total of 30 additional), and eight additional residency slots (total of 17) per year. Assuming that the actual retention rate after residency for practice in North Dakota is at or above 70%, about 13 more physicians per year should be practicing in North Dakota or almost 150 more physicians by 2025 than would have occurred otherwise. Assuming a like number of physicians are retained for practice in North Dakota because of enhanced retention strategies, there should be about 300 more physicians practicing in North Dakota by 2025 than would have occurred otherwise.

However, to enable that growth to occur, the 2013 Legislative Assembly needs to approve and fund Phase 2 of the HWI, along with the attendant capital construction project to house the expanded classes and associated additional faculty and staff.

Table 28
Health Care Workforce Initiative (HWI)

Phase 1 (Ongoing)	Phase 2 (Pending)
8 medical students	16 medical students (eight more than current)
15 health sciences students	30 health sciences students (15 more than current)
9 residency slots	17 residency slots (eight more than current)
RuralMed program	Additional facility to house the > 200 new students, faculty and staff associated with full HWI
Master of Public Health Program	
Geriatrics training program	
Pipeline activities	
Updated admission process	

During the 2011-2013 interim, a Facility Space Study was conducted by the winning competitor for the contract, JLG Architects. They in partnership with the national design firm of Perkins+Will analyzed the ability of the current UND facilities to accommodate the growth envisioned in the HWI. They reported the following:

- Utilization of the current facility is maximized, and already is at or greater than accepted national benchmarks for optimal utilization.

- Expansion of the facility space therefore is essential to permit the full implementation of the HWI.
- Because of various structural and architectural issues, extensive renovation of the current 60-year-old converted hospital building that is the School's principal instructional facility would be unwise.

They, therefore, proposed three options, two of which combined renovation with new construction and the third one consisting solely of new construction.



Figure 96. Option 1.

Option 1 has the lowest initial cost and is a combination of renovation with some new construction (see Figure 96). The advantages and disadvantages of Option 1 are outlined in Table 29.

The major accomplishment of Option 1 is that it provides sufficient additional space to accommodate the proposed class size expansion.

Table 29
Option 1 Advantages and Disadvantages

Advantages	Disadvantages
Lowest cost	Logistical difficulty and upheaval during construction
Shortest project completion time line	Ongoing maintenance costs of old facility
Would meet the needs of the workforce expansion enrollment increases	Limits the opportunity to develop optimal collaborative and educational space
	Would require pedestrian bridge across road
	Little site room for future expansion

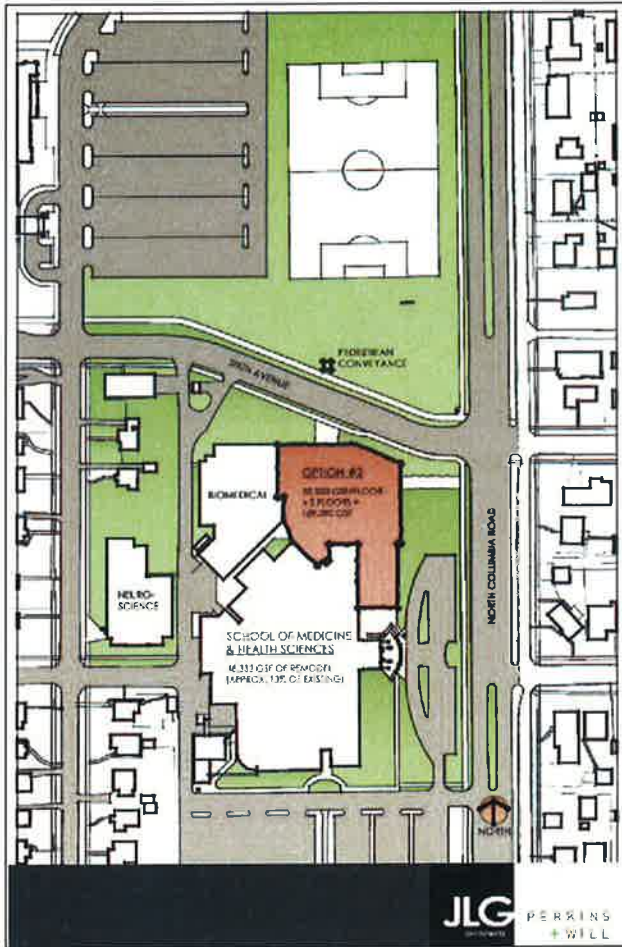


Figure 97. Option 2.

Option 2 is intermediate in cost, and combines renovation with even more new space (see Figure 97). The advantages and disadvantages of this option are outlined in Table 30. In addition to accommodating the larger class sizes, Option 2 permits the consolidation of the various departments and programs of the School, a critically important issue as we emphasize and teach the virtues of interdisciplinary learning and patient care.

Table 30
Option 2 Advantages and Disadvantages

Advantages	Disadvantages
Intermediate costs	Logistical difficulty and upheaval during construction
Intermediate project completion time	Ongoing maintenance costs of old facility
Would meet the needs of the workforce expansion enrollment increases	Limits the opportunity to develop optimal collaborative and educational space
Meets established national standards for educational facilities	Would require pedestrian bridge across road
	Little site room for future expansion



Figure 98. Option 3.

Option 3 is the highest in initial cost, and proposes the construction of an entirely new building, with demolition of the current building. It is envisioned that repurposing of the current building might make strategic sense for UND and the North Dakota University System (NDUS), and that option could be entertained and implemented, depending on the outcome of the ongoing master facility plan that is being undertaken by the NDUS.

Table 31
Option 3 Advantages and Disadvantages

Advantages	Disadvantages
Exceptional space that would provide value and growth potential for decades	Highest cost
Least disruptive to ongoing SMHS operations	Longest project completion time
Lowest maintenance and operational costs	
Allows full integration of scattered units (e.g., occupational therapy, athletic training)	
Would meet the needs of the workforce expansion enrollment increase	
Allows repurposing of buildings to the benefit of UND students (depending on NDUS master plan)	
Positive Faculty and Administration (F&A)	
No need for pedestrian bridge across street	

One of the critical factors involved in deciding between the three options is not just the initial cost of each option, but the downstream costs as well. Using a 40-year-old building lifecycle analysis, it turns out that Option 3 (the new building option) has the lowest lifecycle costs of the three options (see Table 32). Two factors are responsible for this somewhat counterintuitive finding (that the most expensive option initially is the least expensive long term). One factor responsible for this is the elimination of the substantial legacy costs associated with trying to maintain an increasingly old building for the next 40 years. After all, the building will be 100 years old at the end of the 40-year lifecycle. The maintenance, deferred maintenance and utility costs associated with the old building are estimated to consume several million dollars per year for the next 40 years.

The other cost-mitigating factor is the indirect cost return (faculty and administration [F&A]) associated with new construction funded by nonfederal dollars. This should generate almost \$1 million per year in additional revenue accruing to UND, usually from the federal government. Thus, the combination of the elimination of enormous legacy costs coupled with additional (new) revenue generation mitigates the higher initial cost of the new construction, and actually renders Option 3 as the most cost-effective over the long run. A concise summary of the HWI and the associated facility construction options is provided in Figure 99.

CONCLUSION

It is the unanimous recommendation of the leadership of the SMHS and its Advisory Council that full implementation of the HWI be instituted without fail or hesitation during the 63rd Legislative Assembly, with approval of the full amount of funding requested and endorsed by the State Board of Higher Education (\$9,389,942). Additionally, it is strongly recommended that the 63rd Legislative Assembly endorse and fund the construction of a new medical school building (Option 3) with an authorized appropriation for the full amount requested (\$124 million). Full implementation of the HWI, which began during the 2011-2013 biennium, will require four biennial cycles to

complete. Further specifics as to the time table, associated operational costs, and facility needs, are summarized in Figure 99.

Deliverables

Full funding and timely implementation of the HWI and provisions for the associated facility needs will help achieve a variety of goals and should be considered the deliverables to be received in exchange for funding of the HWI.

The most important deliverable will be an adequate supply and distribution throughout North Dakota of caring, team-oriented primary and subspecialty-care practitioners schooled in interdisciplinary care. About half of the needed practitioners will result from a variety of increased retention efforts, and the other half will come from the expansion of the class size and additional residency slots. Inherent in the plan is the anticipation that it will address the twin challenges of provider availability in North Dakota—an adequate supply of providers, as well as an appropriate distribution of those providers throughout all three population areas of the state—metropolitan, micropolitan (large rural) and rural. In addition to the obvious and necessary improvement in health care delivery throughout North Dakota, the increased number of health care providers (numbering several and perhaps many hundreds) also will have a direct positive impact on the economic environment in the state as a result both of their increased employment and the “halo” effect that has been reported to generate \$1 million or more annually as a consequence of each additional physician practitioner employed.

It is further anticipated that the SMHS will generate \$2 of additional revenue for every \$1 appropriated by the Legislative Assembly. This is deemed a conservative estimate, since current data indicate an even greater return on investment of \$2.63 for every state dollar committed. The additional revenue is composed of \$0.62 as a result of tuition, \$1 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

Table 32
40-Year Lifecycle Costs (millions of dollars)

Lifecycle Costs	As-Is	Option No. 1	Option No. 2	Option No. 3 (Demolition)
Construction	\$0	\$38.5	\$68.3	\$124
Maintenance	\$33.2	\$41.1	\$49.1	\$34.7
Deferred maintenance	\$41.8	\$49.5	\$55.5	\$0
Utility	\$27.7	\$34.7	\$41.2	\$34.1
F&A	\$0	\$0	\$0	(\$36.9)
Demolition	\$0	\$0	\$0	\$4
Lifecycle Cost	\$102.7	\$163.8	\$214.1	\$159.9
Incremental Cost	Baseline	\$61.1	\$111.4	\$57.2

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 next three biennia, the SMHS estimates that it will generate over \$90 million biannually in incremental direct economic activity for the state. The total direct economic impact of the SMHS over the next three biennia should 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 33 outlines the expected distribution of the additional requested appropriated dollars in the four corners of the state.

A final positive direct impact will be an additional facility

and administration (F&A) indirect cost return associated with federal and other research grants. Current estimates suggest that UND could garner almost \$1 million per year in additional revenue through this mechanism.

The last benefit is the indirect economic impact through additional tax collections and indirect economic activity that would emanate from the anticipated growth of the state's economy as a result of the HWI.

Table 33
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

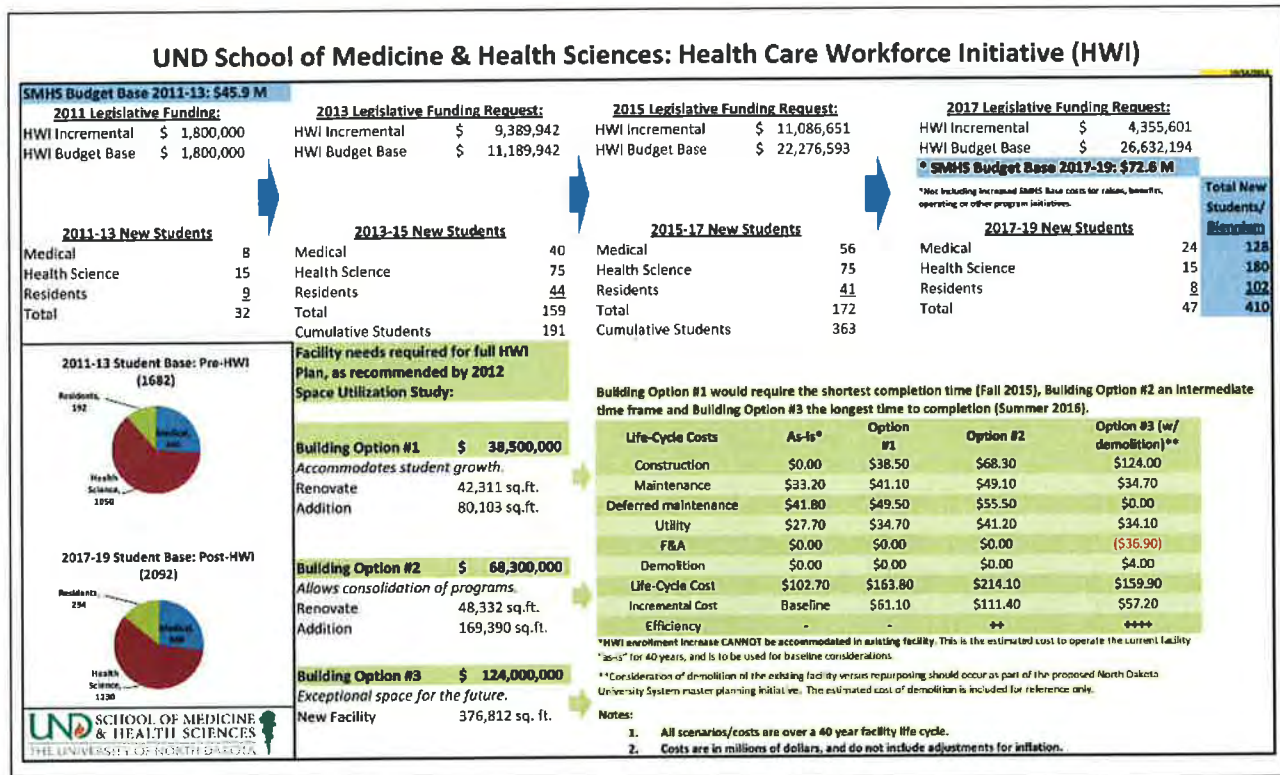


Figure 99. Summary of the Health Care Workforce Initiative (HWI) and attendant facility needs over the four consecutive biennia required for full implementation.

References

1. Robert Wood Johnson. (2009). *Beyond Health Care: New Directions for a Healthier America*. Retrieved from <http://www.rwjf.org/en/research-publications/find-rwjf-research/2009/04/beyond-health-care.html>.
2. Institute of Medicine. *Living Well with Chronic Illness: A Call for Public Health Action*. Washington (DC): The National Academies Press; 2012.
3. Centers for Disease Control and Prevention. (2009). *The Power of Prevention: Chronic Disease...the Public Health Challenge of the 21st Century*. Retrieved from <http://www.cdc.gov/chronicdisease/pdf/2009-power-of-prevention.pdf>.
4. North Dakota State Epidemiological Outcomes Workgroup. (2010). *Alcohol, Tobacco, and Illicit Drug Consumption and Consequences in North Dakota*. Retrieved from <http://www.nd.gov/dhs/services/mental-health/prevention/pdf/2010-epi-profile.pdf>.

Appendix

Health Care Workforce Pipeline Activities Affiliated with The University of North Dakota School of Medicine and Health Sciences programs K-16 Activities			
Activity	Description	Target Audience	Partner(s)
Career and Technical Education (CTE) - Crash Courses	AHEC staff provide information related to health careers. ND College Access Network has developed partnerships across North Dakota to help navigate post-secondary preparation and opportunities.	Students (grades 7-12 grade) and parents	ND CTE
HOPE Grants (Health Opportunities Partnering with Education)	A mini-grant program intended to support rural health career fairs.	Grades 5-12	Local schools
Health Career Academy	One full-day event featuring presentations and hands-on activities focusing on a variety of health careers; held at the SMHS.	Students (grades 10-12) school counselors, health occupation teachers	Center for Rural Health (CRH)
HIPE Week	Teachers and health care providers team up to promote health careers. March 11-15, 2013	All ages	Schools, health care facilities
HIPAA (online) Training	Training on privacy and security of protected health information available at no cost, which is required for job shadowing in health care facilities.	High School Students	AHEC
HOSA-Future Health Professionals	A student organization that promotes career opportunities in health care the industry.	High School Students	CRH, CTE and health occupation instructors
In-A-Box and other Educational Materials Loan Program	In-A-Box Program includes health and science activities. In addition, the AHEC and CRH have a number of resources available to schools, youth organizations, etc.	Grades 4-12	CRH/AHEC

Total Participants	Communities Reached	Lead SMHS Program/ Funding Source
509	Dakota Prairie, Park River, Harvey, Carrington, Linton, Wishek, Kildeer, Hazen, Richardton	AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions [HRSA, BHP])
200+	Park River, Adams, Edmore, Fordville, Lankin, Grafton, Ellendale, Fort Totten	AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions [HRSA, BHP])
99 students	Bismarck	AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions [HRSA, BHP])
Numbers not available	Statewide Activities	CRH/AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions [HRSA, BHP]) and Office of Rural Health Policy [ORHP])
389	Not available	CRH (federal – Health Resources & Services Administration, Office of Rural Health Policy [HRSA, ORHP])
Numbers not available	Not available	AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions [HRSA, BHP])
Numbers not available	Not available	CRH/AHEC (federal – Health Resources & Services Administration, Bureau of Health Profession [HRSA, BHP]) and Office of Rural Health Policy [ORHP])

Health Care Workforce Pipeline Activities

Affiliated with The University of North Dakota School of Medicine and Health Sciences programs

K-16 Activities

Activity	Description	Target Audience	Partner(s)
Indians Into Medicine (INMED) Programs	<p>A comprehensive program designed to assist American Indian students who aspire to be health professionals to meet the needs of our tribal communities.</p>	<p>Indian students who are preparing for health careers. Summer Institute program is a six-week academic enrichment session for junior and senior high school students; the Med Prep and Pathway components provide opportunities for college-level students.</p>	<p>Tribal communities and other national education organizations.</p>
Market Place for Kids	<p>Is an opportunity to explore creativity and inspire entrepreneurship in students.</p> <p>AHEC staff participate by providing health career related information and resources.</p> <p>Local career fairs to inform and encourage students to pursue a career in health care. AHEC staff participate by providing health career related information and resources.</p>	<p>Upper elementary and middle school students</p>	
Other Hands-On Health Career Fairs	<p>Local career fairs to inform and encourage students to pursue a career in health care. AHEC staff participate by providing health career related information and resources.</p>	<p>All ages</p>	<p>Schools statewide</p>

Total Participants	Communities Reached	Lead SMHS Program/ Funding Source
<p>As of the spring of 2012, the program has graduated 199 medical doctors. The program also enrolls students in nursing, clinical psychology and various other allied health specialties, graduating 221 allied health professionals. A total of 420 American Indian health professionals have graduated through the program.</p> <p>79 – Summer Institute 8 – Med Prep Students 9 – Pathway Participants</p>	<p>Tribal</p>	<p>(federal) Indian Health Service grant, National Institutes of Health grant from the IDeA Network for Biomedical Research Excellence (INBRE) Program of the National Center for Research Resources; and (state) SMHS</p>
<p>877</p>	<p>Bottineau, Devils Lake, Jamestown, Wahpeton, Minot, Williston, Dickinson</p>	<p>Market Place for Kids is a non-profit established by elementary teachers in ND and MN.</p>
<p>135</p>	<p>Bismarck, Fort Totten</p>	<p>AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions (HRSA, BHP))</p>

Health Care Workforce Pipeline Activities

Affiliated with The University of North Dakota School of Medicine and Health Sciences programs

K-16 Activities

Activity	Description	Target Audience	Partner(s)
Rural Collaborative Opportunities for Occupational Learning in Health (R-COOL-Health) Scrubs Camps	A competitive mini-grant program intended to increase awareness, interest, and understanding of health careers available in rural ND through creative and interactive activities.	Grades 5-12	Schools statewide
Rural Collaborative Opportunities for Occupational Learning in Health (R-COOL-Health) Scrubs Academy	This is a three day/three night program intended to provide hands-on activities from a wide variety of health professionals and an opportunity to experience campus living.	Grades 6-8	Schools statewide, AHEC
SEARCH (Student/residents Experiences And Rotations in Community Health)	SEARCH links academic institutions and communities to better prepare students and residents in the fields of medicine, nursing, social work, physician assistant studies, psychology, and dentistry for primary care delivery in health professional shortage areas.	Graduate health profession students.	ND Department of Health, DRO Denver, CHAD, SEARCH contractors; University of Mary, North Dakota State University College of Nursing, University of North Dakota College of Nursing-Psychology, Counseling Psychology, Physician Assistant program, Social Work and other out of state academic institutions.

Total Participants	Communities Reached	Lead SMHS Program/ Funding Source
<p>407</p> <p>April, 2011-April, 2012, 32 Scrubs Camps have been hosted; 1,864 students attended representing 143 ND communities.</p>	<p>Adams, Alexander, Ashley, Bottineau, Buxton, Carlson, Cavalier, Clifford, Colfax, Edmore, Elgin, Dakota Prairie, Dawson, Devils Lake, Ellendale, Fairmont, Finley, Flasher, Four Winds, Galesburg, Garden Valley, Glen Ullin, Grenora, Hankinson, Hatton, Hope, Lakota, Langdon, Leeds, Lidgerwood, Lisbon, Maddock, Minnewaukan, Munich, Newburg, New Leipzig, Northwood, NorthStar, Oakes, Osnabrock, Page, Park River, Pettibone, Portland, Ray, Reynolds, Robinson, Rolette, Round Prairie, Rugby, Sharon, Starkweather, Steele, Stony Creek, Tappen, Trenton, Tuttle, Wahpeton, Walhalla, Warwick, Westhope, Williston, Wolford, Wyndmere</p>	<p>Center for Rural Health</p>
<p>Two Scrubs Academies have been held: 2011 – 38 students from 21 different communities; 2012 – 45 students from 22 different communities.</p>	<p>Academy 2011 Beulah, Bismarck, Bottineau, Carrington, Cavalier, Ellendale, Fargo, Fordville, Frontier, Grand Forks, Harvey, Leeds, Mandan, Minot, Mohall, Mott, Northwood, Oakes, Towner, Valley City, West Fargo</p> <p>Academy 2012 Argusville, Beach, Beulah, Bismarck, Cavalier, Dickinson, Drayton, Fargo, Grafton, Grand Forks, Hazen, Jamestown, Leeds, Mandan, McKenzie, Mekinock, Minot, Minto, Oakes, Park River, Wahpeton</p>	<p>CRH-(federal) State Office of Rural Health Grant program; (state) appropriated funds designated for workforce development; UND and Education Council grant.</p>
<p>28</p>	<p>22</p>	<p>UND SMHS – (federal) HRSA, Bureau of Clinician Recruitment and Services</p>

Health Care Workforce Pipeline Activities Affiliated with The University of North Dakota School of Medicine and Health Sciences programs K-16 Activities			
Activity	Description	Target Audience	Partner(s)
Health Profession Student Assistance	Travel assistance for rural clinical rotation	Post-secondary health profession students.	Dakota Nursing Program
Simulation Training	Health care training using human simulators.	Post-secondary education.	Mayville State University, Lake Region State College, VA Hospital, Dickinson State, NDSU
Career and Technical Education (CTE) Professional Education Conference	Myth vs Fact: Health Careers presentation to CTE/Health occupation instructors	High school instructors	ND Department of CTE
Health Care Workforce Pipeline Activities Health Care Professional Continuing Education and Training			
Dakota Conference on Rural and Public Health	Annual conference to share strategies for building and sustaining healthy communities in North Dakota.	Health care administrators, professionals, students, educators, legislators and state agencies.	UND, College of Nursing; Dept. of Family & Community Medicine; Altru Health System; ND Rural Health Association; ND Public Health Association.
NICE Grants (Network for Interprofessional Continuing Education)	(e.g. CNA training, Agricultural Medicine, Military Culture Certificate Program)	Rural health professionals	University of Iowa, ND National Guard, Dakota Conference on Rural And Public Health
Health Care Workforce Pipeline Activities Recruitment and Retention			
Rural Recruitment and Retention Network (3RNet) Membership	A national web-based network helping health professionals find jobs in rural and underserved areas throughout the country.	Health professionals and health care organizations	AHEC
Community Appgar Program	A study of recruitment and retention issues using five focus areas: geographic, economic, scope of practice, medical, hospital and community support.	Rural hospital administrators, board of directors and lead primary care physicians involved in recruitment.	Boise State University, Idaho and Boise Family Medicine Residency Program

Total Participants	Communities Reached	Lead SMHS Program/ Funding Source
1	Bottineau	AHEC (federal)– Health Resources & Services Administration, Bureau of Health Professions (HRSA, BHP)
107	Mayville, Dickinson, Bismarck, Fargo	AHEC (federal) – Health Resources & Services Administration, Bureau of Health Professions (HRSA, BHP)
7	Bismarck	AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions (HRSA, BHP)
270+	2012 Grand Forks (statewide representation)	CRH – funded by sponsorship and registration.
272	Ellendale, Edgeley, LaMoure, Oakes Valley City, LaMoure, Hillsboro, Watford City, Wishek	AHEC (federal – Health Resources & Services Administration, Bureau of Health Professions (HRSA, BHP)
371 health profession candidates disseminated to rural health care entities.	36 (rural) Critical Access Hospitals (CAH), two IHS, three (rural) community health centers.	CRH-(federal) State Office of Rural Health Grant Program; (state) appropriated funds designated for workforce
16 administrators; 16 primary care providers; 16 Board of Directors	16 (rural) Critical Access Hospitals (CAH)	CRH-(federal) State Office of Rural Health Grant Program; (state) appropriated funds designated for workforce.

Health Care Workforce Pipeline Activities

Recruitment and Retention

Activity	Description	Target Audience	Partner(s)
Community Paramedicine Workshop	A workshop to explore the expanded role of a paramedic.	EMS and other multi-stakeholders	ND EMS Association and ND Department of Health, Division of EMS and Trauma
EMS Leadership Training	Series of training workshops conducted to develop leaders among ND EMS professionals.	EMS professionals	ND EMS Association and ND Department of Health, Division of EMS and Trauma
Primary Care Office (PCO)	State-level office, located in the ND Dept. of Health. Purpose is to provide technical assistance to organizations and communities in their efforts to expand access to primary care, oral health, and mental services for underserved populations. PCO's work with National Health Service Corp (NHSC) providers, sites, state loan repayment and J-1 visa waiver programs and conduct health profession shortage area designations.	Sites: Rural Health Clinics, Critical Access Hospitals, tertiary care centers, Indian Health Service, Federally Qualified Health Centers, Human Service Centers and private practice mental health sites. Students/Providers: primary care, oral health, nursing, mental and behavioral health.	ND Department of Health, DRO Denver, Community Healthcare Association of the Dakotas; PCO Network; academic partners in the University system.

Total Participants	Communities Reached	Lead SMHS Program/ Funding Source
75	Statewide representation	CRH-(federal) Rural Hospital Flexibility Grant Program.
25	Statewide representation	CRH-(federal) Rural Hospital Flexibility Grant Program.
128 providers currently serving (64 NHSC; 27 state loan repayment; 37 J-1 visa providers)	131	CRH/Dept. of Family and Community Medicine –Federal funding- HRSA, through a DoH subcontract to CRH.

