North Carolina Rural Health Action Plan:

A Report of the NCIOM Task Force on Rural Health

August 2014

North Carolina Institute of Medicine

In partnership with the Office of Rural Health and Community Care within the North Carolina Department of Health and Human Services

Funded by
Kate B. Reynolds Charitable Trust

NCIOM

NCIOM

North Carolina Institute of Medicine
shaping policy for a healthier state

The North Carolina Institute of Medicine (NCIOM) is a nonpolitical source of analysis and advice on important health issues facing the state. The NCIOM convenes stakeholders and other interested people from across the state to study these complex issues and develop workable solutions to improve health, health care access, and quality of health care in North Carolina.

The full text of this report is available online at **http://www.nciom.org**

North Carolina Institute of Medicine
Keystone Office Park
630 Davis Drive, Suite 100
Morrisville, NC 27560
919.401.6599

Suggested citation
North Carolina Institute of Medicine. *North Carolina Rural Health Action Plan: A Report of the NCIOM Task Force on Rural Health* Morrisville, NC: North Carolina Institute of Medicine; 2014.

In partnership with the Office of Rural Health and Community Care within the North Carolina Department of Health and Human Services. Funded by Kate B. Reynolds Charitable Trust.

Credits
Report design and layout
Angie Dickinson Design, angiedesign@me.com

North Carolina Rural Health Action Plan:

A Report of the NCIOM Task Force on Rural Health

August 2014

North Carolina Institute of Medicine

In partnership with the Office of Rural Health and Community Care within the North Carolina Department of Health and Human Services

Funded by
Kate B. Reynolds Charitable Trust

NCIOM

Table of Contents

Acknowledgements **5**

Task Force Members **9**

Executive Summary **13**

Chapter 1: Introduction **25**

Chapter 2: Factors Influencing Rural Health **35**

Chapter 3: Expand Jobs and Economic Security **51**

Chapter 4: Early Care, Parenting Supports, and Education **69**

Chapter 5: Healthy Eating and Active Living **81**

Chapter 6: Behavioral Health Services in Primary Care Settings **95**

Chapter 7: Insurance Coverage and Safety Net Programs **113**

Chapter 8: Recruitment and Retention of Health Care Professionals into Rural Communities **131**

Chapter 9: Conclusion **155**

Appendix A: Complete List of Strategies Considered by the Task Force **165**

Appendix B: Healthy North Carolina 2020 Objectives **169**

Appendix C: North Carolina County Data **171**

Appendix D: List of Resources that Provide Funding and/or Technical Assistance to Rural Communities **175**

Acknowledgements

In 2013, the North Carolina Institute of Medicine (NCIOM) in partnership with the Office of Rural Health and Community Care (ORHCC) within the North Carolina Department of Health and Human Services (NCDHHS), and the Kate B. Reynolds Charitable Trust (KBR) convened a Task Force on Rural Health. The Task Force on Rural Health was charged with developing a North Carolina Rural Health Action Plan that included workable strategies to improve rural health outcomes that were actionable over the next three to five years. The Action Plan would provide policymakers, funders, and stakeholder organizations with a common vision and set of action steps to improve health in rural North Carolina.

The Task Force was chaired by Chris Collins, MSW, director, Office of Rural Health and Community Care; Robin G. Cummings,[a] MD, FACC, FACS, former director, Office of Rural Health and Community Care, director, Division of Medical Assistance, deputy secretary, North Carolina Department of Health and Human Services; Paul Cunningham, MD, dean, senior associate vice chancellor for medical affairs, Brody School of Medicine, East Carolina University; and Donna Tipton-Rogers, EdD, president, Tri-County Community College. The NCIOM also wants to thank the 57 members of the Task Force and Steering Committee who gave freely of their time and expertise from March 2013 through May 2014 to address this pertinent issue. The Steering Committee members guided the work of the Task Force by helping shape meeting agendas and helping to identify speakers and panelists. For a complete list of Task Force and Steering Committee members please see pages 9-11 of this report.

The NCIOM Task Force on Rural Health thanks the following people for presenting to the Task Force and sharing their expertise and experiences:

Alice S. Ammerman, DrPH, RD, director, Center for Health Promotion and Disease Prevention, professor, Department of Nutrition, Gillings School of Global Public Health and School of Medicine, University of North Carolina at Chapel Hill; Abena Asante, senior program officer, The Kate B. Reynolds Charitable Trust; Jehan Benton-Clark, program officer, The Kate B. Reynolds Charitable Trust; Reuben C. Blackwell, IV, president and CEO, Opportunities Industrialization Center; N. Yolanda Burwel, senior fellow, Rural Research and Innovation Office, North Carolina Rural Economic Development Center; Anna Carter, president, Child Care Services Association; Eric Christian, integrated care manager, Community Care of Western North Carolina; Andrew Clendenin, MSW, behavioral health program manager, Community Care of the Sandhills; Scott Daugherty, commissioner for small business, director, Small Business and Technology Development Center, North Carolina Department of Commerce; John Eller, director, Catawba County Social Services; Robert Ford, PhD, executive director, Hot Springs Health Program; Erin Fraher, PhD, MPP, director, North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill; Dave Gardner, DA, executive director, North Carolina Center for Health and Wellness, University of North Carolina at Asheville; Herbert G. Garrison, MD, MPH, professor, East Carolina University, director, Eastern Carolina Injury Prevention Program, vice president of Medical Affairs, Vidant Medical Center; Katie Gaul, research associate, North Carolina Health Professions Data System,

a Dr. Cummings served as a co-chair of the Task Force on Rural Health during his tenure as the director of the Office of Rural Health and Community Care. Chris Collins became co-chair when she was appointed acting director.

Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill; Dan Gerlach, president, Golden Leaf Foundation; Roy Gilbert, HIT manager, Office of Rural Health and Community Care, Department of Health and Human Services; Jim Graham, MHA, executive director, Northwest Community Care Network; Debbie Hamrick, director of specialty crops, North Carolina Farm Bureau, chair, economic development sub-committee, sustainable local foods advisory council; Pat Hansen, RN, MPH, project manager, Shape NC, the North Carolina Partnership for Children, Inc.; George T. Hardison, Jr., MA, MATCH project director, East Carolina University; Brian Harris, MHA, CEO, Rural Health Group; Molly Hemstreet, founder and general manager, Opportunity Threads, network coordinator, Carolina Textile District; Steven Hill, executive director, North Carolina Eastern Region Partnership; Mark Holmes, PhD, director, North Carolina Rural Health Research and Policy Analysis Center, assistant professor, Department of Health Policy and Management, Gillings School of Global Public Health, University of North Carolina at Chapel Hill; Cathy Hudgins, director, Center of Excellence for Integrated Care, North Carolina Foundation for Advanced Health Programs; Tom Irons, MD, professor of pediatrics, associate vice chancellor, Regional Health Services, medical director, North Carolina Agromedicine Institute, director, Generalist Physician Program, Brody School of Medicine, East Carolina University; Iheoma U. Iruka, PhD, scientist and associate director, Frank Porter Graham Child Development Institute, University of North Carolina at Chapel Hill; Jennifer Johnson, section chief, Quality and Education Section, Division of Child Development and Early Education, North Carolina Department of Health and Human Services; Reverend Richard Joyner, pastor, Conetoe Family Life Center: Rural Missionary Baptist Church; Suzanne Lazorick, MD, MPH, FAAP, associate professor of pediatrics and public health, East Carolina University Pediatric Healthy Weight Research and Treatment Center, associate director, Community Research and Prevention; Adam Linker, policy analyst, Health Access Coalition, North Carolina Justice Center; Will Mahone, MHA, president, Halifax Regional Medical Center; Thomas Maynor II, MD, MPH, deputy CEO, Robeson Health Care Corporation; J. Nelson-Weaver, senior program officer, The Kate B. Reynolds Charitable Trust; Jennifer Nixon, PhD, executive director, Rockingham County Healthcare Alliance; Susan Nixon, executive director, Chowan/Perquimans Smart Start Partnership; Rebecca Olson, RN, MS, executive director, The Good Samaritan Clinic of Jackson County; Elaine Owens, MPA, director, Wake Area Health Education Center; David Peoples, operations manager, Rural Development Division, North Carolina Department of Commerce; Sorien Schmidt, state director of North Carolina, Enroll America; Julie Spero, MSPH, research associate, Program on Health Workforce Research and Policy, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill; Robert W. Strack, PhD, MBA, associate department chair/associate professor, Department of Public Health Education, University of North Carolina at Greensboro; Marvin Swartz, MD, division head, Social and Community Psychiatry, Duke University Medical Center; Marshall Tyson, MPH, manager of the health and wellness unit, Women's and Children's Health Section, Division of Public Health, North Carolina Department of Health and Human Services; Morgan Whitehurst, senior coordinator, E.L. Roberson Senior Center, Tarboro

The NCIOM would also like to extend a special thanks to Mona Kilany, MSPH, who is a doctoral candidate in the Department of Health Policy and Management, in the Gillings School of Global Public Health at the University of North Carolina. Her dissertation focuses on rural and urban differences in North Carolina in the receipt of services for Medicaid recipients with serious

mental illness. She graciously allowed us to use her literature review on the problems people have accessing mental health services in rural areas, as part of our background for Chapter 6.

In addition to the above individuals, the staff of the North Carolina Institute of Medicine contributed to the Task Force's study and the development of this report. Pam Silberman, JD, DrPH, president and CEO guided the work of the Task Force. Kimberly Alexander-Bratcher, MPH, project director, and Berkeley Yorkery, MPP, project director, served as project directors for the Task Force. Kimberly Alexander-Bratcher, Elizabeth Chen, MPH, intern, Pam Silberman, Michelle Ries, MPH, project director, Micha'le Simmons, MHA, intern, and Adam J. Zolotor, MD, DrPH, vice president contributed to the report. Key staff support was also provided by Adrienne Parker, director of administrative operations, Thalia Fuller, administrative assistant, and Laurece Summers, research assistant.

NCIOM Task Force on Rural Health

Co-Chairs:

Chris Collins, MSW
Director
North Carolina Office of Rural Health and Community Care

Paul R. Cunningham, MD, FACS
Dean and Senior Associate Vice Chancellor for Medical Affairs
Brody School of Medicine at East Carolina University

Donna Tipton-Rogers, EdD
President
Tri-County Community College

Task Force Members

Terri Bryant Adou-Dy, MBA
Program Officer
Golden Leaf Foundation

Andy Anderson
Triumph, LLC and Community Innovations, Inc.

Jason Baisden
Executive Director
North Carolina Association of Free Clinics

Ronny Bell, PhD, MS
Professor
Department of Epidemiology and Prevention
Director
Maya Angelou Center for Health Equity
Wake Forest School of Medicine

Danielle Breslin
Vice President of Operations
Blue Cross and Blue Shield of North Carolina Foundation

Silvia Cendejas
Assistant Director
Episcopal Farmworker Ministry

D. Gregory Chadwick, DDS, MS
Dean
East Carolina University School of Dental Medicine

Olivia Collier, MPA
Appalachian Regional Commission Program

Anita Davie
High Country Area Agency on Aging

Laura Gerald, MD, MPH
Former State Health Director
Division of Public Health
North Carolina Department of Health and Human Services

Joy Grady
Executive Director
Wilmington Health Access for Teens

Jim Graham
Northwest Community Care Network

Pearly Graham-Hoskins, MD
Physician
Bladen Healthcare/Bladen Medical Associates
Cape Fear Valley Health System

Tammy Greenwell, BSN, MPH
Performance and Compliance Officer
Blue Ridge Community Health Services, Inc.

Gary R. Gunderson, MDiv
Vice President
Faith and Health
Professor
Public Health Science
Wake Forest University Baptist Medical Center
Professor
Faith and the Health of the Public
Wake Forest University School of Divinity

Task Force continued

Phillip Hardin
Former Director
McDowell County Department of Social Services

Jeff Heck, MD
President & CEO
Mountain Area Health Education Center

Robin Jenkins, PhD
Deputy Director
Division of Juvenile Justice
North Carolina Department of Public Safety

Ammie Jenkins
Executive Director
Sandhills Family Heritage Association

Polly Johnson, RN, MSN, FAAN
President & CEO
North Carolina Foundation for Nursing Excellence

John M. Kauffman Jr., DO
Dean and Chief Academic Officer
Campbell University School of Osteopathic Medicine

Michael Lancaster, MD
Director
Behavioral Health Program
Community Care of North Carolina

Ureh Lekwauwa, MD, DFAPA
Medical Director
Division of Mental Health, Developmental Disabilities, and Substance Abuse Services
North Carolina Department of Health and Human Services

Armando Limon
HealthCare Connection Coordinator
Wilkes County Health Department

Andy Lucas, MPA
Stanly County Manager
Stanly County

Addie S. Luther

Will Mahone, MHA
President
Halifax Regional Medical Center

Thomas Maynor, MD, MPH
Deputy CEO
Robeson Health Care Corporation

E. Benjamin Money Jr., MPH
President & CEO
North Carolina Community Health Center Association

Jennifer Nixon, PhD
Executive Director
Rockingham County Healthcare Alliance
c/o Reidsville Area Foundation

Rebecca Olson, RN, MS
Former Executive Director
The Good Samaritan Clinic of Jackson County

Juvencio Rocha Peralta
Executive Director
Association of Mexicans in North Carolina, Inc (AMEXCAN)

Mary Perez, RN, MSN
Health Director
Montgomery County Health Department

Mary L. Piepenbring
Vice President
The Duke Endowment

John Price, MPA
Senior Advisor for Rural Health
The Kate B. Reynolds Charitable Trust

Andrea Radford, DrPH, MHA
Former Deputy Director
North Carolina Rural Health Research & Policy Analysis Center
Director
Evaluation & Outcomes
Care Share Health Alliance

Nancy F. Reigel
Chair
Community Impact/Vision Council Initiative
High Country United Way

A. Ray Rogers
Financial Administrator
Representative G.K. Butterfield Jr.

Margaret Sauer, MS, MHA
President & CEO
North Carolina Foundation for Advanced Health Programs

Jeff Spade, FACHE
Executive Director
North Carolina Center for Rural Health Innovation and Performance

Willona Stallings, MPH
Program Associate
North Carolina Council of Churches

Jean Steverson, PhD
Assistant Superintendent
Rockingham County Schools

Dennis Streets, MPH, MAT, LNHA
Director
Division of Aging and Adult Services
North Carolina Department of Health and Human Services

Robin Tutor-Marcom, MPH, OTR/L
Director
North Carolina Agromedicine Institute

Franklin Walker
Director
Rural Health Initiatives
North Carolina Medical Society Foundation

Henrietta Zalkind
Executive Director
Down East Partnership for Children

Steering Committee Members

Renee Godwin Batts, RN, MSN
Education Consultant Health Sciences
Academic Programs
North Carolina Community College System

Chris Collins, MSW
Director
North Carolina Office of Rural Health and Community Care

Linda Kinney, MHA
Deputy Director
Care Share Health Alliance

J. Nelson-Weaver, MA, DrPH
Former Senior Program Officer
Health Care Division
The Kate B. Reynolds Charitable Trust

John Price, MPA
Senior Advisor for Rural Health
The Kate B. Reynolds Charitable Trust

Joy F. Reed, EdD, RN, FAAN
Head
Local Technical Assistance & Training Branch
Division of Public Health
North Carolina Department of Health and Human Services

Mikki Sager
Vice President
The Conservation Fund

Patrick N. Woodie
Vice President
Rural Development Programs
North Carolina Rural Economic Development Center, Inc.

NCIOM Staff

Pam Silberman, JD, DrPH
Former President & CEO

Adam J. Zolotor, MD, DrPH
Interim President & CEO

Kimberly Alexander-Bratcher, MPH
Project Director

Michelle Ries, MPH
Project Director

Berkeley Yorkery, MPP
Project Director

Laurece Summers
Former Research Assistant

Adrienne Parker
Director of Administrative Operations
Business Mananger
NCMJ

Thalia Fuller
Administrative Assistant

Elizabeth Chen, MPH
Graduate Research Assistant

Micha'le Simmons, MHA
Graduate Research Assistant

Task Force on Rural Health Executive Summary

Approximately one-in-five North Carolinians, almost 2.2 million people, lives in a rural county (e.g. non-metropolitan statistical area).[1] North Carolinians living in rural areas are less likely to have access to health services, are more likely to engage in risky health behaviors, and have a higher mortality rate than North Carolinians living in non-rural areas.[2] The health disparities between urban and rural residents are due to a number of factors including: differences in demographic and socioeconomic factors, health behaviors, and access to and availability of health care services.

North Carolina's rural communities face many challenges, but they are also quite resilient. There is a strong sense of place and an understanding of community assets. Rural people know the needs of their community.[3] They know what strategies to improve health and well-being will not work. They are also open to learning from others. While rural communities are often under-resourced, there is an innate sense of commitment to the community and to each other. And because of this, rural communities are often able to accomplish a great deal with limited resources.[4]

North Carolina's rural communities face many challenges, but they are also quite resilient.

Task Force on Rural Health

The North Carolina Institute of Medicine (NCIOM) in partnership with the Office of Rural Health and Community Care (ORHCC) within the North Carolina Department of Health and Human Services (NC DHHS), and the Kate B. Reynolds Charitable Trust (the Trust) convened a Task Force on Rural Health. ORHCC has a mission to empower communities to develop innovative strategies to improve access, quality, and cost effectiveness of care, with a special focus on rural and underserved communities. The Task Force was funded by the Trust, which has a long history of leading and supporting rural health efforts and innovations. The Trust's mission is to improve the quality of life and quality of health for the financially needy of North Carolina.

The overall goal of the Task Force on Rural Health was to develop a North Carolina Rural Health Action Plan that included workable strategies to improve rural health outcomes that were actionable over the next three to five years. The Action Plan would provide policy makers, funders, and stakeholder organizations with a common vision and set of action steps to improve rural health. Specifically, the Task Force on Rural Health was charged to examine the health of rural North Carolinians as well as disparities in health access and outcomes for North Carolina's rural and urban residents. As part of this work, the Task Force considered the factors that contribute to rural health problems including community and environmental factors, differences in health behaviors, and the availability and accessibility of health care services. Next the Task Force identified potential strategies to improve rural health outcomes that could be actionable over the next three to five years. Then the Task Force gathered input from eight rural communities across North Carolina to discuss local health needs, priorities, and potential strategies to address those needs.

The communities also gave feedback on the strategies and priorities identified by the Task Force. Lastly, the Task Force considered the feedback from the local community forums to develop the final Rural Health Action Plan.

The Task Force was chaired by Chris Collins, MSW, Director, Office of Rural Health and Community Care;[a] Paul Cunningham, MD, Dean, Senior Associate Vice Chancellor for Medical Affairs, Brody School of Medicine, East Carolina University; and Donna Tipton-Rogers, EdD, President, Tri-County Community College. In addition to the co-chairs, the Task Force had 46 members including representatives of state and local policy making agencies, funders, health care professionals, community agencies and nonprofits, and other interested individuals. Approximately half of the Task Force members were from rural communities and the other half were from statewide organizations with a mission to serve rural communities.

Approximately half of the Task Force members were from rural communities and the other half were from statewide organizations with a mission to serve rural communities.

The Task Force met ten times between March 2013 and May 2014. From March 2013 through July 2013, the Task Force members examined data that focused on major health problems facing rural communities and identified potential strategies to address those problems. Between August 2013 and October 2014, the Task Force held eight community forums in the following rural counties: Beaufort, Bladen, Halifax, Jackson, McDowell, Montgomery, Rockingham, and Wilkes. Community members from these counties, as well as surrounding counties, were invited to participate in these forums. In total, 259 rural participants attended one of the eight community forums. After synthesizing results from these community forums, the Task Force finalized the six priority areas for the final report discussed briefly below.

Community and Environment

Jobs and Economic Security

With a rich history of manufacturing and agriculture and an infrastructure that provides an abundance of natural resources, North Carolina's rural communities serve a vital role to the economy of the state. Although recent years have proven difficult for the industries of rural North Carolina, investing in its development and maintenance will yield benefits throughout the state and contribute to a diverse and healthy state economy.

Over the past several years, an uptick in growth and employment has shown promise and progress for rural areas: since 2010, jobs have been added in rural areas of North Carolina. The rural unemployment rate, while still high at 11.0% in 2012, is declining, down from 11.5% in 2011.[5] However, in contrast, the statewide unemployment rate was 9.5% in 2012, and the urban unemployment

a Robin G. Cummings, M.D., FACC, FACS, Former Director, Office of Rural Health and Community Care, Director, Division of Medical Assistance, Deputy Secretary, N.C. Department of Health and Human Services, served as co-chair of the Task Force on Rural Health during his tenure as the director of the Office of Rural Health and Community Care. When he was promoted to Deputy Secretary for Health Services, Chris Collins assumed his role as co-chair.

rate was 9.1%.[5] Job growth in service industries, health care, farming, and small businesses drove much of the improvement in rural areas. Increases in rural population and high school graduation rates continue to contribute to a potential comeback.

However, many challenges remain in rural North Carolina. Many areas struggle with a high proportion of residents living in poverty, with incomes much lower than the state average. In rural counties, 22.3% of residents lived at or below the federal poverty line in 2012 compared to 16.7% of urban residents. The median per capita income in rural counties was $31,948, compared with the state average of $37,910.[5] Income is directly related to health. Increased income corresponds to better health outcomes, with the greatest impact on health for those with lower incomes. To improve the health of its residents, North Carolina needs to help increase the economic security of the population, especially among low-income North Carolinians.

Priority Strategy 1: Invest in small businesses and entrepreneurship to grow local and regional industries (e.g. farm to table, fishing, tourism, and Renewable Energy)

The Task Force recommends that the Department of Commerce (DOC) and rural funders work with rural businesses and community organizations to enhance the infrastructure and broadband access in rural communities, and to encourage high value added manufacturing. The Department of Agriculture and Consumer Services, DOC, Cooperative Extension and Farm Bureau Federation should promote local agriculture and the sale of agricultural produce to local businesses, schools, and other agencies and directly to consumers. The North Carolina General Assembly and Department of Revenue should continue to encourage investments in renewable energy. Additionally, rural funders, the Office of Rural Health and Community Care, and DOC should invest in rural health care.

The Task Force also recommends that the North Carolina Community College System and Local Education Agencies should continue to partner with small businesses and local economic development offices to develop the workforce. In addition, rural funders should focus on the development and recruitment of local, talented leaders.

Improve Educational Outcomes

Academic achievement and education are strongly related to health. In general, those with less education have more chronic health problems and shorter life expectancies. In contrast, people with more years of education are likely to live longer, healthier lives. This education-health link is one that seems to result

from the overall amount of time spent in school.[6] High quality child care has been shown to have longer term effects and contribute to better school performance and higher graduation rates.[7]

Children spend more time at home with their parents than in any other setting. The relationships children have with caregivers have a profound impact on cognitive, linguistic, emotional, social and moral intelligence. Implementing evidence-based programs to support parents in their caregiver roles has been shown to improve school readiness. In addition, education research has repeatedly shown that high quality, center-based care can improve school readiness and academic success, findings that persist into early workforce entry.[8-10] These findings are especially robust among children at risk for poor educational achievement, a risk largely determined by poverty. North Carolina ranks child care centers based on the quality of care they offer, with 4- and 5-star centers or family care homes being higher quality. Children are more likely to be enrolled in 4- and 5-star child care programs if they live in urban or economically advantaged counties than if they live in rural or economically distressed counties.[b]

Because of the importance of early childhood development on a child's later educational and professional success, the Task Force on Rural Health established, as one of its priorities, a focus on early care, education and parenting supports to ensure school readiness.

Priority Strategy 2: Increase support for quality child care and education (birth through age 8) and parenting supports to improve school readiness

The Task Force recommends the revision of the child care center star rating system to focus on learning that supports children's social and emotional development, executive function, language skills, and health. In addition, the Task Force recommends that the North Carolina General Assembly enhance child care subsidies to centers that receive the highest quality rating, and that the Division of Child Development and Early Education adjust its subsidy formula to incentivize quality care in rural counties. The Task Force also recommends additional funding for evidence based parenting support (e.g. Nurse Family Partnership and Child FIRST) and school readiness programs, as well as support for work force education, training, and professional development for child care workers.

b North Carolina Department of Health and Human Services special data request, 2011

Health Behaviors

Promote Healthy Eating and Active Living (HEAL) to Reduce Overweight and Obesity

Overweight and obesity pose significant health concerns for both children and adults. Excess weight is not only a risk factor for several serious health conditions, but it also can exacerbate existing health conditions. North Carolina is the 16th most overweight/obese state in the nation.[11] Adults in rural areas are more likely to be overweight or obese (68.9%) compared to those in urban areas (63.3%).[12] Physical activity is a key component of a healthy lifestyle and an important part of preventing obesity. Similarly, a healthy diet is a cornerstone of optimal health.

There are several ways to combat obesity and improve rates of physical activity and healthy eating. The Task Force recommended focusing on improving healthy eating and active living in formal and informal educational settings. Children who are overweight or obese are much more likely to be overweight or obese as older children or adults.[13-15] Conversely, those who are at a healthy weight as youngsters are more likely to stay at a healthy weight as older children and adults. While it is important to focus on children, the Task Force also recognized the value of promoting healthy eating and active living amongst adults. Thus, the Task Force explored other evidence-based or evidence-informed strategies to promote healthy eating and active living in settings involving adults.

Priority Strategy 3: Work within the formal and informal education system to support healthy eating and active living (HEAL)

The Task Force recommends support for evidence based programs that improve HEAL in early care and education. Additionally, the North Carolina State Board of Education (SBE) should develop a model wellness policy for local use that ensures that food and beverages served in schools meet the nutritional content of the National School Breakfast and Lunch program, and that child engage in physical education for an appropriate number of hours/week. SBE should also require schools to implement evidence based programs that support HEAL in their core curriculum and should update information in the Healthful Living curriculum. The Task Force encourages funders, the faith community, and other community partners to implement evidence-based HEAL strategies in the community.

Improve Mental Health and Emotional Wellbeing

People with mental health or substance abuse problems or dependence are at risk for premature death, co-morbid health conditions and disability. However, many of these individuals are reluctant to admit they have a problem and thus are unlikely to seek care directly from treatment professionals. Even among those who are aware of their conditions, the associated cost or stigma prevents them from reaching out to health care providers for treatment.

Delivering more mental health and substance abuse services in conjunction with primary care is an important option for rural communities. Access to mental health and substance abuse services is limited in some rural areas because of a lack of providers. People with mental health or substance abuse problems often present to primary care providers with pain related complaints, other body symptoms, or uncontrolled medical conditions such as diabetes. Primary care providers need to be able to diagnose and refer or treat people presenting with comorbid mental health or behavioral health problems. Perhaps as important, patients may be more willing to consider treatment for a behavioral health condition either by his/her primary clinician or by a behavioral health specialist if it is in the context of a whole person, integrated approach to wellness.[16-18] Incorporating behavioral health services into physical health services is one important component to whole person care, and has been associated with improved quality, improved outcomes (for mental health and physical health), improved patient and provider satisfaction, and decreased cost.

Priority Strategy 4: Use Primary Care and Public health settings to screen for and treat people with mental health and substance abuse issues in the context of increasingly integrated primary and behavioral health care

The Task Force encourages patient-centered medical homes to screen for mental health and substance abuse disorders, and provide treatment or referrals to behavioral health professionals when appropriate. Moreover, the Task Force recommends increased technical assistance to primary care practices to increase the level of integrated care by helping with culture change, the right mix of providers, overcoming billing issues, and financial strategies for success. The Task Force also recommends that public and private payers evaluate, and if necessary, change payment policies to promote integrated primary care and behavioral health practices. In addition, the Task Force supports the development and dissemination of evidence-based and evidence-informed community-based mental health and substance abuse treatment strategies, including but not limited to peer support, 12 step programs, faith-based services, and psychological first aid.

Access to and Availability of Services

Maximize Individuals' Insurance Opportunities and Access to the Safety Net

In 2011-2012, 20.2% of nonelderly North Carolinians, or 1.6 million people, were uninsured.[19] People in rural areas are about equally likely to be uninsured as are those in urban areas (20.8% versus 19.5% respectively).[19] However, more than one-in-four nonelderly residents are uninsured in some rural counties (e.g., Alleghany, Avery, Duplin, Jackson, Robeson).[20] Approximately 80% of uninsured adults in North Carolina reported in 2012 that they were uninsured for more than one year, and over half (52%) reported being uninsured for 5 years or more.[21]

More than one-in-four nonelderly residents are uninsured in some rural counties.

Not having health insurance coverage is harmful to the health and well-being of children and adults. People who lack health insurance coverage have a harder time affording necessary care. More importantly, the lack of coverage adversely affects health. The uninsured are less likely to get preventive screenings and ongoing care for chronic conditions. Consequently, the uninsured have a greater likelihood than people with coverage of being diagnosed with severe health conditions (such as late stage cancer), being hospitalized for preventable health problems, or dying prematurely.[22] Uninsured North Carolinians report that the main reason they do not have health insurance is they cannot afford the premiums.[23] Thus, it is important to help those who can gain affordable coverage to purchase it, and to target the safety net resources to people who are unable to obtain affordable health insurance coverage in the health insurance marketplace.

Beginning in January 2014, the Patient Protection and Affordable Care Act (ACA) gave individuals and families new options to purchase health insurance coverage. Many uninsured are able to buy insurance through the new health insurance "Marketplace." Subsidies are available to many families to help make health insurance coverage more affordable.[24] There are also new navigator and certified application counselors to help the uninsured understand their insurance options and apply for coverage.

For those who remain uninsured, there are many safety net organizations across the state with a mission or legal responsibility to serve the uninsured. Many of these organizations provide services to the uninsured for free or on a sliding scale basis. Yet, there are not sufficient safety net resources to meet all of the health care needs of the uninsured. Further, many of the uninsured are unaware of the resources that do exist.

Priority Strategy 5: Educate and engage people in rural communities about new and emerging health insurance options available under the Affordable Care Act and existing safety net resources

The Task Force recommends that existing navigators, certified application counselors, and other community groups continue to work together at the local level to coordinate education, outreach and enrollment efforts to help people enroll in coverage. These groups can also help identify gaps in resources needed to help people enroll. The Task Force recommends that North Carolina foundations support local education, outreach and enrollment activities by targeting rural communities with high unmet needs. For those who remain uninsured, the Task Force recommends that the North Carolina Institute of Medicine work with United Way to support its 211 web-based resource and referral system to include up-to-date information about available safety net organizations.

Improve Recruitment, Retention, and Distribution of Key Health Professionals

Access to health care professionals is important to the health of North Carolinians. Ensuring that people can get the care that they need is an essential factor in good health. Yet there are some areas of the state that have an abundance of health care professionals and health care institutions, and others that lack basic services. Primary care professionals are the entry point into the health care system, and provide a wide range of services including preventive care, chronic disease management, urgent care, and some behavioral health services.[25] The primary care workforce is experiencing increases in demand due to aging baby boomers requiring more care, overall growth in the population, and increasing numbers of people living with chronic illnesses. Additionally, demand is expected to increase due to people gaining insurance coverage as a result of the Affordable Care Act and an aging population.[26] Despite overall growth in the primary care workforce in the last 30 years, many of North Carolina's rural counties face persistent primary care shortages.[27]

Rural communities need other providers in addition to primary care. Rural communities need nurses, allied health professionals, pharmacists, behavioral health specialists, dentists, and specific types of physician specialists to more fully meet the health care needs of the population. The NCIOM Rural Health Task Force examined workforce needs in rural areas, and identified four areas of particular need in rural North Carolina: primary care providers, behavioral health specialists, dental professionals, and general surgeons. The capacity to recruit and retain health professionals in rural and underserved areas across the state is critical to meet the health needs of North Carolinians.

Priority Strategy 6: Ensure adequate incentives and other support to cultivate, recruit, and retain health professionals to rural and underserved areas of the state

The Task Force recommends that community colleges expand successful strategies to recruit health professional students into 2-year and 4-year degrees on or near the community college campuses, as people who are trained in rural communities are more likely to practice there. In addition, the North Carolina academic health programs supported by North Carolina general funds should place a priority, in the admissions process, to students who grew up in or have a desire to practice in health professional shortage areas. The Area Health Education Centers, in conjunction with North Carolina academic health education programs, should identify best practices for rural clinical placements and disseminate those models across the state. Further, the North Carolina General Assembly (NCGA) should fund new rural residency programs for primary care. In addition, the NCGA should appropriate new funding to the Office of Rural Health and Community Care (ORHCC) to support additional staff who will help designate more areas of the state as health professional shortage areas, expand recruitment and retention efforts, and expand the availability of state loan repayment or other incentive payments to recruit needed health professionals into rural and underserved areas. ORHCC with the NC Medical Society Foundation should identify and disseminate model recruitment and retention strategies across the state.

Conclusion

The overall goal of the Task Force on Rural Health was to develop a North Carolina Rural Health Action Plan including specific strategies to improve rural health outcomes that are actionable over the next three to five years. Another related goal was to provide policy makers, funders and stakeholder organizations with a common vision and set of action steps to improve rural health across the state. This Rural Health Action Plan lays out the vision and action steps needed to accomplish these goals. The Task Force, with the input of rural residents across the state, established six broad priority areas. Within each of these areas, the Task Force identified evidence-based or evidence-informed programs, policies, clinical interventions and practices that, if implemented, could have a positive impact on the health of rural North Carolinians. Rural communities face many health challenges, but they also bring a wealth of community assets that can be harnessed to address these challenges. Together, rural residents can work with state agencies, funders, and other organizations to improve the health and well-being of rural communities across the state.

References

1. US Department of Commerce, US Census Bureau. State and County QuickFacts North Carolina. US Census Bureau website. http://quickfacts.census.gov/qfd/states/37000.html. Accessed February 24, 2014.

2. Robert Wood Johnson Foundation. County Health Rankings & Roadmaps A Healthier Nation, County by County. University of Wisconsin Population Health Institute website. http://www.countyhealthrankings.org/app/north-carolina/2013/rankings/outcomes/overall/by-rank. Accessed July 18, 2013.

3. Goris ED, Schutte DL, Rivard JL, Schutte BC. Community leader perceptions of the health needs of older adults. *West J Nurs Res*. 2014;.

4. Averill J. Keys to the puzzle: Recognizing strengths in a rural community. *Public Health Nursing*. 2003;20(6):449-455.

5. US Department of Agriculture Economic Research Service. State Fact Sheets. http://www.ers.usda.gov/data-products/state-fact-sheets/state-data.aspx?StateFIPS=37&StateName=North%20Carolina#.Ux8BqYXfjJs. Accessed March 11, 2014.

6. Cutler D, Lleras-Muney A. National Bureau of Economical Research. Education and health: evaluating theories and evidence. http://www.nber.org/papers/w12352. Published 2006. Accessed May 15, 2009.

7. HighScope Educational Research Foundation. HighScope Perry preschool study. HighScope Educational Research Foundation website. http://www.highscope.org/Content.asp?ContentId=219. Published 2009. Accessed June 2, 2009.

8. HighScope Educational Research Foundation. HighScope Perry Preschool Study Lifetime Effects. http://highscope.org/content.asp?contentid=219. Accessed March 27, 2014.

9. Frank Porter Graham Child Development Institute. Major Findings: The Abecedarian Project. The Carolina Abecedarian Project website. http://abc.fpg.unc.edu/major-findings.

10. US Department of Health and Human Services. Head Start Program Facts Fiscal Year 2013. Administration for Children and Families Office of Head Start website. http://eclkc.ohs.acf.hhs.gov/hslc/mr/factsheets/docs/hs-program-fact-sheet-2013.pdf. Accessed March 27, 2014.

11. United Health Foundation. America's Health Rankings: North Carolina Obesity. http://www.americashealthrankings.org/NC/Obesity/2013. Published 2013. Accessed February 25, 2014.

12. North Carolina Department of Health and Human Services, State Center for Health Statistics. Written (email) communication. April 17, 2014

13. Singh AS, Mulder C, Twisk JW, Mechelen W, Chinapaw M. Tracking of childhood overweight into adulthood: A systematic review of the literature. *Obesity Reviews*. 2008;9(5):474-88.

14. Nader PR, O'Brien M, Houts R, et al. Identifying risk for obesity in early childhood. *Pediatrics*. 2006;118(3):e594-601.

15. Promoting Healthy Weight for Young Children: A Blueprint for Preventing Early Childhood Obesity in North Carolina. North Carolina Institute of Medicine. Morrisville, NC. http://www.nciom.org/wp-content/uploads/2013/09/ChildObesityRpt_090513.pdf. Published September 2013.

16. Klinkman MS. Competing demands in psychosocial care: A model for the identification and treatment of depressive disorders in primary care. *Gen Hosp Psychiatry*. 1997;19(2):98-111.

17. American Psychiatric Association. Collaboration between psychiatrists, primary docs vital to ensuring more people get MH care. *Psychiatric News*. 1998;20.

18. Wells KB, Sherbourne C, Schoenbaum M, et al. Impact of disseminating quality improvement programs for depression in managed primary care: A randomized controlled trial. *JAMA*. 2000;283(2):212-220.

19. North Carolina Institute of Medicine. Running the Numbers 2011-2012. http://www.nciom.org/nc-health-data/running-the-numbers/. Published April 1, 2014. Accessed March 25, 2014.

20. US Census Bureau Small Area Health Insurance Estimates. Health Insurance Coverage Estimates Percent Uninsured 2012. http://www.census.gov/did/www/sahie/data/files/F7_SAHIE_2012_County_Population_Under_65_Uninsured.jpg. Published March 2014. Accessed March 12, 2014.

21. 2012 BRFSS Survey Results North Carolina Reasons Uninsured: "About how long has it been since you had health care coverage?". North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/schs/brfss/2012/nc/all/nc11q02.html. Published August 28, 2013. Accessed January 13, 2013.

22. The Uninsured: A Primer - Key Facts about Health Insurance on the Eve of Coverage Expansions. Kaiser Family Foundation website. http://kff.org/report-section/the-uninsured-a-primer-2013-4-how-does-lack-of-insurance-affect-access-to-health-care/. Published October 23, 2013.

23. 2012 BRFSS Survey Results North Carolina: Reasons Uninsured by Risks, Conditions, and Quality of Life Measures, "Earlier you indicated you do not have health insurance coverage. What is the main reason you do not have health insurance?". North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2012/nc/risk/noinsure.html. Published August 29, 2013. Accessed January 13, 2014.

24. Patient protection and affordable care act. pub L. no. 111-148 § 1401, 42 USC 13031, 26 USC 36B

25. Bodenheimer T, Pham H. Primary care: Current problems and proposed solutions. *Health Affairs*. 2010;29(5):799-805.

26. Schwartz MD. Health care reform and the primary care workforce bottleneck. *J Gen Intern Med*. 2011

27. Spero J. North Carolina's rural health workforce: Challenges and strategies. Presented to: North Carolina Institute of Medicine Task Force on Rural Health; July 31, 2013; Greensboro, NC. http://www.nciom.org/wp-content/uploads/2013/04/Spero_7-31-13.pdf.

Introduction

Chapter 1

Approximately one in five North Carolinians, almost 2.2 million people, live in a rural county (non-metropolitan statistical area).[1] North Carolina's rural communities face many challenges, but they are also quite resilient. There is a strong sense of place and an understanding of community assets. People who live in rural areas tend to know the needs of their community.[2] They know which strategies to improve health and well-being will work and which ones probably will not, but are also open to learning from others. While rural communities are often under-resourced, there is an innate sense of commitment to the community and to each other. Because of this, rural communities are often able to accomplish a great deal with limited resources.[3]

North Carolina's rural communities face many challenges, but they are also quite resilient.

North Carolinians living in rural areas are less likely to have access to health services, are more likely to engage in risky health behaviors, and have a higher mortality rate than North Carolinians living in non-rural areas.[4] Smoking and obesity are more prevalent in rural counties in North Carolina. Rural North Carolinians are more likely to die due to heart disease, diabetes, lung disease, unintentional injuries, and suicide.[5] Rural North Carolinians are also more likely to forgo seeing a doctor due to cost and are less likely to visit a dentist. There are also rural-urban disparities in infrastructure and the capacity to address health needs. The health disparities between urban and rural residents are due to a number of factors including differences in demographic and socioeconomic factors, historic patterns of racial and class discrimination, health behaviors, and access to and availability of health care services.

Why Focus on Rural Areas of North Carolina?

Residents of rural areas are disproportionately older, lower income, unemployed, and have lower levels of education. In 2010, the rural population surpassed 2.2 million (about 22% of the state's population).[6] More than 15% of rural residents are older (age 65 or older), compared to 11% of urban residents, and there is greater outmigration of youth from rural areas to urban areas.[7]

Among North Carolinians 25 and older, 17.3% of rural residents did not complete high school (compared to 17.0% of urban residents), and only 17.0% received a college degree, compared to 29.9% of urban residents.[6] In 2012, the unemployment rate in rural counties was 11.0%, as compared to 9.1% in urban areas.[6] Additionally, rural residents are poorer than are urban residents. More than one in five rural residents (20.8%; 95% CI: 20.7-20.9)[a] lived below the poverty level, compared to 16.8% of urban residents (95% CI: 16.8-16.8) in 2011.[b] Rural residents also have lower household incomes. The median household income in 2010 was $38,433 for rural areas and $47,622 for urban areas.[1]

a The notation 95% CI indicates a 95% confidence interval. This means that there is a 95% certainty that the true rate is between the upper and lower estimates. If the estimates are not overlapping, this is an indication of statistical significance. In some cases, original data was not easily available and analysis was not completed. In such cases, we cannot make assertions regarding the significance of differences reported herein.

b Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

Rural North Carolinians suffer from worse health outcomes and higher rates of chronic conditions than urban residents. In 2012, 77.8% (95% CI: 76.2-79.4) of rural North Carolina residents reported being in "good, very good, or excellent health" vs. 82.0% (95% CI: 80.9-83.0) of urban residents. There is nearly a two year difference between average life expectancy of rural vs. urban North Carolinians: 76.9 years (95% CI: 76.7-77.1) rural vs. 78.7 years (95% CI 78.6-78.7) urban (2012).[b]

Disparities also persist in chronic disease rates. From 2008-2012, nearly all of the counties with the highest cancer death rates were rural counties.[8] The mortality rate for cardiovascular disease among rural residents was 255.6 (95% CI: 250.1-261.1) in 2011, while it was 228.0 for urban residents (95% CI: 224.3-231.7).[9] In 2012, the percentage of adults with diagnosed diabetes was 12.5% in rural counties (95% CI: 11.3-13.7); the rate was 9.5% in urban counties (95% CI: 8.7-10.3).[9] Rural and urban rates of overweight and obese are similar: 68.7% of rural North Carolina residents are overweight or obese (95% CI: 66.7-70.7), and 67.1% of urban residents are overweight or obese (95% CI: 65.6-68.5).[b]

Rural North Carolinians suffer from worse health outcomes and higher rates of chronic conditions than urban residents.

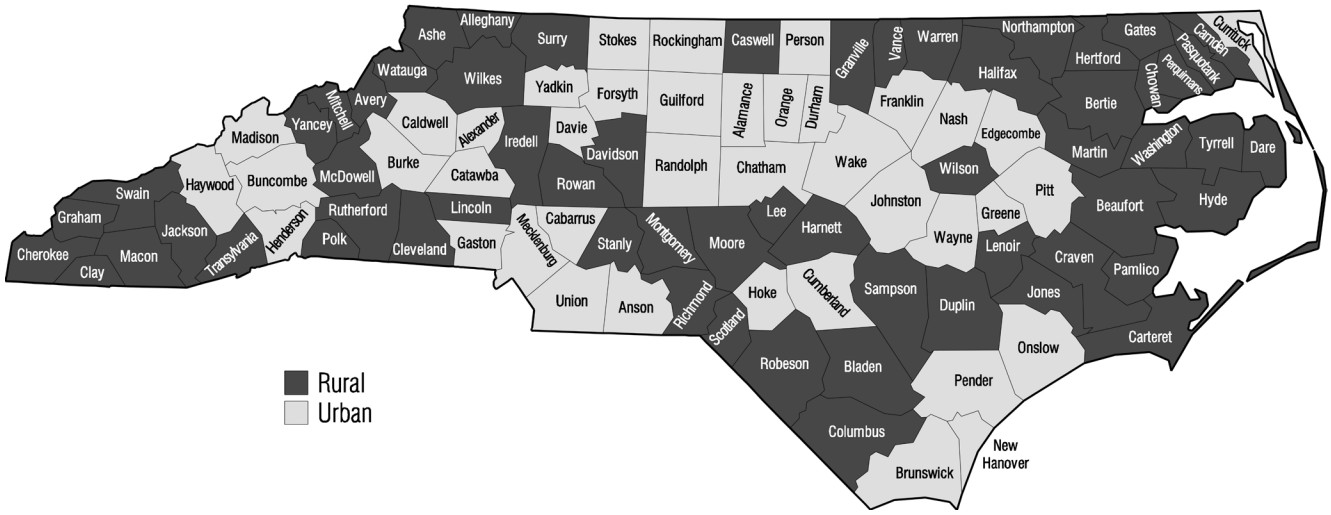
In addition to poorer health outcomes and behaviors, residents of rural North Carolina also experience lower access to care. Nonelderly rural residents are about equally likely to be uninsured than are those living in urban areas (20.8% compared to 19.5% respectively),[10] but in some rural counties, more than one out of every four nonelderly persons is uninsured.[11] In North Carolina there are 66 counties, or parts thereof, that are considered primary care shortage areas, which means that there are too few primary care physicians to meet population needs. There are 22 counties (or parts thereof) that are behavioral health shortage areas, and 69 counties (or parts thereof) that are dental shortage areas. Most of these counties are rural.[12] Health care resources are of crucial importance in rural areas because of the ways in which the health care industry serves as an anchor for many of these communities and is related to economic wellbeing.

Rural Defined

To define "rural," the NCIOM Task Force on Rural Health used the definition from the White House Office of Management and Budget (OMB). OMB issues three designations: metropolitan, micropolitan, and neither, based on the commuting patterns of area residents. Metropolitan areas have a population greater than 50,000; micropolitan areas have an urban core of between 10,000 and 50,000; and all counties not part of a metropolitan statistical area (MSA) are considered rural.[12] When the Task Force began, the 2009 definition was the most current. By this definition, North Carolina has 60 rural counties (see Figure 1.1).

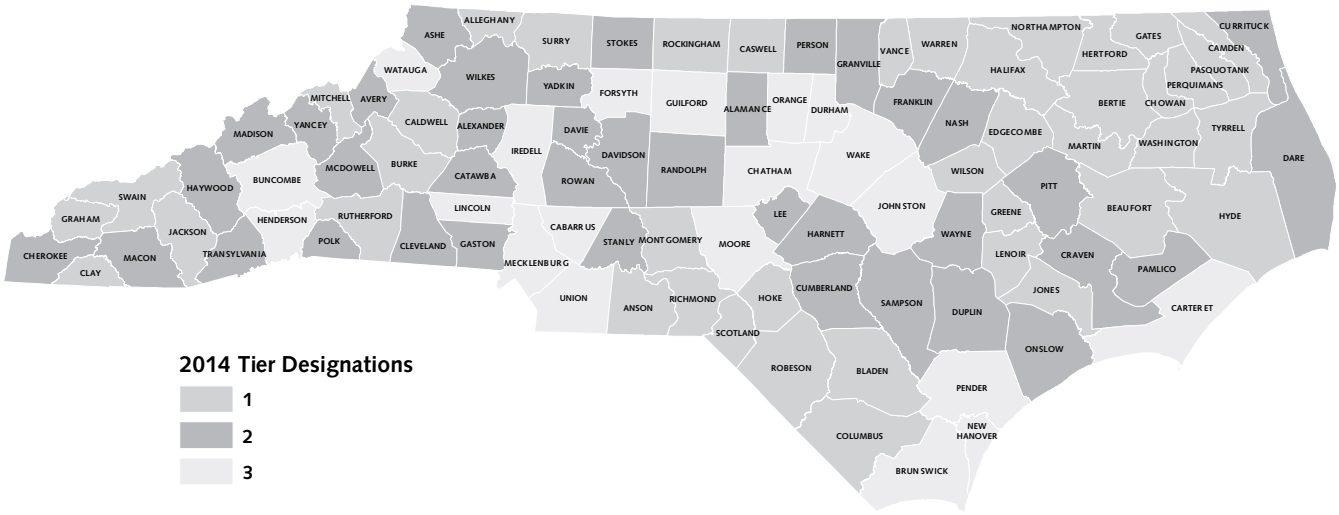
Due to the close alignment between economic strength of an area and that area's population health, the Task Force also used the ranking system from the North Carolina Department of Commerce when prioritizing areas of focus.

Figure 1.1
North Carolina Rural and Urban Counties



The North Carolina Department of Commerce assigns each county a tier based on measures of economic strength: the 40 most distressed counties are designated as Tier 1 (40 counties), the middle counties are designated as Tier 2 (40 counties), and the least distressed as Tier 3 (20 counties).[13] (See Figure 1.2.) In 2014, of the 60 rural counties in North Carolina, 33 are Tier 1 counties, and 22 are Tier 2 counties.

Figure 1.2
North Carolina County Tier Designations, 2014



Source: North Carolina Department of Commerce. 2014 North Carolina county tier designations. North Carolina Department of Commerce website. http://www.nccommerce.com/research-publications/incentive-reports/county-tier-designations. Accessed July 23, 2014.

Task Force Charge

The North Carolina Institute of Medicine (NCIOM), in partnership with the Office of Rural Health and Community Care (ORHCC) within the North Carolina Department of Health and Human Services (NC DHHS), and the Kate B. Reynolds Charitable Trust (the Trust), convened a Task Force on Rural Health. ORHCC has a mission to empower communities to develop innovative strategies to improve access, quality, and cost effectiveness of care, with a special focus on rural and underserved communities. The Task Force was funded by the Trust, which has a long history of leading and supporting rural health efforts and innovations. The Trust's mission is to improve the quality of life and quality of health for the financially needy of North Carolina.

The overall goal was to develop a North Carolina Rural Health Action Plan that included workable strategies to improve rural health outcomes that were actionable over the next three to five years.

The Task Force on Rural Health was chaired by Chris Collins, MSW, director, Office of Rural Health and Community Care;[c] Paul Cunningham, MD, FACS, dean and senior associate vice chancellor for medical affairs, Brody School of Medicine, East Carolina University; and Donna Tipton-Rogers, EdD, president, Tri-County Community College. In addition to the co-chairs, the Task Force had 46 members including representatives of state and local policymakers, funders, health care professionals, community agencies, nonprofit agencies, and other interested individuals. Half of the Task Force members lived or worked in rural communities, while the other half were from statewide organizations with a mission to serve rural communities. A Steering Committee of 9 individuals guided the work of the Task Force over the course of 15 months. For a complete list of Task Force and Steering Committee members please see pages 9-11 of this report.

The overall goal of the Task Force on Rural Health was to develop a North Carolina Rural Health Action Plan that included workable strategies to improve rural health outcomes that were actionable over the next three to five years. The Action Plan would provide policymakers, funders, and stakeholder organizations with a common vision and set of action steps to improve rural health.

Specifically, the Task Force on Rural Health was charged to:

- Examine the health of rural North Carolinians, as well as disparities in health access and outcomes for North Carolina's rural and urban residents. As part of this work, the Task Force considered the factors that contribute to these disparities including demographic and socioeconomic factors, differences in health behaviors, and variations in access to and quality of health care around the state.
- Identify potential strategies that are critical to improve rural health outcomes and actionable over the next three to five years.

c Robin Cummings, MD, FACC, FACS, former director, Office of Rural Health and Community Care, director, Division of Medical Assistance, deputy secretary, North Carolina Department of Health and Human Services, served as co-chair of the Task Force on Rural Health during his tenure as the director of the Office of Rural Health and Community Care. When he was promoted to deputy secretary for health services, Chris Collins assumed his role as co-chair.

- Gather input from eight rural communities across North Carolina to discuss local health needs, priorities, and potential strategies to address those needs, and to seek feedback on the strategies and priorities identified by the Task Force.
- Consider the feedback from local community forums and make adjustments to priority strategies as necessary.

Task Force Process

The Task Force met 10 times between March 2013 and May 2014. From March 2013 through July 2013, the Task Force members examined data that focused on major health disparities facing rural communities, using the Healthy North Carolina 2020 data and objectives, which were issued in 2011. Healthy North Carolina 2020 is a series of 40 health objectives and targeted measures in 13 focus areas, with the primary goal to improve the health of North Carolina residents by the year 2020.[9] Data showed that rural areas had worse health outcomes or related factors for 16 of the 28 measures for which rural/urban data were available (see Appendix C).

The Task Force explored the relationships between community and environmental characteristics, individual health behaviors, and access to and availability of health services.

The Task Force recognized that various factors interact with and influence health, including a person's genes, their health behaviors, and the community and environment in which they live, work, and play.[14] This model—called the Socioecological Model of Health—generally guided the Task Force's work. With this model in mind, the Task Force explored the relationships between modifiable determinants of health including community and environmental characteristics, individual health behaviors, and access to and availability of health services (see Figure 1.3).

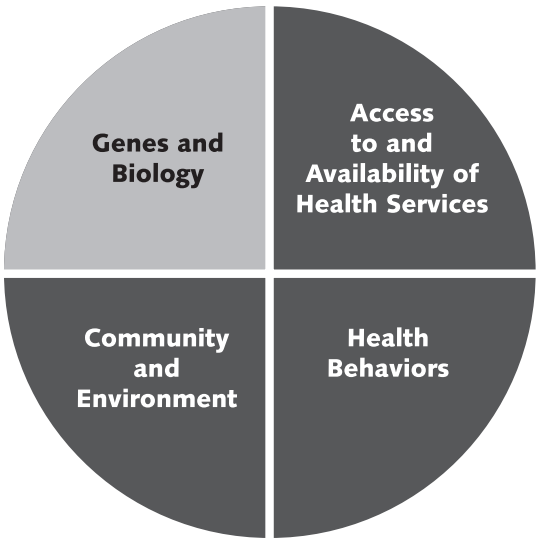
The Task Force examined these issues broadly and then narrowed down its focus into nine initial areas (three within each of the three levels of the Socioecological Model of Health):

- *Community and environment factors:* jobs and economic security; educational outcomes; community leadership.
- *Health behaviors:* healthy eating and active living; mental health and emotional well-being; substance abuse (including tobacco use).
- *Access to and availability of health services:* health insurance coverage and access to the health care safety net; recruitment, retention and distribution of health professionals; new models of care.

Rural Community Meetings

The Task Force identified potential strategies that could positively improve health for these nine initial priority areas. These are described in more detail in Appendix A. This became the basis for a draft rural health plan. Between August 28, 2013 and October 11, 2013, the Task Force hosted eight rural community meetings to obtain feedback on the draft plan. The location of the community

Figure 1.3
Socioecological Model of Health



In total, 259 people attended one of the eight community meetings.

meetings was chosen to represent the variety of rural communities in the state from the mountains to the coast. The Steering Committee selected the host counties for community meetings to represent a variety of Tier 1 and Tier 2 counties with a wide geographic distribution. Additionally, three communities were chosen that had an existing relationship to the Trust through their Healthy Places initiative. The Task Force also invited participants from surrounding counties that might not necessarily be designated as rural, but had similar socioeconomic and health challenges to the surrounding rural areas.

Communities were presented with the draft plan, along with county health data for each of the nine priority areas. Participants from 43 counties were invited to attend the meetings. In total, 259 people attended one of the eight community meetings (the county listed in bold is where the forum was held):

August 28: Caswell, **Rockingham**, Stokes

August 29: Haywood, **Jackson**, Macon, Swain, Transylvania

September 12: **Bladen**, Columbus, Pender, Robeson, Sampson

September 19: Alexander, Alleghany, Ashe, Caldwell, Iredell, Surry, Watauga, **Wilkes**, Yadkin

September 27: Davidson, **Montgomery**, Moore, Richmond, Stanly

October 4: Avery, **McDowell**, Mitchell, Rutherford, Yancey

October 10: **Beaufort**, Craven, Hyde, Martin, Pamlico, Washington

October 11: Bertie, Edgecombe, **Halifax**, Northampton, Warren

Approximately 50% of the 259 participants represented health care organizations, about 25% represented educational organizations, 10% represented human service organizations, and 15% were from other organizations or were simply interested individuals (including representatives from regional industries or economic development organizations, city or county officials, the faith community, or other nonprofit organizations).

Participants were asked to review the draft rural health plan and provide feedback on the actions the community was already taking to address each strategy, any barriers which prevented action on those areas, and what the state could do to help them achieve greater success within their communities. Participants were also asked whether there were other strategies that the Task Force should consider. Participants were asked to help with priority setting by identifying those strategies that had the greatest likelihood of making a positive impact on the health of rural communities over the next three to five years.

The Task Force identified six priority strategies.

Final Priority Strategies

NCIOM staff synthesized the feedback from each of the rural community meetings and presented the findings to the NCIOM Rural Health Task Force. (Summaries from each of the individual meetings can be found at: http://www.nciom.org/task-forces-and-projects/?task-force-on-rural-health.) Based on the feedback from the rural community meetings, the Task Force identified six priority strategies. These priority strategies are the basis of the final Rural Health Action Plan, and are as follows:

Community and Environment

1. **Invest in small businesses and entrepreneurship to grow local and regional industries (e.g. farm to table agriculture, fishing, tourism, and solar energy).**

2. **Increase support for quality child care and education (ages 0-8) and parenting supports to improve school readiness.**

Health Behaviors

3. **Work within the formal and informal education system to support healthy eating and active living.**

4. **Use primary care and public health settings to screen for and, when appropriate, provide treatment for mental health and substance use disorder problems. This could include enhanced training for primary care providers, co-location of behavioral health specialists, integrated care, telepsychiatry consults, or other models that expand access to behavioral health services within a primary care setting.**

Access to and Availability of Health Services

5. **Educate the public about the new health insurance options available under the Patient Protection and Affordable Care Act, the Medicaid expansion state option, and existing safety net resources.**

6. **Expand efforts to recruit health professionals to rural and underserved areas.**

Common sense dictates that, when available, we should invest in strategies with a proven track record of success. These are generally referred to as "evidence-based" strategies. Evidence-based strategies are those that achieved positive health outcomes after being subject to rigorous evaluations.[15] The "gold standard" in a clinical setting is a randomized double blind study, where neither the participants nor the researchers know whether a person is receiving the intervention or a placebo. Outside of clinical trials, however, it is difficult to achieve this same level of evidence. Thus, in health services research, the gold standards are programs, policies, or clinical interventions that have been subject to multiple studies, in different settings, with different populations, and all have yielded positive health impacts. The studies indicate that these interventions have a positive impact on health outcomes (effectiveness), reach the intended audiences, and are feasible, sustainable, and transferable. These are generally referred to as "evidence-based" strategies.[16]

We should invest in strategies with a proven track record of success.

Unfortunately, evidence-based strategies have not been identified to address every health related problem. In addition, some evidence-based strategies are impracticable to implement; they may be too expensive or have other implementation barriers. When evidence-based strategies are not available or when they are not appropriate for other reasons, it is appropriate to explore other "evidence-informed" or promising practices. The Centers for Disease Control and Prevention Best Practices Workgroup has developed four levels of evidence-informed programs, policies, and practices to guide health care interventions (see Table 1.1).

Table 1.1
Evidence-Based Strategies Continuum[16]

Best, Proven, or Evidence-Based Strategies: These programs, policies, or practices are supported by intervention evaluation or studies with rigorous systematic review that have evidence of effectiveness, reach, feasibility, sustainability, and transferability.
Leading: These programs, policies, or practices are supported by intervention evaluations or studies with peer review of practices that have evidence of effectiveness, reach, feasibility, sustainability, and transferability.
Promising: These programs, policies, or practices are supported by intervention evaluations without peer review of practice, or publication, that have evidence of effectiveness, reach, feasibility, sustainability, and transferability.
Emerging: These programs, policies, or practices are supported by field-based summaries or evaluation in progress that have plausible evidence of effectiveness, reach, feasibility, sustainability, and transferability.

Source: Adopted from the Centers for Disease Control and Prevention Best Practices Workgroup[16]

The Task Force identified evidence-based or evidence-informed programs, policies, clinical interventions, and practices for each of the six priority strategies.

NCIOM Task Force Report

The *Rural Health Action Plan* contains 9 chapters, with this chapter being an introduction to the work of the Task Force. Chapter 2 provides a more detailed summary of some of the major factors influencing rural health. Chapters 3-8 focus on the Task Force's priority recommendations. Chapter 9 summarizes the findings and recommendations of the Task Force and includes a chart of all the priority strategies of the Task Force. The report also contains three appendices: Appendix A includes a list of all the potential strategies that the Task Force considered to improve rural health. Appendix B includes data on Healthy North Carolina 2020 health indicators for rural and urban areas. Appendix C includes other health and demographic data for all 100 North Carolina counties. The data that are included in the appendix cover a wide range of health-related areas, including all of the priority areas included in this report. Additionally, the summaries of each of the eight rural community meetings are available online at: http://www.nciom.org/task-forces-and-projects/?task-force-on-rural-health.

References

1. US Department of Commerce, US Census Bureau. State and County QuickFacts: North Carolina. US Census Bureau website. http://quickfacts.census.gov/qfd/states/37000.html. Accessed February 24, 2014.

2. Goris ED, Schutte DL, Rivard JL, Schutte BC. Community leader perceptions of the health needs of older adults. *West J Nurs Res.* 2014;Apr 22. [Epub ahead of print]

3. Averill J. Keys to the puzzle: recognizing strengths in a rural community. *Public Health Nurs.* 2003;20(6):449-455.

4. Robert Wood Johnson Foundation. County health rankings and roadmaps: North Carolina. University of Wisconsin Population Health Institute website. http://www.countyhealthrankings.org/app/north-carolina/2013/rankings/outcomes/overall/by-rank. Accessed July 18, 2013.

5. North Carolina State Center for Health Statistics. North Carolina statewide and county trends in key health indicators. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/data/trends/pdf/. Published July 25, 2013. Accessed March 25, 2014.

6. US Department of Agriculture Economic Research Service. State fact sheets: North Carolina. US Department of Agriculture website. http://www.ers.usda.gov/data-products/state-fact-sheets/state-data.aspx?StateFIPS=37&StateName=North%20Carolina#.Ux8BqYXfjJs. Accessed March 11, 2014.

7. Johnson KM, Winkler R, Rogers LT; Carsey Institute. Age and Lifecycle Patterns Driving US Age and Migration Shifts. Issue Brief No. 62. Carsey Institute website. http://carseyinstitute.unh.edu/sites/carseyinstitute.unh.edu/files/publications/IB-Johnson-Migration-US-Counties-web_0.pdf. Published Spring 2013. Accessed March 11, 2014.

8. North Carolina State Center for Health Statistics. Cancer – all sites. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/schs/deaths/lcd/2012/pdf/maps/Cancer_Allsites.pdf. Accessed March 18, 2014.

9. North Carolina Institute of Medicine. *Healthy North Carolina 2020: A Better State of Health*. Morriville, NC: North Carolina Institute of Medicine; 2011. http://www.nciom.org/wp-content/uploads/2011/01/HNC2020_FINAL-March-revised.pdf. Published January 15, 2011. Accessed August 29, 2012.

10. North Carolina Institute of Medicine. *Characteristics of Uninsured North Carolinians 2011-2012*. Morrisville, NC: North Carolina Institute of Medicine; 2012. http://riversdeveloper.com/wp-content/uploads/2010/08/Uninsured-Snapshot_2011-2012.pdf. Accessed July 16, 2014.

11. US Census Bureau Small Area Health Insurance Estimates. Health Insurance Coverage Estimates: Percent Uninsured, 2012. US Census Bureau website. http://www.census.gov/did/www/sahie/data/files/F7_SAHIE_2012_County_Population_Under_65_Uninsured.jpg. Accessed March 12, 2014.

12. Health Resources and Services Administration, US Department of Health and Human Services. Find shortage areas: HPSA by state and county. US Department of Health and Human Services website. http://hpsafind.hrsa.gov/HPSASearch.aspx. Accessed March 12, 2014.

13. North Carolina Rural Economic Development Center. 2014 Economic tiers. North Carolina Rural Economic Development Center website. http://www.ncruralcenter.org/index.php?option=com_content&view=article&id=399&Itemid=125. Accessed February 24, 2014.

14. Institute of Medicine. *Who Will Keep the Public Healthy? Educating Health Professionals for the 21st Century*. Washington, DC: National Academy Press; 2002. http://www.iom.edu/~/media/Files/Report%20Files/2003/Who-Will-Keep-the-Public-Healthy-Educating-Public-Health-Professionals-for-the-21st-Century/EducatingPHFINAL.pdf. Accessed March 12, 2014.

15. North Carolina Institute of Medicine. *Improving North Carolina's Health: Applying Evidence for Success*. Morrisville, NC: North Carolina Institute of Medicine; 2012. http://www.nciom.org/wp-content/uploads/2012/10/EvidenceBased_100912web.pdf. Accessed April 5, 2013.

16. Spencer LM, Schooley MW, Anderson LA, et al. Seeking best practices: a conceptual framework for planning and improving evidence-based practices. *Prev Chronic Dis.* 2013;10:E207.

Factors Influencing Rural Health

Chapter 2

The Task Force began its work by broadly examining different areas that influence health, including the community and environment in which a person lives, their health behaviors, and access to and availability of health services. The Task Force recognized that within each of these broad areas, there are multiple factors that can directly—or in conjunction with other factors—influence health outcomes. After spending the first three months reviewing a broad array of issues that influence health, the Task Force identified nine areas that it believed had the greatest potential to impact health outcomes. Within the community and environment, the Task Force looked at strategies to increase jobs and economic security; improve educational outcomes; and foster strong, collaborative leadership to improve rural health. For health behaviors, the Task Force focused on strategies to support healthy eating and active living (to reduce overweight and obesity), improve mental health and emotional well-being, and reduce substance abuse and dependence (including tobacco, alcohol, and illegal substances). Finally, within the context of availability and affordability of health services, the Task Force focused on strategies to expand health insurance coverage and access to safety net services; recruit and retain health professionals in rural communities; and create new models of care that expand health care access and improve health care quality.

The Task Force identified nine areas that it believed had the greatest potential to impact health outcomes.

Community and Environment

Jobs and Economic Security

Income is directly related to health. Increased income corresponds to better health outcomes, with the greatest impact on health for those with lower incomes.[1] A person's income or wealth is generally a proxy for their social conditions and community and economic opportunities.[2] It is these factors more generally, rather than money specifically, that impact health.

Wealthier people have greater opportunities to live healthier lifestyles. They often have the financial resources to live in safe and healthy communities with access to better schools, places to exercise and play, and grocery stores that offer fresh fruits and vegetables. In addition, higher income individuals more often have health insurance coverage.

Conversely, people who have low incomes have more limited opportunities for healthful living. They may live in poor housing in unsafe communities. They may have limited access to grocery stores or outdoor recreational facilities. In addition, poor individuals are much more likely to be uninsured.[3] People in lower socioeconomic levels may experience greater stress and/or lack a sense of control.[4] These factors also affect health. Rural residents are more likely to live in poverty (20.8%) than are urban residents (16.8%).[a] To improve the health

a Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

of its residents, North Carolina needs to help increase the economic security of the population, especially among low-income North Carolinians.

Improve Educational Outcomes

Academic achievement and education are strongly related to health. In general, those with less education have more chronic health problems and shorter life expectancies. In contrast, people with more years of education are more likely to live longer, healthier lives. This education-health link is one that seems to result from the overall amount of time spent in school rather than from any particular content area studied or the quality of education.[5]

High school students in the most economically distressed Tier 1 communities are less likely to graduate than are those in Tier 3 counties.

Children who live in poverty lag behind more affluent children in cognitive, language, and socio-emotional skills as early as three years of age.[6] Gaps in behavioral and academic skills at the start of schooling have an impact on both short- and long-term achievement. High quality child care and preschool programs can help low-income children start school on more equal footing.[7] High quality child care has also been shown to have longer term effects, including higher graduation rates and lower crime rates.[8]

Children in poverty are also less likely to perform as well as those with higher incomes once they reach school age.[7] In North Carolina, 677,000 students are enrolled in rural schools, as compared to a median of 131,129 rural students per state among all 50 states. Of these 677,000 rural students, 46% of them live below the poverty line.[9]

Adults who have not finished high school are more likely to be in poor or fair health than college graduates. High school students in rural and urban areas are about equally likely to graduate from high school (82.7%; 95% CI: 81.7-83.7) and 83.0% (95% CI: 82.3-83.6) respectively in the 2012-2013 school year.[10] However those in the most economically distressed Tier 1 communities are less likely to graduate (80.9%; 95% CI: 79.6-82.3) than are those in Tier 3 counties (83.6%; 95% CI: 82.8-84.3).[b]

People ages 25-64 who dropped out of high school face mortality rates about twice as high as those with some college education. They are also more likely to suffer from the most acute and chronic health conditions, including heart disease, hypertension, stroke, elevated cholesterol, emphysema, diabetes, asthma attacks, and ulcers.[5] College graduates live, on average, five years longer than those who do not complete high school. In addition, people with more education are less likely to report functional limitations and are also less likely to miss work due to disease.[5]

Foster Strong, Collaborative Community Leaders

Local leadership is integral to the success of any health initiative in a rural community. Rural health outcomes will not be improved remotely from Raleigh.

b Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

Local leaders need to be enlisted since they understand the specific challenges facing the community in which they live and they know how to work effectively in their communities. A one-size-fits-all approach to improving rural health outcomes is insufficient since rural communities can vary widely in terms of their health needs and barriers to care.[11] Local leaders should help define community health needs, identify suitable interventions, and assist with implementation.

In addition to health professionals, there are many other community leaders that positively impact the health of a community, including leaders from the faith, education, business, government, and nonprofit sectors. Community leaders can complement the work of health professionals by focusing on other factors that influence health including education, jobs, housing, community, and environment. They can help create a community environment that supports healthy lifestyles.[12] They can also help support the provision of health care services more directly by helping with recruitment and retention of health professionals, creation of new clinics, or support for existing health care organizations.[13]

Local leaders should help define community health needs, identify suitable interventions, and assist with implementation.

Involving community leaders in supporting the local health care system can also contribute to the local economy. The health care industry is one of the top five employers in 64 of North Carolina's rural or economically depressed counties. For every one worker employed in the health care industry, an additional 0.72 workers are employed in the state's workforce. The most recent data from 2008 also shows that for every $1 produced by the health care industry, an additional $0.89 is generated in the state's economy.[14]

In addition, community leaders bring other valuable skills necessary to the health of a community, including collaboration, cultural competence, communication, relationship building, and expanded professional networks.[15] The deliberate cultivation of local community leaders is critical to ensure successful implementation of the Rural Health Task Force strategies. Leadership development programs can foster emerging leaders by identifying, engaging, training, and supporting community members who have the time, energy, and passion to pursue community change.[16] In North Carolina, leadership development programs have succeeded by providing skills, knowledge, inspiration, and support to residents who are invested in and committed to their community's well-being and take action once they have a clear understanding of a strategy's function and benefit.[22] Without buy-in from community leaders, strategies are unlikely to be effective or sustainable in the long term.

Health Behaviors

Promote Healthy Eating and Active Living (HEAL) to Reduce Overweight and Obesity

Overweight and obesity pose significant health concerns for both children and adults. Excess weight is not only a risk factor for several serious health conditions, but it also exacerbates existing conditions. North Carolina is the

16th most overweight/obese state in the nation.[17] In 2012, two-thirds (68.4%) of North Carolina adults were overweight [Body Mass Index (BMI) of 25 or greater] or obese (BMI of 30 or greater). Adults in rural and urban areas had similar rates of overweight or obesity in 2012 (68.7%; 95% CI: 66.7-70.7) as those in urban areas (67.1%; 95% CI: 65.6-68.6).[c] Between 1990 and 2010, the prevalence of overweight in North Carolina grew just slightly from 33.5% to 37.1%. However, the obesity rate increased rapidly during that time period. In 1990, 12.9% of adults in North Carolina were obese; by 2010, 27.8% of adults in North Carolina were obese, an increase of 14.9%.[18] Obesity can be prevented. In adition to genes and metabolism, behaviors and environment affect body weight.

Adults in rural areas are less likely than adults in urban areas to get the recommended level of physical activity.

Physical activity is a key component of a healthy lifestyle and an important part of preventing obesity.[19] The health and financial benefits of high levels of physical activity have been demonstrated by numerous studies.[20] Regular physical activity reduces the risk of premature death by reducing the risk of coronary heart disease, stroke, high blood pressure, type 2 diabetes, and colon cancer. In addition, it protects against feelings of depression and helps build healthy bones, muscles, and joints. Regular physical activity is also an important part of reaching and maintaining a healthy weight.[21]

The current recommendations are for adults to have at least 30 minutes of moderate intensity physical activity, such as walking, five days per week or at least 20 minutes of vigorous intensity physical activity, such as jogging, three days per week. Additionally, adults should incorporate muscle strengthening activities twice a week.[22] Adults in rural areas (43.8%; 95% CI: 40.6-47.0) are less likely than adults in urban areas (47.4%; 95% CI: 45.6-49.2) to get the recommended level of physical activity (2009).[23]

Good nutrition is a cornerstone of optimal health. An optimal diet is one that includes the recommended consumption of fruits and vegetables, foods high in fiber (e.g. whole grains), and adequate sources of calcium and important nutrients. Healthy diets are also low in saturated and trans fats, cholesterol, added sugars, and salt. A healthy diet can help protect against osteoporosis, heart disease, hypertension, type 2 diabetes, and certain cancers. Managing calorie intake, while consuming adequate nutrients, is important to avoid overweight and obesity.[24]

Only one in five (20.6%) adults in North Carolina consumed five or more servings of fruits or vegetables a day in 2011.[25] Again, those in rural areas are less likely to consume fruits and vegetables (18.8%; 95% CI: 16.5-21.0) than adults in urban areas (21.6%; 95% CI: 20.3-22.9) (2009).[23] In general, data on the specific dietary patterns of North Carolinians are limited.

c Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

Improve Mental Health and Emotional Well-Being

Many people with mental health or substance abuse problems are reluctant to admit they have a problem and thus are unlikely to seek care directly from treatment professionals. Even among those who are aware of their conditions, the associated cost or stigma often prevents them from reaching out to health care providers for treatment. Therefore, primary care settings are optimal for providing appropriate screening, early intervention, and referral if necessary.

The Substance Abuse and Mental Health Services Administration (SAMHSA) conducts a household survey of drug use and health each year to determine the mental health status of respondents.[26] In 2006, a large proportion of North Carolinians reported serious psychological distress in the prior year, including 17% of 18-25 year olds and 11% of people older than age 26.[27] Serious psychological distress is a nonspecific indicator of mental health problems such as anxiety or mood disorders.[28,29] In addition, approximately 7% of North Carolinians age 12 or older reported having had a diagnosable major depressive episode.[27] Currently data are not available to compare these rates between rural and urban populations in North Carolina.

In 2006, 17% of 18-25 year olds and 11% of people older than age 26 reported serious psychological distress in the prior year.

Mental health disorders can have a profound effect on an individual, including his or her interpersonal relations, functioning in schools or in the workplace, and overall sense of well-being.[28] Having a current mental health problem is one of the most common circumstances surrounding suicide (47.5%) with a history of treatment for mental illness (46.7%), or a depressed mood (46.3%) following closely behind.[30] According to the Youth Risk Behavior Surveillance survey of North Carolina high school students, between 2005 and 2009, 25.6%-27.4% of students reported feeling so sad or hopeless for at least two weeks over the past year that they stopped doing some usual activities and 12.5%-15.6% considered attempting suicide.[30] Suicide rates per 100,000 population are similar in rural areas (13.4; 95% CI: 12.0-13.6) and urban areas (12.8; 95% CI: 12.0-14.8).[d]

Emerging research has also shown the impact of mental illness—particularly depression—on the use and cost of health services. People that are depressed or have anxiety disorders have more unexplained medical symptoms than do people without these mental health problems. Depression has been associated with a 50% increase in medical costs for other chronic illnesses, even after controlling for the type and severity of physical illness. Depression has also been linked to longer lengths of stay in the hospital, even after controlling for severity of medical illness, and it has been linked to higher mortality rates for people who have diabetes or heart disease.[31]

Depression also makes it more difficult to treat or manage chronic conditions, as people who are depressed are less likely to take their medications as prescribed

d Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

or to otherwise follow their treatment regimens.[31] People who are depressed are also more likely to engage in risky health behaviors including smoking, overeating, and sedentary lifestyles.

Ideally, people who have a mental illness can be treated by health professionals in an outpatient or community setting. However when community resources are lacking or people are unwilling to seek mental health or substance abuse services, they sometimes end up in the emergency department. People in rural areas are far more likely to visit the emergency department for mental health-related visits (126.4 per 10,000 population; 95% CI: 125.1-127.7), compared to those in urban areas (95.6 per 10,000 population; 95% CI: 94.8-96.3).[e]

People in rural areas are far more likely to visit the emergency department for mental health-related visits compared to those in urban areas.

Reduce Substance Abuse and Dependence, Including Tobacco, Alcohol, and Illegal Substances

People with substance abuse problems or dependence are at risk for premature death, co-morbid health conditions, and disability. Furthermore, substance abuse carries additional adverse consequences for the individual, his or her family, and society at large. People with addiction disorders are more likely than people with other chronic illnesses to end up in poverty, lose their job, or experience homelessness.

Addiction to drugs or alcohol contributes to the state's crime rate as well as to family upheaval and motor vehicle fatalities. Approximately 90% of the criminal offenders who enter the prison system have substance abuse problems.[32] More than two out of five youth in the state's juvenile justice system are in need of further assessment or treatment services for substance abuse.[33] Substance abuse is also one of the primary causes for motor vehicle fatalities, contributing to more than one-quarter (26.8%) of all crash-related deaths.[34] In addition, alcohol or drug use is a major contributor to family disintegration. Nationally, parental use of alcohol or drugs contributes to more than 75% of cases in which children are placed in foster care.[35] The direct and indirect costs of alcohol and drug abuse in North Carolina totaled more than $12.4 billion in 2004.[36]

The 2010-2011 SAMHSA survey results showed that approximately 548,000 (7.0%) of North Carolinians age 12 or older reported alcohol or illicit drug dependence or abuse.[37] A large majority of these—431,000 North Carolinians—reported alcohol dependence or abuse, and 210,000 people reported illicit drug dependence or abuse. A much higher number of people reported drug use (692,000) or binge alcohol use (1.5 million).[37] Unfortunately, data are not available on rural and urban differences in alcohol or illegal drug dependence or abuse. But available data on alcohol-related traffic crashes suggest that alcohol dependence or abuse may be a bigger problem in rural areas (5.8%; 95% CI: 5.6-6.0) compared to urban areas (5.1%; 95% CI: 5.0-5.2).[f]

e Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

f Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

Recently, overdose death rates have skyrocketed in North Carolina. Since 1999, the number of these deaths has increased by more than 300%, from 297 deaths in 1999 to 1,140 deaths in 2011.[38] The majority of these overdose deaths involve prescription opioid pain relievers (like methadone, oxycodone, and morphine). In fact, opioid analgesics are now involved in more drug deaths than cocaine and heroin combined.

Tobacco use is also a major cause of health related problems. Cigarette smoking leads to one-third of all cancer cases and 90% of all lung cancer cases.[39] In North Carolina, 22.1% (95% CI: 20.4-23.9) of adults living in rural counties are current smokers as compared to 20.3% (95% CI: 19.1-21.5) in urban counties.[g,40] In addition to cancer, smoking causes lung diseases such as emphysema and chronic bronchitis, and increases the risk of heart disease among smokers and those who are around them. It is estimated that secondhand smoke exposure caused nearly 34,000 heart disease deaths annually (from 2005-2009) among adult nonsmokers in the United States.[41] In North Carolina, rural and urban exposure to secondhand tobacco smoke are similar [11.7% rural (95% CI: 8.2-15.2) and 7.5% urban (95% CI: 6.0-9.0)].[h]

In North Carolina, 22.1% of adults living in rural counties are current smokers as compared to 20.3% in urban counties.

Youth are particularly susceptible to the influence of tobacco, drugs, or alcohol, as these substances affect the developing brain. Repeated exposure to tobacco, drugs, or alcohol can alter brain chemistry and microanatomy, making it harder for people to weigh the trade-offs of short-term pleasure derived from tobacco, drug, or alcohol use versus the longer term consequences to the individual and his/her family by the use or misuse of these substances.[42] Use and misuse of alcohol and other drugs is particularly problematic for people under the age of 25, as the brain does not fully form until that age.[43] According to the 2011 North Carolina Youth Risk Behavior Survey, one in five high school students has taken a prescription drug without a doctor's prescription.[44] Additionally, 45% of North Carolina high school students have tried smoking a cigarette (rural/urban breakdown not available).[45]

Access to and Availability of Services

Maximize Individuals' Insurance Opportunities and Access to the Safety Net

In 2011-2012, 20.2% of nonelderly North Carolinians, or 1.6 million people, were uninsured.[46] People in rural areas are about equally as likely to be uninsured as are those in urban areas (20.8% versus 19.5% respectively).[47] However, more than one in four nonelderly residents is uninsured in some rural counties (e.g. Alleghany, Avery, Duplin, Jackson, and Robeson).[48] People who lack health insurance coverage have a harder time affording necessary care. Lack of coverage adversely affects health. Those without insurance are less likely to get

g Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

h Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

preventive screenings and ongoing care for chronic conditions. Consequently, the uninsured have a greater likelihood than people with coverage of being diagnosed with severe health conditions (such as late stage cancer), being hospitalized for preventable health problems, or dying prematurely.[49]

Uninsured North Carolinians report that the main reason they do not have health insurance is because they cannot afford the premiums.[40] Rising health care costs over the past decade have led to decreases in the number of employers offering health insurance and the number of employees who can afford the co-premiums when health insurance is offered.[49]

Uninsured North Carolinians report that the main reason they do not have health insurance is because they cannot afford the premiums.

Beginning in 2014, under the implementation of the Patient Protection and Affordable Care Act (ACA, also known as health reform), individuals and families have new options for purchasing health insurance. Most people are required to have health insurance or pay a penalty. Many North Carolina families are eligible for subsidies through the Health Insurance Marketplace to help them purchase private coverage if they do not have access to affordable employer-based coverage, do not qualify for public coverage, and have incomes between 100-400% of the federal poverty level (FPL).[i] Individuals with incomes below 100% of FPL are not eligible for subsidies in the Marketplace. Current Medicaid eligibility guidelines are very restrictive for nonelderly adults. Coverage is generally limited to disabled adults with incomes up to 100% of the federal poverty guideline (FPG), or parents of dependent children with incomes less than 50% of FPG. Childless, nondisabled, and nonelderly adults are not eligible for Medicaid. The ACA gives states the option to expand Medicaid to cover more low-income adults (those with incomes up to 138% of FPG),[j] However North Carolina has decided not to expand Medicaid.[k] Therefore, health insurance remains unaffordable for many with the lowest incomes.

There are certain health care providers, including community and migrant health centers, rural health centers, public health departments, free clinics, and hospitals that have a mission or legal obligation to provide health care services to the uninsured.[50] However, these organizations are not able to meet all of the health care needs of the uninsured. In addition, funding to some of these organizations has been, or is likely to be, reduced in the future, which will make it increasingly difficult to serve all of the uninsured. Thus, it is important to help those who can gain affordable coverage to purchase it, and to target

i The penalty is $95/year or 1% of income (whichever is greater) in 2014. The penalty amount increases to $695/year or 2.5% of income by 2016. Certain individuals are exempt from the mandate including, but not limited to, those who are not required to pay taxes because their incomes are less than 100% of the federal poverty guideline, those who qualify for a religious exemption, American Indians, and those for whom the lowest cost plan would exceed 8% of their income.

j As originally passed, the Affordable Care Act required states to expand Medicaid to all individuals with family incomes below 138% of the federal poverty guideline, or lose federal funding. In June 2012, the Supreme Court ruled this was unduly coercive to the states and changed it to an optional expansion of Medicaid.

k North Carolina Session Law 2013-5.

the safety net resources to people who are unable to obtain affordable health insurance coverage in the Health Insurance Marketplace.

Improve Recruitment, Retention, and Distribution of Key Health Professionals

Many rural communities experience shortages of key health professionals. Primary care professionals are the entry point into the health care system and provide a wide range of services including preventive care, chronic disease management, urgent care, and some mental health care.[51] The primary care workforce is experiencing increasing demand due to aging baby boomers requiring more care, overall growth in the population, and increasing numbers of people living with chronic illnesses. Additionally, demand is expected to increase in 2014 due to people gaining insurance coverage as a result of the Affordable Care Act.[52] Despite overall growth in the primary care workforce in the last 30 years, many of North Carolina's rural counties, or parts thereof, face persistent primary care shortfalls.[53]

North Carolina has 66 counties that are designated as primary care shortage areas, 22 counties that are designated as behavioral health shortage areas, and 69 counties that are designated as dental shortage areas.

There are many parts of the state that currently lack sufficient numbers of primary care providers, dentists, and mental health professionals to meet population needs. These communities are called health professional shortage areas (HPSAs). North Carolina has 66 counties (or parts of counties) that are designated as primary care shortage areas, 22 counties (or parts thereof) that are designated as behavioral health shortage areas, and 69 counties (or parts thereof) that are designated as dental shortage areas.[l,54] Of those designated communities, 48 of the primary care HPSAs, 20 of the behavioral health HPSAs, and 56 of the dental HPSAs are in rural counties. In addition, 16 rural counties lack general surgeons, who play an important role in meeting the health needs in a community, and are integral to the sustainability of many rural hospitals. North Carolina must find ways to expand the health workforce in underserved areas. It will take specific incentives and strategies to accomplish this goal.

Direct economic incentives can be used to recruit providers to practice in underserved communities. There are four main direct incentive mechanisms: scholarships, loans, loan repayment, and direct incentives such as payments for capital costs or as income guarantees. Incentive mechanisms may be tied to specific service obligations.[55] The federal government provides scholarships or loan repayment to certain types of health care practitioners in return for practicing in a health professional shortage area through the National Health Service Corps (NHSC). NHSC funding can be used to recruit primary care, mental health, and dental professionals into rural and underserved communities that are designated as HPSAs. North Carolina has fewer practitioners receiving NHSC loan repayment than it should based on its size.[56] In addition to federal funding, there is some funding available from the state and from the North

l The HPSAs designated as Single County, Geographical Area, and Population Group were counted on August 15, 2013.

Carolina Medical Society Foundation for loan repayment for individuals who commit to practice in a HPSA. The Office of Rural Health and Community Care manages the state loan repayment program. In addition, the Office helps eligible health professionals apply for the federal and state loan repayment programs. The capacity to recruit and retain health professionals in rural and underserved areas across the state is critical to meet the health needs of North Carolinians.

In addition to financial incentives, broad support for health professionals and their families can help with recruitment and retention. Higher retention of health professionals is associated with several variables including a good match between the physician and community, physician satisfaction with the community, professional fulfillment, and ownership or sense of control in one's practice.[57] Local leaders can help support health professionals and their families both professionally and with acclimation to the community.[13] Mentoring and professional development, along with social engagement with the community and local leaders, may also help recruit and retain more health providers in rural communities in North Carolina.

Table 2.1
Ratio of Health Care Professionals to Population (Professionals per 10,000 population)

Indicator	State	Rural	Urban
All Physicians	22.1	13.71	25.56
Primary Care Physicians	7.8	6.11	8.47
Nurse Practitioners	4.1	2.9	4.6
Physician Assistants	4.0	2.86	4.5
Psychiatrists	1.0	0.52	1.21
General Surgeons	0.63	0.54	0.66
Dentists	4.3	3.04	4.89

Source: Calculations based on 2011 Health professionals state and county totals. North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill. (2011).[57]

Twenty-four rural counties in North Carolina have no general surgeons, three counties have no dentists, and 13 have no psychiatrists.

Support New Models of Care That Expand Access to Health Services

Residents in rural North Carolina are less likely to have access to health care services than those in urban areas. There are fewer health professionals of all types (e.g. primary care, oral health, and mental health) in rural areas of the state.[53] Twenty-four rural counties in North Carolina have no general surgeons, three counties have no dentists, and 13 have no psychiatrists. Most of North Carolina's counties have a local hospital in the county that provides outpatient and emergency care as well as inpatient care for those with more complex needs; however 17 rural counties do not have a hospital in the county.[58] Rural hospitals are typically smaller than urban hospitals and have fewer specialists or specialty health services. In addition to hospitals, communities are served by health clinics, health departments, and independent health care practitioners. Rural health systems are typically more financially fragile than urban health systems due to smaller patient populations, higher percentages of uninsured patients, payment differences, and other factors.[59] Many rural hospitals are consolidating with larger health systems.

North Carolina has a long history of engaging in efforts to strengthen and improve health care services in rural areas and improve rural residents' access to care. These efforts have helped recruit health professionals to rural communities, open rural health centers, and improve the quality of care in rural health systems.[60] While much has been done historically, new models are needed to fill gaps in available resources. There is an ongoing need to develop and implement innovative models of care to improve the quality, efficiency, and availability of health care services. New models that focus on improving population health and expanding access to needed services are particularly important in those rural areas that lack sufficient numbers of health care professionals, but that experience higher rates of many illnesses.

While much has been done historically, new models are needed to fill gaps in available resources.

References

1. Braveman P, Egerter S. *Overcoming Obstacles to Health: Report From the Robert Wood Johnson Foundation to the Commission to Build a Healthier America*. Princeton, NJ: Robert Wood Johnson Foundation; 2008. http://www.rwjf.org/content/dam/farm/reports/reports/2008/rwjf22441. Accessed June 8, 2009.

2. Adler NE, Rehkopf DH. US disparities in health: Description, causes, and mechanisms. *Annu Rev Public Health*. 2008;29:235-252.

3. NCIOM Health Access Study Group. North Carolina Institute of Medicine. *Expanding access to health care in North Carolina: A report of the NCIOM Health Access Study Group*. Morrisville, NC. Published March; 2009.

4. Lantz PA, House JS, Lepkowski JM, Williams DR, Mero RP, Chen J. Socioeconomic factors, health behaviors, and mortality: Results from a nationally representative prospective study of US adults. *JAMA*. 1998;279(21):1703-1708.

5. Cutler D, Lleras-Muney A. National Bureau of Economical Research. *Education and Health: Evaluating Theories and Evidence*. NBER Working Paper 12352. Cambridge, MA: National Bureau of Economic Research; 2006. http://www.nber.org/papers/w12352. Accessed May 15, 2009.

6. Fiscella K, Kitzman H. Disparities in academic achievement and health: The intersection of child education and health policy. *Pediatrics*. 2009;123:1073-1080.

7. Rouse C, Brooks-Gunn J, McLanahan S. Introducing the issue: school readiness closing racial and ethnic gaps. *Future Child*. 2005;15(1):5-13.

8. HighScope Educational Research Foundation. HighScope Perry Preschool Study. HighScope Educational Research Foundation website. http://www.highscope.org/Content.asp?ContentId=219. Published 2009. Accessed June 2, 2009.

9. The Rural School and Community Trust. *Why Rural Matters 2009: North Carolina*. The Rural School and Community Trust website. http://files.ruraledu.org/wrm09/North_Carolina.pdf. Accessed March 21, 2014.

10. Accountability Services Division, North Carolina Department of Public Instruction. Cohort graduation rates. North Carolina Department of Public Instruction website. http://www.ncpublicschools.org/accountability/reporting/cohortgradrate. Accessed March 21, 2013.

11. Crane S. Rural physicians and community leadership: skills for building health infrastructure in rural communities. *NC Med J*. 2006;67(1):63-65.

12. Rhodes J. Pitt County: Celebrating our community and our community's wellness. Trust for America's Health website. http://healthyamericans.org/assets/files/TFAH2012InvstgAmrcsHlthPitt.pdf. Published March 2012.

13. P Mattessich PW, Rausch EJ. *Collaboration to Build Healthier Communities: A Report for the Robert Wood Johnson Foundation Commission to Build a Healthier America*. Princeton, NJ: Robert Wood Johnson Foundation; 2013. http://www.rwjf.org/content/dam/farm/reports/surveys_and_polls/2013/rwjf406479. Accessed July 16, 2014

14. North Carolina Office of Rural Health and Community Care. Health care and North Carolina's economy. North Carolina Office of Rural Health and Community Care website. http://www.ncdhhs.gov/orhcc/data/01opening_text.pdf. Accessed July 16, 2014.

15. Reinelt C, Foster P, Sullivan S. *Evaluating Outcomes and Impacts: A Scan of 55 Leadership Development Programs*. Brookline, MA: Development Guild/DDI, Inc.; 2002. http://www.wkkf.org/knowledge-center/resources/2006/08/evaluating-outcomes-and-impacts-a-scan-of-55-leadership-development-programs.aspx. Accessed July 16, 2014.

16. Chapin Hall Center for Children at the University of Chicago. *Leadership Development in the Program for the Rural Carolinas*. Durham, NC: The Duke Endowment; 2004. http://www.dukeendowment.org/sites/

default/files/media/images/stories/downloads/issues/Program%20for%20the%20Rural%20Carolinas/LeadershipDevelopmentintheProgramfortheRuralCarolinas.pdf. Accessed July 16, 2014.

17. United Health Foundation. America's Health Rankings: North Carolina Obesity. http://www.americashealthrankings.org/NC/Obesity/2013. Published 2013. Accessed February 25, 2014.

18. Division of Nutrition, Physical Activity and Obesity, National Center for Chronic Disease Prevention and Health Promotion. Overweight and Obesity. North Carolina: State Nutrition, Physical Activity, and Obesity Profile. http://www.cdc.gov/obesity/stateprograms/fundedstates/pdf/north-carolina-state-profile.pdf. Published September 2012. Accessed July 18, 2013.

19. Devlin L, Plescia M. The public health challenge of obesity in North Carolina. *NC Med J*. 2006;67(4):278-282.

20. Centers for Disease Control and Prevention. Physical activity and health. Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/health/index.html. Accessed March 21, 2014.

21. Centers for Disease Control and Prevention. How much physical activity do you need? Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html. Accessed March 21, 2014.

22. Centers for Disease Control and Prevention. Physical activity for everyone. Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html. Accessed March 21, 2014.

23. North Carolina State Center for Health Statistics. 2009 Behavioral Risk Factor Surveillance System (BRFSS) Calendar Year 2009 Results. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/schs/brfss/2009/. Updated March 13, 2012. Accessed March 21, 2014.

24. US Department of Health and Human Services and US Department of Agriculture. *Dietary Guidelines for Americans, 2005*. Washington DC: US Government Printing Office; 2006. http://www.health.gov/dietaryguidelines/dga2005/document/pdf/DGA2005.pdf Accessed March 21, 2014.

25. North Carolina State Center for Health Statistics. 2011 BRFSS Survey Results: North Carolina, tobacco use, current smoker. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2011/nc/all/_rfsmok3.html. Published 14 Sep 2012. Accessed April 5, 2013.

26. Hughes A, Sathe N, Spagnola K. *State Estimates of Substance Use from the 2006-2007 National Surveys on Drug Use and Health*. Rockville, MD: US Department of Health and Human Services; 2009. http://www.oas.samhsa.gov/2k7state/2k7State.pdf. Accessed January 28, 2011.

27. Substance Abuse and Mental Health Services Administration. 2006 state estimates of depression and serious psychological distress: North Carolina. US Department of Health and Human Services website. http://www.oas.samhsa.gov/2k6State/NorthCarolinaMH.htm. Updated December 30, 2008. Accessed July 18, 2013.

28. Kessler RC, Barker PR, Colpe LJ, et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry*. 2008;60:184-189.

29. Kessler RC, Andrews G, Colpe LJ, et al. Short screening sales to monitor population prevalences and trends in non-specific psychological distress. *Psychol Med*. 2002;32(6):959-976.

30. Injury Epidemiology and Surveillance Unit, North Carolina Division of Public Health. *The Burden of Suicide in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services; 2013. http://www.injuryfreenc.ncdhhs.gov/ForHealthProfessionals/2013BurdenofSuicide.pdf. Accessed July 16, 2014.

31. Katon WJ. Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. Biol Psychiatry. 2003;54(3):216-226.

32. Division of Alcoholism and Chemical Dependency Programs, North Carolina Department of Correction. *Annual Legislative Report, FY 2006-2007*. Raleigh, NC: North Carolina Department of Correction; 2008. http://www.doc.state.nc.us/Legislative/2008/2006-07_Annual_Legislative_Report.pdf. Accessed March 21, 2014.

33. North Carolina Department of Juvenile Justice and Delinquency Prevention. *2007 Annual Report*. Raleigh, NC: North Carolina Department of Juvenile Justice and Delinquency Prevention; 2008. http://www.ncdjjdp.org/resources/pdf_documents/annual_report_2007.pdf. Accessed July 31, 2008.

34. The University of North Carolina Highway Safety Research Center. About the North Carolina Alcohol Facts (NCAF) website. http://www.hsrc.unc.edu/ncaf/. Accessed October 29, 2010.

35. Schneider Institute for Health Policy, Brandeis University. Substance Abuse: The Nation's Number One Health Problem. Princeton, NJ: Robert Wood Johnson Foundation; 2011. http://www.rwjf.org/content/dam/farm/reports/reports/2001/rwjf13550. Accessed December 11, 2008.http://www.rwjf.org/files/publications/other/SubstanceAbuseChartbook.pdf. Published February 2001. Accessed December 11, 2008.

36. Alcohol/Drug Council of North Carolina. 2004 North Carolina epidemiologic data. http://www.nciom.org/wp-content/uploads/NCIOM/projects/prevention/finalreport/Prevention-Chptr6.pdf. Accessed July 31, 2014.

37. Substance Abuse and Mental Health Services Administration. 2010-2011 National Survey on Drug Use and Health: Model-based estimated totals (in thousands) (50 states and the District of Columbia). US Department of Health and Human Services website. http://www.samhsa.gov/data/NSDUH/2k11State/NSDUHsaeCountTabs2011.htm. Accessed July 18, 2013.

38. North Carolina Injury and Violence Prevention Branch. Prescription and drug overdoses. North Carolina Department of Health and Human Services website. http://injuryfreenc.ncdhhs.gov/About/PoisoningOverdoseFactSheet2013.pdf. Published January 2013. Accessed July 18, 2013.

39. National Institute on Drug Abuse. Drug facts: cigarettes and other tobacco products. National Institutes of Health website. http://www.drugabuse.gov/publications/drugfacts/cigarettes-other-tobacco-products. Updated December 2012. Accessed March 25, 2014.

40. North Carolina State Center for Health Statistics. 2011 Behavioral Risk Factor Surveillance System (BRFSS) survey results: North Carolina uninsured. North Carolina Department of Health and Human Services website. http://www.schs.state.nc.us/schs/brfss/2011/nc/all/noinsure.html. Published September 14, 2012. Accessed July 23, 2014.

41. Centers for Disease Control and Prevention. Smoking and tobacco use: secondhand smoke (SHS) facts. Centers for Disease Control and Prevention website. http://www.cdc.gov/tobacco/data_statistics/fact_sheets/secondhand_smoke/general_facts/. Updated April 11, 2014. Accessed March 25, 2014.

42. Friedman D. Drug addiction: a chronically relapsing brain disease. *NC Med J*. 2009;70(1):35-37.

43. Weinberger DR, Elvevåg B, Giedd JN. The Adolescent Brain: A Work in Progress. Washington, DC: The National Campaign to Prevent Teen Pregnancy; 2005. https://thenationalcampaign.org/sites/default/files/resource-primary-download/brain.pdf. Accessed May 6, 2009.

44. North Carolina Injury and Violence Prevention Branch. Prescription drug abuse: 2011 NC Youth Risk Behavior Survey (YRBS). North Carolina Department of Health and Human Services website. http://www.injuryfreenc.ncdhhs.gov/DataSurveillance/YRBS/2011MSHSPrescriptionDrugUse.pdf. Published September 2010. Accessed July 18, 2013.

45. Office of Adolescent Health. North Carolina adolescent substance abuse facts. US Department of Health and Human Services website. http://www.hhs.gov/ash/oah/adolescent-health-topics/substance-abuse/states/nc.html. Updated July 19, 2013. Accessed March 25, 2014.

46. United States Census Bureau. Health insurance historical tables - HIB series. Health insurance coverage status and type of coverage by state—persons under 65: 1999 to 2012. United States Census Bureau website. http://www.census.gov/hhes/www/hlthins/data/historical/HIB_tables.html. Updated September 17, 2013. Accessed January 13. 2014.

47. North Carolina Institute of Medicine. Characteristics of Running the numbers: The uninsured in Nnorth Ccarolinians.a 2011-2012 data snapshot. North Carolina Institute of Medicine website. http://riversdeveloper.com/wp-content/uploads/2010/08/Uninsured-Snapshot_2011-2012.pdf. Accessed July 25, 2014.

48. US Census Bureau. Small Area Health Insurance Estimates. Health Insurance Coverage Estimates Percent Uninsured 2012. US Census Bureau website. http://www.census.gov/did/www/sahie/data/files/F7_SAHIE_2012_County_Population_Under_65_Uninsured.jpg. Accessed March 12, 2014.

49. Institute of Medicine of the National Academies. *America's Uninsured Crisis: Consequences for Health and Health Care*. Washington, DC: Institute of Medicine of the National Academies; 2009.

50. Silberman P, Odom CH, Smith S Jr, Dubay KL, Thompson KW, Task Force on the North Carolina Healthcare Safety Net. The North Carolina healthcare safety net, 2005: fragments of a lifeline serving the uninsured. *NC Med J*. 2005;66(2):111-119.

51. Bodenheimer T, Pham H. Primary care: current problems and proposed solutions. *Health Affairs*. 2010;29(5):799-805.

52. Schwartz MD. Health care reform and the primary care workforce bottleneck. *J Gen Intern Med*. 2011.

53. Spero J. North Carolina's rural health workforce: Challenges and strategies. Presented to: North Carolina Institute of Medicine Task Force on Rural Health; July 31, 2013; Greensboro, NC. http://www.nciom.org/wp-content/uploads/2013/04/Spero_7-31-13.pdf. Accessed July 23, 2014.

54. Health Resources and Services Administration. Find shortage areas: HPSA by state and county. US Department of Health and Human Services website. http://hpsafind.hrsa.gov/HPSASearch.aspx. Updated July 24, 2014. Accessed July 24, 2014.

55. North Carolina Institute of Medicine Primary Care and Specialty Supply Task Force. North Carolina Institute of Medicine. *Providers in Demand: North Carolina's Primary Care and Specialty Supply*. Durham, NC. North Carolina Institute of Medicine; 2007. http://www.nciom.org/projects/supply/provider_supply_report.pdf. Accessed December 10, 2008.

56. Pathman D. Two (Among Many) Possible Health Workforce Building Approaches for NC. Presented at: North Carolina Institute of Medicine Workgroup on Health Reform: Health Professional Workforce; December 15, 2010; Morrisville, NC. http://riversdeveloper.com/wp-content/uploads/2010/10/Pathman_12-15-10.pdf. Accessed January 9, 2012.

57. North Carolina Health Professions Data System. 2011 Health professionals per 10,000 population ratios. Cecil G. Sheps Center for Health Services Research website. http://www.shepscenter.unc.edu/hp/prof2011.htm. Accessed July 23, 2014.

58. Dihoff S, Spade JS. The special role for rural hospitals in meeting the needs of their communities. *NC Med J*. January/February 2006;67(1):86-89.

59. Holmes M. Health care costs in rural North Carolina. Presented to: North Carolina Institute of Medicine Task Force on Rural Health; July 31, 2013; Greensboro, NC.

60. Ricketts TC. State and local partnerships for meeting the healthcare needs of small and often remote rural communities. *NC Med J*. January/February 2006;67(1):43-50.

Expand Jobs and Economic Security **Chapter 3**

With a rich history of manufacturing and agriculture, and a land base that provides an abundance of natural resources, North Carolina's rural communities play a vital role to the economy of the state. Although recent years have proven difficult for the industries of rural North Carolina, investing in its development and maintenance will yield benefits throughout the state by contributing to a diverse and healthy state economy.

Global economic trends and the multiple recessions in the decade from 2000-2010 led to high unemployment and little economic growth in rural North Carolina. As traditional industries have left North Carolina and technological advances have allowed remaining manufacturers to employ fewer workers, all of the state's United States Department of Agriculture (USDA) designated persistent poverty counties (where more than 20% of the population has lived in poverty for the last 30 years) remain rural. The Task Force recognized that fostering sustainable economic development through investments in infrastructure, regional industry, and workforce development is crucial to improving health for rural North Carolina.

I always knew I wanted to be a family physician. Serving in my rural hometown of Taylorsville was the goal I set when I first walked through the doors of the medical school at East Carolina. Looking back, my whole medical journey has been a dream come true!

Cody Wingler, MD
Family Physician,
Taylorsville, NC
Recipient, 2009 NCAFP Foundation Scholarship

Over the past several years, an uptick in growth and employment has shown promise and progress for rural areas: since 2010, jobs have been added in rural areas of North Carolina. The rural unemployment rate, while still high at 11.0% in 2012, is declining, down from 11.5% in 2011.[1] In contrast, however, the statewide unemployment rate was 9.5% in 2012, and the urban unemployment rate was 9.1%.[1] Job growth in service industries and health care, along with growth of farms and small businesses, drove much of the improvement in rural areas. Increases in rural population and high school graduation rates continue to contribute to a potential comeback.

However, many challenges remain in rural North Carolina. Many areas struggle with a high proportion of residents living in poverty, with income much lower than the state average as well as lower levels of education. In rural counties, 20.8% of residents lived at or below the Federal Poverty Guideline in 2012 compared to 16.8% of urban residents. The median per capita income in rural counties was $31,948, compared with the state average of $37,910.[1] During the period of 2008-2012, 20.5% of rural residents did not complete high school, compared with only 14.5% of urban residents. In addition, only 17% of rural residents received a college degree, compared to 29.9% of urban residents.[1]

Economic Measures and Health

Economic factors are closely related to health status and outcomes. People who are unemployed or who have lower incomes fare worse on most health indicators as compared to people with jobs or with higher incomes. Lower incomes are also associated with other risk factors for poor health, including

poor health behaviors, poor housing quality, lack of health insurance coverage, food insecurity, and lower educational attainment.[2]

In North Carolina, 34.8% of those with annual incomes below $25,000 reported their health as fair or poor, while only 10.2% of those with incomes above $25,000 reported fair or poor health status.[3] Lower income also affects access to care across North Carolina: nearly one-third of North Carolinians with incomes below $25,000 reported cost as a factor in not being able to see a doctor, with only 10.5% of those with higher incomes reporting the same.[3]

In rural counties, 20.8% of residents lived at or below the Federal Poverty Guideline in 2012 compared to 16.8% of urban residents.

Among adults in the United States, 25.2% of those out of work for more than one year reported their health as fair or poor, compared to 16.6% of those unemployed for less than one year and 8.2% of currently employed respondents.[4] People who are employed are more likely to report that they had no unhealthy days in the last 30 days compared to those who were unemployed for more than one year (70.3% vs. 55.9% respectively). This difference is also true of mental health, with 67.3% of employed respondents vs. 50.6% of those unemployed for more than one year reporting zero mentally unhealthy days in the past 30 days.[4]

Strategies to Improve Rural Infrastructure and Promote Economic Development

Acknowledging the correlation between economic factors and health outcomes, the Task Force on Rural Health developed the following strategies to address economic development and security in rural areas of North Carolina:

- Invest in infrastructure
- Develop regional industries and local resources
- Recruit and retain industry
- Create workforce development programs to support the local economy

Invest in Infrastructure

The Task Force identified several current initiatives in place to address infrastructure needs of rural North Carolina and the potential ways that addressing these needs can contribute to improved health outcomes for residents of these areas. Some of these initiatives are statewide and support local infrastructure (such as water, sewer, broadband access, and neighborhood stabilization) focused in low to moderate income communities. Others are focused more specifically in rural communities, emphasizing building restoration and expansion of broadband networks.

The North Carolina Department of Commerce (DOC) currently supports several initiatives designed to support rural communities. These are part of the Rural Development Division at DOC, and include the Community Development Block Grant (CDBG) program, Appalachian Regional Commission (ARC), NC Broadband, and other programs. Administered by the Office of Community

Investment and the Commerce Finance Center, the CDBG program focuses on local governments and fund economic development projects.[a] The aim of the CDBG program is to expand economic opportunity for low- and moderate-income residents. The state requires that at least 70% of this grant funding goes to benefit this population.

The Department of Commerce also administers the Building Reuse program. This program aims to create new, full-time jobs in Tier 1 or Tier 2 communities. This program provides grants and loans of up to $500,000 (or half of project cost) to restore buildings and properties that have been vacant for more than three months and/or build, expand, or restore rural health care facilities. The program gives priority to projects that will create jobs with higher salaries and benefits and also requires participating communities to match grant funding with local resources, with local governments required to provide at least 5% of the cash match.[5] In addition, the Department of Commerce, through the Rural Grants/Programs section, funds the Economic Infrastructure Program. This program aims to create new, full-time jobs in rural areas through investments in infrastructure projects such as repairs or upgrades to drinking and waste water or sewer lines, extensions of publicly owned gas lines, and transportation projects such as road and rail upgrades.[6]

Nearly one-third of North Carolinians with incomes below $25,000 reported cost as a factor in not being able to see a doctor, with only 10.5% of those with higher incomes reporting the same.

Access to high-speed internet is increasingly required both for recruiting industry and to support individuals' employment (i.e. finding/applying to jobs, communicating with colleagues, or telecommuting). Enhancing the broadband infrastructure is crucial for rural North Carolinians. Many North Carolina broadband projects target the "middle mile," the portion of the telecommunications network that connects the network operator's core to the local network plant, generally located with the local telecommunications provider. Other projects target the "last mile," the portion of the telecommunications network that reaches individual consumers. Because it is often not cost-effective for telecommunications companies to install appropriate technologies in areas that serve few consumers, rural areas are often underserved by these technologies, particularly for the "last mile." However, an investment in broadband technology yields significant economic returns; the US Bureau of Economic Analysis estimates that for each dollar invested in broadband, $3 is returned to the local economy.[7] In addition, it is estimated that increasing broadband access in North Carolina could add between 9,100 and 12,700 jobs to the state economy with a 1-3% increase in broadband penetration, respectively.[8,9]

A combination of federal and state grants, private loans, and private grants help fund additional broadband projects, targeting homes as well as community

a In the past, CDBG funds were used to support housing development and physical infrastructure (including water and sewer). The investments in the physical infrastructure were moved to the Department of Environment and Natural Resources (DENR). DOC still has a number of housing projects on the ground, but it will not be awarding any new funding to support additional housing efforts.

organizations such as schools, libraries, and local businesses. The Golden LEAF Rural Broadband Initiative provides matching funds to the federal Broadband Technology Opportunities Program (BTOP #2), as part of the American Recovery and Reinvestment Act Broadband Recovery Funds. Through this initiative, Golden LEAF works with 69 rural counties to provide high-speed broadband and has helped build 1,300 miles of "middle-mile" broadband fiber throughout the state. It also builds broadband capacity for public schools, libraries, community colleges, and other community organizations. As private sector partners can lease broadband fiber through this program, it will also allow a greater number of "last mile" service providers to increase broadband service options for businesses, community organizations, and individual consumers in this area. Not only does this provide key infrastructure to many remote rural areas, it also encourages competition which will improve the price structure for those in rural areas, while creating an additional tax base that can be used to support other local government services.

Golden LEAF works with 69 rural counties to provide high-speed broadband and has helped build 1,300 miles of "middle-mile" broadband fiber throughout the state.

NC Broadband, also a division of the Department of Commerce, seeks to build broadband capacity and examine the impact of broadband expansion, particularly in rural areas. Through an 18-month pilot project called NC LITE-UP (Linking Internet to Economically Underprivileged People), NC Broadband partners with broadband providers and county offices within the North Carolina Department of Social Services to research barriers to wider broadband adoption in underserved areas of the state. Through NC LITE-UP, NC Broadband hopes to inform and contribute to a national roll-out of increased internet access by the Federal Communications Commission. NC Broadband also provides technical assistance and support to communities wishing to expand their broadband networks, particularly to the "last mile."

As health care providers also increase their utilization of internet technology in their practices, an enhanced broadband infrastructure can improve access to and coordination of care, increase access to personal medical information through online patient portals, and will be instrumental in helping practices reach "meaningful use" standards for health information technology. The North Carolina Telehealth Network (NCTN), run by the Cabarrus Health Alliance and subsidized by the Federal Communications Commission's Rural Health Care Pilot Project, provides a telecommunications network through the North Carolina Research and Education Network (NCREN) infrastructure and the North Carolina Office of Information Technology Services (ITS) infrastructure. The North Carolina Telehealth Network provides this network for health institutions throughout the state and supports telehealth needs, exchange of health information, and disaster monitoring and response support.[10] In 2012, Vidant Medical Center in Greenville, North Carolina, was the first not-for-profit hospital to be connected to NCTN. It was estimated that the hospital saves $44,000 annually and received a large increase in internet bandwidth capacity.[10]

A stronger broadband infrastructure can also increase access to health services in underserved areas. In 2013, a three-year, $1.6 million grant from The Duke Endowment, managed by the Albemarle Hospital Foundation in partnership with Vidant Health and the Brody School of Medicine at East Carolina University, founded the North Carolina Telepsychiatry Network. This program provides 10 hospitals in the Vidant Health system with funding to enhance telehealth capacity in order to provide psychological evaluation of emergency department patients when a mental health provider is not available on site. The program reduces mental health care costs for hospitals, increases patient satisfaction, and also allows health care facilities to provide prioritized care for patients most in need.[11]

Significant federal dollars are available to support infrastructure improvements in rural communities through USDA-Rural Development, which administers more than 40 programs designed to invest loans and grants to support water, sewer, housing, business, telecommunications, community facilities, electricity, and economic development.[12] Non-federal match dollars required for the grants can be provided by local and state agencies and private (for-profit, nonprofit, and philanthropic) partners.

If residents of North Carolina spent 10% of their food dollars on local food, it would mean $4.1 billion available in the local economy each year.

Develop Regional Industries and Local Resources

Strong regional industry and investment in local resources is critically important for economic strength and development in rural North Carolina. The Task Force examined a number of industries that are showing promise in strengthening rural economies, including agriculture and sustainable energy.

Local efforts to enhance the agriculture sector can help revitalize North Carolina's rural economy. In the 2012 Census of Agriculture, North Carolina ranked eighth in the country for total value of agricultural products sold, with a value of approximately $12.5 billion (this figure includes total crops, livestock, and poultry). In total, North Carolina had more than 50,000 farms employing nearly 650,000 people.[13] North Carolinians spend approximately $35 billion on food annually. Thus, encouraging consumers to purchase more locally grown foods can greatly enhance local economies. A study of Iowa farms showed that if consumers purchased 25% of fruits and vegetables directly from Iowa farmers, it would create more than 2,000 jobs and generate $139.9 million annually.[14] Similarly, if residents of North Carolina spent 10% of their food dollars on local food, it would mean $4.1 billion available in the local economy each year.[b]

As of 2010, North Carolina had an estimated 200 farmers' markets and 100 community-supported agriculture programs. Through these efforts, there were more than 3,700 farms selling directly to consumers for a total sales value of more than $29 million.[14] Some farmers encounter challenges when selling directly to consumers. Food-safety requirements such as the Good Agricultural Practices

b Nancy Creamer, PhD, Professor and Director, Center for Environmental Farming Systems, North Carolina State University. Email communication. April 10,2014.

(GAPs) certification and audit procedures can be prohibitively expensive or otherwise difficult for small farms. With this in mind, representatives from North Carolina State University, North Carolina Agricultural and Technical State University, the North Carolina Department of Agriculture and Consumer Services, the US Food and Drug Administration, the North Carolina Farm Bureau, and several other stakeholders, have created the North Carolina Fresh Produce Safety Task Force. This Task Force developed a tiered system of food-safety certification, sponsors additional training programs, and implemented a GAPs certification assistance program to assist farmers with paying for government audits.[15]

In rural communities, food hubs and aggregation organizations such as Feast Down East, Eastern Carolina Organics, and TRACTOR are being used to pool and distribute the harvests of multiple farms.

The Farm to Fork initiative, launched in 2008 by the Center for Environmental Farming Systems, seeks to promote policy changes around local food economies; promote collaboration between local and regional food and farming organizations; and identify best practices that will enhance the local food economy. The Farm to Fork initiative recommends support for small local farmers to meet additional challenges presented by a larger food market infrastructure, including state-based support for locally produced food for state institutions (including schools, prisons, state-run health providers, and government agencies); business planning and marketing support; and local food job training opportunities. Farm to Fork also encourages local and community initiatives such as dedicating vacant land for farmers' markets or community gardens, revising land use ordinances to encourage small-scale food production in residential areas, and procuring more local food for institutional use.

At the community level, there are many examples of locally-driven efforts that are increasing access to healthy food while creating and sustaining jobs and small businesses. In rural communities, food hubs and aggregation organizations such as Feast Down East, Eastern Carolina Organics, and TRACTOR are being used to pool and distribute the harvests of multiple farms. Shared-use commercial kitchens are providing opportunities for value-added food processing and catering enterprises to grow their businesses without having to invest in major equipment or facility costs. Cooperative grocery stores are being established in food deserts that are unlikely to be served by major grocery store chains, and are providing new markets for local farmers. Additionally, there are Catch groups in coastal counties (NC Catch, Brunswick Catch, Carteret Catch, Ocracoke Fresh, and Outer Banks Catch) that are working to educate the public about the health benefits of local seafood and increase access to new and established markets, in order to sustain and strengthen our commercial fishing industry.

In addition to contributing to the state and local economies, such programs aimed at increasing the use of local food can also contribute to the reduction in health and food access disparities across rural North Carolina. As an additional resource, policy makers can also refer to the American Planning Association's *Policy Guide on Community and Regional Food Planning* to engage in community planning that improves access to and cost of local food, thus

stimulating the rural economy and improving residents' health.[16] There are additional opportunities to increase the purchasing volume of fresh vegetables, fruits, meats, and cheeses from locally sourced growers to nearby metro areas by addressing some additional barriers in systems and facilities for efficient processing, distribution. and marketing of the products.

In March of 2013, USDA Secretary Vilsack announced that North Carolina had been added to the "StrikeForce" initiative, designed to increase partnerships with rural communities and leverage community resources in targeted, persistent poverty counties.[17] Programs providing financial support and technical assistance through the Farm Service Agency, Rural Development, and Natural Resources Conservation Service are available to help local and state governments and community organizations implement projects that promote economic development and job creation. There are 43 North Carolina counties that have been identified as priorities: Anson, Beaufort, Bertie, Bladen, Camden, Caswell, Cherokee, Chowan, Cleveland, Columbus, Currituck, Duplin, Edgecombe, Gates, Graham, Granville, Greene, Halifax, Hertford, Hoke, Hyde, Jackson, Jones, Lenoir, Martin, Montgomery, Nash, Northampton, Pasquotank, Perquimans, Person, Pitt, Richmond, Robeson, Rowan, Rutherford, Sampson, Scotland, Tyrrell, Vance, Washington, Wayne, and Wilson counties.

43 North Carolina counties have been identified as priorities to the USDA "StrikeForce" initiative.

In addition to agriculture, investments in alternative and sustainable energy sources show promise for rural North Carolina. Between 2007 and 2013, North Carolina spent nearly $2.7 billion in renewable energy investments, with a resulting contribution to gross state product of $2.97 billion and 21,163 job-years by 2012.[15,c] Much of this investment occurred in rural areas of North Carolina, with Duplin and Robeson counties investing over $100 million each between 2007 and 2013. Beaufort and Cleveland counties each invested between $50 and $100 million between 2007 and 2013. State incentives for renewable energy investment, including the renewable energy investment tax credit and the Utility Savings Initiative, contributed to the ability of these communities and industries to invest in these areas.[18]

Since 2007, over $1.65 billion has been invested in the solar industry, contributing to job growth and the improvement of the energy infrastructure.[19] In 2013, North Carolina was sixth in the nation in the number of installed megawatts of solar energy and had more than 500 organizations working in the sector, employing over 2,000 workers.[18] In particular, due to transferable skills, many of these jobs were created in rural areas that had been adversely affected by job loss in the construction industry. Wind power is also a renewable energy option that is available in many communities across the state.[20]

It is also important for rural communities to invest in regional industries that take advantage of their unique resources and heritage. One example of a new

c A job year is one full-time equivalent job per year.

company seeking to utilize local resources and build on historical infrastructure is Opportunity Threads, a Burke County textile company. Founded in 2009, Opportunity Threads is worker-owned and committed to reclaiming the area's textile heritage and providing economic opportunities for local residents. Opportunity Threads has collaborated with the Manufacturing Solutions Center and Burke Development, Inc., to create the Carolina Textile District, which provides manufacturing and development resources to local designers and entrepreneurs throughout western North Carolina. This collaboration seeks to provide employment, build wealth for local workers, revitalize the textile industry, and sustain local heritage, particularly for young residents of rural western North Carolina.[21]

An additional 0.72 workers are employed for every one worker employed in health care and an additional $0.55 in wages is earned in a community for every one dollar paid to health care workers.

Recruit and Retain Industry

In addition to investing in existing regional industries, North Carolina must also invest in recruiting additional industry to rural areas as a strategy for economic development. Renewed focus on strengthening the health care industry and identifying opportunities in high value added manufacturing are key economic drivers.

As discussed more fully in Chapter 8, many areas of rural North Carolina suffer from a shortage of health care providers. This shortage leads to direct adverse effects on the health of these areas' residents, and can have negative economic consequences for the region.

North Carolina has recently seen the financial downturn of many rural hospitals. Due in part to the fact that local hospitals are in the top three employers in many counties, the impact of these downturns can be economically devastating, with research estimating long-term decreases of 1.5% in per capita income with a hospital closure.[22] There is also a multiplier effect to health care jobs and wages, with an additional 0.72 workers employed for every one worker employed in health care and an additional $0.55 in wages in a community for every one dollar paid to health care workers.[23] Estimates show that for every 10 critical access hosptial (CAH) employees in rural communities, an additional 7.6 jobs indirectly depend on the CAH's economic activity.[24] In addition, the National Center for Rural Health Works at Oklahoma State University estimates that the closing of one CAH would result in the loss of 141 jobs and have an income impact of $6.8 million to a community.For these and other reasons, it is therefore critical to commit resources and effort to keeping health care providers and hospitals in rural communities.

In many cases, rural hospitals suffer financially because patients are disproportionately poor and/or uninsured. According to the North Carolina Hospital Association, rural hospitals have an average 75.4% of patients on Medicaid, Medicare, or without insurance, compared to 68.2% in urban hospitals.[22] While the payer mix may change due to increased insurance coverage through the Affordable Care Act, new models of care may be necessary for rural health care providers to remain in their communities. In Anson County, for

example, the traditional 125-bed hospital, built in the 1950s, was too large and costly for the small community. The Carolinas HealthCare System, which operated the Anson County hospital, closed the hospital and built a new facility focused on outpatient care, with a free-standing emergency department, outpatient clinics, and an on-site nursing home facility.[25] By replacing struggling hospitals with more cost-effective and accessible facilities, rural areas can keep jobs in the community and remain financially viable.

The retention of primary care providers also has a strong economic impact on rural communities. For each primary care physician in a rural area, there is an average of four jobs created in the physician's office: one physician, one nurse, one medical technician, and one receptionist, with a total compensation (including salary and benefits) of $395,024.[26] In addition, because of the referrals to hospitals that physicians make, there is also a large downstream financial impact on a rural hospital. The revenue that primary care physicians create from inpatient and outpatient services helps create an estimated 13.5 additional jobs at the local hospital, with a total compensation of $704,444. The increase in jobs and salaries at the physicians' offices and hospitals also has an impact on the greater local economy, with secondary impacts estimated at approximately $1.35 million in the local economy.[26]

For each primary care physician in a rural area, there is an average of four jobs created in the physician's office: one physician, one nurse, one medical technician, and one receptionist, with a total compensation of $395,024.

In addition to the impact that increasing health sector jobs can have on local rural economies, improving the health care infrastructure of a community can also have a broader beneficial impact on recruiting industry to rural areas. Businesses report that the existence of a strong health care system is a top priority when deciding where to pursue relocation or expansion of a company. A strong health care system also helps promote a healthier workforce and helps businesses to recruit employees from other areas.[27] The retention of health care facilities and robust health care infrastructure also ensures that areas can attract and keep retired residents who bring economic growth to communities.

North Carolina also has significant opportunity to recruit and enhance manufacturing in order to improve the economic security of rural communities. Historically, manufacturing has been a large part of North Carolina's economy, especially in textiles, tobacco, and furniture. More recently, high tech industries including pharmaceuticals, aviation, transportation, and electronics have emerged as key parts of North Carolina's manufacturing sector, contributing to North Carolina's rank as the fourth largest manufacturing state.[28] Manufacturing is a large portion of the North Carolina economy, making up 84.4% of total exports and 10.9% of jobs statewide, and over 20% of jobs in some rural counties.[29] Like most industries, manufacturing experienced a downturn in the recessions of the early 2000s. However, in recent years it has been making a comeback in North Carolina. Some industries are shifting to local material and labor sourcing as international costs increase. Growth through 2011 and 2012 brought total manufacturing jobs to approximately 440,000 in the state.[29] Manufacturing jobs also tend to have higher wages, with an average salary in North Carolina of $63,457 annually, compared to the average non-farming

salary of $41,520.[28] In addition, growth in manufacturing also can lead to economic expansion in other sectors, as area manufacturing leads to increased need for utilities, local retail, and management and employment services.[30] For every dollar in manufacturing output, there is an additional $1.75 created in the local economy.[28]

For every dollar in manufacturing output, there is an additional $1.75 created in the local economy.

Within both the manufacturing and the agriculture sector, high value-added products also show great promise in improving North Carolina's rural economy. A manufactured good becomes a high value-added product when the manufacturer enhances its value through additional processing, packaging, or marketing in a way that allows the product to meet a different demand or fulfill a niche market. Expansion of high value-added products allows for lower costs through lower expenditures on transportation (i.e. transporting raw goods to another facility for additional processing) and other supply chain logistics. Establishing high value-added products is a way for manufacturers and farmers to increase their profitability and receive additional recognition for their business and products. Examples of high value-added products include converting soybean oil into biodiesel fuel; direct marketing of local and/or organic foods to local restaurants and businesses (while marketing as such); and running an ice cream or cheese shop as part of a dairy farm.[31] Other high value-added industries that are growing in North Carolina include microbreweries that produce craft beers from locally-produced hops, wineries that attract visitors to their regions, and grass-fed beef, pork, and other specialty meat products.

Create Workforce Development Programs to Support the Local Economy

Developing a strong workforce is another priority for rural areas seeking to improve economic security. It is important to address workforce development in order to encourage and incentivize young people to remain in or relocate to work in these communities rather than migrate to urban centers in search of better job opportunities. This is particularly important as existing workers age out of the workforce.

In June 2012, the North Carolina Rural Economic Development Center (the Rural Center) awarded the first 25 grants of its New Generation initiative, which targets communities with grants of up to $100,000 to develop business-driven training, job placement, and rural career path development assistance. The New Generation grants also fund projects that seek to recruit young adults to rural areas and improve technical skills. The Department of Commerce administers the Rural Community Mobilization Project which funds community organizations (including community colleges, economic development agencies, and workforce development agencies) in connecting unemployed and underemployed workers with job training and job placement services. From January 2010 to May 2011, the Mobilization Project served 1,821 people, with 936 participating in education or job-related training, 562 earning a credential, and 322 participants finding a new job.[32,33] Several of these projects emphasize demand-driven workforce development by developing programs

supported directly by individual employers or in industries where employers have identified the greatest need for new workers.[34]

The Conservation Fund also administers several projects aimed at developing the rural workforce. Through the Resourceful Communities initiative, the Conservation Fund uses a "triple bottom line" approach (environmental stewardship, sustainable economic development, and social justice) to address the economic needs of rural communities, and provides small grants to local grassroots organizations for job training and economic growth projects.[35]

The North Carolina Community College System (NCCCS), a statewide network of 58 community colleges, is also heavily involved with workforce development within their respective communities, many of which are rural areas. SuccessNC is a planning initiative of NCCCS that aims to increase the percentage of students who transfer, complete credentials, or remain continuously enrolled from a six-year baseline of 45% in 2004 to 59% in 2014. SuccessNC has multiple components, including Career and College Promise, which offers dual enrollment programs for high school students wishing to earn college transfer credit and technical education certification.[36] NCCCS also works with the North Carolina Department of Public Instruction to administer the North Carolina High School to Community College Articulation Agreement, which provides opportunities for students to receive community college credit for proficiency in high school courses in the same subject.[36]

The North Carolina Community College System administers the Small Business Center Network, which provides resources and assistance for small business owners and employees, including business development, marketing, bookkeeping, taxes, and assistance with networking.

NCCCS works directly with business and industry to develop career training and job readiness programs tailored specifically to the businesses' workforce needs. Through the Customized Training Program, NCCCS focuses on job growth and productivity for local businesses. The program provides community college representatives who collaborate directly with local businesses to determine and coordinate the kinds of assistance they need. Offered services include training needs assessment, curriculum design and development, orientation development, and lab and computer training.[37] NCCCS also administers the Small Business Center Network, which provides resources and assistance for small business owners and employees, including business development, marketing, bookkeeping, taxes, and assistance with networking.[38] To this end, federal grant money has recently been allocated toward linking community colleges directly with business and industry associations and expanding on the job training through apprentice programs.[39] In addition to the programs focused on skill development and workforce readiness for young adults, some communities are expanding their focus to include workforce development and training programs for middle and high school students. The NCEast Alliance, a nonprofit organization dedicated to economic development for eastern North Carolina, addresses workforce development through the STEM East project. STEM East works with middle school and high school students to engage and enhance learning in science, technology, engineering, and math (STEM), preparing students for local work in these fields. STEM East also created a

public/private partnership between public schools, businesses, government, community organizations, and higher education institutions to develop teacher-training programs and regional advocacy programs, as well as offer preliminary job opportunities to students and identify other specific regional workforce needs.[40] By reaching students at an earlier age, STEM East aims to develop a skilled workforce, incentivize employers to "grow their own" workforce, and encourage students to remain in their home communities.

Many community- and state-level agencies and nonprofits provide services, programs, and financial assistance to support workforce training and small business development that is needed for diverse rural economies.

There are many community- and state-level agencies and nonprofits that provide services, programs, and financial assistance to support workforce training and small business development that is needed for diverse rural economies; a few examples are described below. North Carolina's Small Business and Technology Development Center (SBTDC) is the business and technology extension service of the University of North Carolina system (UNC), which is administered by North Carolina State University and operated in partnership with the US Small Business Administration. Through 10 regional service centers in 15 offices and six special programs, SBTDC provides management counseling and educational services to small and mid-sized businesses. Opportunities Industrialization Centers are located in Rocky Mount and Wilson, and provide a wide range of services and programs that address the integrated educational, economic, and social needs of workers. Community development financial institutions (incliding the Latino Community Credit Union, Mountain BizWorks, Natural Capital Investment Fund, NC Community Development Initiative, Self-Help Credit Union, SJF Ventures, and The Support Center) provide loans and technical assistance to entrepreneurs. Community economic development organizations (incliuding the Land Loss Prevention Project, North Carolina Association of Community Development Corporations, North Carolina Community Development Initiative, North Carolina Indian Economic Development Initiative, North Carolina Institute of Minority Economic Development, North Carolina Rural Center, North Carolina REAL Enterprises, RAFI-USA, The Conservation Fund's Resourceful Communities, and others) provide grants, training, technical assistance, and other support to community-driven rural community and economic development.

Many organizations are also providing scholarship opportunities for young rural students with the intention of providing educational opportunities and job training for those wishing to remain in their home communities. The Golden LEAF Foundation, a nonprofit dedicated to the economic development of rural areas, has awarded nearly $30 million to more than 10,000 students since its inception. Golden LEAF's scholarship programs provide funding for students from tobacco dependent and economically stressed counties to attend either two-year or four-year colleges. For those students attending colleges away from home, recipients must express a commitment to return or relocate to economically-distressed rural counties.[41] The Golden LEAF scholarships aim to revitalize these areas and provide replacement workers for the aging workforce. In 2013, more than 200 scholarship recipients from 68 rural counties participated in internships

and other career development programs in health care, law, education, and other industries.[42]

Based on evidence concerning the ways in which the economic strength of a community relates to health outcomes, one of the priorities of the Rural Health Action Plan is to focus more resources on rural economic development activities. This should include a focus on investments in the local infrastructure, development of local resources and regional industries, and efforts to recruit or support local health and manufacturing industries. Rural economic development activities should also include an investment in workforce development to ensure an adequate local supply of workers with the skills required for the next generation of workers.

Recommendation 1: To improve the economy of rural and economically distressed counties, the Task Force recommends:

a) The Department of Commerce (DOC) and rural funders should:

1) Create a dedicated funding stream for rural communities to further investments in infrastructure, regional industry, manufacturing, and workforce development.

2) Work with local and regional offices of economic development to invest in economic development activities that capitalize on local strengths and resources.

3) Work with rural businesses and community organizations to enhance broadband access (particularly "last-mile" access) and infrastructure for rural communities.

4) Fund or provide support to local entrepreneurs to develop high quality jobs and businesses that build on local resources to grow regional industries.

5) Develop a system of incentives and grants to encourage high value-added manufacturing and agriculture industries including farming, fishing, and forestry and to make investments in rural areas.

b) To promote local agriculture and the sale of agricultural produce to local businesses, schools, and other government agencies, as well as directly to consumers:

1) The North Carolina Farm Bureau and other agricultural support organizations and agencies should provide technical assistance to small farmers to help minimize costs and support GAPs certification.

2) **The North Carolina Department of Agriculture and Consumer Services, DOC, and the Division of Public Health within the North Carolina Department of Health and Human Services should review and revise, as necessary, existing regulations related to local farm rules in order to remove barriers to farm-to-table initiatives while still protecting public health.**

3) **Rural funders should consider investing in projects that support local food programs, especially those that focus on marketing directly to consumers (particularly those with low-income), and improving consumer access, as these programs may be financially feasible and improve rural health outcomes.**

c) **The North Carolina General Assembly and Department of Revenue should continue to encourage investments in renewable energy development through tax and other incentives.**

d) **Rural funders, the Office of Rural Health and Community Care, and the DOC should invest in rural health care, including recruitment and retention of providers to rural communities (discussed in Recommendation 6), and support for rural clinics and other rural health care institutions.**

e) **The North Carolina Community College System and Local Educational Agencies should continue to partner with small businesses, rural entrepreneurs, and local economic development offices to develop the rural workforce.**

1) **The North Carolina Community College System should enhance programs that offer college transfer credit to high school students proficient in college subjects.**

2) **Community colleges should offer career readiness certificates for job skills commensurate with the education of students in the community college and the needs of community businesses and industries. These career readiness certificates should be focused on the industries local to a community college and developed in partnership with local industries.**

f) **Rural funders should focus on supporting the recruitment and development of local, talented leaders. Funders should provide scholarship opportunities to talented youth leaders who agree to return, or relocate, to live and work in rural communities in exchange for scholarship funding.**

References

1. United States Department of Agriculture Economic Research Service. State fact sheets: North Carolina. http://www.ers.usda.gov/data-products/state-fact-sheets/state-data.aspx?StateFIPS=37&StateName=North%20Carolina#.Ux8BqYXfjJs. Accessed March 11, 2014.

2. North Carolina Institute of Medicine. *New Directions for North Carolina: A Report of the NC Institute of Medicine Task Force on Child Abuse Prevention*. Morrisville, NC: North Carolina Institute of Medicine; 2008. http://www.nciom.org/projects/childabuse/2008update.pdf. Accessed July 15, 2014.

3. Imai S. Center for Health Services Research and Development. Disparities in Health Status and Health Risk Factors in Eastern North Carolina: Data from the Behavioral Risk Factor Surveillance System, 2005-2009 Aggregated. Greenville, NC: East Carolina University; 2011. http://www.ecu.edu/cs-dhs/chsrd/BehRiskFactors/upload/BRFSS-disparities-in-health-and-risk-factors-2005-09.pdf. Accessed July 15, 2011.

4. Athar HM, Chang MH, Hahn RA, Walker E, Yoon P. Centers for Disease Control and Prevention. Unemployment—United States, 2006 and 2010. *MMWR_Surveill-Summ*. 2013;62(3):27-32.

5. Rural Development Division. Building reuse grants. North Carolina Department of Commerce website. http://www.nccommerce.com/rd/rural-grants-programs/building-reuse. Accessed April 11, 2014.

6. Rural Development Division. Economic infrastructure program. North Carolina Department of Commerce website. http://www.nccommerce.com/rd/rural-grants-programs/economic-infrastructure. Accessed June 27, 2014.

7. Mahasuweerachai P, Whitacre B, Shideler D. Does broadband access impact migration in america? examining differences between rural and urban areas. *The Review of Regional Studies*. 2010;40(1):5-26.

8. Strategic Networks Group: NC and SNG release broadband findings for North Carolina. Strategic Networks Group website. http://sngroup.com/e-nc-and-sng-release-broadband-findings-for-north-carolina/. Published October 2010. Accessed July 15, 2014.

9. Crandall R, Lehr W, Litan R. The Brookings Institution. *The Effects of Broadband Deployment on Output and Employment: A Cross-sectional Analysis of U.S. Data*. Washington DC. The Brookings Institution; 2007. http://www.brookings.edu/views/papers/crandall/200706litan.pdf. Accessed April 23, 2014.

10. Microelectronics Center of North Carolina. North Carolina TeleHealth Network: Public Health and Hospitals. Microelectronics Center of North Carolina website. https://www.mcnc.org/our-community/healthcare. Accessed April 15, 2014.

11. Ellis A. Telepsychiatry project delivers mental health care to remote corners of NC. North Carolina Health News website. http://www.northcarolinahealthnews.org/2013/03/01/telepsychiatry-project-delivers-mental-health-care-to-remote-corners-of-nc/. Published March 2013.Accessed April 16, 2014.

12. United States Department of Agriculture. USDA Rural Development Programs & Opportunities. United States Department of Agriculture website. http://www.rurdev.usda.gov/ProgramsAndOpportunities.html. Published September 14, 2011. Accessed July 9, 2014.

13. United States Department of Agriculture. *2012 Census of Agriculture Preliminary Report U.S. and State Data*. Washington, DC: United States Department of Agriculture, 2014. http://www.agcensus.usda.gov/Publications/2012/Preliminary_Report/Full_Report.pdf. Accessed April 11, 2014.

14. GNP Company. *Farm to Fork Report 2012*. St. Cloud, MN: GNP Company; 2013.http://gnpcompany.com/files/GNPCO_AnnualF2FReport.pdf. Accessed July 15, 2014.

15. Kizer J; NC Cooperative Extension. NC Fresh Produce Safety Task Force promotes message on Capitol Hill. NC State University website. http://ncfreshproducesafety.ncsu.edu/contact-us/n-c-fresh-produce-safety-task-force. Published May 1, 2010. Accessed April 11, 2014.

16. American Planning Association. Policy guide on community and regional food planning. American Planning Association website. http://www.planning.org/policy/guides/pdf/foodplanning.pdf. Published May 11, 2007. Accessed April 14, 2014.

17. United States Department of Agriculture. USDA StrikeForce Announced for North Carolina. Natural Resources Conservation Service North Carolina. United States Department of Agriculture website. http://www.nrcs.usda.gov/wps/portal/nrcs/detail/nc/newsroom/releases/?cid=NRCS142P2_046765. Published March 26, 2013. Accessed July 31, 2014.

18. RTI International. *Economic Impact Analysis of Clean Energy Development in North Carolina – 2014 Update*. Research Triangle Park, NC: RTI International; 2014. http://www.rti.org/pubs/ncsea_2013_update_final.pdf. Accessed April 17, 2014.

19. Governor Pat McCrory proclaims June Solar Energy Month in North Carolina [press release]. Raleigh, NC: State of North Carolina; June 4, 2013. http://www.energync.net/LinkClick.aspx?fileticket=SBCWHMFs3V0%3d&tabid=1653&mid=4596. Published June 4, 2013. Accessed April 11, 2014.

20. North Carolina Wind Energy. North Carolina Wind Application Center. Appalachian State University website. http://wind.appstate.edu/programs/small-wind-initiative. Published 2014. Accessed June 27, 2014.

21. Carolina Textile District. Textile production unravelled. Carolina Textile District website. http://www.carolinatextiledistrict.com/value-chain/. Accessed April 11, 2014.

22. Fleming ST, Williamson HA Jr, Hicks LL, Rife I. Rural hospital closures and access to services. *Hosp Health Serv Adm*. 1995;40(2):247-262.

23. NC Office of Rural Health and Community Care. Health care and North Carolina's economy. http://www.ncdhhs.gov/orhcc/data/01opening_text.pdf. Accessed January 4, 2012.

24. Keilers LW. The future of healthcare: It starts with you. A focus on national health policy trends. Talk presented at: 27th NW Regional Rural Health Conference; March 18, 2014; Spokane, WA. http://extension.wsu.edu/ahec/conferences/cah-rhc/cah/schedule/Documents/CAH%202014/CAH%20Lunch%20Plenary.pdf. Accessed April 23, 2014.

25. Hoban R. Local hospitals drive local economies as they evolve. *North Carolina Health News*. http://www.northcarolinahealthnews.org/2013/08/16/rural-hospitals-drive-local-economies-even-as-they-evolve/. Published August 2013.Accessed April 16, 2014.

26. Eilrich FC, Doeksen GA, St. Clair CF. National Center for Rural Health Works. *The Economic Impact of a Rural Primary Care Physician and the Potential Health Dollars Lost to Out-migrating Health Services*. Stillwater, OK: Oklahoma State University; 2007. http://ruralhealthworks.org/wp-content/files/Physician-Dollars-Jan-2007.pdf. Accessed July 15, 2014.

27. Gerlach D. Jobs and economic security develop regional industries and local resources overview. Talk presented to: North Carolina Institute of Medicine Task Force on Rural Health; March 5, 2014; Greensboro, NC.

28. Institute for Emerging Issues. NC Manufacturing Facts. North Carolina State Univeristy website. http://iei.ncsu.edu/wp-content/uploads/2013/01/manufacturingworks.pdf. Accessed April 23, 2014.

29. The North Carolina Rural Economic Development Center. *Our Manufacturing Future: Part 1 Findings Toward a More Prosperous Rural North Carolina*. Raleigh, NC: The North Carolina Rural Economic Development Center; 2013. http://www.ncindian.com/docs/NC%20Manufacturing%20Future%202013.pdf. Accessed April 11, 2014.

30. Lind M, Freedman J. New America Foundation. *Value Added: America's Manufacturing Future*. Washington, D.C; New America Foundation: 2012. http://files.publicaffairs.geblogs.com/files/2013/02/Lind-Michael-and-Freedman-Joshua-NAF-Value-Added-Americas-Manufacturing-Future.pdf. Accessed April 11, 2014.

31. National Sustainable Agriculture Coalition. Value-Added Producer Grants. National Sustainable Agriculture Coalition website. http://sustainableagriculture.net/publications/grassrootsguide/local-food-systems-rural-development/value-added-producer-grants/. Accessed April 11, 2014.

32. The North Carolina Rural Economic Development Center. 2012 *Annual Report* http://mobile.ncleg.net/documentsites/committees/govops/Full%20Commission/2012%20Meetings/10_October%202012/1.%20Mandated%20Reports/Natural%20&%20Economic%20Resources/REDC_2012_Annual_Report_NCREDC_2012-08-30.pdf Accessed April 11, 2014.

33. North Carolina Commission on Workforce Development. *Putting North Carolina Back to Work; Preparing North Carolina's Workforce and Businesses for the Global Economy*. Raleigh, NC: North Carolina Department of Commerce; 2011.. http://www.nccommerce.com/Portals/11/Documents/Reports/NC-Back-to-Work.pdf. Accessed April 16, 2014.

34. CD Liston Consulting. *Demand-Driven Workforce Development Practices in North Carolina: Findings and SWOT Analysis from an Environmental Scan*. The North Carolina Rural Economic Development Center; 2010. http://www.ncruralcenter.org/images/PDFs/demand-driven%20workforce%20dev%20%20practices.pdf. Accessed April 11, 2014.

35. The Conservation Fund. Resourceful communities: investing in communities. The Conservation Fund website. http://www.conservationfund.org/our-conservation-strategy/major-programs/resourceful-communities-program/investing-in-communities/. Accessed June 27, 2014.

36. Success NC. Career and college promise. North Carolina Community College System website. http://www.successnc.org/initiatives/career-college-promise-0. Accessed April 16, 2014.

37. North Carolina Community Colleges Workforce continuing education. North Carolina Community College System website. http://www.nccommunitycolleges.edu/workforce-continuing-education. Accessed April 15, 2014.

38. Small Business Center Network. Business alliances. North Carolina Community College System website. https://www.ncsbc.net//DocumentMaster.aspx?doc=1006. Updated March 24, 2011. Accessed April 16, 2014.

39. Wilson S. Obama announces $600 million in grant programs to prepare workforce for jobs. *Washington Post*. April 16, 2014. http://www.washingtonpost.com/politics/obama-to-announce-600-million-in-grant-programs-to-prepare-workforce-for-jobs/2014/04/16/8feebcb8-c4e9-11e3-bcec-b71ee10e9bc3_story.html. Accessed April 17, 2014.

40. STEM East. About us. STEM East website. http://stemeast.org/about-us/. Accessed April 11, 2014.

41. Golden LEAF Foundation. Golden LEAF scholarship programs. Golden LEAF Foundation website. http://www.goldenleaf.org/scholarships.html. Updated April 4, 2014. Accessed April 11, 2014.

42. Golden LEAF Foundation. *Golden LEAF Foundation. 2013 Annual Report*. Rocky Mount, NC: Golden LEAF Foundation; 2014. http://www.goldenleaf.org/files/annualreport2013.pdf. Accessed April 11, 2014.

Early Care, Parenting Supports, and Education

Chapter 4

Early childhood neuroscience has demonstrated that children make new neuronal connects from ages 0-6. Although rapid learning continues beyond age 6, neuronal connections are lost. The more stimulating and less stressful the early childhood environment is, the more rapidly a child will learn and be prepared for elementary school. That preparation sets the critical stage for lifelong academic and career success. Education research has repeatedly shown that high quality, center-based care can improve school readiness and academic success, findings that persist into early workforce entry.[1-3] These findings are especially robust among children at risk for poor educational achievement, a risk largely determined by poverty. Because of the importance of early childhood development on a child's later educational and professional success, the Task Force on Rural Health established, as one of its priorities, to focus on early care, education, and parenting supports to help ensure school readiness.

The Young Brain

Infants, toddlers, and preschoolers have an amazing ability to form new connections and acquire new knowledge and skills. We know from research on language acquisition that young children (those between ages 3-7) can acquire a new language much more rapidly and with superior ultimate competency than older children or adults.[4] Studies have shown that infants develop new neuronal connections very rapidly, and in fact develop an excess of neuronal connections that will be pared down later in childhood.[5,6] Stimulating and stable environments with rich social interactions are critical to early brain development and language acquisition. An unfortunate corollary is that toxic stress, poverty, and neglect have all been shown to be associated with limited early brain development.[7,8]

School success can be predicted at entry into school. A child's academic skills at age 5 predict how he or she will fare academically in adolescence and beyond.[9,10] Certainly cognitive and academic skills are still resilient at entry into school and intervention can help ameliorate deficits. However, other skills, such as vocabulary and attention capacity are less resilient by the time of school entry and are highly subject to early environmental influences such as stimulating environments.

There has been an explosion of research and interest into early learning over the past four decades. We now know that infants acquire a range of abilities related to language, human interaction, counting, spatial reasoning, causality, and problem solving. There is some data to support specific stimulating contexts on infant development in some areas. For example, preschool language skills and vocabulary size have been related to the sheer amount that mothers talk to their infants.[11] Such qualities as explaining, giving choices, and listening are much more predictive of language development than sheer volume of talking.[11] In a large study of 5 year olds followed over time, vocabulary comprehension

I have been an active participant in the Child Care WAGE$ Project for the past four years. I remember as if it were yesterday when I received my first supplement from WAGE$. I felt appreciated. Participation in this program has helped to relieve the burden that comes with managing a household, continuing education, and maintaining an effective classroom. WAGE$ allowed me to maintain my employment in early childhood education as a teacher, and now I can proudly say I serve as director of our school and will soon receive my bachelor's degree in Educational Studies.

Shawanda Jordan
Director, Church of the Good Shepherd Day School, Rocky Mount, NC

at age 5 ranged from that of a typical 2 year old to that of a typical 10 year old, and these differences persisted over time.[12] One study demonstrated that 5 year old children of low socioeconomic status (SES) had lower language test scores and lower development of a brain region highly involved in language known as Broca's area.[13] The authors postulated that it was not SES per se that 'caused' Broca's area to be less developed, but that this was due to decreased opportunities to learn. Children of low SES backgrounds may have fewer such opportunities in early childhood.

High quality, center-based care can augment the social and developmental nurturing provided in the home.

Stimulating early childhood environments that promote school readiness can include home, center-based care, informal and formal child care, and the larger community. There is no 'right' kind of care or environment for all children. High quality, center-based care can augment the social and developmental nurturing provided in the home. This is particularly important for low-income families that may not have the same resources or skills to provide an enriching academic home environment. For example, families with low socioeconomic status have been shown to have fewer children's books in the home.[14] In addition, high quality child care is in short supply in many communities, especially in rural areas. Lastly, the cost of high quality, center-based care may be prohibitive to many families. Though many poor and near-poor families may be eligible for child care subsidies, wait lists for those subsidies preclude many needy families from the opportunity for high quality, center-based care. It is for these reasons that the Task Force on Rural Health focused on recommendations to support high quality nurturing environments in the home and the early care and education settings.

Early Care and Education

Second to the home, the early care and education environment is the place where children ages 0-5 spend the most time. In 2011, approximately 24% of children ages 0-5 were enrolled in licensed care in North Carolina in any given month. We know that many more children spend some portion of the year moving in and out of care as parents' work schedules change.[a] Nationally, 83% of children spend some time in non-parental care or education arrangements and 64% of children spend some time in formal early care or education the year before kindergarten.[15] Because so many young children spend time in formal child care or preschool arrangements, these settings are important opportunities for learning, nurturing, and early brain development.

In addition to the sheer volume of time children spend in early care and education, these environments are easier than the home environment to influence in ways that improve nurturing and stimulation. For example, the state can set caregiver ratios, teacher education requirements, a behavioral support system, and a curriculum in center-based care. It goes without saying that the state cannot establish such requirements in the home environment.

a Pat Hansen, MPH. Project Manager, Shape NC, The North Carolina Partnership for Children, Inc. Email communication. January 18, 2013.

The recommendations from this chapter focus on early childhood, ages 0-8. Most children start formal school at or by age 6. However, both research and policy on early childhood education and cognitive neuroscience tends to include early grade school. There are a number of reasons for this. The child care and education functions of substitute caregiving, which include safety and enrichment, extend into elementary school. Also, a child's approach to learning fundamentally shifts when she makes the developmental transition from learning to read to reading to learn. Literacy skills must be well supported by age 8 for ongoing educational success. By including the transition to elementary school as we considered school readiness, the Task Force acknowledged that all children won't be at the same level of readiness to learn by kindergarten entry, but the ongoing work in early care, education, and parenting support, which is a focus of many Smart Start Partnerships, could continue to support this transition.

Research Surrounding High Quality Early Childhood Education

There has been substantial research into the impact of high quality center-based care on early childhood development and academic success. The sentinel studies, the Perry Preschool Project, the Abecedarian Project, and the Head Start Impact Study merit special attention.[1-3]

The Perry Preschool Project randomized 123 low-income African-American children in Ypsilanti, Michigan in high quality center-based care or control conditions (usually home or relative care). Children have been followed through age 40. Children who were in center-based care were enrolled in full-time child care for two years, from approximately age 3-5. Most teachers had a master's degree and all had completed training in child development. There were no more than 16 children in a class and two lead teachers as well as a teacher's assistant. The preschool classes followed one of three specific theory-based curricula. Children were matched on gender, IQ, and socioeconomic status. When the study started, the average IQ for children in both groups was 79. The IQ for children in the treatment group rose to 102 (control: 83) after one year in the preschool and was 92 at age 10 (control: 85). As adults, children who participated in the preschool program had higher incomes, were more likely to have jobs and have completed high school, and have committed fewer crimes than those in the control group.[1]

Children who participated in the preschool program had higher incomes, were more likely to have jobs and have completed high school, and have committed fewer crimes.

The Abecedarian Project followed four cohorts of children enrolled in full-time early care and education from infancy through age 5 in Chapel Hill, North Carolina. Children had individualized educational programs and low teacher ratios. The curriculum focused on education as play in the curricular areas of social, emotional, and cognitive development, with a special emphasis on language skills. Children were followed through age 21. Children in the intervention group had higher IQs starting as toddlers through age 21, higher academic achievement in reading and math through young adulthood, were

more likely to attend college, and were more likely to have their first child at a later age. Not only are the results of this program impressive for the young children, but mothers of intervention preschoolers were more likely to go further in school and have better employment than those in the control group.[2]

While the two previous examples represent exclusively urban based centers, 30% of centers in the Head Start Impact Study were from rural counties, comprising 23% of the total children in the study. The Head Start Impact Study was a large scale attempt to evaluate the Head Start national program that serves many low-income children. In the 2012-2013 academic year, 1,130,000 children were served by Head Start for at least some time during the year. Head Start serves mostly 3 and 4 year olds from low-income families.[3] The Head Start Impact study included 4,667 newly entering 3 and 4 year olds. There were modest gains over the course of the year in cognitive and socio-emotional development; however, findings generally did not persist beyond the Head Start year. This study highlights real world challenges of large scale implementation of early care and education. Compared to the smaller Abecedarian and Perry Preschool projects, the quality was less consistently high. In the Head Start Impact Study, 70% of children were in high quality programs; 60% with curriculum that emphasized language and math, and 60% of children had teachers with an associate's degree or bachelor's degree.[16]

Full-time child care, longer-term child care, low teacher ratios, high quality and specific curriculum emphasizing math and literacy, and higher teacher education all support school readiness and long-term academic success.

The sum of evidence from these and other studies on formal early care education indicate that earlier child care (ages 0-2) has more short- and long-term impacts on cognitive development and school performance. Furthermore, full-time child care, longer-term child care, low teacher ratios, high quality and specific curriculum emphasizing math and literacy, and higher teacher education all support school readiness and long-term academic success.[1-3]

Quality of Care in North Carolina

Child care quality has been rated using a star system in North Carolina since 1999. All licensed child care centers receive a star rating from 1-5, based on program standards and education standards. The program standards are rated using an observation scale [either the Early Childhood Environment Rating Scale (ECERS), the Infant/Toddler Environment Rating Scale (ITERS), or the Family Child Care Environment Rating Scale (FCCERS)]. These rating scales include observations of sufficient space, variety of play materials, clean and comfortable play area, interactions between adults and children, interactions between children, and interactions of children with activities and material. The education standards component of the star rating includes education and experience of lead administrators and the level of education and experience of classroom teachers.[17]

Since moving to a more rigorous system in 2005, most licensed facilities have improved in quality and are now licensed as 4 or 5 star centers or family child care homes (see Table 4.1). However children living in urban or economically advantaged (Tier 3) counties are more commonly enrolled in 4 or 5 star child

care programs than if they live in rural or economically distressed (Tier 1) counties (see Table 4.2).

Table 4.1
North Carolina Child Care Program Star Ratings[18]

	Center-Based (Number, %)	Home-Based (Number, %)
1 Star	85 (2%)	390 (16%)
2 Stars	37 (1%)	282 (11%)
3 Stars	946 (20%)	748 (30%)
4 Stars	1,153 (24%)	716 (29%)
5 Stars	1,929 (41%)	326 (13%)
Other[b]	570 (12%)	12 (< 1%)
Total	4,720	2,474

Table 4.2
North Carolina 4 or 5 Star Child Care Programs* Enrollment by Rural and Tier Classifications

	Rural	Urban	
Percent of children in child care who are enrolled in 4 or 5 star child care programs	59.6%	66.5%	
	Tier 1	**Tier 2**	**Tier 3**
Percent of children in child care who are enrolled in 4 or 5 star child care programs	59.1%	58.5%	70.0%

*Child care programs includes licensed child care centers and family child care homes.[c]

Children living in urban or economically advantaged counties are more commonly enrolled in 4 or 5 star child care programs than if they live in rural or economically distressed counties.

Subsidies

Child care subsidies are administered through a local agency, often a department of social services. The subsidies are from a combination of state and federal funds and are administered based on a legislatively determined allocation formula. If a local agency has more eligible applicants than funds allow, the local agency can establish priorities for allocation of funding. Parents are allowed to use the child care subsidies to support their needs for child care in any arrangement that is most appropriate for their family, so long as the child care service provider accepts subsidies. Regulated care must be of 3, 4, or 5 star quality to receive child care subsidies. Child care subsidies are only available to families that meet situational and income criteria. Families must meet one or more of the following: parents working, looking for work, or in a job training program; children receiving child protective services or child welfare services; or children having an identified developmental need.[19]

b Other ratings include those which have probationary, provisional, religious, special, and temporary permits.

c Pat Hansen, MPH. Project Manager, Shape NC, The North Carolina Partnership for Children, Inc. Written (email) communication. January 18, 2013.

Currently, 71,573 children in North Carolina receive child care subsidies.[20] However, available subsidies do not adequately meet the need. As of July 2012, there were 34,252 children on the waiting list.[20] Child care subsidies offer an opportunity for children who may be at risk for low school readiness to participate in high quality center-based care. Some counties have chosen to incentivize quality by offering higher subsidy rates to higher rated centers. One drawback to this approach is that it inevitably means there will be fewer subsidized child care slots without commensurate increases in resources. However, given the research on early childhood brain development and school readiness, the Task Force concluded that incentivizing quality was critical to maximizing impact on school readiness.

As of July 2012, there were 34,252 children on the waiting list for child care subsidies.

Workforce Development

A professional workforce is critical to the delivery of high quality child care. Credentials and ongoing training have been strongly associated with teacher quality and academic success in child care and early education. Training takes place in university and community college settings across the state. The quality star rating system incentivizes centers to encourage teachers to get ongoing education. However, less than half of child care teachers in North Carolina have a two or four year degree and many make minimum wage.[21] With low salaries and benefits, it is hard for an individual teacher to justify ongoing education and investment in early childhood education as a profession. Studies conducted outside of North Carolina have demonstrated that teacher education is, on average, lower in rural areas than urban areas.[22,23] The Child Care Services Association runs two important programs to support workforce development of teachers in the state: T.E.A.C.H Early Childhood Project – North Carolina and the Child Care WAGE$® Project – North Carolina. The Teacher Education and Compensation Helps (T.E.A.C.H) program provides a partial scholarship to child care teachers for college coursework in early education and provides a cash bonus upon completion. In return, the teacher commits to continued work in the field of early childhood education for 6-12 months, depending on the scholarship. In 2011-2012, 3,831 teachers received T.E.A.C.H scholarships.[24] WAGE$® supports ongoing education and decreases teacher turnover by providing a salary supplement to teachers based on ongoing education, center quality, and partnership with the local Smart Start. As a teacher advances his or her education, WAGE$® salary supplements increase.[25] Local Smart Start agencies are critical partners in these child care workforce development efforts.

Parenting Supports

Children spend more time at home with their parents or caregivers than in any other setting. The relationships children have with their parents or caregivers have a profound impact on cognitive, linguistic, emotional, social, and moral intelligence. Supporting parents in their caregiver roles may have an important impact on school readiness. Three decades of research on parent support programs illustrates some common themes. Most parenting support programs target low-income families, provide social support, and educate

parents about child development.[26] North Carolina has invested in evidence-based home visitation programs, particularly in the last decade. A combination of state appropriation, philanthropic support, and federal grants as well as local leadership and support has facilitated the increased delivery of the Nurse-Family Partnership (NFP) and of Parents as Teachers (PAT). NFP has been shown to lead to higher language scores, higher IQ, and a higher grade point average in math and reading at age 9.[27,28] PAT has led to improved school readiness through increased parent reading and more enrollment in preschool.[29] Child FIRST, a new program under development in North Carolina, and Healthy Families America, a program with limited reach in North Carolina, have shown similar school readiness outcomes.[30,31]

The NFP is, in some ways, an exemplary program to support parents through intensive home visiting. This program has been studied in three randomized control trials with first time, low-income mothers. Mothers are enrolled during the third trimester of pregnancy and a nurse visits the mother and family through the child's 2nd birthday. NFP has demonstrated success in reducing child maltreatment, delaying second pregnancies, improving child and maternal health, decreasing juvenile delinquency, and increasing economic self-sufficiency.[32] In 2005, North Carolina had one NFP site in Guilford County. With a combination of state, federal, and private philanthropic support, North Carolina now has 14 NFP programs serving families in 24 counties.[d] NFP cannot serve all families in need; it is limited to first time mothers that are either adolescent or low-income. It is expensive to run an NFP program, which limits the number of communities that can be served at this time. Additionally, running NFP programs in rural communities has special challenges due mostly to the geographic distance between families served.[33] The three main trials that established the evidence base for NFP were conducted in urban communities. NFP has been widely replicated in rural and urban communities, but rigorous evaluation and cost effectiveness studies have not been done in rural communities.

With a combination of state, federal, and private philanthropic support, North Carolina now has 14 NFP programs serving families in 24 counties.

A recent systematic review by the Administration for Children and Families demonstrated positive results on child development and school readiness from a variety of home visiting programs. All of the following programs have high or moderate levels of evidence for overall impact on children and families: Child FIRST, Early Head Start Home Visiting, Early Start, Family Check-Up, Healthy Families America, Parents as Teachers, Home Instruction for Parents of Preschool Youngsters, Nurse-Family Partnership, and Play and Learning Strategies Infant. Of these evidence-based programs, North Carolina has invested heavily in NFP and PAT. In addition, North Carolina has invested more modestly in HealthyFamilies America and may begin to invest in Child FIRST. The systematic review evaluated effectiveness along eight domains of child and family well-being.

d Catherine Joyner, MSW, Child Maltreatment Prevention Leadership Team, Women's and Children's Health Section - Division of Public Health, North Carolina Department of Health and Human Services. Email communication. June 27, 2014

Of these four evidence-based programs, it should be noted that PAT has demonstrated positive results in two domains, Child FIRST in four domains, NFP in seven domains, and Healthy Families America in eight domains.[34] Studies of these programs and experience with replication are generally more limited in rural communities.

Triple P (Positive Parenting Program) is an evidence-based population approach to promoting young children's social-emotional development. Though school readiness has not been studied as a direct outcome of Triple P, the program has been shown to increase protective factors, improve parental confidence, and increase the use of positive parenting practices.[35] The demonstrated impact of Triple P on children's social-emotional well-being can be thought of as indirect evidence for the impact on school readiness. Triple P is a multi-level system of interventions. Level 1 is a broad-based parenting information campaign. Levels 2 and 3 involve training public health, social service, and medical providers with specific skills to provide brief interventions to caregivers with specific mild behavioral concerns. Level 4 provides intensive parenting skills training. Level 5 provides intensive family behavioral interventions. North Carolina has invested significant resources from local communities, private philanthropic organizations, Maternal and Child Health block grants, Race to the Top – Early Learning Challenge, and other resources. Triple P has expanded rapidly in North Carolina, with some communities partially implementing Triple P, and other communities implementing all five levels.[36]

Local Communities

Ultimately, local rural communities should partner with state agencies to implement evidence-based programs that will best meet the needs of their community. Local community members are experts in the culture and custom of early child care, education, and parenting supports in their community. However, in some cases, they will need resources, technical assistance, and training to implement the strongest programs at the local level.

Recommendation 2: Ensure that all childhood settings (ages 0-8), including child care, home, and other environments, provide a high quality and nurturing environment, and promote parenting supports that improve school readiness and long-term educational success.

a) The North Carolina Division of Child Development and Early Education should re-evaluate its star rating system to identify high quality child care facilities based on updated evidence and best practices. The rating system should specifically include criteria that consider the program's focus on learning that supports children's

social and emotional development, executive function, language skills, and health.

b) The North Carolina General Assembly should enhance child care subsidies to facilities that receive the highest star ratings by the North Carolina Division of Child Development and Early Education. Given the rural/urban disparity in both the quality and quantity of regulated child care, the Division should consider adjustments to its funding formula to incentivize quality care in rural counties.

c) The North Carolina Division of Public Health should seek additional funding from multiple sources, including North Carolina and national foundations to support more evidence-based parenting programs in rural communities such as Nurse-Family Partnership, Child FIRST, and Triple P to enhance school readiness and improve long-term educational success.

d) The North Carolina Division of Child Development and Early Education, in partnership with community stakeholders including child care resource and referral agencies, community colleges, Smart Start partnerships, and child care providers should continue to work toward adequate wages and/or wage support, benefits (especially health insurance), education and training, and career advancement opportunities to continue to grow a high quality and well-trained early care and education work force.

e) Local Smart Start partnerships, in conjunction with the North Carolina Partnership for Children, the North Carolina Division of Child Development and Early Education, child care resource and referral agencies, the North Carolina Department of Public Instruction, local education agencies, and local businesses should choose from and implement a range of evidence-based and best practices strategies for improving school readiness and long-term educational success. These agencies should involve parent coalitions in the selection and implementation of strategies in local communities.

References

1. HighScope Educational Research Foundation. HighScope Perry Preschool Study. Lifetime effects: the HighScope Perry Preschool Study through age 40. HighScope Educational Research Foundation website. http://highscope.org/content.asp?contentid=219. Accessed March 27, 2014.

2. The Carolina Abecedarian Project. Major findings. Frank Porter Graham Child Development Institute website. http://abc.fpg.unc.edu/major-findings. Accessed July 24, 2014.

3. Administration for Children and Families, Office of Head Start. Head Start program facts fiscal year 2013. US Department of Health and Human Services website. http://eclkc.ohs.acf.hhs.gov/hslc/mr/factsheets/docs/hs-program-fact-sheet-2013.pdf. Accessed March 27, 2014.

4. Johnson JS, Newport EL. Critical period effects in second language learning: the influence of maturational state on the acquisition of English as a second language. *Cogn Psychol*. 1989;21(1):60-99.

5. Huttenlocher PR. Synaptic density in human frontal cortex – developmental changes and effects of aging. *Brain Res.* 1979;163(2):195-205.

6. Chugani HT, Phelps ME, Mazziotta JC. Positron emission tomography study of human brain functional development. *Ann Neurol*. 1987;22(4):487-497.

7. Shonkoff JP, Phillips DA, eds. *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academies Press; 2000.

8. Twardosz S. Effects of experience on the brain: the role of neuroscience in early development and education. *Early Educ Dev*. 2012;23(1):96-119.

9. Cunningham AE, Stanovich KE. Early reading acquisition and its relation to reading experience and ability 10 years later. *Dev Psychol*. 1997;33(6):934-945.

10. Chen C, Lee S, Stevenson HW. Long-term prediction of academic achievement of American, Chinese, and Japanese adolescents. *J Educ Psychol*. 1996;88(4):750-759.

11. Risley T, Hart B. *Meaningful Differences in the Everyday Experience of Young American Children*. Baltimore, MD: Paul H. Brookes Publishing Co.; 1995.

12. Morrison FJ, Griffith EM, Alberts DM. Nature–nurture in the classroom: entrance age, school readiness, and learning in children. *Dev Psychol*. 1997;33(2):254-262.

13. Raizada RD, Richards TL, Meltzoff A, Kuhl PK. Socioeconomic status predicts hemispheric specialisation of the left inferior frontal gyrus in young children. *Neuroimage*. 2008;40(3):1392-1401.

14. Olson RK, Keenan JM, Byrne B, Samuelsson S. Why do children differ in their development of reading and related skills? *Sci Stud Read*. 2014;18(1):38-54.

15. Chapman C; National Center for Education Statistics. Early Childhood Longitudinal Study. Institute of Education Sciences website. http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2010052. Published March 2, 2010.

16. Office of Planning, Research, and Evaluation, Administration for Children and Families. *Head Start Impact Study Final Report Executive Summary*. Washington, DC: US Department of Health and Human Services; 2010. http://www.acf.hhs.gov/sites/default/files/opre/executive_summary_final.pdf. Accessed March 27, 2014.

17. North Carolina Division of Child Development and Early Education. Choosing quality child care: overview. North Carolina Department of Health and Human Services website. http://ncchildcare.nc.gov/parents/pr_sn2_ov.asp. Accessed March 27, 2014.

18. North Carolina Division of Child Development and Early Education. Child care facility search site. North Carolina Department of Health and Human Services website. http://ncchildcaresearch.dhhs.state.nc.us/search.asp. Accessed March 27, 2014.

19. North Carolina Division of Child Development and Early Education. Financial assistance: overview.

North Carolina Department of Health and Human Services website. http://ncchildcare.dhhs.state.nc.us/parents/pr_sn2_ov_fa.asp. Accessed March 27, 2014.

20. Schoenbach S. *The Importance of Child Care Subsidies in NC*. Raleigh, NC: North Carolina Justice Center; 2013. http://www.ncjustice.org/sites/default/files/Child%20Care%20Subsidies%20in%20NC_0.pdf. Accessed March 27, 2014.

21. Child Care Services Association. T.E.A.C.H.® Early Childhood Project - North Carolina. Child Care Services Association. http://www.childcareservices.org/ps/teach.html. Accessed March 27, 2014.

22. Manlove EE, Benson MS, Strickland MJ, Fiene RJ. *A Comparison of Regulated Child Care in Rural and Urban Pennsylvania*. Harrisburg, PA: The Center for Rural Pennsylvania; 2011. http://www.rural.palegislature.us/regulated_child_care_2011.pdf. Accessed June 27, 2014.

23. Child and Family Research Institute at the University of Texas at Austin. *Texas Early Childhood Workforce Compensation Study*. Houston, TX: Texas Early Learning Council; 2013. http://www.earlylearningtexas.org/media/23683/texas%20early%20childhood%20workforce%20compensation%20study.pdf. Accessed June 27, 2014.

24. Child Care Services Association. *T.E.A.C.H. Early Childhood® Annual Report July 1, 2011-June 30, 2012*. Chapel Hill, NC: Child Care Services Association; 2012. http://www.childcareservices.org/_downloads/TEACH_NC_AnnualReport_11_12.pdf. Accessed March 27, 2014.

25. Child Care Services Association. *The Child Care WAGE$® Project: An Evidence-Informed Initiative*. Chapel Hill, NC: Child Care Services Association; 2013. http://www.childcareservices.org/_downloads/WAGES_EvidenceInformed_7_13.pdf. Accessed March 27, 2014.

26. Duncan GJ, Brooks Gunn J. Family poverty, welfare reform, and child development. *Child Dev*. 2000;71(1):188-196.

27. Olds DL, Kitzman H, Cole R, et al. Effects of nurse home-visiting on maternal life course and child development: age 6 follow-up results of a randomized trial. *Pediatrics*. 2004;114(6):1550-1559.

28. Olds DL, Kitzman H, Hanks C, et al. Effects of nurse home visiting on maternal and child functioning: age-9 follow-up of a randomized trial. *Pediatrics*. 2007;120(4):e832-845.

29. Zigler E, Pfannenstiel JC, Seitz V. The Parents as Teachers program and school success: a replication and extension. *J Prim Prev*. 2008;29(2):103-120.

30. Lowell DI, Carter AS, Godoy L, Paulicin B, Briggs Gowan MJ. A randomized controlled trial of Child FIRST: a comprehensive home based intervention translating research into early childhood practice. *Child Dev*. 2011;82(1):193-208.

31. DuMont K, Kirkland K, Mitchell-Herzfeld S, et al. A randomized trial of healthy families new york (HFNY): Does home visiting prevent child maltreatment. Washington, DC: National Institute.https://www.ncjrs.gov/pdffiles1/nij/grants/232945.pdf. 2010.

32. MacMillan HL, Wathen CN, Barlow J, Fergusson DM, Leventhal JM, Taussig HN. Interventions to prevent child maltreatment and associated impairment. *Lancet*. 2009;373(9659):250-266.

33. Nurse-Family Partnership. *Nurse-Family Partnership in North Carolina*. Denver, CO: Nurse-Family Partnership; 2013. http://www.nursefamilypartnership.org/assets/PDF/Communities/State-profiles/NC_State_Profile.aspx. Accessed March 27, 2014.

34. Office of Planning, Research, and Evaluation. *Home Visiting Evidence of Effectiveness Review: Executive Summary October 2012*. Washington, DC: Administration for Children and Families; 2012. http://homvee.acf.hhs.gov/HomVEE_Executive_Summary_2012.pdf. Accessed March 27, 2014.

35. Prinz RJ, Sanders MR, Shapiro CJ, Whitaker DJ, Lutzker JR. Population-based prevention of child maltreatment: the US Triple P System Population Trial. *Prev Sci*. 2009;10(1):1-12.

36. North Carolina Department of Health and Human Services. Maternal and Child Health Services Title V Block Grant State Narrative for North Carolina. http://www.ncdhhs.gov/dph/wch/doc/NC-MCHBG-071514.pdf. Published July 15, 2014. Accessed August 1, 2014.

The agricultural traditions and variety of fresh local foods are great assets in rural North Carolina. There are active farm-to-table initiatives in many communities including efforts to reach lower-income communities. Many rural areas have local initiatives through schools, churches, and nonprofits to promote healthy eating and active living. These activities include farmers' markets with local foods supporting the local economy; healthier foods being offered during the school day and at community events; and opportunities for active play. Nonetheless, challenges remain in ensuring that individuals and families can make healthy choices that support healthy eating and active living.

Obesity

Overweight and obesity pose significant health concerns for both children and adults. Excess weight is not only a risk factor for several serious health conditions, but it also exacerbates existing conditions. North Carolina is the 16th most overweight/obese state in the nation. In 2011, almost one-third (29.6%) of North Carolina adults were obese (BMI of 30 or greater).[1] Between 1990 and 2010, the prevalence of overweight in North Carolina grew slightly from 33.5% to 37.1%.[2] However, the obesity rate increased rapidly during that time period. In 1990, 12.9% of adults in North Carolina were obese; by 2011, 29.6% of adults in North Carolina were obese.[1] Adults in rural and urban areas have similar rates of overweight or obese (the rural rate is 68.7%; 95% CI: 66.7-70.7, and the urban rate 67.1%; 95% CI: 65.6-68.5).[a] Those in Tier 1 counties—the most economically distressed counties—have the highest rate of overweight or obesity (70.8; 95% CI: 68.1-73.6), compared to those in Tier 2 (69.2%; 95% CI 67.3-71.1), or Tier 3 (65.5%; 95% CI 63.8-67.2).[b] This indicates that overweight and obesity is more closely related to the economic distress of a county rather than the rural/urban nature of a county.

Rates of overweight and obesity are also high for North Carolina's young children and adolescents. In 2011, 14.6% of North Carolina high school students were overweight (≥ 85th and < 95th percentiles for BMI by age and sex, based on reference data) and 13% were obese (≥ 95th percentile BMI by age and sex, based on reference data).[4] Among North Carolina children ages 2-4 in families with low incomes, 16.2% were overweight and 15.4% were obese in 2009.[5] The rate of obesity among these young children with low incomes has more than doubled over the past 30 years, rising from 6.9% in 1981 to 15.4% in 2011. The percentage of overweight children in this age group also increased during this time, from 11.7% in 1981 to 16.2% in 2011. These data are not available comparing rural and urban areas.[6]

We hosted the first Faithful Families Eating Smart and Moving More in western North Carolina. Macon County Public Health hosts the 9-week program to help faith communities connect healthy eating and physical activity to their spiritual beliefs. Faithful Families is the first faith-based intervention to be accepted as a "Practice-Tested Intervention" by the Center of Excellence for Training and Research Translation at UNC Chapel Hill. The Church Wellness Committee has also partnered with the health department to promote healthy eating and physical activity through health classes, create a walking trail, designate tobacco free buildings, and establish a breastfeeding room.

Holly Springs Baptist Church, Faithful Families Eating Smart and Moving More, Holly Springs, NC

a Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

b Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

The trends of increasing overweight and obesity have alarming potential health consequences. Complications of overweight and obesity can negatively affect most organ systems including the cardiovascular, circulatory, digestive, reproductive, respiratory, and skeletal systems. People who are overweight or obese are more likely to develop type 2 diabetes, high blood pressure, heart disease, certain cancers, and stroke.[7] Overweight and obesity can also cause other health complications including high cholesterol, sleep apnea, osteoarthritis, gynecological problems, and liver and gall bladder disease.[8] Although a person's genetic composition can influence obesity, obesity is not predetermined. Other factors aside from genetics can affect body weight, including the community and environment where the person lives and personal lifestyle behaviors.

North Carolina adults in Tier 1 counties—the most economically distressed counties—have the highest rate of overweight or obesity compared to those in Tier 2 or Tier 3.

Physical Activity

Physical activity is a key component of a healthy lifestyle and an important part of preventing obesity. The health benefits of high levels of physical activity have been demonstrated by numerous studies. Regular physical activity reduces the risk of premature death by reducing the risk of heart disease, stroke, high blood pressure, type 2 diabetes, and colon cancer. In addition, it protects against feelings of depression and helps build healthy bones, muscles, and joints. Regular physical activity is an important part of reaching and maintaining a healthy weight.[9]

Current recommendations are for adults to have at least 30 minutes of moderate intensity physical activity, such as brisk walking, five days per week, or at least 20 minutes of vigorous intensity physical activity, such as jogging, three days per week. Additionally, adults should incorporate muscle strengthening activities twice a week.[10] Less than half (46.8%) of adults in North Carolina meet the recommended level of aerobic activity and only 27.7% of adults meet the recommended level of muscle strengthening activity.[11] Adults in rural and urban areas report getting the recommended levels of physical activity at similar rates (43.8%; 95% CI: 40.6-47.0) compared to those in urban areas (47.4%; 95% CI: 45.6-49.2).[c] Rates of adequate physical activity are similar across Tier 1, Tier 2, and Tier 3 counties.

Current recommendations are for children and adolescents to have at least 60 minutes or more of physical activity each day.[12] Less than one-quarter (24.1%) of high school students meet the recommended guidelines of physical activity for a total of at least 60 minutes per day during the week and 15.4% did not participate in at least 60 minutes of physical activity on any day during the week. In contrast, 36.2% watched television three or more hours per day on an average school day.[2] The National Association for Sport and Physical Education (NASPE), a leading national authority on physical education, recommends that elementary school students receive 150 minutes (2.5 hours) per week, and middle and high school students receive 225 minutes (3.75 hours) per week of formal instruction in physical education.[13]

c Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

In order to help North Carolina's students achieve the recommended amount of physical activity, in 2009 the North Carolina Institute of Medicine Task Force on Prevention recommended that the State Board of Education implement quality physical education in schools that would reflect the NASPE recommendations.[14]

Healthy Eating

Good nutrition is a cornerstone to optimal health. A healthy diet can help protect against osteoporosis, heart disease, hypertension, type 2 diabetes, and certain cancers. Maintaining a calorie balance over time can help achieve and sustain a healthy weight. Managing calorie intake, while consuming adequate nutrients, is important to avoid overweight and obesity.[15]

Rather than focusing on specific foods, the 2010 Dietary Guidelines for Americans recommend balancing calories and building healthy eating patterns.[d] The balance and patterns can be achieved by reducing some foods and increasing others.[15,16] The guidelines recommend reducing intake of sodium, saturated fats, cholesterol, solid fats, and added sugars. They also recommend increasing intake of fruits and vegetables, with a variety of dark green, red, and orange vegetables; fat free or low fat milk and milk products; and the amount and variety of seafood. In addition, the guidelines recommend replacing refined grains with whole grains; replacing solid fats with oils; and choosing a variety of proteins, as well as foods that provide more potassium, dietary fiber, calcium, and vitamin D. The typical American diet has not achieved the recommended balance, and includes less than the recommended amounts of foods to increase (only 59% of the recommend vegetable intake, 42% of fruit, and 15% of whole grain) and significantly more than the recommended amounts foods to reduce (110% of the recommended saturated fat intake, 149% of sodium, and 280% of solid fat and added sugars).[17] In North Carolina, fewer than one in six (13.7%) adults consume five or more servings of fruits or vegetables a day.[18] Those in rural and urban counties report consuming five or more servings of fruit and vegetables at similar rates (18.8% in rural counties; 95% CI: 16.5-21.0, compared to 21.6% in urban counties; 95% CI: 20.3-22.9).[e] Those in Tier 1 counties are less likely to consume five or more servings of fruit and vegetables (17.4%; 95% CI: 14.4-20.5), than people in Tier 2 counties (19.1%; 95% CI 17.2-21.1) or Tier 3 counties (22.9%; 95% CI 21.3-24.5). Only 19.4% of high school students consume fruits and vegetables five or more times per day.[f,19]

In North Carolina adults in Tier 1 counties are less likely to consume five or more servings of fruit and vegetables than people in Tier 2 counties or Tier 3 counties.

Schools that participate in the National School Lunch Program and School Breakfast Program are required to serve meals that meet the most recent Dietary Guidelines for Americans.[g] The Healthy, Hunger-Free Kids Act of 2010 required

d The US Department of Agriculture and the US Department of Health and Human Services produce the national dietary guidelines. It is updated on a periodic basis, as evidence about diet and health changes over time.

e Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

f Similar data is not available for younger children and adolescents.

g Child Nutrition Act of 1966 and the Richard B. Russell National School Lunch Act (NSLA).

MountainWise is a partnership of the eight far western counties of North Carolina. Through funding from the Community Transformation Grant, several counties have implemented the "MountainMarkets" Healthy Corner Store campaign, a highly targeted marketing campaign aimed at increasing access to healthy items in local convenience stores. Each corner store is located in a rural food desert. They have agreed to sell fresh produce, low fat dairy, whole grains, and lean cut protein. The MountainWise team, in partnership with local health departments and local Cooperative Extension agents, are working to sustain the healthy options after the grant funding ends.

MountainWise western North Carolina

standards to be applied to all food sold outside the school meal programs, on the school campus, and at any time during the school day.[h] Standards for beverages and snack foods are voluntary. Further, food sold after the school day and during fundraisers may be exempted. Beginning to 2014-2015, the United States Department of Agriculture Smart Snacks rules apply the Dietary Guidelines to a la carte items and food sold in vending machines.[i] In order to meet the intended goals to improve the health and well-being of children, increase consumption of healthful foods during the school day, and create an environment that reinforces the development of healthy eating habits, the Dietary Guidelines should be applied to all food and beverages served at school or sold for fundraisers.

Promoting Healthy Eating and Physical Activity

There are several ways to combat obesity and improve rates of physical activity and healthy eating, commonly referred to as healthy eating and active living (HEAL).[20] As noted in Chapter 2, health is influenced by many different factors, including those at the individual level (e.g. genetics, lifestyle choices), interpersonal level (e.g. friends, family), community and environment level (e.g. school, community, worksite, health care settings), and policy level (e.g. land use, transportation, food policies). The Task Force recommended focusing on improving healthy eating and active living in formal and informal educational settings. Children who are overweight or obese are much more likely to be overweight or obese as older children or adults.[20-22] Conversely, those who are at a healthy weight as young children are more likely to stay at a healthy weight as older children and adults. School-aged children spend a large portion of their week in the school, whereas many younger children spend time in preschool environments. Instilling sound health habits around young children can make a positive impact on their lifelong health. While it is important to focus on children, the Task Force also recognized the importance of promoting healthy eating and active living amongst adults. Thus, the Task Force explored other evidence-based or evidence-informed strategies to promote healthy eating and active living in informal educational settings involving adults.

School-Based Strategies to Promote Healthy Eating and Active Living

The Task Force identified three evidence-based or evidence-informed strategies to improve healthy eating and active living in the preschool and school setting. Two of these interventions have been developed and tested in North Carolina: SHAPE NC (addressing HEAL in the preschool environment) and Motivating Adolescents with Technology to Choose Health (MATCH). The other evidence-based model has been tested in multiple states in the school environment: the Coordinated Approach to Child Health (CATCH).

h 7 CFR Parts 210 and 220.

i Susanne Schmal, MPH, Early Child Care and School Coordinator, Community and Clinical Connections for Prevention and Health Branch, Division of Public Health, North Carolina Department of Health and Human Services. Email communication. July 8, 2014

Shape NC, The North Carolina Partnership for Children, Inc.

Shape NC aims to address early childhood obesity in early childhood care centers and communities. It began as a $3 million, three-year grant from the Blue Cross and Blue Shield of North Carolina Foundation (BCBSNCF) to the North Carolina Partnership for Children (NCPC). The goal is to promote healthy weight and combat early childhood obesity by enhancing nutrition and physical activity in select Smart Start partnerships across the state. Shape NC unites three initiatives in child care programs that have proven to be effective: Nutrition and Physical Activity Self Assessment in Child Care (NAP SACC) to assess nutrition and physical activity policy and practice; Preventing Obesity by Design (POD) to focus on the built environment and outdoor play and learning; and Be Active Kids® to focus on programming and training with its physical activity curriculum.[23,24]

In Phase 1 of Shape NC's intervention, the program was implemented in 19 Smart Start partnerships. Results from the first phase show:

- Child care centers across North Carolina almost doubled the number of healthy best practices adopted, increasing the percent of best practices met from 40% to 74%.
- The percent of children being provided with 90 minutes or more of physical activity daily rose from 51% to 85%.
- The percent of children being provided with fruit two or more times per day rose from 34% to 80%. Additionally, the percent of children provided with nutrient dense vegetables at least twice a day rose from 16% to 54%.
- All 19 child care centers made improvements to outdoor learning environments including additions such as bike paths and vegetable gardens.
- Smart Start partnerships leveraged almost $1.2 million to support improvements in their local communities.[25]

In Phase 1 of Shape NC's intervention, Smart Start partnerships leveraged almost $1.2 million to support improvements in their local communities.

In early 2014, the BCBSNC Foundation announced it was investing a second $3 million grant over three years to the NCPC to expand Shape NC. The additional $3 million grant will expand the program's reach through the Smart Start network to 240 additional child care centers across the state.[24]

MATCH, East Carolina University

The MATCH project (Motivating Adolescents with Technology to Choose Health) is a school-based childhood obesity prevention program that integrates behavior change curriculum into academic courses in the 7th grade. It was designed to be both feasible and effective by incorporating educational goals of teachers and engaging students by creating internal motivation.[26] The MATCH intervention educational model addresses conceptual knowledge, health skills, individualized tasks, and motivation strategies. Over the course of 14 weeks, students track

their daily physical activity with pedometers. They record and analyze their food intake and perform energy balance activities. Students calculate their BMI, determine their weight category, perform fitness testing, and evaluate their own health behaviors. Students set their own goals and develop action plans along with peer accountability contracts. The students receive positive reinforcement through a recognition bulletin board and incentive items for achieving their goals.[27]

Fit to Farm encourages farmers to adopt a healthy lifestyle by partnering with North Carolina Cooperative Extension to offer health education during meetings. Five modules provide farmers with information on health risks associated with poor dietary choices and inactivity. Simple, realistic strategies for making positive health behavior changes amidst the unique challenges of working in the farm environment are also provided. Farmers are also encouraged to complete health screenings with an AgriSafe NC nurse and they are assisted with referrals to a health care provider if needed. Extension agents are encouraged to provide a healthy food option to reinforce Fit to Farm concepts.

Fit to Farm

The MATCH program began in 2006 with 7th grade students at one rural eastern North Carolina middle school. Before the program, in Cohort 1, 25% of the students were overweight and 36% were obese. In Cohort 2, 15% were overweight and 32% were obese. Following the MATCH intervention and during follow-up, each cohort significantly decreased BMI percentiles among the overweight and obese students.[j,28] Since then, MATCH has expanded to 19 schools in 12 eastern North Carolina counties.[28] In 2014, follow-up results showed MATCH participants sustained improvement from overweight to healthy weight or maintained healthy weight. The MATCH students were compared to data from the 2006 Child Survey and 2010 Child and Young Adult Surveys from the National Longitudinal Survey of Youth. Over the five year follow up, none of the MATCH participants who began at the upper end of healthy weight (between 70th and 85th BMI percentile) increased to overweight. Only 2% (1 of 52) of all participants who began at a healthy weight increased to overweight during the study. In the survey comparison group, 13% increased to overweight or obese after four years.[28] These results suggest that some high risk adolescents can have their growth trajectory follow a healthier path than expected. The program showed cost savings and is expanding into other states.[28]

Coordinated Approach to Child Health (CATCH)

CATCH is a nationally accepted evidence-based program for HEAL in schools. It began as a university study in 1987 and now includes early childhood, middle school, and afterschool programs that teach children how to be healthy for a lifetime.[29] Originally known as the Child and Adolescent Trial for Cardiovascular Health, the controlled clinical CATCH trial was evaluated from 1991 to 1994 in 96 schools (56 intervention and 40 control) in four states (California, Louisiana, Minnesota, and Texas) and included over 5,100 students with diverse cultural and ethnic backgrounds. CATCH was a multi-component, multi-year coordinated school health promotion program designed to decrease fat, saturated fat, and sodium in children's diets; increase physical activity; and prevent tobacco use.[30]

The CATCH program is based on social cognitive theory and includes both school-based and family-based components. The interventions include changes in school food service and physical education (PE), and the addition of the CATCH curriculum with or without a family-based program. The program

j In Cohort 1, the healthy weight subgroup minimally changed BMI measures following the intervention.

reduced the total fat content of food served in schools to 30% of the student's total energy intake and the sodium content to 600-1,000 mg per serving. Food service personnel had a full day of training and monthly follow-up visits to help learn, implement, and maintain the program. The CATCH program also increased the time students spent in PE doing moderate to vigorous physical activity to more than 50% of PE class time. The classroom curricula were specific to the students' grade level and varied from 15-24 lessons in 3rd to 5th grade. Fifth grade students also had four sessions of the tobacco use prevention curriculum called FACTS for Five. Classroom teachers had 1 to 1.5 days of training to implement the program. The home curriculum included activities that complemented classroom activities and required adult participation. There were 19 packets over the course of the three year intervention. Families were invited to fun nights to reinforce the lessons at the end of the classroom sessions.[31]

The MATCH program results suggest that some high risk adolescents can have their growth trajectory follow a healthier path than expected.

The CATCH trial was the largest school-based health promotion study ever funded in the United States (funded through the National Heart, Lung, and Blood Institute). The CATCH results showed decreased student fat consumption and increased physical activity among children and adolescents, as well as maintenance of those results over time. In 1999, CATCH was renamed Coordinated Approach to Child Health to better reflect the shift from a research trial to a proven, sustainable program.[31] Although the program began in large urban centers, it has now expanded to rural communities across the country.

Using Informal Education Settings to Promote Healthy Eating and Active Living among Adults

The North Carolina Institute of Medicine Task Force on Rural Health heard about several examples of evidence-based or promising practices to improve HEAL for adults in informal educational settings, including Faithful Families Eating Smart and Moving More and Living Healthy: Chronic Disease Self-Management Program.

Faithful Families Eating Smart Moving More

Faithful Families Eating Smart and Moving More (FFESMM) is a faith-based community program that promotes healthy eating habits through a series of group nutrition and physical activity education sessions. It can be used within any faith tradition but has been tested mainly in low-income African-American faith communities. FFESMM is a partnership between the North Carolina Division of Public Health and North Carolina Cooperative Extension.

FFESMM works at the four levels of the Socioecological Model of Health. At the individual level, the program coordinator and faith lay leaders work with each faith community to offer educational materials. The individuals complete health assessments and are encouraged to participate in the nutrition and physical activity classes. At the interpersonal/family level, lay leaders offer a series of nine group nutrition, food safety, and food resource management lessons. The participants are encouraged to make positive behavior changes and

set healthy goals. At the organizational level, each faith community conducts a Faith Community Health Assessment to determine the most important areas for behavior, environmental, and policy change. Based on these results, the program coordinator may provide additional education materials for the community. Finally, at the community level, FFESMM staff connects the faith communities with existing resources in their communities and encourages them to make changes around HEAL. One of the resources available to faith communities is the North Carolina Council of Churches' Partners in Health and Wholeness Initiative.[k]

In North Carolina, a significant percentage of participants reported improvements in general health and daily activities through the Living Healthy program.

FFESMM has shown positive changes both in individual health behavior and community policy. Over a two-year period, of those who participated in the HEAL education sessions, 43% reported eating more fruit, 46% reported eating more vegetables, and 35% reported increasing amounts of physical activity. The 24 faith communities adopted 14 Eat Smart policies, 9 Move More policies, and 5 environmental policies in 4 counties. Of the 25 faith communities participating, 24 adopted multiple policies. FFESMM began in 2008 with 11 faith communities in Harnett County, NC. In three years, the program spread to more than 39 faith communities in 9 North Carolina counties.

Living Healthy: Chronic Disease Self-Management Program

Living Healthy is North Carolina's version of the internationally recognized evidence-based programs developed by Stanford University and collectively referred to as Chronic Disease Self-Management Programs (CDSMP). CDSMP are a series of workshops lasting 2.5 hours, once a week for six weeks, in community settings such as senior centers, churches, libraries, and hospitals.[32]

In North Carolina, Living Healthy is offered in all 16 Area Agencies on Aging. Since April 2010, more than 6,500 people have participated in 628 workshops. People with different chronic health problems attend together. Workshops are facilitated by two trained leaders, one or both of whom are non-health professionals with chronic diseases themselves. North Carolina has more than 983 lay leaders, 105 master trainers, and 4 T-trainers (who can lead the program in Spanish).[l]

Although the program was developed to improve the health of people with chronic diseases, it has components that are targeted to improve healthy eating and enhance physical activity. The HEAL subjects covered include appropriate exercise for maintaining and improving strength, flexibility, and endurance. Nutrition classes are highly participatory, where mutual support and success build the participants' confidence in their ability to manage their health and

k Partners in Health and Wholeness, an initiative of the North Carolina Council of Churches, is designed to promote health as an expression of faith and to improve the health of clergy and congregants through increased physical activity, healthy eating, and tobacco use prevention and cessation.

l Heather Burkhardt, MSW. Division of Aging and Adult Services, North Carolina Department of Health and Human Services. Email communication. February 12, 2014.

maintain active and fulfilling lives. In North Carolina, a significant percentage of participants reported improvements in general health and daily activities through the Living Healthy program.

In the rural meetings held across the state, community members and participants discussed other opportunities for healthy eating and active living. The community discussed the need for greater investments into the built

infrastructure (to support sidewalks, bike lanes, and parks). They also talked about the need to promote the use of EBT cards at farmers markets, support community gardens, and expand the use of joint use agreements so that communities could use existing school and/or other resources to promote greater physical activity. Partners like the Blue Cross and Blue Shield of North Carolina Foundation and the Center for Environmental Farming Systems have been working with rural communities to provide grant funding and other support to improve opportunities for healthy eating and active living. The Task Force thought it was important for foundations and other partners to continue this work and involve other stakeholders in their efforts.

Recommendation 3: In order to promote these types of evidence-based and evidence-informed strategies to support healthy eating and active living, the NCIOM Rural Health Task Force recommends:

a) The North Carolina Division of Child Development and Early Education, in collaboration with the Partnership for Children, local Smart Start partnerships, North Carolina foundations, and other collaborating partners, should implement evidence-based and evidence-informed strategies to promote and support healthy eating, increased physical activity, reduced screen time, and active learning environments in licensed child care settings. Such strategies should include, but not be limited to, implementation of SHAPE NC.

b) The State Board of Education (SBE) should develop a model local wellness policy that includes evidence-based or evidence-informed age-appropriate strategies to reduce overweight and obesity among school-aged children. The SBE should promote the use of this model policy by all local education agencies. The policy should include, but not be limited to:

1) A requirement that all food and beverages served during and after school hours comports with the nutritional content required in the National School Breakfast Program and the National School Lunch Program; and

2) **At least 2.5 hours (for elementary students) and 3.75 hours (for middle and high school students) per week of physical education.**

c) **The State Board of Education should require that:**

1) **Schools implement evidence-based educational curricula that are woven through different courses that teach students about healthy weight, good nutrition, and the importance of physical activity; and give students the skills to make healthy choices. Such curricula could include, but not be limited to, MATCH or CATCH.**

2) **The Healthful Living curriculum be updated to include evidence-based information about healthy weight, nutrition, and physical activity; and to teach students skills to make healthy choices.**

d) **North Carolina private foundations, the faith community, community-based organizations, and other agencies that work with rural communities should continue to partner and support:**

1) **Opportunities for healthy eating and active living (e.g. farmers markets, community supported agriculture, and green spaces for play/exercise); and**

2) **Implementation of evidence-based or evidence-informed strategies that have been shown to improve healthy eating and active living among different rural populations. Such strategies may include, but not be limited to, implementation of Faithful Families, Living Healthy, and other promising practices.**

References

1. United Health Foundation. America's Health Rankings. Obesity: North Carolina rank: 33. United Health Foundation website. http://www.americashealthrankings.org/NC/Obesity/2013. Accessed February 25, 2014.

2. National Center for Chronic Disease Prevention and Health Promotion, Division of Nutrition, Physical Activity, and Obesity. *Overweight and Obesity. North Carolina: State Nutrition, Physical Activity, and Obesity Profile*. Atlanta, GA: Centers for Disease Control and Prevention; 2012. http://www.cdc.gov/obesity/stateprograms/fundedstates/pdf/north-carolina-state-profile.pdf. Accessed July 18, 2013.

3. Centers for Disease Control and Prevention. Adolescent and school health. Youth Risk Behavior Surveillance System (YRBSS). Centers for Disease Control and Prevention website. http://www.cdc.gov/HealthyYouth/yrbs/index.htm?s_cid=tw_cdc16. Updated July 9, 2014. Accessed July 16, 2014.

4. Centers for Disease Control and Prevention. *Table 6D. 2011 Pediatric Nutrition Surveillance. National Comparison of Growth and Anemia Indicators by Contributor: Children Aged < 5 Years*. Atlanta, GA: Centers for Disease Control and Prevention; 2012. http://www.cdc.gov/pednss/pednss_tables/pdf/national_table6.pdf. Accessed July 24, 2014.

5. Centers for Disease Control and Prevention. Overweight and obesity. Centers for Disease Control and Prevention website. http://www.cdc.gov/obesity/index.html. Updated May 22, 2014. Accessed July 25, 2014.

6. Centers for Disease Control and Prevention. Overweight and obesity. Causes and consequences. Centers for Disease Control and Prevention website. http://www.cdc.gov/obesity/adult/causes/index.html. Published April 27, 2012. Accessed April 5, 2013.

7. Centers for Disease Control and Prevention. Healthy weight - it's not a diet, it's a lifestyle! About BMI for adults. Centers for Disease Control and Prevention website. http://www.cdc.gov/healthyweight/assessing/bmi/adult_bmi/index.html. Updated July 11, 2014. Accessed July 24, 2014.

8. Centers for Disease Control and Prevention. Physical activity and health. Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/health/index.html. Accessed March 21, 2014.

9. Centers for Disease Control and Prevention. How much physical activity do you need? Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/guidelines/index.html. Accessed March 21, 2014.

10. Adult participation in aerobic and muscle-strengthening physical activities — United States, 2011. *MMWR Morb Mortal Wkly Rep*. 2013;62(17):326-330.

11. Centers for Disease Control and Prevention. Physical activity. How much physical activity do children need? Centers for Disease Control and Prevention website. http://www.cdc.gov/physicalactivity/everyone/guidelines/children.html. Published November 9, 2011. Accessed July 24, 2014.

12. National Association for Sport and Physical Education. No time to lose in physical education class. Published November 6, 2007.

13. North Carolina Institute of Medicine Task Force on Prevention. *Prevention for the Health of North Carolina: Prevention Action Plan*. Morrisville, NC: North Carolina Institute of Medicine;.2009. http://www.nciom.org/wp-content/uploads/NCIOM/projects/prevention/finalreport/PreventionReport-July2010.pdf. Accessed July 24, 2014.

14. US Department of Agriculture, US Department of Health and Human Services. *Dietary Guidelines for American, 2010: Executive Summary*. 7th edition. Washington, DC: US Government Printing Office; 2010. http://www.cnpp.usda.gov/Publications/DietaryGuidelines/2010/PolicyDoc/ExecSumm.pdf. Accessed March 17, 2014.

15. US Department of Health and Human Services and US Department of Agriculture. *Dietary Guidelines for Americans, 2005*. Washington DC: US Government Printing Office; 2006. http://www.health.gov/dietaryguidelines/dga2005/document/pdf/DGA2005.pdf Accessed March 21, 2014.

16. US Department of Agriculture, Agricultural Research Service What We Eat in America, NHANES overview. US Department of Agriculture website. http://www.ars.usda.gov/services/docs.htm?docid=13793. Updated November 13, 2013. Accessed July 24, 2014.

17. North Carolina State Center for Health Statistics. 2011 BRFSS Survey results: North Carolina, tobacco use, current smoker. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2011/nc/all/_rfsmok3.html. Published September 14, 2012. Accessed April 5, 2013.

18. North Carolina Department of Public Instruction. *North Carolina Youth Risk Behavior Survey High School 2011 Survey Results*. Raleigh, NC: North Carolina Department of Health and Human Services; 2012. http://www.nchealthyschools.org/docs/data/yrbs/2011/statewide/high-school.pdf. Accessed July 1, 2013.

19. Ammerman A. Healthy eating and active living: overview of evidence-based and promising practices, school focus. Presented at: North Carolina Institute of Medicine Task Force on Rural Health; January 8, 2014; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2013/04/RH_Ammerman_1-8-14.pdf. Accessed July 24, 2014.

20. Singh AS, Mulder C, Twisk JW, van Mechelen W, Chinapaw MJ. Tracking of childhood overweight into adulthood: a systematic review of the literature. *Obes Rev*. 2008;9(5):474-488.

21. Nader PR, O'Brien M, Houts R, et al; National Institute of Child Health and Human Development, Early Child Care Research Network. Identifying risk for obesity in early childhood. *Pediatrics*. 2006;118(3):e594-601.

22. NCIOM Task Force on Preventing Early Childhood Obesity. *Promoting Healthy Weight for Young Children: A Blueprint for Preventing Early Childhood Obesity in North Carolina*. Morrisville, NC: North Carolina Institute of Medicine; 2013. http://www.nciom.org/wp-content/uploads/2013/09/ChildObesityRpt_090513.pdf. Published September 2013.

23. Be Active Kids. Be Active Kids. Blue Cross and Blue Shield of North Carolina Foundation website. http://beactivekids.org/bak/Front/Default.aspx. Accessed July 24, 2014.

24. Hansen P. Healthy eating and active living panel and discussion. Presented at: North Carolina Institute of Medicine Rural Health Task Force; January 8, 2014; Morrisville, NC.

25. Smart Start. Shape NC awarded $3 million from BCBSNC Foundation. North Carolina Partnership for Children, Inc. website. http://www.smartstart.org/shape-nc/shape-nc-in-the-news/shape-nc-awarded-3-million-from-bcbsnc-foundation. Published January 23, 2014. Accessed July 24, 2014.

26. Lazorick S, Hardison G, Esserman D, Perrin E. Sustained Body Mass Index changes one and two years post MATCH: a school-based wellness intervention in adolescents. *Child Obes*. 2011;7(5):372-378.

27. Lazorick S, Crawford Y, Gilbird A, et al. Long-term obesity prevention and the Motivating Adolescents with Technology to CHOOSE Health™ program. *Child Obes*. 2014;10(1):25-33.

28. Hardison T. MATCH – Motivating Adolescents with Technology to CHOOSE Health.™ Presented at: North Carolina Institute of Medicine Task Force on Rural Health; January 8, 2014; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2013/04/MATCHpresentation.pdf. Accessed July 24, 2014.

29. CATCH. CATCH research. CATCH website. http://catchusa.org/catchresearch.htm. Accessed July 24, 2014.

30. Luepker RV, Perry CL, McKinlay SM, et al. Outcomes of a field trial to improve children's dietary patterns and physical activity. The Child and Adolescent Trial for Cardiovascular Health. CATCH collaborative group. *JAMA*. 1996;275(10):768-776.

31. Nader PR, Stone EJ, Lytle LA, et al. Three-year maintenance of improved diet and physical activity: the CATCH cohort. Child and Adolescent Trial for Cardiovascular Health. *Arch Pediatr Adolesc Med*. 1999;153(7):695-704.

32. Stanford Patient Education Research Center. Chronic Disease Self Mangement Program: Better Choices, Better Health® Workshop. Stanford School of Medicine website. http://patienteducation.stanford.edu/programs/cdsmp.html. Accessed July 24, 2014.

Behavioral Health Services in Primary Care Settings

Chapter 6

Mental illness and substance abuse disorders are a critical determinant of health and represent an important drain on the economy of rural communities and contributor to health care costs. In 2011-2012, the Substance Abuse and Mental Health Services Administration (SAMHSA) reported that a total of 7.3% of the North Carolina population age 12 or older reported dependence or abuse of illicit drugs or alcohol in the past year.[1] More specifically, 4.9% of the state's population age 12 or older reported alcohol dependence or abuse in the past year,[2] and 2.9% reported illicit drug dependence of abuse.[3] In addition, 3.9% of the state's population age 18 or older reported a serious mental illness in the past year,[4] 6.6% reported at least one major depressive episode,[5] and 16.8% reported any mental illness.[a,6] Some people with mental health and substance abuse disorders fail to recognize or admit that they have a problem. One study showed that 40% of people with major depression either did not want or perceive the need for treatment.[7] Others may be afraid to seek care due to real or perceived stigma.[8,9] Still others who want and need treatment are unable to access it. In 2010-2011, only a little more than 50% of children and adults who needed mental health services, and only about 10% of youth and adults needing substance abuse services were able to access it through the state's publicly-funded mental health system.[10] The Task Force on Rural Health recognized that improvements in behavioral health services are critical to improving both the physical and mental health of people living in rural communities.

Mental Health

Mental health disorders can have a profound effect on an individual, their interpersonal relations, their functioning in schools or workplace, and their overall sense of well-being.[11] The average number of poor mental health days over the past 30 days in rural counties is 3.9 days (95% CI: 3.6-4.2) and 3.7 days in urban counties (95% CI: 3.6-4.1). In Tier 1 counties that number is 4.1 days (95% CI: 3.6-4.5), Tier 2 is 3.9 days (95% CI: 3.5-4.2), and Tier 3 is 3.8 days (95% CI: 3.6-4.1).[b] The 'poor mental health days' measure is based on an individual's response to a survey item indicating the number of days during the last 30 days that he/she feels like his/her activities were limited by mental illness. The relationship between mental health and functional status

As a behavioral health professional, I meet with patients before the primary care visit to introduce myself and screen for depression. I recently had a great discussion about depression with a gentleman who had just screened positive. We brought his primary care provider into our conversation, and the patient agreed to begin medication and continue brief behavioral health work whenever he was in for medical visits. I later met his wife during her check-up, when she explained, "You met with my husband last week – our family has already noticed such a change! I just don't think he would've gotten help had he not been asked about it here!"

Christine E W Borst, PhD, LMFT
Pamlico Community Health Center, Bayboro, NC

a A serious mental illness is defined as a "diagnosable mental, behavioral, or emotional disorder, other than a developmental or substance use disorder, that met the criteria found in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and resulted in serious functional impairment." Any mental illness is defined similarly, as having a diagnosable mental health, behavioral, or emotional disorder that is not a developmental disability or substance use disorder that meets the DSM-IV criteria, but does not result in serious functional impairment. A major depressive disorder is defined as having a period of "at least 2 weeks when a person experienced a depressed mood or loss of interest or please in daily activities and had a majority of specified depression symptoms" as defined in the DSM-IV. Source: SAMHSA. 2011-2012. *National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia)*. Tables 23, 24, and 26. Available at: http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTables2012.pdf. Accessed July 24, 2014.

b Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

is complex and, at times, subtle. Functional status can be defined as a person's ability to perform normal daily activities required to meet basic needs, fulfill usual roles, and maintain health and well being. People with severe mental illness or substance abuse problems often have trouble with work attendance, relationships, or even activities of daily living, and this social isolation is often associated with depression increases the risk of disability.[12] One study conducted in North Carolina demonstrated that individuals with depression had 5.5 times more absent days from work over the last 90 days compared with people without mental health symptoms (11 days versus 2 days).[13] Many people with moderate depression also have chronic conditions and physical limitations. It may be that physical symptoms (such as joint pain from rheumatoid arthritis) lead to depression and that disability results from both. Individuals with pre-existing depression or other mental illnesses tend to fare less well when recovering from injury, illness, or surgery.[14,15]

In North Carolina, the rates of mental health related emergency department visits are far higher in rural counties compared to urban counties.

Having a current mental health illness is one of the most common risk factors for suicide ideation and death. Almost half (47.5%) of North Carolinians who die by suicide had a current mental health illness, with a similar percentage (46.7%) having a history of treatment for mental illness.[16] The rate of suicide is similar in rural and urban communities, with 13.4 per 100,000 deaths by suicide in rural areas (95% CI: 12.0-13.6) compared to 12.8 in urban areas (95% CI: 12.0-14.8).[17]

Emerging research has also shown the impact of mental illness—particularly depression—on the use and cost of health services. People who are depressed or have anxiety disorders have more unexplained medical symptoms than do people without a mental health illness. Depression has been associated with a 50% increase in medical costs for other chronic illnesses, even after controlling for the type and severity of physical illness. Depression has also been linked to longer lengths of stays in the hospital, even after controlling for severity of medical illness, and it has been linked to higher mortality rates for people who have diabetes or heart disease.[18] The increase in physical disease burden among people affected by mental illness supports a more integrated approach in which both physical and mental health care are provided in the same setting and with increased coordination.

Mental health and substance use related symptoms often result in the need for acute medical care. In North Carolina, the rates of mental health related emergency department visits are far higher in rural counties (126.4/10,000 people; 95% CI: 125.1-127.7) compared to urban counties (95.6/10,000; 95% CI: 94.8-96.3). The disparity is greater when comparing Tier 1 counties (129.5/10,000; 95% CI:127.7-131.2) to Tier 3 counties (86.9/10,000; 95% CI:86.1-87.7).[c] The increased cost of physical health care for people with mental illness and the increased use of emergency departments in rural North Carolina

c Eleanor Howell, MS, State Center for Health Statistics, North Carolina Department of Health and Human Services, email communication, April 17, 2014

are important cost drivers and indicate a need to focus on improved mental health care to control costs in both physical and mental health care.

Depression also makes it more difficult to treat or manage chronic conditions, as people who are depressed are less likely to take their medications as prescribed or to otherwise follow their treatment regimens.[17] People who are depressed are also more likely to engage in risky health behaviors including smoking, overeating, and sedentary lifestyles. Depression doubles the risk of death for people with diabetes, underscoring the importance of diagnosis and treatment to ensure optimal medical and mental health outcomes.[18]

Substance Abuse

People with substance abuse problems or dependence are at risk for premature death, co-morbid health conditions, and disability. Furthermore, substance abuse carries additional adverse consequences for the individual, his or her family, and society at large. People with addiction disorders are more likely than people with other chronic illnesses to end up in poverty, lose their job, or experience homelessness. Addiction to drugs or alcohol significantly contributes to the state's crime rate as well as to family upheaval and motor vehicle fatalities. Approximately 90% of the criminal offenders who enter the prison system have substance abuse problems.[8,19] More than two out of five youth in the state's juvenile justice system are in need of further assessment or treatment services for substance abuse.[20] Substance abuse is also one of the primary causes for motor vehicle fatalities, contributing to more than one-quarter (26.8%) of all crash-related deaths.[21] A greater proportion of motor vehicle crashes are alcohol related in rural counties than in urban counties (5.8% rural; 95% CI: 5.6-6.0; 5.1% urban; 95% CI: 5.0-5.2).[22] In addition, alcohol or drug use is a major contributor to family disintegration. Nationally, parental use of alcohol or drugs contributes to more than 75% of cases in which children are placed in foster care. The relationship between substance abuse and injury or illness points to the need to support a more integrated approach.[23]

A greater proportion of motor vehicle crashes are alcohol related in rural counties than in urban counties.

Recently, overdose death rates have skyrocketed in North Carolina. Since 1999, the number of these deaths has increased by more than 300%, from 297 deaths in 1999 to 1,140 deaths in 2011. The majority of these overdose deaths involve prescription opioid pain relievers (like methadone, oxycodone, and morphine). In fact, opioid analgesics are now involved in more drug deaths than cocaine and heroin combined.[24]

Youth are particularly susceptible to the influence of drugs or alcohol, as these substances affect the developing brain. Repeated exposure to drugs or alcohol can alter brain chemistry and microanatomy, making it harder for people to weigh the trade-offs of short-term pleasure derived from drug or alcohol use versus the longer term consequences to the individual and his/her family by the use or misuse of these substances.[25] Use and misuse of alcohol and other drugs is particularly problematic for youth and young adults under age 25. According to the 2011 North Carolina Youth Risk Behavior Survey, about 20% of high school

students have taken a prescription drug without a doctor's prescription.[26] Thus, efforts should be made to target prevention strategies to youth and adolescents.

Delivering more mental health and substance abuse services in conjunction with primary care is an important option for rural communities. Access to mental health and substance abuse services may be limited by virtue of provider supply (discussed in Chapter 8), type and extent of insurance coverage, and stigma. Primary care has become the de facto mental health system for many people with mental health and substance abuse disorders as most people have a primary care clinician, while access to and use of behavioral health specialists is limited.[7] In addition to the lack of behavioral health providers, another limiting factor is insurance coverage. Historically, most private insurers limited coverage for mental health and substance abuse services, either by charging higher coinsurance (e.g. the client pays 50% for mental health services but 20% for other physical health services), limiting the number of visits each year, or excluding mental health or substance abuse services entirely. The Mental Health Parity and Addiction Equity Act of 2008 mandated that large employers provide coverage for mental health and substance abuse services in parity with coverage offered for physical health (e.g. diabetes, asthma), but this law did not extend to small employers or plans purchased in the individual (non-group market).[27] The Patient Protection and Affordable Care Act mandates mental health and substance abuse parity in individual and small group plans.[d] This should mean that, by virtue of insurance coverage, more people are able to access mental health and substance abuse services.

Delivering more mental health and substance abuse services in conjunction with primary care is an important option for rural communities.

People with a mental health illness or substance abuse problem often present to primary care providers with pain related complaints, other body symptoms, or uncontrolled medical conditions such as diabetes. Primary care providers need to be able to diagnose, refer, and/or treat people presenting with such symptoms. Perhaps as important, patients may be more willing to consider treatment for a behavioral health condition either by his/her primary clinician or by a behavioral health specialist if it is in the context of a whole person, using an integrated approach to wellness.[28-30] Behavioral health training is a required part of residency training in family medicine, internal medicine, pediatrics, and obstetrics and gynecology.[31] However, the education and experience with behavioral health training varies by discipline and between programs within a discipline. Further, after a primary care provider enters practice, an individual's confidence, competence, and interest may determine scope of practice. Further, meeting behavioral health needs can be time consuming and reimbursement models do not always support whole person care.[32,33]

Incorporating behavioral health services into physical health services is one important component to whole person care, and has been associated with improved quality, improved outcomes (for mental health and physical health),

d Patient Protection and Affordable Care Act. 2010; 111-148:1501.

patient and provider satisfaction, and decreased cost.[29] The quality and consistency of treatment in primary care settings, and the integration with referral specialty services for behavioral health care, are essential to improved behavioral health treatment.

Integrated Care

The NCIOM Task Force on Rural Health, informed by experts on mental health and integrated care, as well as significant evidence from rural communities, chose to focus recommendations for mental health and substance abuse screening and treatment on integrated care. Integrated care refers to either the delivery of mental health and substance abuse services in a primary care context, or the delivery of primary care in behavioral health care settings (sometimes referred to as reverse integration or reverse co-location). Recognizing that the availability of behavioral health care settings in rural North Carolina is limited, the recommendations generally apply to integrating more behavioral health care into primary care settings.

A meta-analysis of 57 studies showed an average cost savings of 20% with integrated care.

Integrated care has been described along a continuum, from minimal collaboration to close collaboration in a fully integrated system. The Task Force on Rural Health recognized that all rural primary health settings are not ready to fully integrate care to the same extent, and that fully integrated care requires culture change, leadership, investment, and additional staff. At the same time, the Task Force recognized that most rural primary health care settings were in a position to move toward more integrated care, and state and local resources should be made available to assist and incentivize integrated care. Even primary health care settings providing the lowest level of behavioral health care should consider adding services such as screening and referral in the context of an increasingly integrated system of care.

Systematic reviews and large randomized controlled trials have shown that behavioral health care integrated into primary care improves symptoms of depression, functional status, and patient satisfaction.[34-37] In addition, integrated care may improve management of chronic health conditions such as diabetes.[38] However, all integrated care is not the same. The evidence base for integrated care has been largely built on studies of close collaboration or fully integrated care. Common strategies were observed in the studies of high quality, successfully integrated care: active management by a primary care clinician, collaboration with a mental health professional, adherence monitoring, treatment response assessment using a symptom checklist, active support for patient self-management skills, and integrated treatment lasting at least 16 weeks.[39] Such integrated care has been shown to be cost effective. Because the management of behavioral health conditions accounts for as much as half of the time of primary care clinicians, integrated care can ensure that the right provider cares for the right condition at the right time. A meta-analysis of 57 studies showed an average cost savings of 20% with integrated care.[40] In a fully integrated system, the relationship with the provider is continuous (similar to

primary care), although the episodes may be time limited. For example, a patient in a primary care setting may have episodic depression during times of stress, and may occasionally need care by a behavioral health specialist. The behavioral health specialist in the integrated setting has an ongoing relationship. With episodic mental illness in mental health specialty care, treatment episodes occur until symptoms remit, then a relationship is effectively terminated. If mental health symptoms recur, that will require a new referral, new approval for services, and sometimes the development of a new relationship with a new office, staff, and behavioral health care specialist.

Approaches to integrated care vary widely, and some variations may be best suited for some clinical settings. The Task Force considered a range of integrated approaches, starting with models that focus on primary care providers (such as screening, brief intervention, and referral into treatment when necessary), to models that fully integrate behavioral health and primary care providers into the same practice. Close collaboration or full integration can still take place even if there are few behavioral health specialists available in a community. This can occur through the use of available part-time behavioral health specialists, consultations with behavioral health providers, or the use of telebehavioral health.

The Task Force considered a range of integrated approaches, starting with models that focus on primary care providers to models that fully integrate behavioral health and primary care providers into the same practice.

Minimal Collaboration

Small rural health care practices can expand the availability of high quality behavioral health services even absent full integration. At a minimum, primary care providers should include routine universal validated screening for mental health symptoms and substance abuse. Primary care providers should follow up on positive screenings with a detailed history to assess for presence and severity of conditions. If detailed evaluation by a provider skilled in the assessment of mental health and substance abuse disorders indicates such an illness is present, treatment can be initiated in the primary care setting. Follow up should be assured and treatment response assessed. Validated screening tools exist for a variety of mental health and substance abuse conditions in pediatric and adult populations. These are typically self-administered while a patient is waiting for his or her provider. Many clinics will give patients brief mental health screening tools to complete at the check-in process so that the information is available for the provider at the start of the visit. In many cases, such screening is required or incentivized for reimbursement. However, referral and care coordination may not be required and may be more limited in some settings. People with severe and persistent mental illness or substance abuse should be referred to the specialty behavioral health system. Referral to specialty behavioral health care systems can be a particular challenge in rural settings where mental health providers can be in severely limited supply. This challenge is addressed in Chapter 8 of this report. Care managers can be heavily utilized in this type of integrated care for assessment of treatment response, adherence, and coordination of referrals when needed.

Basic Collaboration from a Distance

A somewhat more collaborative approach occurs when the primary care provider and behavioral health specialist establish a closer working relationship. This can include occasional consultation around more challenging diagnostic or treatment issues. Clinicians still work in essentially separate systems and communication is occasional. The behavioral health specialist generally does not see the primary care patient being treated for a behavioral health disorder in a primary care setting.

Basic Collaboration on Site

Increasing collaboration can occur with regular remote consultation and collaboration around a care plan or onsite collaboration. With co-location, primary care and behavioral health care providers generally care for the same patients in parallel systems under the same roof. Billing is independent. Scheduling is independent. However, co-location helps remove the stigma the patient might otherwise experience in seeking specialty behavioral health services. The patient is just 'going to the doctor's office' thus avoiding behavioral health stigma. The health care providers have more regular opportunity to interact around a patient's care and provide bi-directional support for each other's roles in the team.

Close Collaboration in a Partly Integrated System

Higher levels of integration occur when providers start to share charts, scheduling systems, and billing systems. Providers should also have more regular face-to-face communication and collaboration. This level of integration can occur with intensive telebehavioral health support, allowing for virtual face-to-face visits with patients and communication between providers. Typically "warm hand-offs" can occur at this level of integration. A warm hand-off is when a medical provider introduces a patient to a behavioral health specialist at the time of the visit. This allows for the patient to feel more comfortable coming back to see the behavioral health specialist. The behavioral health specialist can also triage the behavioral health need and ensure follow-up. For example, a patient with palpitations who is thought to be having panic attacks can be introduced to a behavioral health specialist and rapid follow-up assured before the patient leaves the office.

Close Collaboration in a Fully Integrated System

The most integrated care occurs when all systems are shared, collaboration is the norm, and the care occurs continuously for patients with behavioral health needs. Warm hand-offs are the norm, and a primary care provider who identifies a behavioral health need during a visit can introduce the patient to a behavioral health specialist in real time for initial intervention, while coordinating with the primary care clinician around visit wrap up and team-based follow up. This type of integration holds the most promise for increasing the efficiency and satisfaction of the primary care clinician. It also requires the most culture change in practice, leadership, and investment. Further, structural barriers of

traditional fee-for-service care makes this the most difficult to implement in a sustainable manner. For example, some payers will not allow two charges on the same day from the same facility for the same diagnosis. Also, both providers (primary care and behavioral health) are not accustomed the fluidity and scheduling challenges inherent in this more dynamic care model.

The current discussion around Medicaid reform and the proposal from Secretary Wos to the North Carolina General Assembly is an opportunity to invest in integrated care in our state. Specifically, the proposed plan for Medicaid reform recognizes both the improved quality and potential for cost savings with integrated care. Accountable Care Organizations can choose to invest in primary care-behavioral health integration as a means of improving health outcomes and lowering overall health care costs.[41] However, there is no requirement for integrated care. As the Medicaid reform proposal is reviewed by the North Carolina General Assembly and then implemented, partners involved in primary care such as Community Care of North Carolina and experts in integrated care such as the North Carolina Center of Excellence for Integrated Care should work with policymakers and the Division of Medical Assistance to best support the delivery of integrated care and the technical challenges of such integration in rural environments. The North Carolina Center of Excellence for Integrated Care recently co-hosted a policy summit on integrated care in North Carolina. The panelists and practitioners focused on the policy and practice opportunities and barriers within integrated care and formed the following workgroups as a result of the summit: workforce development, data collection/payment model development, consumer engagement, and team building.[e]

In North Carolina, most hospitals are now affiliated with one of 19 health systems. In 2013, there were only 22 (of 126) non-affiliated hospitals.

Medicaid reform is taking place in a state context which includes the rapid consolidation of health systems. In addition, at both the state and national level, there is a movement toward the development of shared savings Accountable Care models. In North Carolina, most hospitals are now affiliated with one of 19 health systems. In 2013, there were only 22 (of 126) non-affiliated hospitals.[42] Many of these health systems are developing contractual agreements with private payers and Medicare around shared savings models. Shared savings programs include a variety of models which shift both the risk and the reward from the payer of services to the provider of services. Such models include pay for performance, bundled payment, and Accountable Care Organizations. A number of such models are a product of reforms, demonstration projects, and incentives under the Patient Protection and Affordable Care Act. There are currently 24 Accountable Care Organizations in North Carolina.[43] The Toward Accountable Care Consortium is a program of the North Carolina Medical Society that includes 39 member organizations. Toward Accountable Care is designed to provide information about Accountable Care Organizations and develop health system and specialty guides around accountable care.

e A video of the summit will be available at http://ncfahp.org/icare.aspx.

Evolving mental health reform is an important context for considering primary care-based or integrated mental health and substance abuse services. Over the past several years, we have seen significant consolidation in mental health managed care organizations (MCOs). These MCOs are the local delivery organization for community-based mental health, substance abuse, and developmental disability services paid for by Medicaid. Since 2009, MCOs in North Carolina have consolidated from 23 to 9.[44] These MCOs provide the behavioral health carve out services to defined groups of Medicaid beneficiaries under contract with the state Division of Medical Assistance, wherein the financial risk remains with the state.[45] The proposed plan for Medicaid reform in North Carolina by Secretary Wos and Governor McCrory call for further consolidation to four MCOs, and continues to carve out mental health from other health services.[41]

Since 2009, mental health managed care organizations (MCOs) in North Carolina have consolidated from 23 to 9.

Use of Evidence-Based or Evidence-Informed Integrated Care Strategies in Rural Communities

In the Task Force on Rural Health rural community forums, we heard about many existing models of successful care integration. Many of these efforts focus on enhancing the capability of primary care providers to meet the behavioral health needs of their patients without full integration. Some co-locate or integrate licensed clinical social workers or other behavioral health providers into primary care or school-based settings. These types of programs should be seen as the foundation for expanding integrated care and moving towards increasingly integrated care. Other organizations use remote behavioral health care providers to deliver care (e.g. telepsychiatry) or consultation and review of cases. The Task Force on Rural Health learned about three exemplar organizations that integrate behavioral health and primary care in rural communities: Community Care of the Sandhills, the North Carolina Statewide Telepsychiatry Program, and The Rural Health Group.

Community Care of the Sandhills

Community Care of the Sandhills (CCS) is in the midst of implementing telepsychiatry in 40 primary care practices over three years to address the recognized shortage of psychiatrists in the CCS region. CCS is providing hardware, a toolkit, scheduling support, and other technical assistance (with grant support from Easter Seals, FirstHealth of the Carolinas, Monarch NC, and the Kate B. Reynolds Charitable Trust). Psychiatrists will schedule two types of visits: one for assessment (1 hour) and the other for consultative medication management (30 minutes). The psychiatrist will bill the insurer independent of the primary care practice.

North Carolina Statewide Telepsychiatry Program (NC-STeP)

In July of 2013, the North Carolina General Assembly funded an initiative to expand statewide telepsychiatry services. Though not focusing on primary care integration, this is an important step in whole person care, and may support expanded reach into primary care such as the current CCS program

(above). The NC-STeP program builds off of the experience of eastern North Carolina, which extended telepsychiatry services to 14 hospitals, resulting in an over 50% reduction in emergency department length of stays for discharge to inpatient mental health treatment, as well as a reduction in emergency department recidivism, involuntary commitments, and readmission to mental health facilities.[46] In addition, rates of patient satisfaction with telepsychiatry services were high. Building on this experience, NC-STeP was funded with appropriations of $2 million per year for two years. Since this program started on January 1, 2014, 18 additional hospitals have begun providing telepsychiatry services (in addition to the 49 hospitals already with in-person or telepsychiatry services in the emergency department).[46]

The NC-STeP program builds off of the experience of eastern North Carolina, which extended telepsychiatry services to 14 hospitals, resulting in an over 50% reduction in emergency department length of stays for discharge to inpatient mental health treatment.

The Rural Health Group

The Rural Health Group is a federally qualified health center operating 14 locations in northeastern North Carolina. The center offers fully integrated behavioral health care by psychologists and licensed clinical social workers onsite. The mission of the Rural Health Group is for every patient to have a behavioral health specialist on his or her health care team, just like each patient has a primary care provider and a dentist on his or her team. Real time collaboration and dynamic integration are the norm. In this fully integrated model, a patient's primary care provider and behavioral healthcare provider share a medical record, operate with the same scheduling system, and are supported by the same office staff.

Community-Based Services

Though the Task Force on Rural Health recognized that integrated care is, in some ways, ideal for many people with mental health and substance abuse disorders residing in rural communities in North Carolina, the Task Force also recognized that, in many settings, primary care is also in short supply or limited by cost, distance, and transportation. Thus the Task Force explored evidence-based or evidence-informed community based programs and supports to fill the gap, including Mental Health First Aid; 12 step programs; faith-based support; and Screening, Brief Intervention, and Referral to Treatment (SBIRT).

Mental Health First Aid

Mental Health First Aid is a brief training program designed to teach people about developing mental health symptoms with the goal of early identification, increasing understanding and awareness, offering help in crisis or acute situations, and linking with other resources when appropriate. There is a training program focused on youth as well. Studies of mental health first aid have showed increased reporting of helping behaviors, greater confidence in

providing help, and less social distance from those with mental illness. Mental Health First Aid has been studied in urban, rural, and workplace settings.[47] Mental Health First Aid and Youth Mental Health First Aid Training is widely available in North Carolina.[48,49]

12 Step Programs

12 step programs, such as Alcoholics Anonymous (AA) and Narcotics Anonymous, are widely available and highly effective at helping members maintain sobriety. In the United States, an average of 5 million people attend 12 step programs each year.[51] There are over 64,000 AA groups with over 1.4 million members in the United States. 12 step programs are highly effective for frequent meeting goers, with a median length of abstinence of five years for those who attend two to four meetings per week. In addition, 12 step programs have been associated with other important psychosocial outcomes and social connectedness. It is important to note that the success of 12 step programs is highly user dependent, and may be related to an individual's prognosis and social relationships.[51]

The Task Force explored evidence-based or evidence-informed community based programs and supports to fill the gaps.

Faith-Based Support

Faith communities are a critical part and partner of the behavioral health care landscape in many communities. For example, 12 step programs are often housed at or sponsored by faith communities. In addition, psychological first aid training is often targeted at church ministry programs.[51] Furthermore, many congregational leaders and lay ministries are involved in behavioral and mental health support and services which, at times, carry fewer stigmas and offer a religious context that may be more accessible for members of a faith community.[52] One such example is CareNet Counseling, a faith-based service house at Wake Forest University that provides wellness opportunities, education, and counseling in a number of rural communities in North Carolina.

Screening, Brief Intervention, and Referral to Treatment (SBIRT)

SBIRT is a universal approach to the identification and treatment of alcohol and drug use problems that can be delivered to all patients in a variety of clinical settings, including emergency departments, primary care offices, and health department clinics. The goal of SBIRT is to identify early problem alcohol and drug use behaviors and offer brief treatment or referral as appropriate to mitigate the problem before it becomes more serious. SBIRT has been shown in clinical trials to result in a decrease in problem alcohol drinking, improved overall health, fewer arrests, and more stable housing. SBIRT has also been shown to be a cost effective approach to problem substance and alcohol use.[53]

Recommendation 4: Use Primary care and public health settings to screen for and treat people with mental health and substance abuse issues in the context of increasingly integrated primary and behavioral health care.

a) **Community Care of North Carolina, the Division of Medical Assistance, and private payers should provide incentives to encourage primary care medical homes to screen patients during wellness visits for mental health symptoms and substance abuse using validated screening tools. As part of the incentives, practices should be required to offer treatment or referral resources for patients that screen positive and express interest in addressing symptoms.**

b) **The North Carolina Center of Excellence for Integrated Care, Community Care of North Carolina, North Carolina Pediatric Society, North Carolina Academy of Family Physicians, the Division of Public Health, and other appropriate partners should continue to provide technical assistance to increase both the level of integrated care and the amount of integrated care available in all practice settings, including but not limited to, private primary care practices, health department primary care clinics, FQHCs, rural health centers, and health systems. Practices should be offered technical assistance to help with culture change, the right mix of providers, overcoming billing issues, and financial strategies for success.**

   1) **The Division of Medical Assistance and private payers should evaluate payment policies to promote integrated primary care and behavioral health practices. This would include, but not be limited to, facilitating and allowing behavioral health and primary care providers to both bill for services provided to the same patient on the same day and incentivizing implementation of integrated care through quality initiatives and Medicaid reform.**

   2) **The Division of Mental Health, Developmental Disabilities, and Substance Abuse Services, Community Care of North Carolina, the North Carolina Pediatric Society, the North Carolina Academy of Family Physicians, and the North Carolina Foundation for Advanced Health Programs should develop a working group to best support integrated care under Medicaid reform.**

3) **Toward Accountable Care Consortium (a program of the North Carolina Medical Society) should work with Accountable Care Organizations and other shared savings delivery models to identify and implement best practices for integrated care to improve quality and decrease cost given the ample evidence that well integrated care does both.**

4) **Health systems and primary care providers should work to develop increasingly integrated care. This should be done working with technical assistance providers and in the context of current payment systems to maximize sustainability of integrated care, but also with attention to evolving payment reform.**

c) **The Division of Mental Health, Developmental Disabilities, and Substance Abuse Services, Community Care of North Carolina, and state mental health and substance abuse prevention and treatment organizations (North Carolina chapter of the National Alliance on Mental Illness, Alcoholics Anonymous /Narcotics Anonymous) should develop local resources and capacity for evidence-based and evidence-informed strategies to identify, support, and treat people with mental health symptoms and substance abuse issues, including psychological first aid, peer support, lay health workers, 12 step programs, and faith-based services.**

References

1. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia). Table 20: Dependence or Abuse of Illicit Drugs or Alcohol in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 16, 2014.

2. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia). Table 16: Alcohol Dependence or Abuse in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 16, 2014.

3. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia). Table 18: Illicit Drug Dependence or Abuse in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 16, 2014.

4. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia). Table 23: Serious Mental Illness in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 16, 2014.

5. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia). Table 26: Had at Least One Major Depressive Episode in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 16, 2014.

6. Substance Abuse and Mental Health Services Administration. 2011-2012. National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia). Table 24: Any Mental Illness in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 16, 2014.

7. Williams JW Jr. Competing demands: does care for depression fit in primary care? *J Gen Intern Med*. 1998;13(2):137-139.

8. North Carolina Institute of Medicine. *Building a Recovery-Oriented System of Care: A Report of the NCIOM Task Force on Substance Abuse Services*. Morrisville, NC: North Carolina Institute of Medicine; 2009. http://www.nciom.org/wp-content/uploads/NCIOM/projects/substance_abuse/chapters/FullReport.pdf. Accessed May 5, 2009.

9. Corrigan P. How stigma interferes with mental health care. *Am Psychol*. 2004;59(7):614-625.

10. Thompson S, Nichols KA, Ebron RG. A snapshot of North Carolina's public mental health, developmental disabilities, and substance abuse service system. *NC Med J*. 2012;73(3):235-239.

11. Kessler RC, Barker PR, Colpe LJ, et al. Screening for serious mental illness in the general population. *Arch Gen Psychiatry*. 2003;60(2):184-189.

12. Penninx BW, Leveille S, Ferrucci L, van Eijk JT, Guralnik JM. Exploring the effect of depression on physical disability: longitudinal evidence from the established populations for epidemiologic studies of the elderly. *Am J Public Health*. 1999;89(9):1346-1352.

13. Broadhead WE, Blazer DG, George LK, Tse CK. Depression, disability days, and days lost from work in a prospective epidemiologic survey. *JAMA*. 1990;264(19):2524-2528.

14. McKillop AB, Carroll LJ, Battié MC. Depression as a prognostic factor of lumbar spinal stenosis: a systematic review. *Spine J*. 2014;14(5):837-846.

15. Schmeding A, Schneider M. Fatigue, health-related quality of life and other patient-reported outcomes in systemic lupus erythematosus. *Best Pract Res Clin Rheumatol*. 2013;27(3):363-375.

16. Injury Epidemiology and Surveillance Unit, Injury and Violence Prevention, North Carolina Division of Public Health. *The Burden of Suicide in North Carolina*. Raleigh, NC: North Carolina Department of Health and Human Services; 2013. http://www.injuryfreenc.ncdhhs.gov/ForHealthProfessionals/2013BurdenofSuicide.pdf. Accessed July 16, 2014.

17. Katon WJ. Clinical and health services relationships between major depression, depressive symptoms, and general medical illness. *Biol Psychiatry*. 2003;54(3):216-226.

18. Holt RI, de Groot M, Golden SH. Diabetes and depression. *Curr Diab Rep*. 2014;14(6):491.

19. Division of Alcoholism and Chemical Dependency Programs, North Carolina Department of Correction. *Annual Legislative Report, FY 2006-2007*. Raleigh, NC: North Carolina Department of Correction; 2008. http://www.doc.state.nc.us/Legislative/2008/2006-07_Annual_Legislative_Report.pdf. Accessed July 18, 2014.

20. North Carolina Department of Juvenile Justice and Delinquency Prevention. *2007 Annual Report*. Raleigh, NC: North Carolina Department of Juvenile Justice and Delinquency Prevention; 2008. http://www.ncdjjdp.org/resources/pdf_documents/annual_report_2007.pdf#pagemode=bookmarks&page=1. Accessed May 5, 2009.

21. The University of North Carolina Highway Safety Research Center. About the North Carolina Alcohol Facts (NCAF) website. http://www.hsrc.unc.edu/ncaf/. Accessed July 16, 2014.

22. North Carolina State Center for Health Statistics. Data for traffic crashes that are alcohol-related by county, 2011. NC Department of Health and Human Services website. http://healthstats.publichealth.nc.gov/indicator/view_numbers/MVCAlcohol.County.html. Updated January 9, 2013. Accessed July 18, 2013.

23. Schneider Institute for Health Policy, Brandeis University. *Substance Abuse: The Nation's Number One Health Problem*. Princeton, NJ: Robert Wood Johnson Foundation; 2011. http://www.rwjf.org/content/dam/farm/reports/reports/2001/rwjf13550. Accessed December 11, 2008.

24. North Carolina Injury and Violence Prevention Branch. Prescription and Drug Overdoses. North Carolina Department of Health and Human Services website. http://injuryfreenc.ncdhhs.gov/About/PoisoningOverdoseFactSheet2013.pdf. Published January 2013. Accessed July 16, 2014.

25. Friedman DP. Drug addiction: a chronically relapsing brain disease. *NC Med J*. 2009;70(1):35-37.

26. North Carolina Injury and Violence Prevention Branch. Surveillance Update: Prescription Drug Abuse: 2011 N.C. Youth Risk Behavior Survey (YRBS). North Carolina Department of Health and Human Services website. http://www.injuryfreenc.ncdhhs.gov/DataSurveillance/YRBS/2011MSHSPrescriptionDrugUse.pdf. Published September 2010. Accessed July 16, 2014.

27. Goodell S. Health Affairs. Mental Health Parity Health Policy Brief. http://www.healthaffairs.org/healthpolicybriefs/brief.php?brief_id=112. Published April 3, 2014.

28. Klinkman MS. Competing demands in psychosocial care. A model for the identification and treatment of depressive disorders in primary care. *Gen Hosp Psychiatry*. 1997;19(2):98-111.

29. American Psychiatric Association. Collaboration between psychiatrists, primary docs vital to ensuring more people get MH care. *Psychiatric News*. 1998;20.

30. Wells KB, Sherbourne C, Schoenbaum M, et al. Impact of disseminating quality improvement programs for depression in managed primary care: a randomized controlled trial. *JAMA*. 2000;283(2):212-220.

31. Accreditation Council for Graduate Medical Education. *ACGME Common Program Requirements*. Chicago, IL; Accreditation Council for Graduate Medical Education: 2013. https://www.acgme.org/acgmeweb/Portals/0/PFAssets/ProgramRequirements/CPRs2013.pdf. Accessed June 27, 2014.

32. MacCarthy D, Weinerman R, Kallstrom L, Kadlec H, Hollander M, Patten S. Mental health practice and attitudes of family physicians can be changed! *Perm J*. 2013;17(3):14-17.

33. Oyama O, Burg MA, Fraser K, Kosch SG. Mental health treatment by family physicians: current practices and preferences. *Fam Med*. 2012;44(10):704-711.

34. Lin EH, Katon W, Von Korff M, et al; IMPACT Investigators. Effect of improving depression care on pain and functional outcomes among older adults with arthritis: a randomized controlled trial. *JAMA*. 2003;290(18):2428-2429.

35. Hunkeler EM, Katon W, Tang L, et al. Long term outcomes from the IMPACT randomised trial for depressed elderly patients in primary care. *BMJ*. 2006;332(7536):259-263.

36. Williams JW Jr, Katon W, Lin EH, et al; IMPACT Investigators. The effectiveness of depression care management on diabetes-related outcomes in older patients. *Ann Intern Med*. 2004;140(12):1015-1024.

37. Williams JW Jr. Integrative care: what the research shows. *NC Med J*. 2012;73(3):205-206.

38. Bogner HR, Morales KH, de Vries HF, Cappola AR. Integrated management of type 2 diabetes mellitus and depression treatment to improve medication adherence: a randomized controlled trial. *Ann Fam Med*. 2012;10(1):15-22.

39. Rubenstein LV, Williams JW Jr, Danz M, Shekelle P, Suttorp M, Johnsen B; Department of Veterans Affairs Health Services Research and Development Service. *Determining Key Features of Effective Depression Interventions*. Washington, DC: Department of Veterans Affairs; 2009. http://www.hsrd.research.va.gov/publications/esp/depinter.cfm. Accessed July 23, 2014.

40. Chiles JA, Lambert MJ, Hatch AL. The impact of psychological interventions on medical cost offset: a meta analytic review. *Clin Psych*. 1999;6(2):204-220.

41. North Carolina Department of Health and Human Services. *Proposal to Reform North Carolina's Medicaid Program*. Raleigh, NC: North Carolina Department of Health and Human Services; 2014. http://ncdhhs.gov/pressrel/2014/DHHS_Medicaid_Reform_Legislative_Report-2014-03-17.pdf. Accessed July 25, 2014.

42. Porter-Rockwell B. Rural hospital mergers make for improved bottom lines, mixed feelings. North Carolina Health News website.http://www.northcarolinahealthnews.org/2013/08/14/rural-hospital-mergers-make-for-improved-bottom-lines-mixed-feelings/. Published August 14, 2013. Accessed July 25, 2014.

43. Toward Accountable Care Consortium. List of North Carolina Accountable Care Organizations. Toward Accountable Care Consortium website. http://www.tac-consortium.org/nc-acos/. Accessed July 25, 2014.

44. North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services. Local contacts: Local Management Entities by name. North Carolina Department of Health and Human Services website. http://www.ncdhhs.gov/mhddsas/lmeonbluebyname.htm. Updated October 22, 2012. Accessed May 21, 2014.

45. Swartz M, Morrissey J. Public behavioral health care reform in North Carolina: will we get it right this time around? *NC Med J*. 2012;73(3):177-184.

46. Holton A, Brantley T, Duda A; North Carolina Center for Public Policy Research. *Telepsychiatry in North Carolina: Mental Health Care Comes to You*. Raleigh, NC: North Carolina Center for Public Policy Research; 2014. http://www.nccppr.org/drupal/sites/default/files/file_attachments/accomplishments/telepsychiatry.pdf. Accessed May 21, 2014.

47. Kitchener BA, Jorm AF. Mental health first aid training: review of evaluation studies. *Aust N Z J Psychiatry*. 2006;40(1):6-8.

48. North Carolina Department of Health and Human Services. Press release: DHHS launches Youth Mental Health First Aid to address mental illness and substance abuse issues. North Carolina Department of Health and Human Services website. http://www.ncdhhs.gov/pressrel/2014/2014-02-21_dhhs_launches_youth_mh.htm. Published February 24, 2014. Updated February 24, 2014. Accessed June 27, 2014.

49. Mental Health First Aid USA. Find a course. National Council for Behavioral Health website. http://www.mentalhealthfirstaid.org/cs/take-a-course/find-a-course/. Accessed June 27, 2014.

50. Donovan DM, Ingalsbe MH, Benbow J, Daley DC. 12-step interventions and mutual support programs for substance use disorders: an overview. *Soc Work Public Health*. 2013;28(3-4):313-332.

51. McCabe OL, Perry C, Azur M, Taylor HG, Bailey M, Links JM. Psychological first-aid training for paraprofessionals: a systems-based model for enhancing capacity of rural emergency responses. *Prehosp Disaster Med*. 2011;26(4):251-258.

52. Fallon EA, Bopp M, Webb B. Factors associated with faith based health counselling in the United States: implications for dissemination of evidence-based behavioural medicine. *Health Soc Care Community*. 2013;21(2):129-139.

53. Madras BK, Compton WM, Avula D, Stegbauer T, Stein JB, Clark HW. Screening, brief interventions, referral to treatment (SBIRT) for illicit drug and alcohol use at multiple healthcare sites: comparison at intake and 6 months later. *Drug Alcohol Depend*. 2009;99(1-3):280-295.

Insurance Coverage and Safety Net Programs

Chapter 7

Background

Most North Carolinians have a source of insurance coverage, but the source of coverage varies across rural and urban areas. In 2011-2012, rural North Carolinians were more likely to be covered by Medicare (21%) or Medicaid (18%) and were less likely to be covered by employer sponsored insurance (40%), than people in urban areas (15%, 11%, and 48% respectively).[a]

In 2011-2012, 20.2% of *nonelderly* North Carolinians, or 1.6 million people, were uninsured.[b,1] Rural residents were about equally likely to be uninsured (20.8%) as urban residents (19.5%).[2] However, there is significant variation among counties in the percentage of the population who is uninsured. In some rural counties (e.g. Alleghany, Avery, Duplin, Jackson, Robeson), more than one in four nonelderly residents are uninsured. Approximately 80% of uninsured adults in North Carolina reported in 2012 that they were uninsured for more than one year, and over half (52%) reported being uninsured for five years or more.[3] Most of the uninsured in North Carolina report that they lack coverage because of costs (61.1%) or because they lost a job or changed employers (12.0%).[4]

Not having health insurance coverage is harmful to the health and well-being of children and adults alike. People who lack health insurance coverage have a harder time obtaining the care they need because of the costs. National studies show that people who are uninsured are less likely to obtain preventive screening or obtain care for their chronic conditions.[5] The uninsured are more likely to be hospitalized for preventable conditions, to be diagnosed with late stage cancer, and are more likely to die prematurely than those with insurance coverage.[5] North Carolina data confirm that adults without health insurance are more likely than those with insurance coverage to report being in fair or poor health,[c,6] but less likely to visit a doctor for a routine doctor's visit,[d,7] less likely to see a doctor when they need it because of the costs,[e,8] and are less likely to report having a personal doctor.[f,9] They are also less likely to have a

Bill Harrison, 50, and his family, have never had health insurance before. Bill is self-employed as a plumber and his wife's job doesn't offer coverage. Bill and his family lost everything in 2008 when the bottom fell out of the economy. He was hospitalized recently for panic attacks and then a heart attack. His wife had a strong family history of colon cancer and needed a colonoscopy for $1,200. Bill and his wife came into the Blue Ridge Community Health Services to talk to a navigator about subsidized insurance. Bill had heard of people that lost their insurance due to Obamacare, and he was skeptical about the government taking such a big role. When he walked out, having signed for heavily subsidized insurance for $2.38 per month for his family, he was no longer skeptical and had a new found security.

Blue Ridge Community Health Services, Hendersonville, NC

a Mark Holmes, PhD. Associate Professor, Health Policy and Management. University of North Carolina Gillings School of Global Public Health. Analysis of the Current Population Survey 1999-2012 by special request. May 15, 2014.

b When examining the uninsured, we focus on the nonelderly because almost ll people have insurance coverage once they reach age 65. In North Carolina, only 1% of the elderly (age 65 or older) are uninsured.

c In a statewide survey in 2012, the uninsured were more likely to report being in fair or poor health (26.1%) than are those with insurance coverage (17.5%).

d In 2012, North Carolina uninsured adults were much less likely to have seen a doctor in the last two years for a routine check-up (61.3%) compared to those with insurance coverage (90.4%).

e Almost half (48.6%) of uninsured adults in North Carolina reported in 2012 that they could not visit a doctor when they needed to because of the costs. In contrast, only 11.1% of those with insurance coverage had similar financial access difficulties.

f People who are uninsured were also less likely to report having a personal doctor (62.9%) compared to 14.4% for those with insurance coverage in 2012.

prescription filled because they cannot afford to pay for the medications.[g,10,11]

The lack of insurance coverage also impacts a person's finances. People who lack insurance coverage are more likely to report being contacted by a credit agency to collect outstanding medical bills, being unable to pay for basic necessities due to outstanding medical bills, and having no savings or assets.[5] Outstanding medical bills and/or health-related problems are among the major contributors to personal bankruptcy.[12]

As noted earlier, many people in rural communities rely on Medicaid as their source of insurance coverage. North Carolina has historically linked Medicaid recipients to a primary care provider in a medical home. Medicaid recipients with chronic illnesses or other complex health problems also have access to care managers who help them coordinate their care. This system, called Community Care of North Carolina, links individual practices to larger networks, which helps with care coordination, pharmacy management, psychiatric services, and quality improvement efforts. This broader network is particularly helpful in rural and under-resourced communities, because the resources available at the network level can help address some of the provider shortages that exist in small rural communities. The North Carolina Department of Health and Human Services has proposed a major reform of the state's Medicaid program, as described in more detail below. This could have significant implications for the delivery of health services in rural areas.

Community Care of North Carolina, links individual practices to larger networks and is particularly helpful in rural and under-resourced communities, because the resources available at the network level can help address some of the provider shortages that exist in small rural communities.

For those who remain uninsured, there are many safety net organizations across the state with a mission or legal responsibility to serve the uninsured. Many of these organizations provide services to the uninsured for free or on a sliding scale basis. However, there are not sufficient safety net resources to meet all of the health care needs of the uninsured. Further, many of the uninsured are unaware of the resources that do exist.

The Patient Protection and Affordable Care Act

Congress enacted the Patient Protection and Affordable Care Act (ACA) in 2010.[h] The ACA was designed to address many of the challenges facing the United States health care system. It attempts to expand coverage to more uninsured, improve population health, improve quality of care, and reduce rising health care costs.[13] The Task Force on Rural Health focused on the new insurance coverage provisions that went into effect in 2014.

Insurance Mandate

Beginning in January 2014, individuals and families have new options to purchase health insurance coverage. The ACA requires most people to either

g In 2010, North Carolina adults were asked about medication compliance. One-third of the uninsured (33.3%) compared to 29.2% of those with insurance coverage reported that there was a time when they had not filled a medication prescribed by a health professional. Of these, 68.6% of the uninsured and 27.7% of those with insurance coverage reported that they had not filled the medication because they could not afford to pay for it.

h Patient Protection and Affordable Care Act. Pub L no. 111-148

have health insurance coverage or pay a penalty.[i,j] Most nonelderly North Carolinians will continue to receive health insurance coverage through their jobs or through a family member who has employer-sponsored insurance coverage. Older adults and some people with disabilities will continue to rely on Medicare as their primary source of health insurance coverage.

Medicaid and NC Health Choice (North Carolina's child health insurance program) provide coverage to some—but not all—low-income individuals in the state. Most uninsured children in the state qualify for either Medicaid or NC Health Choice (which provides coverage to children through age 18 if their family incomes are no greater than 200% the federal poverty guideline or "FPG"). However, because of certain eligibility restrictions, Medicaid only covers 28% of low-income nonelderly adults (with incomes below 100% FPG).[14] This is because current Medicaid eligibility rules require adults to meet certain categorical and income restrictions (and sometimes resource restrictions). For example, Medicaid eligibility is currently limited to adults who are 65 or older, disabled, or who are parents of dependent children under the age of 19 and who have incomes below a state-specified standard. Those who are elderly or disabled can qualify with incomes up to 100% FPG, but parents of dependent children can only qualify if their income is less than half (approximately 45%) of the FPG.[15] Because of the categorical eligibility requirements, most childless, nonelderly, and nondisabled adults cannot qualify for Medicaid.

Medicaid and NC Health Choice (North Carolina's child health insurance program) provide coverage to some—but not all—low-income individuals in the state.

As originally enacted, the ACA required states to expand Medicaid to all citizens and many lawful permanent residents with family incomes below 138% FPG. The United States Supreme Court in National Federation of Independent Businesses v. Sebelius, 132 S. Ct. 2566 (2012), held that the mandatory Medicaid expansion was unconstitutionally coercive to the states. Instead, states have the option to expand Medicaid, but are not required to do so. In North Carolina, the Division of Medical Assistance estimated that this expansion, if offered, would provide coverage to approximately 500,000 adults with incomes below 138% FPG.[16] At the time this report was written, North Carolina has decided not to expand Medicaid.[k]

Health Insurance Marketplace

Many uninsured people will be able to buy insurance through the new health insurance marketplace. States were given the option of creating their own state-based marketplace or having the federal government operate one for the state.[l] In North Carolina, the federal government is operating the marketplace. In general, people can only enroll in the marketplace during an open enrollment

i The penalty is $95/year or 1% of income (whichever is greater) in 2014. The penalty amount increases to $695/year or 2.5% of income by 2016. Certain individuals are exempt from the mandate, including but not limited to those who are not required to pay taxes because their incomes are less than 100% of the federal poverty guideline (FPG), those who qualify for a religious exemption, American Indians, and those for whom the lowest cost plan would exceed 8% of their income.

j Patient Protection and Affordable Care Act. Pub L no. 111-148 §1501, 42 USC 18091

k North Carolina Session Law 2013-5.

l Patient Protection and Affordable Care Act. Pub L. no. 111-148 §§ 1311, 1321, 42 USC 13031, 18041

period. The initial open enrollment period ran from October 1, 2013 through March 31, 2014. The next open enrollment period will run from November 15, 2014 to February 15, 2015.[17] Certain individuals can enroll outside the open enrollment period if they have special circumstances (e.g. they lost their job and employer-sponsored insurance, got divorced, or had a child).

Subsidies are available to many families to help make health insurance coverage more affordable.[18] Individuals and/or families can qualify for subsidies if they have incomes between 100-400% FPG, do not have access to affordable employer-sponsored coverage, and are not eligible for publicly-funded health insurance (e.g. Medicaid, NC Health Choice, or Medicare). Subsidies are not available to most individuals with incomes below 100% FPG because, as the law was written, people living in poverty would be eligible for Medicaid (and if eligible for Medicaid, they were not eligible for the subsidies). The Supreme Court decision that made Medicaid expansion optional to the states created a coverage gap for the lowest income adults in states, like North Carolina, that chose not to expand Medicaid.

Individuals and/or families can qualify for subsidies if they have incomes between 100-400% FPG, do not have access to affordable employer-sponsored coverage, and are not eligible for publicly-funded health insurance.

Outreach, Education, and Enrollment Assistance

Most of the uninsured adults in North Carolina have little recent experience with commercial insurance coverage. As noted earlier, more than half of the uninsured adults in North Carolina reported being uninsured for five years or more, or had never had insurance coverage. Nationally, poll data from November 2013 showed that most of the uninsured knew little (33%) or nothing (38%) about the health insurance marketplaces.[19] And fewer than half of the uninsured polled reported any confidence in understanding most of the basic health insurance terms including: premiums, deductibles, copay, coinsurance, covered services, excluded services, provider networks, maximum annual out of pocket spending limits, or annual limits on services. Less than one-quarter of the uninsured reported that they understood all of these concepts.[20] Because of the general lack of understanding about how insurance works, and the fact that the health insurance marketplace is new, ongoing education, outreach, and enrollment assistance is needed.

Enroll America is a nonprofit organization created to "maximize the number of Americans who are enrolled in and retain health coverage."[21] The organization operates in 11 states, including North Carolina. Enroll America conducts outreach to the uninsured, helping educate them about the new insurance options available in the marketplace.[m] Enroll America also helps link uninsured people to in-person assisters when they need more information to understand their insurance options or to complete the steps to apply for coverage.

The ACA requires each marketplace to contract with "navigator" entities. These organizations get grants from the federal government to provide education,

m Sorien Schmidt, JD. State Director, North Carolina Enroll America. Email communication. February 11, 2014

outreach, and enrollment assistance. In North Carolina, four organizations or consortia of organizations, were awarded federal funding to offer navigator services: North Carolina Community Care Networks (a consortium of 11 organizations including Access East, Council on Aging of Buncombe County, Disability Rights North Carolina, Legal Aid of North Carolina, Legal Services of Southern Piedmont, MDC-The Benefit Bank of North Carolina, North Carolina Agromedicine Institute, NC MedAssist, Partnership for Community Care, Pisgah Legal Services, and Wake County Medical Society Health Foundation); Alcohol and Drug Council of North Carolina; Mountain Projects (serving Cherokee, Clay, Graham, Haywood, Jackson, Macon, and Swain counties); and Randolph Hospital (serving Randolph, Moore, and Montgomery counties).

Community health centers also received funding to hire staff to help with outreach, education, and enrollment assistance. Other organizations, such as hospitals, community clinics, or other nonprofits, can apply to help people enroll into the marketplace by becoming certified application counselors (CACs). Aside from navigator organizations and community health centers, approximately 60 other organizations have been certified as CACs (as of January 31, 2014).[22] Navigators, certified application counselors, and community health center outreach and enrollment staff must all be trained and certified by the federal government before they can help people enroll. Agents and brokers, once trained and certified, can also help people enroll into coverage in the marketplace.

Because of the general lack of understanding about how insurance works, and the fact that the health insurance marketplace is new, ongoing education, outreach, and enrollment assistance is needed.

In addition, local departments of social services (DSS) have a legal responsibility to help people with the enrollment process. Local DSS offices must take applications for people interested in applying for Medicaid, NC Health Choice, or for subsidized coverage through the marketplace.[23]

Helping People Enroll into Insurance Coverage

Because open enrollment began recently, no studies evaluating different outreach, education, and enrollment assistance practices have been conducted to determine the most effective practices in helping the uninsured enroll in new insurance options. But past studies have identified best practices from state and national efforts to enroll uninsured children through Medicaid and/or Child Health Insurance Programs (CHIP);[24-28] from state health insurance programs (SHIP) that help Medicare recipients select Medicare supplement, Medicare Advantage and Medicare prescription drug plans;[25] and from Massachusetts as it implemented Mass Health Reform in 2006.[29] Unfortunately, because most states and communities have implemented multiple outreach, education, and enrollment strategies simultaneously, it is difficult to fully assess which of these strategies is most effective.[26,27] Thus, most of the past studies have been based on state officials' and/or other stakeholders' perceptions of which strategies are most effective and/or based on limited evaluations linking increases in enrollment to specific outreach and enrollment strategies. These studies suggest that certain marketing, outreach, and enrollment practices may be effective in

helping people understand their insurance options and enroll into coverage.[n] In addition to the past studies which have tried to identify best practices, some early studies and reports have described ACA marketing, outreach, and enrollment efforts in particular states.[23,28]

Marketing, Outreach, and Education

Mass media is important initially to help people learn about the new coverage, but thereafter, it is more effective to target marketing and outreach efforts to harder to reach populations.[24,25,27,28,30]

It is more effective to target marketing and outreach efforts to harder to reach populations.

- Make written materials accessible to people with low health literacy and limited English proficiency. Materials should be written at a literacy level that is appropriate for the target population and offered in multiple languages. It is not sufficient to translate English materials word for word into other languages. Rather, all materials should be reviewed by members of the target population to ensure that the messages are culturally and linguistically appropriate.[24,28-30]
- Develop simple messages and avoid using technical terms. The materials should emphasize a limited number of key messages, such as how the new insurance coverage will help people pay for preventive services or doctor's care, and will provide financial security in the event of an unanticipated medical emergency. It is also important to emphasize that financial help is available to make the coverage more affordable.[24,27,28]
- Use different approaches to reach a diverse population, including written materials, websites, online tools, telephone hotlines and in-person assistance.[25] Use web-based outreach and education to augment other efforts. These materials should be accessible to mobile devices, including smart phones and tablets as research shows that lower-income people are more reliant on these devices for internet access than higher income individuals.[26,30,31]
- Partner with trusted community-based organizations to help with the outreach and education at enrollment sites. Such organizations may include, but not be limited to: faith-based organizations, human services organizations, health care providers, schools, child care centers, family resource centers, food banks and, Goodwill.[24-28,30] In addition, work with

n The studies also focused on other elements needed for successful outreach and enrollment, such as a simple application form; an online eligibility and enrollment system that can verify eligibility through searches of federal and state databases; and decision supports to help people sort and compare health insurance options. These studies also noted the importance of having telephone hotlines staffed by knowledgeable staff who can answer consumer questions with accurate information. Having a simple recertification procedure was also noted as important. While all of these elements are important to ensure the success of the ACA enrollment efforts, they are primarily the responsibility of the federal government. North Carolina policymakers, agency staff, foundations, and community-based organizations have little impact on these elements. This chapter focuses on outreach, education, and enrollment assistance efforts that can be undertaken throughout the state or in local communities.

nontraditional partners that may have more name recognition among targeted populations, such as sports franchises.[26,28,30] Train different staff in health care organizations, including front-office staff, nurses and health care providers, to understand basic information about ACA eligibility and enrollment so that they can provide appropriate referral information to their patients and/or encourage them to apply.[23,28,32]

- Develop a network of community-based organizations that are helping with outreach and enrollment efforts. Community coalitions can help identify and address gaps in outreach and enrollment.[23,27]

Enrollment Assistance

- Offer people different options to file applications, including online, telephone, mail, or in person.[24] Provide access to in-person assisters to help people decide whether or not to enroll, get the necessary information needed to file the application, apply for financial assistance, understand official notices, choose a plan, and, if necessary, file an appeal.[25,28,29] Adequate resources are needed to ensure that there are sufficient numbers of in-person assisters who can work with all the people who want assistance, and that technology is available to help people apply online in appropriate venues.[25,29]

- Develop strategic partnerships with other state and local governmental agencies that interface with uninsured people, including but not limited to social services, local health departments, and employment security agencies.[26] In addition, outstation in-person assisters into hospitals, federally qualified health centers (FQHCs), health departments, or other places where the uninsured are likely to seek services.[24,27]

- Develop in-reach strategies. Hospitals, FQHCs, and other health professionals may be able to examine their own data systems to identify people who are uninsured and potentially eligible.[32]

- Change the culture of DSS eligibility workers to more actively help people enroll into health insurance coverage.[24]

Develop a network of community-based organizations that are helping with outreach and enrollment efforts.

Post Enrollment

- Provide ongoing help to people who need help understanding how to use their insurance once they have enrolled. Newly insured are likely to need additional help understanding provider networks, formularies, and cost sharing.[25,29]

- Provide help to people who need to report changes that could affect their eligibility for or amount of subsidies.[25]

- Offer help to people in the next open enrollment period in deciding whether to stay in their existing plans or to change to a new plan.[25]

Rural Outreach and Enrollment Efforts

Past studies have looked at marketing, outreach, education, and enrollment generically across different states, but have not focused on issues that may be specific to rural areas. Rural beneficiaries may experience other barriers that are unique or more prevalent in rural areas. For example, studies indicate that people living in rural areas have less access to the internet.[33] Rural beneficiaries also are more likely to report transportation barriers, which could make it more difficult for them to get to central locations for enrollment events.[34] Further, the receipt of public benefits carries a stigma for many rural families, which is arguably larger in rural areas than in urban areas.[35] It is not yet clear whether the subsidies available through the marketplace will carry the same stigma as does the receipt of public benefits. In addition, even though the proportion of people who are uninsured may be larger in many rural communities than urban, there are fewer people who are uninsured (because population density is less in rural areas than urban). Thus, many of the existing outreach, education, and enrollment efforts have focused initially on urban areas.[36]

Between October 1, 2013 and April 19, 2014, more than 350,000 people selected a marketplace plan in North Carolina (and more than 8 million nationally).

North Carolina Outreach, Education, and Enrollment Assistance in Rural Areas

Although open enrollment for the new health insurance coverage officially started on October 1, 2013, problems with the functioning of the federal website (www.healthcare.gov) made it difficult to enroll until mid-to-late November.[37] Thus, enrollment started slowly. However, enrollment accelerated later during the open enrollment period. Between October 1, 2013 and April 19, 2014, more than 350,000 people selected a marketplace plan in North Carolina (and more than 8 million nationally).[38] North Carolina had the fifth largest number of individuals selecting a marketplace plan during this time period.

As noted earlier, North Carolina received federal grants to support navigator activities among four different organizations (or consortia of organizations). In addition, 31 FQHCs received funding to hire outreach and enrollment specialists.[39] These FQHCs serve 62 counties, including 51 counties that are rural.[o] There are also other CACs across the state.[22]

While there are organizations that ostensibly serve the entire state, the Task Force heard from several organizational representatives that there were not sufficient in-person assisters to meet all the needs across the state, and in particular in rural communities. Organizations like Enroll America initially concentrated its efforts in urban areas. Legal Aid of North Carolina—which serves the entire state—has most of its branch offices (physical presence) in urban settings. While these organizations also try to reach rural areas, they do not have sufficient resources to serve everyone needing assistance. Local, state, and national funders helped to augment the navigator and FQHC funding, but

o Alice Pollard, MSW, MSPH. Outreach and Enrollment Specialist – Eastern North Carolina, North Carolina Community Health Center Association. Email communication. August 1, 2014.

these efforts have been largely targeted to communities with community or hospital foundations willing to contribute, and/or urban areas with the largest numbers of uninsured.[p] The only statewide philanthropic organization that targeted its funding to rural communities was the Kate B. Reynolds Charitable Trust.

The NCIOM Task Force on Rural Health heard presentations from representatives of organizations working to provide outreach, education, and/or enrollment assistance in rural areas.[36] In addition, a panel of navigators and CACs discussed rural outreach and enrollment challenges and successes in a meeting of the "Big Tent" (a consortium of navigators and CACs that meet biweekly to discuss outreach and enrollment efforts).[40] Further, the Task Force obtained feedback from rural community members directly in eight rural community feedback meetings. Some common themes that were presented include:

The only statewide philanthropic organization that targeted its funding to rural communities was the Kate B. Reynolds Charitable Trust.

Successes

- Health care providers can be important outreach ambassadors. People trust their physicians, nurses, pharmacists, and other health care providers, so it is important to enlist the provider community to disseminate information about the ACA and appropriate referral sources to their patients.
- Educate the office staff in health care organizations so that they will engage the patients and help refer them to appropriate resources (either inside the organization or to other in-person assisters).
- Health care organizations should look at their own populations (in-reach) to identify people who are uninsured and who may benefit from the new coverage options. Once identified, the health care organization should reach out to those individuals to help them understand the new options.
- Find other trusted people in the local community to educate community members about the new insurance options and the possible Medicaid expansion option for the state. This can include the faith community, schools, businesses, local government, or other community leaders. Panelists at the Task Force meetings talked about the importance of reaching out to the faith leaders, schools, businesses, local government, and professional associations (such as the North Carolina Growers Association) to educate parishioners, employees without access to employer-sponsored insurance, farmers/farm workers, and the general public about coverage options in the marketplace and the potential Medicaid expansion option.[36]
- People often need to hear the information about the Affordable Care Act multiple times before they begin to understand and/or consider enrolling into coverage.

p Kellan Moore, Executive Director, Care Share Health Alliance. Email communication. February 11, 2014.

- It is important to go to where uninsured people are, and not expect them to come to you. Aside from hospitals and health clinics, North Carolina agencies have had success reaching the uninsured in churches or other faith-based organizations, farms or livestock shows, cooperative extension, libraries, community colleges, and other gathering places in rural communities.
- Work with rural newspapers to disseminate information about local education or enrollment events. The local media look for local stories, so it is important to explain the local connection when talking to the media.

Challenges

Many people in rural communities are unaware of the new health insurance options available through the ACA, the state option to expand Medicaid to low-income uninsured people, or existing safety net resources in the community.

- Many people in rural communities are unaware of the new health insurance options available through the ACA, the state option to expand Medicaid to low-income uninsured people, or existing safety net resources in the community.
- Many of the uninsured do not understand how health insurance works (in general) or the new health insurance options available under the ACA.
- Some people in rural communities have a general mistrust of government programs. Many rural people pride themselves on being self-sufficient and do not want a government handout. In addition, some people are afraid of, or distrust, "Obamacare" and think it is different than private insurance coverage.
- Even with subsidies, the premiums are not affordable to some individuals.
- Some rural people who are self-employed are ineligible for subsidies because they have so many deductions that reduce their countable income below 100% FPG.
- A number of uninsured people fall into the coverage gap (e.g. they are ineligible for Medicaid but not eligible for subsidies in the marketplace because their income is below 100% FPG). Several panelists talked about the difficulty in telling people who are ineligible that they are "too poor" to be helped by the Affordable Care Act. The panelists try to refer the people to safety net organizations, but in many communities, the safety net organizations are already at capacity and cannot accommodate many new patients or have long waiting times.
- Transportation can be a problem for people without their own vehicle. The lack of transportation is a particular problem in rural areas because rural areas are less likely to offer public transportation.
- The North Carolina navigator organizations and FQHCs created a statewide appointment scheduler to assist people in finding an in-person assister who can talk with them about enrollment and insurance options.

However, the scheduler does not include all of the other CAC agencies and does not have enough appointments listed to meet the needs of all the people who want to talk to in-person assisters.

- The number of people and the amount of time are both insufficient to reach all the people who are uninsured.

Medicaid Reform

The North Carolina Medicaid program serves approximately 1.8 million people in any given month.[41] Most Medicaid recipients are enrolled in the Community Care of North Carolina (CCNC) program. CCNC links Medicaid recipients to a primary care provider.[41] Primary care providers are currently paid on a fee-for-service basis for all the services they provide. In addition, they receive a small per-member per-month management fee that compensates them to coordinate care for their patients.

The North Carolina Medicaid program serves approximately 1.8 million people in any given month.

CCNC includes 14 networks that are part of the North Carolina Community Care Network, Inc. (NCCCN) statewide organization. NCCCN receives a small, per-member per-month payment that helps pay for care coordinators, pharmacists, psychiatrists, quality improvement specialists, and a data analytics center that supports each of the 14 networks. Care coordinators are often housed in larger practices, and work closely with the primary care provider to help educate individuals about their health problems, and provide care management services when needed. The pharmacists, psychiatrists, and quality improvement specialists work in the network, but provide consultation to primary care practices.

Most providers who participate in the Medicaid program continue to be paid on a fee-for-service basis. That means that the providers are reimbursed every time they provide a service—whether or not the service was needed or led to health improvements. Many experts believe that our current fee-for-service system incentivizes providers to offer more services (volume), but does not reward providers on the basis of the value of the services they provide.[42] This, in turn, increases health care expenditures, but does little to improve overall quality. CCNC attempts to improve quality by measuring and reporting information back to providers on the quality of care they provide to Medicaid recipients. Yet in the past, provider reimbursement was not tied to the quality of care they provided.

The North Carolina Department of Health and Human Services (NCDHHS) has proposed a major overhaul of the state's Medicaid program, called Partnership for a Healthy North Carolina.[43] NCDHHS has proposed contracting with Accountable Care Organizations (ACOs). Within the Partnership for a Healthy North Carolina, a participating ACO will be a group of providers who agree to assume responsibility for all of the physical health needs of a group of Medicaid recipients. The goal of the Partnership for a Healthy North Carolina is to be

patient centered and promote whole-person care. The partnership also aims to secure budget predictability and cost savings, and partner with North Carolina's health care community to achieve these goals.

Medicaid recipients are assigned to an ACO based on whether their primary care provider is part of an ACO. ACOs must have a minimum of 5,000 Medicaid recipients to be eligible to participate in this initiative. By the end of the first year, the state aims to have 40% of Medicaid recipients enrolled in an ACO. This is expected to grow to 60% by the end of Year 2, 80% by the end of Year 3, and 90% thereafter.[47] If the ACOs lack capacity or geographic breadth to reach these targets, then NCDHHS will take such steps as are necessary (such as lowering payments to nonparticipating providers) to ensure the provider participation in the ACOs is sufficient to achieve these goals.

Many different types of safety net organizations provide health services to people who lack health insurance coverage in North Carolina.

By SFY 2016-2017 (the second year of implementation), the state expects the ACOs to reduce the rate of growth in Medicaid physical health expenditures by two-fifths of expenditures expected without this new program. If the ACO achieves certain quality standards and saves money, the ACO can share these savings with the state. However, if costs exceed the targeted amount, the ACO must share in the losses with the state.

The intent of this initiative is to move from "volume to value," by focusing not as much on the quantity of services provided as on the value of services provided. While a laudable goal, this model may not work as well in rural communities as in urban communities. Rural communities may lack the infrastructure or comprehensive provider network necessary to support an ACO. Further, some of the urban ACOs may choose not to contract with rural providers in order to avoid rural recipients who may be sicker than urban recipients. Thus, as the state moves forward to implement Medicaid reform, it is important to examine the potential impact of these efforts on rural communities.

Safety Net Resources

Many different types of safety net organizations provide health services to people who lack health insurance coverage in North Carolina.[44] These include hospitals, community and migrant health centers, rural health centers, public health departments, free clinics, and other nonprofit organizations that have a mission or legal obligation to provide services to the uninsured. Because of the federal Emergency Medical Treatment and Active Labor Act (EMTALA),[45] hospitals with emergency departments have a legal responsibility to screen and stabilize anyone who presents, regardless of ability to pay.[13] However, hospitals can charge people for the services they provide, although most offer some charity care to people with lower incomes.[5,46] Community and migrant health centers (also referred to as federally qualified health centers or FQHCs) also provide primary care services on a sliding scale basis to people who lack insurance coverage, as do some health departments and rural health centers.[44] Free clinics

also provide services to the uninsured, but most free clinics rely on volunteer health care professionals and, as a result, typically operate more limited hours and are able to see fewer patients during a week than a traditional clinic. While primary care services are available to some uninsured people—either for free or on a sliding scale basis—access to specialists is far more limited.[47] Some communities have tried to address this problem on a volunteer basis. Many uninsured also have difficulty obtaining needed prescription medications, mental health or substance abuse services, or dental care.[47]

National studies have shown that most of the uninsured are unaware of existing safety net resources, and only a little more than half of the uninsured know about safety net resources that are located within five miles of where they live.[48] To help address this issue, the NCIOM created a website—www.nchealthcarehelp.org—that provides information about some of the safety net resources that exist within the state, but most people are unaware of this website. In addition, United Way created a website that includes information about nonprofit health and human resources that exist across the state, www.nc211.org. This website is augmented by two call centers that cover all but eight counties across the state.[q,r] The United Way website is maintained by local partners and is updated on a more regular basis than is the NCIOM website. Some, but not complete, overlap, exists between the information collected on both websites.

Most of the safety net organizations in these communities were operating at or near capacity and would not be able to serve many more of the uninsured absent new resources.

Despite the availability of these website resources, there is still a general lack of knowledge about existing safety net resources across the state. This general lack of knowledge of existing safety net resources was confirmed in the eight rural community meetings hosted as part of this Task Force. We heard from people in almost all of the community meetings that many of the uninsured were unaware of the safety net resources that operated in their communities (aside from the hospital). However, rural representatives at these meetings expressed concern about broadly advertising the availability of safety net resources. We heard that most of the safety net organizations in these communities were operating at or near capacity and would not be able to serve many more of the uninsured absent new resources.

Based on the feedback from the rural community meetings, presentations, and best practices from prior outreach and enrollment efforts, the Task Force recommends:

q Marti Morris, Director, NC 211. Verbal communication. March 12, 2014.
r At the time this report was being written, www.nc211.org covered all but eight counties across the state. However, United Way has plans to include the last eight counties in the summer of 2014.

Recommendation 5: Educate and engage people in rural communities about new and emerging health insurance options available under the Affordable Care Act as well as existing safety net resources.

a) Existing navigator entities, certified application counselors, hospitals, departments of social services, health departments, local government, safety net organizations, businesses, the faith community, and other nonprofits, should continue to work together collaboratively at the local level to coordinate education, outreach, and enrollment efforts, and to identify gaps in necessary resources.

b) North Carolina foundations should support local education, outreach, and enrollment activities by targeting rural communities with high unmet needs. High unmet needs should be demonstrated by having large numbers or a large percentage of uninsured, with few navigators, CACs, or other enrollment specialists. Funding should be targeted first to those communities that have a coordinated effort in place to examine the need; identify existing resources and gaps in resources; and develop a plan to outreach to hard to reach rural populations.

c) The North Carolina General Assembly and North Carolina Department of Health and Human Services should examine the potential impact of any changes to Medicaid payment and delivery models on rural communities before implementing major system reforms.

d) The North Carolina Institute of Medicine should work with United Way's 211 line to transition the maintenance of www.nchealthcarehelp.org to www.nc211.org to better promote the availability of safety net resources across the state. North Carolina foundations should encourage that safety net grantees review and update information on the site at least once annually.

References

1. United States Census Bureau. Health insurance historical tables (HIB Series). Health insurance coverage status and type of coverage by state—persons under 65: 1999 to 2012. HIB-6. United States Census Bureau website. http://www.census.gov/hhes/www/hlthins/data/historical/HIB_tables.html. Updated September 17, 2013. Accessed January 13, 2014.

2. North Carolina Institute of Medicine. Characteristics of uninsured North Carolinians. 2011-2012 data snapshot. North Carolina Institute of Medicine website. http://riversdeveloper.com/wp-content/uploads/2010/08/Uninsured-Snapshot_2011-2012.pdf. Accessed July 25, 2014.

3. North Carolina State Center for Health Statistics. 2012 BRFSS Survey results: North Carolina. Reasons uninsured: About how long has it been since you had health care coverage? North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/schs/brfss/2012/nc/all/nc11q02.html. Published August 28, 2013. Accessed January 13, 2013.

4. North Carolina State Center for Health Statistics. 2012 BRFSS Survey results: North Carolina. Reasons uninsured – by risks, conditions, and quality of life measures: Earlier you indicated you do not have health insurance coverage. What is the main reason you do not have health insurance? North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2012/nc/risk/noinsure.html. Published August 29, 2013. Accessed January 13, 2014.

5. The Uninsured: A Primer – Key Facts about Health Insurance on the Eve of Coverage Expansions. Kaiser Family Foundation website. http://kff.org/report-section/the-uninsured-a-primer-2013-4-how-does-lack-of-insurance-affect-access-to-health-care/. Published October 23, 2013.

6. North Carolina State Center for Health Statistics. 2012 BRFSS Survey results: North Carolina. Health status – by risks, conditions, and quality of life measures:, General health indicator for Healthy North Carolina 2020. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2012/nc/risk/nc_health.html. Published August 5, 2013. Accessed January 13, 2013.

7. North Carolina State Center for Health Statistics. 2012 BRFSS Survey results: North Carolina. Health care access: About how long has it been since you last visited a doctor for a routine checkup? A routine checkup is a general physical exam, not an exam for a specific injury, illness, or condition. North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2012/nc/all/checkup1.html. Published August 2, 2013. Accessed January 13, 2014.

8. North Carolina State Center for Health Statistics. 2012 BRFSS Survey results: North Carolina. Health care access – by risks, conditions, and quality of life measures: Was there a time during the last 12 months when you needed to see a doctor, but could not because of the cost? North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2012/nc/risk/medcost.html. Published August 5, 2013. Accessed January 13, 2014.

9. North Carolina State Center for Health Statistics. 2012 BRFSS Survey results: North Carolina. Health care access – by risks, conditions, and quality of life measures: Do you have one person you think of as your personal doctor or health care provider? North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/SCHS/brfss/2012/nc/risk/persdoc2.html. Published August 5, 2013. Accessed January 13, 2013.

10. North Carolina State Center for Health Statistics. 2010 BRFSS Survey results: North Carolina. Prescription medication adherence – by risks, conditions, and quality of life measures: Has there ever been a time when you have NOT filled or refilled a medication prescribed by a doctor or dentist or other health professional? North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/schs/brfss/2010/nc/risk/nc07q01.html. Published May 26, 2011. Accessed January 13, 2014.

11. North Carolina State Center for Health Statistics. 2010 BRFSS Survey results: North Carolina. Prescription medication adherence – by risks, conditions, and quality of life measures: I'm going to read a list of reasons people sometime don't get their medications filled or refilled. Do any of these reasons apply to you … You could not afford to pay for the medicine? North Carolina State Center for Health Statistics website. http://www.schs.state.nc.us/schs/brfss/2010/nc/risk/nc07q03d.html. Published May 26, 2011. Accessed January 13, 2014.

12. Himmelstein DU, Thorne D, Warren E, Woolhandler S. Medical bankruptcy in the United States, 2007: results of a national study. *Am J Med.* 2009;122(8):741-746.

13. Silberman P. Implementing the Affordable Care Act in North Carolina: the rubber hits the road. *NC Med J.* 2013;74(4):298-307.

14. The Henry J. Kaiser Family Foundation. Health insurance coverage of adults 19-64 living in poverty (under 100% FPL). Kaiser Family Foundation website. http://kff.org/other/state-indicator/poor-adults/. Accessed January 28, 2014.

15. The Henry J. Kaiser Family Foundation. Medicaid income eligibility limits for adults at application, as of April 1, 2014. Kaiser Family Foundation website. http://kff.org/medicaid/state-indicator/medicaid-income-eligibility-limits-for-adults-at-application-as-of-april-1-2014/. Accessed July 25, 2014.

16. North Carolina Institute of Medicine. *Examining the Impact of the Patient Protection and Affordable Care Act in North Carolina*. Morrisville, NC: North Carolina Institute of Medicine; 2013. North Carolina Institute of Medicine website. http://www.nciom.org/wp-content/uploads/2013/01/FULL-REPORT-2-13-2013.pdf. Accessed July 25, 2014.

17. HealthCare.gov. Open enrollment period. US Centers for Medicare and Medicaid website. https://www.healthcare.gov/glossary/open-enrollment-period/. Accessed July 25, 2014.

18. Patient protection and affordable care act. pub L. no. 111-148 § 1401, 42 USC 13031, 26 USC 36B.

19. The Henry J. Kaiser Family Foundation. Kaiser Health Tracking Poll: November 2013. Kaiser Family Foundation website. http://kff.org/health-reform/poll-finding/kaiser-health-tracking-poll-november-2013/. Published November 22, 2013.

20. Long SK, Kenney GM, Zuckerman S, et al. The health reform monitoring survey: addressing data gaps to provide timely insights into the Affordable Care Act. *Health Aff.* 2014;33(1):161-167.

21. Enroll America. Our mission. Enroll America website. http://www.enrollamerica.org/about-us/our-mission/. Accessed July 25, 2014.

22. HealthCare.gov. Find local help. US Centers for Medicare and Medicaid website. https://localhelp.healthcare.gov/#address=CHAPEL%20HILL,%20NC&start=0&num=10&filter=off&lang_filter=0&shop_filter=0&chip_filter=0&navc_filter=1&aba_filter=0. Accessed July 25, 2014.

23. Hagan E. Coordinating assistance efforts: lessons from Wisconsin. Enroll America website. http://www.enrollamerica.org/coordinating-assistance-efforts-lessons-from-wisconsin/. Published October 2012. Accessed July 25, 2014.

24. The Kaiser Commission on Medicaid and the Uninsured. *Key Lessons from Medicaid and CHIP for Outreach and Enrollment under the Affordable Care Act*. Menlo Park, CA: Kaiser Family Foundation; 2013. http://kaiserfamilyfoundation.files.wordpress.com/2013/06/8445-key-lessons-from-medicaid-and-chip.pdf. Accessed January 28, 2014.

25. Hoadley J, Corlette S, Summer L, Monahan C; The Center on Health Insurance Reforms, Georgetown University Health Policy Institute. *Launching the Medicare Part D Program: Lessons for the New Health Insurance Marketplaces*. Washington, DC: Georgetown University; 2013. http://www.rwjf.org/content/dam/farm/reports/issue_briefs/2013/rwjf406589. Accessed January 28, 2014.

26. Hoag S, Harrington M, Orfield C, et al; Mathematica Policy Research. *Children's Health Insurance Program: An Evaluation (1997-2010). Interim Report to Congress*. Cambridge, MA: Mathematica Policy Research; 2011. http://aspe.hhs.gov/health/reports/2012/CHIPRA-IRTC/index.pdf. Accessed January 28, 2014.

27. Rosenbach M, Irvin C, Merrill A, et al; Mathematica Policy Research. *National Evaluation of the State Children's Health Insurance Program: A Decade of Expanding Coverage and Improving Access*. Cambridge, MA: Mathematica Policy Research; 2007. http://www.mathematica-mpr.com/publications/pdfs/schipdecade.pdf. Accessed July 25, 2014.

28. Hill I, Courtot B, Wilkinson M; Urban Institute. *Reaching and Enrolling the Uninsured: Early Efforts to Implement the Affordable Care Act*. Washington, DC: Urban Institute; 2013. http://www.rwjf.org/en/research-publications/find-rwjf-research/2013/10/reaching-and-enrolling-the-uninsured.html. Accessed July 25, 2014.

29. Paradise J, Rosenbaum S, Shin P, et al. Providing outreach and enrollment assistance: lessons learned from community health centers in Massachusetts. Kaiser Family Foundation website. http://kff.org/health-reform/issue-brief/providing-outreach-and-enrollment-assistance-lessons-learned-from-community-health-centers-in-massachusetts/. Published September 24, 2013. Accessed July 25, 2014.

30. Plaza CI. *Lessons Learned from Children's Coverage Programs: Outreach, Marketing, and Enrollment*. Portland, ME: National Academy for State Health Policy; 2012. http://www.nashp.org/sites/default/files/outreach.lessons.children.pdf. Accessed January 28, 2014.

31. Smith A. Mobile access 2010. Pew Research Internet Project. http://pewinternet.org/Reports/2010/Mobile-Access-2010.aspx. Published July 7, 2010. Accessed July 25, 2014.

32. Kendall J, Sullivan J. *Best Practices in Outreach and Enrollment for Health Centers*. Washington, DC: Enroll America; 2012. http://www.enrollamerica.org/wp-content/uploads/2013/12/Best_Practices_in_Outreach_and_Enrollment_for_Health_Centers.pdf. Accessed July 25, 2014.

33. Federal Communications Commission. *Eighth Broadband Progress Report*. Washington, DC: Federal Communications Commission; 2012. http://hraunfoss.fcc.gov/edocs_public/attachmatch/FCC-12-90A1.pdf. Accessed July 25, 2014.

34. Arcury TA, Preisser JS, Gesler WM, Powers JM. Access to transportation and health care utilization in a rural region. *J Rural Health.* 2005;21(1):31-38.

35. Rank MR, Hirschl TA. A rural-urban comparison of welfare exists: the importance of population density. *Rural Sociol.* 1988;53(2):190-206.

36. Insurance Education Panel and Discussion. Presented at: North Carolina Institute of Medicine Task Force on Rural Health meeting. January 8, 2014. Morrisville, North Carolina.

37. Goldstein A, Eilpern J, Sun LH. Troubled HealthCare.gov unlikely to work fully by end of November, as White House vowed. *The Washington Post.* November 12, 2013. http://www.washingtonpost.com/national/health-science/troubled-healthcaregov-unlikely-to-work-fully-by-end-of-november-as-white-house-vowed/2013/11/12/daf9670a-4bca-11e3-be6b-d3d28122e6d4_story.html. Accessed July 25, 2014.

38. Office of the Assistant Secretary for Planning and Evaluation. *ASPE Issue Brief - Health Insurance Marketplace: Summary Enrollment Report for the Initial Annual Open Enrollment Period*. Washington, DC: US Department of Health and Human Services; 2014. http://aspe.hhs.gov/health/reports/2014/MarketPlaceEnrollment/Apr2014/ib_2014apr_enrollment.pdf. Accessed June 20, 2014.

39. Health Resources and Services Administration. *Health Center Outreach and Enrollment Assistance Fiscal Year 2013*. Washington, DC: US Department of Health and Human Services; 2013. http://bphc.hrsa.gov/outreachandenrollment/hrsa-13-279.pdf. Accessed July 25, 2014.

40. Marketing and Enrolling Consumers in Rural North Carolina Panel. Presented at: Big Tent meeting. January 24, 2014. Raleigh, North Carolina.

41. Dobson LA Jr, Hewson DL, Wade TL. Community Care of North Carolina in 2013. *NC Med J.* 2013;74(suppl):S12-S15.

42. The Network for Regional Healthcare Improvement. *From Volume to Value: Transforming Health Care Payment and Delivery Systems to Improve Quality and Reduce Costs*. Portland, ME: he Network for Regional Healthcare Improvement; 2008. http://www.nrhi.org/downloads/NRHI2008PaymentReformRecommendations.pdf. Published Accessed May 15, 2014.

43. North Carolina Department of Health and Human Services. *Proposal to Reform North Carolina's Medicaid Program*. Raleigh, NC: North Carolina Department of Health and Human Services; 2014 http://ncdhhs.gov/pressrel/2014/DHHS_Medicaid_Reform_Legislative_Report-2014-03-17.pdf. Accessed July 25, 2014.

44. Silberman P, Odom CH, Smith S Jr, Dubay KL, Thompson KW. The North Carolina healthcare safety net, 2005: fragments of a lifeline serving the uninsured. *NC Med J.* 2005;66(2):111-119.

45. Zibulewsky J. The Emergency Medical Treatment and Active Labor Act (EMTALA): what it is and what it means for physicians. *Proc (Bayl Univ Med Cent)*. 2001;14(4):339-346.

46. Linker A. *How Charitable are North Carolina Hospitals? A Look at Financial Assistance Policies for the Uninsured*. Raleigh, NC: North Carolina Justice Center; 2010. http://www.ncjustice.org/sites/default/files/NC%20Health%20Report%20-%20Hospital%20Charity%20Care.pdf. Accessed July 25, 2014.

47. Felland LE, Felt-Lisk S, McHugh M. Health care access for low-income people: significant safety net gaps remain. *Issue Brief Cent Stud Health Syst Change.* 2004;84:1-4.

48. May JH, Cunningham PJ, Hadley J. *Most Uninsured People Unaware of Health Care Safety Net Providers.* Ed. Center for Studying Health System Change; 2004.

Recruitment and Retention of Health Care Professionals into Rural Communities

Chapter 8

Access to health care professionals is important to the health of North Carolinians. Ensuring that people can get the care that they need is an essential factor in ensuring people's health. Yet some areas of the state have an abundance of health care professionals and health care institutions, and others lack even the most basic infrastructure.

Primary care professionals (PCP) include family physicians, general practitioners, pediatricians, general internists, obstetrician/gynecologists, nurse practitioners, and physician assistants. They typically serve as the entry point into the health care system and provide a wide array of services including preventive, diagnostic, chronic disease management, and urgent care. As noted in Chapter 6, many primary care providers also offer or provide linkages to behavioral health services. Further, some of the more comprehensive patient-centered medical homes also offer some oral health services, and/or pharmacy management.

Primary care providers are the backbone of the health care delivery system, and are often the first point of entry into care. But rural communities need other providers in addition to primary care. Rural communities need nurses, allied health professionals, pharmacists, behavioral health specialists, and dentists to fully meet the health care needs of the population. Rural communities also need access to specialists, but it is often difficult to support certain types of specialty practices because there are not enough patients in many rural communities who need the services.

The North Carolina Institute of Medicine Task Force on Rural Health examined workforce needs in rural areas, and identified four priority areas for rural communities: primary care providers, behavioral health specialists, dental professionals, and general surgeons. Many rural communities would benefit from the addition of other health care professionals, but the aforementioned health professionals are the top priorities for many rural communities.

Primary Care Providers

The primary care workforce has experienced increases in demand due to overall population growth, the aging of the population, and the increasing numbers of people living with chronic illnesses.[1] Additionally, demand is expected to increase as more people gain insurance coverage as part of the Affordable Care Act. Although the primary care workforce has grown over the last 30 years, many areas of the state still have too few primary care physicians to meet population needs.

The federal Health Resources and Services Administration (HRSA) identifies areas of the country that have too few providers to meet the health care needs of the population. These are called Health Professional Shortage Areas (HPSA). A primary care HPSA is an area that has no more than one primary care physician for every 3,500 population (or 1:3,000 if there are unusually high primary

Since 2000, 44 medical students in North Carolina have been awarded scholarships by the North Carolina Academy of Family Physicians Foundation, with 91% entering family medicine residency training programs. Several now serve rural underserved communities including Advance, Taylorsville, Clyde, and Washington, North Carolina. The Foundation is also investing to strengthen the primary care pipeline with the Blue Cross and Blue Shield of North Carolina Foundation. Beginning in 2010, total investment in the NCAFP Foundation's six-year Family Medicine Interest and Scholars program is $1.8 million, with almost $1.2 million from the BCBSNC Foundation and over $600,000 from the NCAFP.

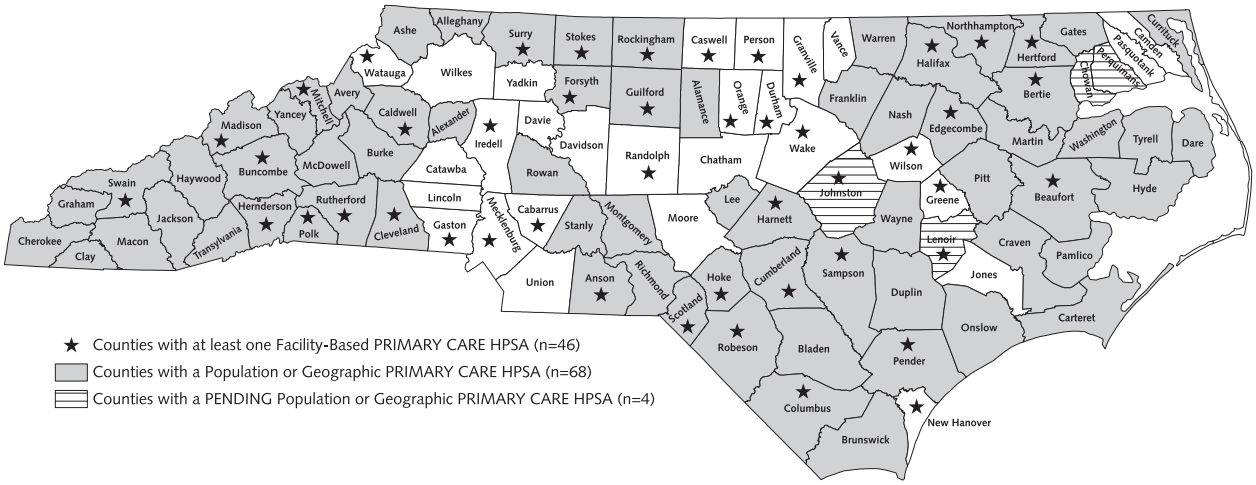
North Carolina Academy of Family Physicians

care needs, such as having 20% or more of the population living in poverty). There are three different types of primary care HPSAs: geographic (either whole or partial counties); population-based (e.g. parts of a county with a high concentration of low-income people with incomes no greater than 200% FPG or federally recognized American Indian tribes); or facility designations (e.g. correctional facilities or FQHCs).[2] Documentation must be submitted to HRSA to get the HPSA designation. It is advantageous to be designated as a HPSA for federal and other funding opportunities. In North Carolina, the Office of Rural Health and Community Care (ORHCC) helps communities, facilities, and population groups seek federal HPSA designations by submitting such data. Because ORHCC does not have sufficient staff to seek HPSA designation for every community, facility, or population group that could potentially qualify, ORHCC prioritizes its work on those communities, facilities, or population groups that request assistance.

North Carolina has one of the strongest state offices of rural health in the country.

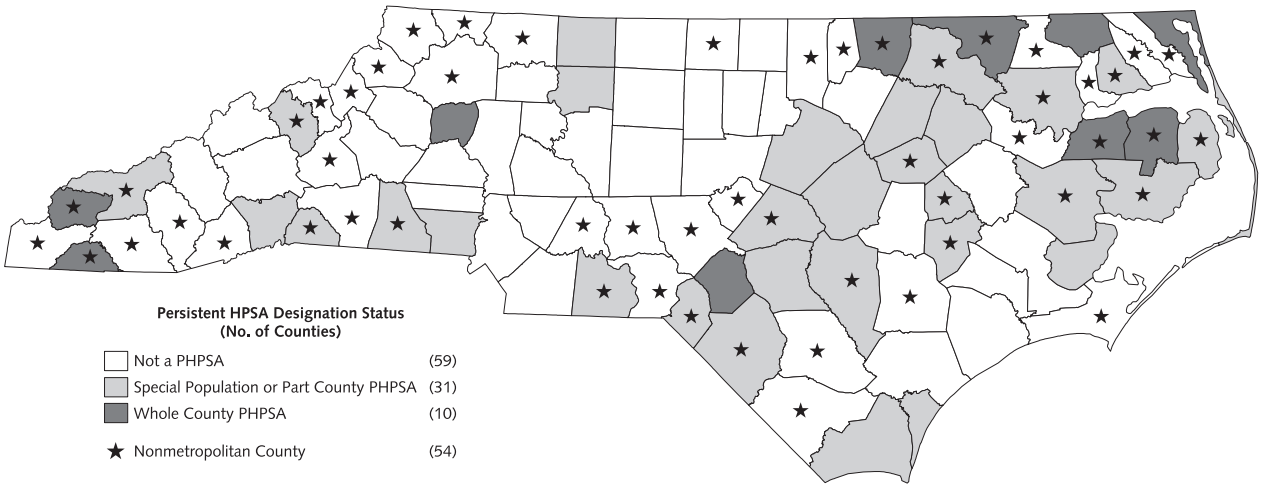
North Carolina has one of the strongest state offices of rural health in the country, with strong collaborations with other organizations (e.g. The North Carolina Medical Society's Community Practitioner Program) that also helps with recruitment and retention. As of April 2014, North Carolina had 55 population-based and 17 geographic-based primary care HPSAs in North Carolina.[a] In addition, another 15 counties had a facility HPSA (not including correctional facilities; see Figure 8.1). Counties, or parts thereof, that have been designated as HPSAs in six of the last seven HPSA designations are called Persistent Primary Care Health Professional Shortage Areas (PHPSAs). In 2010, 10 whole county PHPSAs and 31 population or part county PHPSAs existed in North Carolina (see Figure 8.2).

Figure 8.1
Primary Care Health Professional Shortage Areas in North Carolina



a Mark Snuggs, MSPH, Office of Rural Health and Community Care, North Carolina Department of Health and Human Services. Email communication. April 1, 2014

Figure 8.2
Persisten Primary Care Health Professional Shortage Areas (PHPSAs), North Carolina, 2010



Source: North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill, with data derived from the Area Resource File, HRSA, DHHS, various years; US Census Bureau, 2013. Note: Persistent Primary Care HPSAs are those designated as HPSAs by the Health Resources and Services Administration (HRSA) from 2004-2010, or in 6 or the 7 releases of HPSA definition. Core Based Statistical Areas are current as of the February 2013 update. Nonmetropolitan counties include micropolitan and counties outside of CBSAs.

Primary Care Physicians

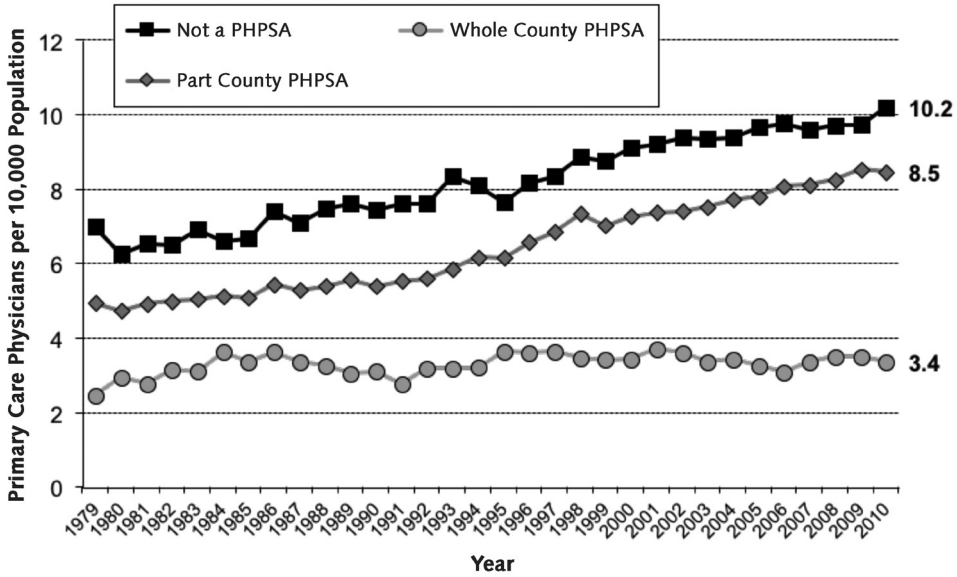
According to data from the American Medical Association and the United States Census Bureau, there were 8.0 primary care physicians per 10,000 population in North Carolina in 2011.[2,3] This ratio is on par with the 2011 US average of 8.1 primary care physicians per 10,000 population. However, the statewide average masks significant maldistribution issues. Physicians often set up practice close to where they completed their residency or in proximity to large health systems.[4] Thus, there are far more primary care physicians per 10,000 in higher resourced counties—including those with major teaching institutions—than in many other areas of the state. For example, the county with the highest primary care physician to population ratio in 2011 was Orange County, with 23.7 primary care physicians per 10,000 population. Other high resourced counties included Durham (16.2), Pitt (13.8), Forsyth (12.7), and Buncombe (11.9).[3] In contrast, there is one county (Tyrrell) with no active primary care physicians, and another 13 counties—all rural—with fewer than 2.86 primary care physicians per 10,000 population (the amount needed to meet the definition for geographic primary care HPSA).

There is one county (Tyrrell) with no active primary care physicians, and another 13 counties—all rural—with fewer than 2.86 primary care physicians per 10,000 population.

The primary care physician supply per 10,000 population has grown 42% between 1991 and 2010, but the physician growth in PHPSAs has not kept pace with the growth in other parts of the state. The primary care physician supply grew in non-PHPSAs and in part-county or special population PHPSAs, but remained stagnant in PHPSAs (see Figure 8.3).[5]

Less than half of all NPs (43%) and even fewer PAs (39.8%) reported a primary care specialty.

Figure 8.3
Primary Care Health Physicians per 10,000 Population by Persistent Health Professional Shortage Area (PHPSA) Status, North Carolina, 1979-2010



Notes: Figures include all active, instate, nonfederal, non-resident-in-training physicians licensed as of October 31st of the respective year.
Primary care physicians include those indicating a primary specialty of family practice, general practice, internal medicine, Ob/Gyn or pediatrics.

Nurse Practitioners and Physician Assistants

In addition to physicians, nurse practitioners (NPs) and physician assistants (PAs) provide primary care services. Many people have focused on increasing the supply of NPs and PAs to meet the growing need for primary care practitioners, as the typical training program for NPs is two to three years post baccalaureate degree, with a two-year program for PAs. Currently no requirements exist for post-graduate training for NPs or PAs, although individual organizations' transition programs are being developed in some locations to provide additional training and clinical experience to new NP and PA graduates. In contrast, it typically takes seven years post baccalaureate training to train a primary care physician (four years in medical school, and three years in a residency program). In North Carolina, NPs and PAs require physician supervision in order to practice.

There has been a significant growth in the overall number of NPs and PAs. Between 1991 and 2010, the number of NPs grew by 383%, and the number of PAs grew by 214%. The total number of primary care physicians grew 35% during the same time period.[6] While the growth among NPs and PAs has been large, this will not necessarily address the primary care shortage in PHPSAs. Less than half of all NPs (43%) and even fewer PAs (39.8%) reported a primary care specialty.[4] Further, the overall growth masks distribution issues. There has been very little growth in the NP or PA supply per 10,000 population between

1991-2010 in whole county PHPSAs.[5] In short, more needs to be done to attract all types of primary care professionals (physicians, nurse practitioners, and physician assistants), into rural and underserved areas—particularly to those counties or parts thereof that have persistent health professional shortages.

Behavioral Health Specialists

Many types of licensed health professionals are specially trained to address the behavioral health needs of people with mental health or substance abuse problems. These include, but are not limited to, psychiatrists, psychologists, licensed clinical social workers, advanced practice psychiatric nurses, licensed professional counselors, marriage and family therapists, certified substance abuse counselors, and licensed clinical addiction specialists.[7-9] As noted in Chapter 6, the federal Substance Abuse and Mental Health Services Administration household survey on drug use and health showed that 7.3% of the North Carolina population age 12 or older reported dependence or abuse of illicit drugs or alcohol in the past year (2011-2012).[10] In addition, 3.9% of the state's population age 18 or older reported a serious mental illness in the past year, 6.6% reported at least one major depressive episode,[11] and 16.8% reported any mental illness.[12,b] While a significant number of people in the state have mental health or substance abuse problems, few people seek services in the state's publicly-funded mental health system. In 2011-2012, only a little more than 50% of children and adults who needed mental health services, and only about 10% of youth and adults needing substance abuse services obtained care through the state's publicly-funded mental health system.[13]

There are significant maldistribution problems for North Carolina's behavioral health workforce.

People who need, but do not receive, appropriate treatment often end up in other systems of care. As noted in Chapter 6, many people first seek care from their primary care providers. Yet, primary care providers are not trained, nor do they have the capacity, to handle all types of mental health and substance abuse disorders. People with untreated substance abuse or mental health problems also frequent North Carolina's hospitals.[14] And some people with untreated disease end up in North Carolina's jail and prison system.[8]

As with primary care, there are significant maldistribution problems for North Carolina's behavioral health workforce. To address this problem, HRSA has a mental health HPSA designation. To be recognized as a mental health geographic HPSA, the community must meet at least one of the following conditions:

b A serious mental illness is defined as a "diagnosable mental, behavioral, or emotional disorder, other than a developmental or substance use disorder, that met the criteria found in the 4th edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) and resulted in serious functional impairment." Any mental illness is defined similarly, as having a diagnosable mental health, behavioral, or emotional disorder that is not a developmental disability or substance use disorder that meets the DSM-IV criteria, but does not result in serious functional impairment. A major depressive disorder is defined as having a period of "at least two weeks when a person experienced a depressed mood or loss of interest or pleasure in daily activities and had a majority of specified depression symptoms" as defined in the DSM-IV. Source: Substance Abuse and Mental Health Services Administration. *2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia)*. Tables 23, 24, and 26. SAMHSA website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTables2012.pdf. Accessed July 25, 2014.

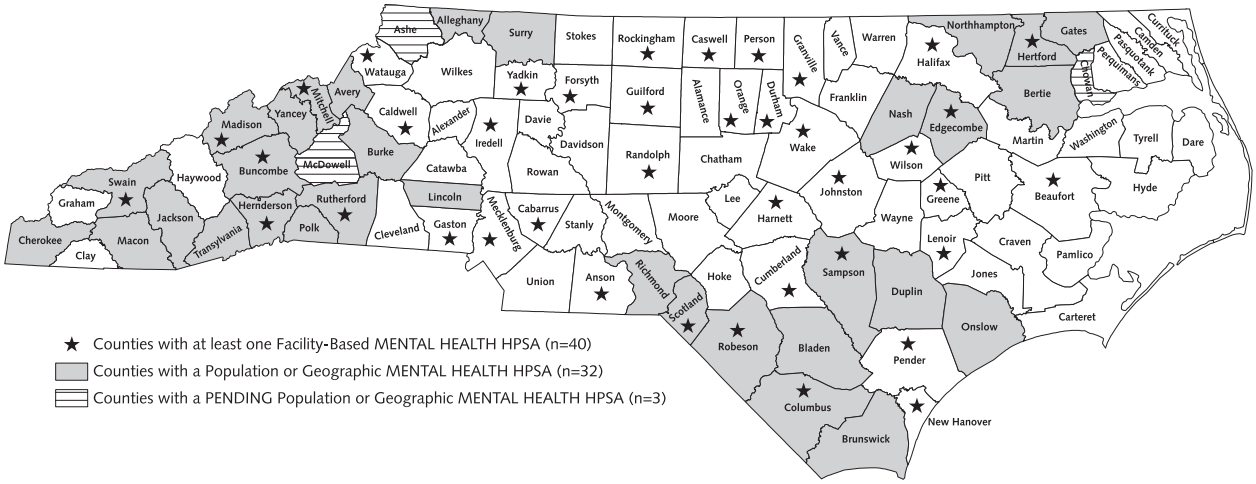
- A population-to-core mental health professional ratio that is at least equal to (or greater) than 6,000 population to one core mental health professional and a population-to-psychiatrist ratio that is at least 20,000:1.
- A population-to-core mental health professional ratio that is at least equal to (or greater) than 9,000 population to one core mental health professional.
- A population-to-psychiatrist ratio that is at least equal to 30,000:1.

In April 2014, there were 35 mental health whole or partial county geographic HPSAs, and population-based HPSA county designations.

Core mental health professionals include psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, and marriage and family therapists. A community can be recognized as a mental health HPSA with a lower population-to-core mental health ratio if it has unusually high needs for mental health services. In addition, there are different criteria for population group and facility designation. Certain public correctional institutions, mental hospitals, and/or nonprofit mental health facilities can be designated as mental health HPSAs, such as federal or state correctional facilities or state or county mental health hospitals.[15]

In April 2014, there were 35 mental health whole or partial county geographic HPSAs, and population-based HPSA county designations (see Figure 8.4). In addition, another 28 counties had a facility-based designation only (not including correctional facilities).[c] Communities and/or facilities that receive the mental health HPSA designation can qualify for National Health Service Corps funds to pay for loan forgiveness to core mental health professionals willing to serve in mental health HPSAs.

Figure 8.4
Mental Health Professional Shortage Areas in North Carolina



c Mark Snuggs, MSPH, Office of Rural Health and Community Care, North Carolina Department of Health and Human Services. Email communication. April 1, 2014

Relying on the existing mental health HPSA designations to identify counties with shortages may be somewhat misleading because the state must submit documentation to HRSA to gain the HPSA designation. ORHCC does not have sufficient personnel to proactively identify every community that may meet the federal guideline. Instead, ORHCC waits for communities to seek their services to obtain the designation. Thus, other communities may also lack sufficient behavioral health providers to meet the needs in the community. In 2011, there were 27 counties with no psychiatrists,[d] and another 15 counties with fewer than 0.33 psychiatrists per 10,000 population, the amount needed to meet the federal geographic mental health HPSA designation.[16]

In addition, there are far fewer child psychiatrists. In 2004, 70 counties had no child psychiatrists, and another 7 had fewer than 0.33 per 10,000 population under age 18.[e]

In 2011, there were 27 counties with no psychiatrists, and another 15 counties with fewer than 0.33 psychiatrists per 10,000 population.

The federal mental health HPSA designation does not include a focus on other types of behavioral health specialists needed to meet the needs of people with substance abuse disorders. The North Carolina Substance Abuse Professional Practice Board (NCSAPPB) has the statutory authority in North Carolina to credential substance abuse professionals. NCSAPPB offers six types of substance abuse credentials: Certified Substance Abuse Counselor, Licensed Clinical Addiction Specialist, Certified Clinical Supervisor, Certified Substance Abuse Prevention Consultant, Certified Substance Abuse Residential Facility Director, and Certified Criminal Justice Addictions Professional. The only two types of professionals who can practice independently are Licensed Clinical Addiction Specialists (LCAS) and Certified Clinical Supervisors (CCS).[17] The others must practice under the supervision of another licensed substance abuse professional. Other health professionals such as physicians, nurse practitioners, licensed clinical social workers, psychologists, or marriage and family therapists can provide substance abuse services under their own licensure (e.g. they are not required to obtain a NCSAPPB credential to practice). However, few of these professionals specialize in treating substance abuse disorders.[8] As with other health professionals, there is a wide variation in the availability of licensed or certified professionals to meet the needs of people with addiction disorders. In 2009, the North Carolina Institute of Medicine did an analysis of the population-to-provider ratio for health professionals who provide services to people with substance abuse disorders. The NCIOM included CCS, LCAS (and provisionally licensed LCAS), as well as physicians, physician assistants, nurse practitioners, and nurses with drug or alcohol specialties in this analysis. The population-to-substance abuse professional ranged from a high of one clinician with an additional specialty to every 48 people in Polk County, to a low of 1:3,092 in

d Psychiatrists include any physician with a primary specialty of psychiatry, child psychiatry, psychoanalysis, psychosomatic medicine, addiction/chemical dependency, forensic psychiatry, geriatric psychiatry, or addiction medicine.

e Mark Snuggs, MSPH, Office of Rural Health and Community Care, North Carolina Department of Health and Human Services. Email communication. April 1, 2014

Pasquotank County. There were 10 counties, all rural, that had more than 1,000 population to every one substance abuse specialist: Bertie, Carteret, Greene, McDowell, Mitchell, Pasquotank, Person, Richmond, Sampson, and Stokes.[8]

Oral Health Professionals

Oral health is an important but often overlooked part of health care. Dental caries is the most common chronic infectious disease among children. Most dental disease is preventable with appropriate oral hygiene and routine visits to a dentist or dental hygienist or, for preschool age children, through interventions from primary care providers[18,19] Poor dental hygiene can lead to tooth decay, chronic pain, and loss of teeth. Additionally, dental disease has been associated with exacerbated cardiovascular and chronic respiratory diseases.[20,21] Preventing dental disease through good dental hygiene and addressing disease early can improve the health and well-being of people living in rural communities.

In 2011, 3 counties were without any dentists (Camden, Hyde, and Tyrrell), and another 22 counties had fewer than 2 dentists per 10,000 population.

North Carolina has historically had one of the lowest dentist-to-population ratios in the country, consistently ranking 47th in terms of dental supply. In 2011, North Carolina had 4.3 dentists per 10,000 population compared to the national ratio of 6.0 dentists per 10,000 population.[22] In 2011, 3 counties were without any dentists (Camden, Hyde, and Tyrrell), and another 22 counties had fewer than 2 dentists per 10,000 population, the amount needed to meet the definition of a geographic dental HPSA.[3] More hygienists are located across the state, with 5.6 hygienists per 10,000 population. In 2011, four counties were without any dental hygienists (Alleghany, Camden, Hyde, and Tyrrell), but only five additional counties had fewer than 2 hygienists per 10,000 population.

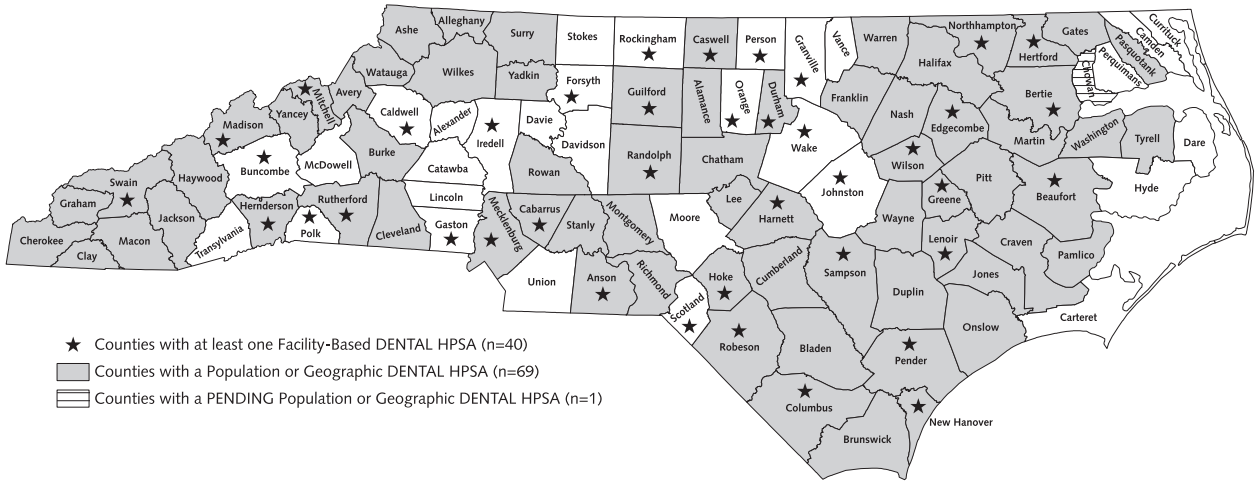
More than two-thirds of North Carolina counties qualify as dental HPSAs. A dental HPSA is defined as having a population-to-full-time equivalent dentist ratio of at least 5,000:1, or at least 4,000:1 and unusually high need for dental services. As with primary care and mental health HPSAs, there are also criteria to designate a population group or facility dental HPSA.[23]

A total of 69 counties have been designated as population-based dental HPSAs, including one that is designated as a geographic-based HPSAs, and an additional 13 counties that have a facility-based HPSA only, not counting correctional facilities.[f] (see Figure 8.5). As mentioned previously, the number of counties that meet the HPSA definition is likely greater, but the Office of Rural Health and Community Care does not have the resources to systematically apply for all of them.

People are unable to access needed oral health services for many reasons, including financial barriers and a lack of dental professionals in their area.[24] Until recently, medical insurance did not often cover oral health services.

f Mark Snuggs, MSPH, Office of Rural Health and Community Care, North Carolina Department of Health and Human Services. Email communication. April 1, 2014

Figure 8.5
Dental Health Professional Shortage Areas in North Carolina



However, health insurance plans offered in the non-group marketplace must now offer dental services for children (although coverage for adults is not required).[g,h] Beginning in 2015, children will be covered for fluoride varnish in the medical environment as a result of the recent US Preventive Services Task Force (USPSTF) recommendation for this service. Despite this, however, North Carolinians who are unable to access dental care when they need it often end up in the hospital emergency department for untreated dental disease. In fact, North Carolina has a high per capita use of emergency departments for dental disease as compared to other states, and the number has been growing rapidly (2006-2010) (see Figure 8.6).

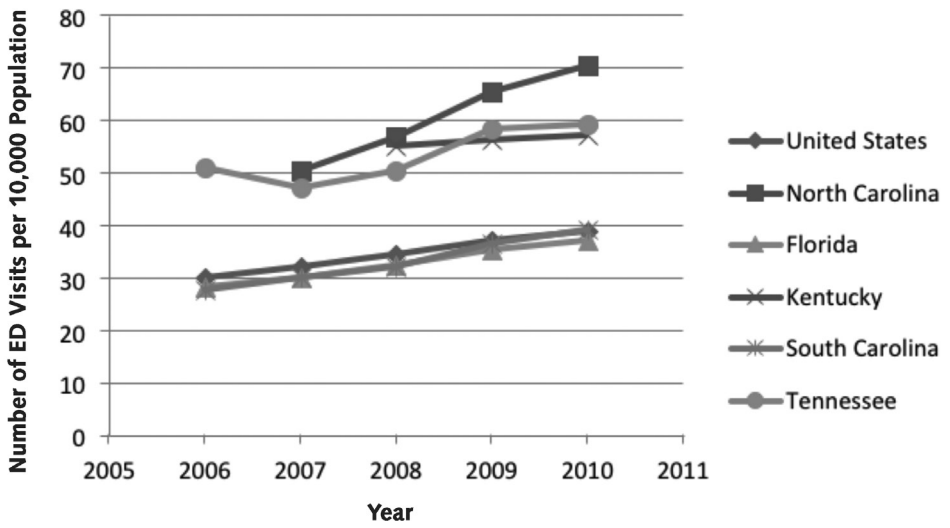
In 2011, 24 counties—almost all rural—had no general surgeons, and another 26 had fewer than 0.5 general surgeons per 10,000 population.

General Surgeons

General surgeons are critical to the financial sustainability of small rural hospitals.[7] They provide needed surgical services in such areas as head/neck, breast/skin/soft tissue, abdomen, alimentary tract, endocrine, and oncology.[25] General surgeons also help with trauma management and care for critically ill patients with underlying surgical conditions; provide needed revenues to the hospital; and serve as a backup to other practitioners. "For the one-quarter of Americans who live outside metropolitan areas, general surgeons are the essential ingredient that keeps full-service medical care within reach. Without general surgeons as backup, family practitioners can't deliver babies, emergency rooms can't take trauma cases, and most internists won't do complicated procedures such as colonoscopies."(David Brown, Washington Post Staff Writer, Thursday, January 1, 2009)[26]

g Separate, stand-alone dental plans may also be offered. These are available for more comprehensive dental coverage including services for adults.
h 42 USC 18022 Sec.1302.

Figure 8.6
Emergency Department Visits for ICD-9-CM All-Listed Diagnosis Code 525.9, Dental Disorder Not Otherwise Specified, per 10,000 Population



North Carolina has a high per capita use of emergency departments for dental disease as compared to other states, and the number has been growing rapidly.

Just as primary care providers are the backbone of the health care delivery system, general surgeons are integral to the operation of small rural hospitals. However, general surgeons are in short supply in many rural communities and are declining overall. Since 1997, there has been an overall decline in general surgeons in rural North Carolina and across the nation. This is due to a multiplicity of reasons, including increased specialization and the high call burden in rural areas.[27] In 2011, 24 counties—almost all rural—had no general surgeons, and another 26 had fewer than 0.5 general surgeons per 10,000 population.[3]

While primary care professionals, behavioral health practitioners, dentists, and general surgeons are not the only health care professionals needed in rural communities, these were identified by the Task Force as priority areas in many rural areas of the state. The Task Force thus focused on strategies to recruit and retain these health professionals into rural and underserved areas in the state.

Recruitment and Retention Strategies

Past research has shown that certain key strategies help improve the likelihood of recruiting and retaining health professionals in rural areas. While most of the research has focused on recruiting primary care providers into rural areas,[28] other reports suggest that similar strategies are effective for other types of health care professionals.[29] These strategies can generally be divided into three areas: health professional training and residency programs; financial incentives to encourage health care professionals to work in rural areas; and matching recruits and their families to the specific community.

The Task Force also discussed pipeline programs as a means of encouraging rural youth to enter health professions. Pipeline programs expose students to the health professions during middle, high school, undergraduate and post-baccalaureate stages. Studies suggest many positive outcomes associated with students' participation in structured pipeline programs.[30] These studies address interventions across a spectrum of pipeline stages and involve a variety of targeted health professions and health science careers, including medicine, nursing, and allied health.[30] While Task Force members support the implementation of effective pipeline programs, they did not prioritize these programs in the Rural Health Action Plan because the goal of the Rural Health Action Plan was to focus on strategies that can be implemented within three to five years and which would yield positive health impacts. Pipeline programs generally have a longer time trajectory between implementation and the production of new health care professionals for rural areas.

Health Professional Training and Residency Programs

Studies have shown that certain people are more likely to practice in rural areas, including those who grew up in rural areas, and those who have a spouse or partner that grew up in a rural community.[7] In addition, exposing students to rural practice while in health professional training schools can help promote rural practice.[28]

North Carolina medical schools have made a more concerted effort to provide rural training opportunities.

Over the past 20 years, North Carolina medical schools have made a more concerted effort to provide rural training opportunities. For example, at the Brody School of Medicine at East Carolina University, there is a strong preference for people with rural backgrounds as part of the admissions process. (Brody School of Medicine only admits North Carolina residents but gives preference to those from rural areas.) In addition, first and second year students spend time in the practice of a community primary care physician, often in rural areas, to experience the practice of medicine and to learn more about the life of a rural physician during their preclinical training. During the required third year clerkships in family medicine and pediatrics, students are required to spend two to four weeks in the office of a community physician, for a more in-depth experience in clinical office practice and continuity of care, as well as to better understand the role of a physician in their community. Many of these sites are in rural settings. As a result of these practices, the Brody School of Medicine at East Carolina University is consistently above the 90th percentile nationally for percent of their medical school graduates who enter primary care practice (41.8%); percent practicing in state (55%); percent practicing in rural areas (19.5%); and percent practicing in underserved areas (40.8%).[i] In addition, the ECU Department of Family Medicine has developed a longitudinal integrated rural medicine experience for all family medicine residents. Currently over 20 rural sites in North Carolina train residents, with a one week experience

i American Medical Association Physician Masterfile 2014.

Based on the North Carolina Community College System's Personal and Home Care State Training Program, the Allied Health Career Pipeline Program supports a smooth transition for people who have long been unemployed into allied health careers. The program addresses key challenges with support including career guidance, academic program structure, individual supports, and employer collaboration. Nine students who enrolled in the demonstration program in August 2013 are preparing to take the nurses aid exam. Rural partners including Area L AHEC, Turning Point Workforce Development Board, Edgecombe/ Nash NC Works Career Center, and Edgecombe Community College collaborated and leveraged resources to pilot the model. Regional expansion is planned through an Economics Innovations grant from the North Carolina Department of Commerce.

Allied Health Career Pipeline Program

during the first year, a two week experience during the second year, and a four week experience during the third year. Associated with this program is a comprehensive rural recruitment system, including semi-annual rural recruitment opportunities for family medicine residents, as well as an annual Rural Health Day featuring national speakers and student presentation on rural health topics. Since the inception of the program, placement in rural areas has drastically increased among residents. In 2010, 4 of 7 residents remained in North Carolina (57%), with 2 placed in rural communities (29%); whereas in 2013, 7 of 10 remained in North Carolina (70%), with 6 placed in rural communities (60%).[j]

The School of Medicine at the University of North Carolina at Chapel Hill (UNC-CH) provides scholarship support to a small group of medical students who are committed to rural primary care. In addition, UNC School of Medicine has established a rural track to provide a longitudinal curriculum in a rural setting for a small cohort of third and fourth year medical students. UNC Asheville School of Medicine began with its first class of four students in July 2009 with the support of UNC School of Medicine, Mission Health, and Mountain AHEC. Twenty students will start their third year training in July 2014. The foundation of this program and its innovative third year curriculum is similar to the longitudinal Cambridge Model. In 2004, Harvard restructured the third year clerkships to place a cohort of students in outpatient settings for the majority of their curriculum, which allows students to follow "their patients" in all health care settings.[31] The longitudinal integrated curriculum utilizes a smaller number of dedicated teachers and a greater reliance on outpatient teaching. Students have more exposure to experienced practicing physicians and a much greater likelihood of seeing the same patients over an extended period of time and through the continuum of care. The fourth year reverts to block schedules and presents opportunities for rotations including in rural western North Carolina. UNC-CH also offers a residency program for residents interested in practicing with underserved populations. This program operates through Carolinas HealthCare Center in Charlotte. Approximately half of the three year residency program is spent in a federally qualified health center. The remainder of the training is offered in different locations across the state, including Pardee Hospital in Hendersonville (a rural site).

Campbell University has established North Carolina's first new medical school in more than three decades to meet the primary care needs of the state. The Campbell University Jerry M. Wallace School of Osteopathic Medicine (CUSOM) emphasizes the development of primary care physicians and general specialists who will serve rural and underserved areas of North Carolina. On June 1, 2013, CUSOM accepted 162 students for the 2017 charter class: 22% of the students were from rural areas, 25% were from health professional shortage

j Elizabeth G. Baxley, MD, Senior Associate Dean for Academic Affairs, Professor of Family Medicine, Brody School of Medicine at East Carolina University. Email communication. April 8, 2014

areas, and 20% were from medically underserved areas. CUSOM students will spend the third and fourth years of medical school, as well as three to five years of residency training, in community settings where they will be more likely to practice and establish roots. Training students in underserved communities equips them to learn and grow in an environment less dependent upon sub-specialty care and more suited to practicing in a primary care setting. Nationally, a higher percentage of osteopathic medical school graduates choose primary care and 31% of osteopathic physicians practice in rural areas.[k]

Ensuring that medical students have the opportunity to experience rural practice during their undergraduate medical education is important, but not sufficient enough to attract an adequate number of practitioners into rural areas. North Carolina data show that people who complete their residency program in state are more likely to remain in North Carolina to practice than are those who completed medical school outside of North Carolina.[7] Further, physicians are likely to set up practice within 90 miles of where they completed their residency program.[7] The North Carolina Area Health Education Centers Program (AHEC) operates four primary care residencies located in community health settings serving rural and underserved populations: Hendersonville (family medicine, MAHEC), Wilmington (family medicine, SEAHEC), Prospect Hill (family medicine, UNC) and Greensboro (pediatrics, Greensboro AHEC). These residents train in community health centers, private clinics, hospital patient clinics, and other rural community settings. AHEC residency graduates are more likely to practice in North Carolina, remain in primary care, and to practice in rural and underserved areas than their peers in other residency programs in the state.[l,32]

AHEC residency graduates are more likely to practice in North Carolina, remain in primary care, and to practice in rural and underserved areas than their peers.

While more has been done in recent years to promote rural clinical experiences in medical school, this same opportunity is not always available in all other health professional training programs. AHEC helps support clinical rotations for health professional students. Creating strong clinical training in rural community settings can be challenging. Students need housing for clinical rotations in distant communities. Further, rural practitioners who serve as preceptors may require stipends to help offset the patient revenues they lose when they reduce their patient loads in order to precept the students.[7] There is often competition for the limited number of rural training slots that are available. The Task Force recognized the importance of expanding the availability of clinical rotations in rural communities along with funds needed to support this effort

The East Carolina University School of Dental Medicine is expanding access to oral health care and clinical training sites in rural areas across the state. The core of the School of Dental Medicine's community-based educational model involves all senior dental students providing comprehensive care in the Community Service Learning Centers (CSLCs), located within communities of

k 2013 National Center for the Analysis of Healthcare Data Enhanced State Licensure.
l American Medical Association Physician Masterfile 2011.

need across the state of North Carolina. Beginning in May of their senior year, students will spend three nine week rotations, in three different CSLC locations in the state, providing care for patients and living within the communities they serve. Through working in a real world, community-based care delivery system, students will further develop their skills in caring for vulnerable populations while gaining hands-on experience in managing a dental practice. They will engage in a wide range of community outreach activities and participate in public health and leadership training to prepare them for future health advocacy and community leadership roles. Four CSLCs are fully operational with faculty, staff, students, and residents providing care in Ahoskie, Elizabeth City, Lillington, and Sylva. Three additional CSLCs will open in 2014 in Davidson County, Spruce Pine, and Lumberton. The Brunswick CSLC was just recently announced with construction starting soon. It is expected to open fall of 2015.

In FY 2013, North Carolina was able to recruit 268 of the 10,886 health care professionals nationally who received NHSC funds.

Financial Incentives to Encourage Health Care Professionals to Work in Rural Areas

There are different types of financial incentives that have been used to recruit health professionals into rural areas, including scholarships, loans, loan repayments, and direct incentives (such as payments for capital costs or income guarantees). These incentive payments are often tied to specific performance requirements. For example, HRSA operates the National Health Services Corps (NHSC) program which provides scholarships or loan repayment to certain types of health professionals in return for their agreement to practice in a HPSA for a certain number of years. NHSC funds can be used for primary care providers (primary care physicians, nurse practitioners, physician assistants, and certified nurse midwives); mental health professionals (psychiatrists, clinical psychologists, clinical social workers, psychiatric nurse specialists, marriage and family therapists, and licensed professional counselor); and dental professionals (dentists and dental hygienists) who agree to practice in a HPSA. Placements are limited to certain communities depending on the HPSA score they receive (the higher the score, the more likely the community can qualify for a placement). Practitioners who agree to practice for at least two years in a qualifying HPSA are eligible for $50,000 in loan repayment. If they practice for five years, they can receive up to $145,000 in loan repayment, and the whole debt can be repaid if the person practices in a HPSA for six or more years.[32] ORHCC helps match practitioners to rural communities (described more below) and qualify for NHSC funding.

In FY 2013, North Carolina was able to recruit 268 of the 10,886 health care professionals nationally who received NHSC funds[33] (see Figure 8.7).

In addition to the NHSC funding, the state has separate funding to help with loan repayment for health professionals who agree to serve in rural and underserved areas. At one time, the North Carolina General Assembly provided over $3 million in state appropriations to recruit health professionals to rural areas through incentive payments. However, due to reductions totaling $1,676,914 in recent

fiscal years, ORHCC currently receives $1,499,977 annually for these provider incentives. The state funding can be used as loan repayment or other incentive payments. Providers are eligible for nontaxable loan repayment of up to $100,000 for physicians or $60,000 for other practitioners for agreeing to practice in a rural or underserved area.[m] The amount of the loan repayment varies depending on the number of years the person practices in the underserved area, with the maximum payment for four years of service. In addition, to recruit providers without outstanding loans, the state can offer a high needs service bonus of up to half of the loan repayment amount. The state can use its funding in rural and underserved communities that qualify as HPSAs, but do not meet NHSC priority scores. In general, the state uses the state loan or incentive payments to help recruit providers to community, safety net, and nonprofit practices. Overall, with both federal and state recruitment funds, ORHCC was able to recruit 168 new health professionals in SFY 2013, a 37% increase over SFY 2012.[33]

Figure 8.7
Number of Health Professionals Participating in the National Health Service Corp Loan Repayment Program, FY 2013

Discipline	National	NC
Primary Care Providers		
Non-Psychiatrist Physician (MD/DO)	2,425	73
Nurse Practitioner	1,792	36
Physician Assistant	1,438	67
Dental Professionals		
Dentist (DDS/DMD)	1,327	28
Dental Hygienist	245	8
Mental Health Professionals		
Psychiatrist (MD/DO)	245	4
Licensed Professional Counselor	1,082	13
Licensed Clinical Social Worker	1,034	9
Health Service Psychologist	887	28
Marriage and Family Therapist	165	0
Psychiatric Nurse Specialist	42	0
Other		
Nurse Midwife	204	2
Total	**10,886**	**268**

Source: Collins C. Physician recruitment and retention efforts. Presented at: North Carolina Institute of Medicine Task Force on Rural Health, February 5, 2014, Morrisville, NC.

ORHCC was able to recruit 168 new health professionals in SFY 2013, a 37% increase over SFY 2012.

ORHCC has been highly successful in its provider recruitment placements, with approximately 70% of the providers placed fulfilling their contract term.[n] In the past, state funds could not be used to help recruit general surgeons or behavioral health professionals into shortage areas (aside from psychiatrists), but the Task Force recognized that there are other needed health professionals aside from primary care doctors, nurse practitioners, physician assistants, psychiatrists, and dental professionals. ORHCC could do more to place additional practitioners

m The state can use state funds to recruit most of the same types of providers as are eligible for NHSC funding, except licensed professional counselors, licensed clinical social workers, marriage and family therapists, nurse midwives, health service psychologists, or psychiatric nurse specialists. The state cannot currently use state funds to recruit general surgeons to rural areas.

n ORHCC is refining this data to reflect which of those have not fulfilled their ORHCC contracts due to receipt of NHSC funding.

in rural areas if more state funds were available. Therefore, the Task Force recommended a larger appropriation to restore loan repayment dollars and to provide additional funding to support recruitment and retention efforts.

The North Carolina Medical Society Foundation (NCMSF) also operates the Community Practitioner Program (CPP), a program that uses private funds to recruit certain types of providers to rural and underserved communities. CPP funding can only be used to recruit physicians, nurse practitioners, and physician assistants for rural and underserved communities. The NCMSF works closely with ORHCC to ensure that the applicant is not eligible for federal or state loan repayment funding. CPP has more flexibility in where its funding can be used. CPP uses HPSA designations, county tiering (1, 2, or 3), percentage of patients that are indigent, Medicare/Medicaid population, and innovative practice techniques as part of programmatic admission criteria. CPP also prefers that participants live in the community that they serve. In 2013, CPP funds were used to recruit nine providers: five physicians (four MDs and one DO), one physician assistant, and three nurse practitioners.

In 2013, CPP funds were used to recruit nine providers: five physicians (four MDs and one DO), one physician assistant, and three nurse practitioners.

In addition to the loan repayment and incentive funding available through ORHCC and the NCMSF, the North Carolina General Assembly established the Forgivable Education Loans for Service (FELS) program in 2011.[34] The FELS program provides financial assistance to qualified students enrolled in an approved education program and committed to working in critical employment shortage professions in North Carolina. The program was designed to be flexible so that it will respond to current as well as future employment shortages in the state. The program initially targeted future teachers, nurses, and allied health professionals. For the 2014-2015 academic year, eligible degree programs include allied health, medicine, nursing, and teaching.[34] The North Carolina State Education Assistance Authority provides administration for the program.

Matching Recruits and Their Families to the Specific Community

A person's decision to stay in a particular community is influenced by many factors, including both professional and family factors. ORHCC and CPP have been conducting provider retention surveys since July 2010. The survey is conducted annually and at the end of the provider's service agreement. The survey found that a practitioner's decision about whether to leave the practice is influenced by their job satisfaction, family satisfaction, and community involvement.[33] A rural practitioner's decision to remain in a rural community can be influenced by his or her ability to take time off work, access to professional development, professional connections, and having an adequate infrastructure to support his or her practice.[7,28,29] Similarly, a practitioner's decision to remain in a particular community can be driven by family concerns, including professional opportunities for his or her spouse or partner, the education system, community connections, and/or cultural opportunities. Thus, successful recruitment entails more than just recruiting a provider to a

rural area. Successful recruitment—leading to longer-term retention—requires matching the practitioner and his or her family to the particular community.[7,29]

Over the years, ORHCC has learned that the most successful recruitment efforts involve the broader community. Community leaders, including the broader health care community, educational leaders, business leaders, and faith leaders can all assist with the recruitment effort to help ensure that the particular community is a good match for the individual practitioner and his/her family.[33] Creating strong community ties early on will also help in longer-term retention efforts.

Researchers at the Cecil G. Sheps Center for Health Services Research at the University of North Carolina at Chapel Hill recently completed a survey of clinicians in 11 states (including North Carolina) who received NHSC funding in 2012.[35] The survey identified factors that were associated with longer retention in underserved areas. Some of the key findings were that more loan repayment program participants remained in their service sites beyond their service years than scholarship recipients. Physicians and mental health clinicians were more likely to remain in their service sites than nurse practitioners, physician assistants, and dentists. In addition, clinicians who were 30 years old or older, non-Hispanic white, had children, and who trained or grew up in the states where they were practicing were more likely to remain in their service sites than clinicians who were younger, minority, childless, or who grew up or trained out of state. People who reported having a sense of belonging in the community and who reported that their spouse was happy were more likely to report longer retention. Similarly, being satisfied with the practice, the practice administrator, salary, and access to specialty consults was also associated with longer retention in underserved communities. The study found that state primary care offices (similar to ORHCC) did a good job helping practitioners find NHSC sites, but did less to help them once they were in service (e.g. help practitioners settle into their sites, avoid burnout, or help their spouse find employment).

Over the years, ORHCC has learned that the most successful recruitment efforts involve the broader community.

ORHCC currently has three FTE staff devoted to recruitment and retention efforts, two dedicated to HPSA designation, and one administrative support. In SFY 2013, ORHCC recruited 168 health care professionals and leveraged its state resources to more than $49 million in economic impact for the state (see Figure 8.8). More could be done if funding to ORHCC for recruitment and retention efforts were expanded.

Other Strategies to Support Rural Health Professionals

While the Task Force focused most of its attention on recruiting primary care providers, behavioral health practitioners, dental health professionals, and general surgeons to rural communities, it also recognized the importance of having a full complement of other health professionals to support the rural

Figure 8.8
ORHCC Provider Recruitment and Economic Impact3

Provider Type	Recruited FY 13	Estimated Dollar Amount	Economic Impact
Physicians	56	$390,000	$21,840,000
Physician Assistants	38	$195,000	$7,410,000
Nurse Practitioners	33	$195,000	$6,435,000
Certified Nurse Midwives	3	$195,000	$585,000
Dentists	25	$360,000	$9,000,000
Dental Hygienists	4	$110,000	$440,000
Psychiatrists	9	$390,000	$3,510,000
Total*	**168**	**$1,835,000**	**$49,220,000**

*Represents direct economic impact not indirect impact to the community which conservatively could add an additional 30%.
Source: The estimated economic impact of rural practitioners is based on the IMPLAN data and software model. This is a conservative indirect method for determining the revenues generated from a rural health professionals' practice. Eilrich FC, Doeksen GA, St. Clair CF; National Center for Rural Health Works. *The Economic Impact of a Rural Primary Care Physician and the Potential Health Dollars Lost to Out-migrating Health Services*. Stillwater, OK: Oklahoma State University; 2007.

Associate Degree Nursing (ADN) nurses are two times more likely to practice in rural areas, and three times more likely to practice in North Carolinas's most underserved communities.

health delivery system. Rural practices need nurses and other allied health professionals[o] to support the rural health infrastructure.

The majority of North Carolina registered nurses (RNs) entered the workforce with less than a baccalaureate degree. Of the total health care workforce in 2011, 13% of RNs entered the workforce with a diploma, 55% had an associate degree, and 32% had a baccalaureate degree or higher.[36] A 2008 study of graduates of the North Carolina Community College System (NCCCS) Associate Degree Nursing (ADN) Programs showed that 90% of the RNs graduating with an ADN from the NCCCS stayed in North Carolina, practiced close to where they were educated, and worked in higher need settings such as home health, long-term care, home health/hospice, and mental health compared to nursing students who graduated with a Bachelor's Degree in Nursing (BSN), ADN nurses are two times more likely to practice in rural areas, and three times more likely to practice in North Carolinas's most underserved communities.[37] Further, ADNs who went on to complete their BSN degree were also more likely than other BSN trained nurses to practice in rural areas, almost as likely as the ADNs who did not pursue an advance degree. Thus, one strategy to strengthen the rural health workforce is to promote training opportunities in rural communities, building on the training offered through NCCCS, and building stronger education ladders between the community college and university systems.

o Allied health professions include the fields of Audiology, Cytotechnology, Health Information Management, Medical Social Work, Physical Therapy, Radiologic Technology, Recreation Therapy, Respiratory Care/Cardiopulmonary, Clinical Laboratory Science, Dietetics/Nutrition, Histologic Technology, Nuclear Medicine Technology, Occupational Therapy Phlebotomy, Physician Assistant, Radiation Therapy Technology, Rehabilitation Counseling, and Speech/Language Pathology.

Several promising initiatives partner community college programs with four-year institutions, whereby the student can get most of the formative education in the community college system and then complete their training in a local university. The Regionally Increasing Baccalaureate Nurses (RIBN) Program is an effort to promote the education and training of ADN prepared nurses, while keeping them in their local community.[38] Students in this program are dually admitted to a community college and the local university in a four-year nursing curriculum. These students receive their training in the community college for the first three years, while taking university courses. These students receive their ADN degree at the end of the third year, and become licensed after passing their NCLEX (nurse licensure) exam. They then move to the university for their fourth year for additional coursework and clinical training and graduate with a BSN. Currently, 8 universities partner with 26 community colleges and one private college of health sciences across the state.

The Regionally Increasing Baccalaureate Nurses (RIBN) Program is an effort to promote the education and training of ADN prepared nurses, while keeping them in their local community.

In addition to the RIBN program which allows nurses to remain in their home communities while achieving a baccalaureate degree in nursing at the beginning of their careers, a Uniform Articulation Agreement between the University of North Carolina RN to BSN Program and the North Carolina Community College System Associate Degree Nursing Program is currently under review and should be finalized by fall 2014. Registered nurses with an associate degree in nursing (ADNs) who complete the general education and nursing-related courses outlined in this agreement at any of North Carolina's community college nursing programs will thereby meet the admission requirements to any of the state-funded RN to BSN university programs offered in North Carolina. Both the RIBN model and this Articulation Agreement will significantly increase the opportunities for nurses, particularly in rural and underserved areas of our state, to achieve the academic preparation needed to improve the delivery of care as well as build the pool for future nursing faculty and advanced practice nurses in their home communities.

In addition to the RIBN program, there are a number of "2+2" programs, where the students receive their two-year associate degree, and then are able to take an additional two years in a university and graduate with a bachelor's degree. For example, the University of North Carolina at Charlotte (UNCC) has a 2+2 program in respiratory therapy. UNCC admits practicing respiratory therapists with an associate degree and provides an additional two years of training. The additional training enhances their education, preparing them to graduate with a bachelor's degree in respiratory therapy. There are also 2+2 programs offered in neurodiagnostics and sleep science at UNCC.[39] UNCC admits practicing neurodiagnostic technicians and polysonographers with an associate degree, then provides an additional two years of training, so that they graduate with a bachelor's degree in neurodiagnostics and sleep science. Other innovative models exist where students can complete their two-year associate degree, and then complete their four-year education on the community

college campus. All of these strategies that focus on training students for two or more years in the community college system, and providing an avenue for more advanced training through a local college or university, hold promise as new avenues to train many of the future rural health professionals.

After identifying priority needs and successful training, recruitment, and retention strategies, the Task Force made several recommendations aimed at ensuring that rural areas have an adequate supply of needed health professionals.

Recommendation 6: Ensure adequate incentives and other support to cultivate, recruit, and retain health professionals to underserved areas of the state.

a) The North Carolina Community College System should identify, disseminate, and expand successful strategies to help recruit and retain health professional students into two-year and four-year degrees on or near the community college campus. Such models could include, or be modeled after, other successful initiatives, including but not limited to:

1) RIBN program

2) 2+2 programs

b) North Carolina academic health education programs supported by North Carolina general funds should place a priority during the admissions process, on students who grew up in, and/or have a desire to practice in, health professional shortage areas. The North Carolina General Assembly should consider different methods of incentivizing North Carolina health professional schools and community clinical practice sites to produce the mix of health professionals needed to address the unmet health needs of the state. Priority should be given to programs and community clinical practice sites that increase the number of health professionals who set up and maintain practices in rural and underserved areas.

c) The North Carolina Area Health Education Centers Program, in conjunction with North Carolina academic health education programs, should identify best practices for rural clinical placement opportunities and help to disseminate those models across the state. Such models may include, but not be limited to:

1) Stipends to rural health care professionals to pay for clinical supervision.

2) Development of rural longitudinal placement rotations.

3) **Expansion of the number of rural residency programs for primary care. For each new slot created, the North Carolina General Assembly should appropriate $75,000 to $100,000 per resident per year.**

4) **Provide support for primary care health care professionals to improve quality of care and implement new models of care.**

d) **The North Carolina General Assembly should appropriate $2.0 million in recurring funds to the Office of Rural Health and Community Care to:**

1) **Support additional staff with responsibility to designate areas of the state as geographic, population, or facility-based Health Professional Shortage Areas (HPSAs) to support the recruitment of primary care, mental health, and dental health care providers.**

2) **Expand efforts and resources necessary to enhance recruitment and retention of primary care, general surgeons, behavioral health, and dental health professionals into HPSAs.**

3) **Expand the availability of state loan repayment or other incentive payments to recruit primary care, general surgeons, behavioral health, and dental health professionals into HPSAs. The Office should maximize National Health Service Corps resources first before using the state appropriations.**

e) **The Office of Rural Health and Community Care, in conjunction with the North Carolina Medical Society Foundation, should:**

1) **Identify and disseminate model recruitment strategies, including strategies that have been successful in matching potential recruits and their families with the broader community.**

2) **Record and review individual provider retention assessments, aggregate state data to determine best retention practices, and disseminate these models across the state.**

References

1. North Carolina Institute of Medicine Task Force on Primary Care and Specialty Supply. *Providers in Demand: North Carolina's Primary Care and Specialty Supply*. Morrisville, NC: North Carolina Institute of Medicine; 2007. http://www.nciom.org/projects/supply/provider_supply_report.pdf. Accessed January 7, 2009.

2. Health Resources and Services Administration. Primary medical care HPSA designation overview. US Department of Health and Human Services website. http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/primarycarehpsaoverview.html. Accessed July 26, 2014.

3. Cecil G. Sheps Center for Health Services Research. North Carolina Health Professions Data System. 2011 Health Professionals per 10,000 Population. Cecil G. Sheps Center for Health Services Research website. http://www.shepscenter.unc.edu/hp/2011/2011_10000pop_all.pdf. Accessed July 25, 2014.

4. Fraher E. Trends in the supply and distribution of the health workforce in North Carolina. Presented to at: Committee on Health Care Provider Practice Sustainability and Training/Additional Transparency; January 21, 2014; Raleigh, NC. http://www.shepscenter.unc.edu/wp-content/uploads/2014/03/NCGA_NCHlthWkfc_Fraher_Jan2014.pdf. Accessed July 25, 2014.

5. Spero J, Fraher E. The maldistribution of health care providers in rural and underserved areas in North Carolina. *NC Med J.* 2014;75(1):74-79.

6. Spero J. North Carolina's rural health workforce: challenges and strategies. Presented at: North Carolina Institute of Medicine Task Force on Rural Health; July 31, 2013; Greensboro, NC. http://www.nciom.org/wp-content/uploads/2013/04/Spero_7-31-13.pdf. Accessed July 25, 2014.

7. North Carolina Institute of Medicine. *Providers in Demand: North Carolina's Primary Care and Specialty Supply*. Morrisville, NC: North Carolina Institute of Medicine; 2007. http://www.nciom.org/wp-content/uploads/2007/06/provider_supply_report.pdf. Published June 2007. Accessed December 10, 2008.

8. North Carolina Institute of Medicine. *Building a Recovery-Oriented System of Care: A Report of the NCIOM Task Force on Substance Abuse Services*. Morrisville, NC: North Carolina Institute of Medicine; 2009. http://www.nciom.org/wp-content/uploads/NCIOM/projects/substance_abuse/chapters/FullReport.pdf. Accessed May 5, 2009.

9. Thomas KC, Ellis AR, Konrad TR, Morrissey JP. North Carolina's mental health workforce: unmet need, maldistribution, and no quick fixes. *NC Med J.* 2012;73(3):161-168.

10. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 States and the District of Columbia). Table 16: Alcohol Dependence or Abuse in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 16, 2014.

11. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 states and the District of Columbia). Table 26: Had at Least One Major Depressive Episode in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 25, 2014.

12. Substance Abuse and Mental Health Services Administration. 2011-2012 National Survey on Drug Use and Health: Model-Based Prevalence Estimates (50 states and the District of Columbia). Table 24: Any Mental Illness in the Past Year, by Age Group and State: Percentages, Annual Averages Based on 2011 and 2012 NSDUHs. Substance Abuse and Mental Health Services Administration website. http://www.samhsa.gov/data/NSDUH/2k12State/Tables/NSDUHsaeTOC2012.htm. Accessed July 25, 2014.

13. Thompson S, Nichols KA, Ebron RG. A snapshot of North Carolina's public Mental Health, Developmental Disabilities, and Substance Abuse System. *NC Med J.* 2012;73(3):235-239.

14. Vicario M. The "crisis" crisis: emergency department use and community resources in North Carolina's behavioral health crisis system. *NC Med J.* 2012;73(3):216-218.

15. Health Resources and Services Administration. Mental health HPSA designation overview. US Department of Health and Human Services website. http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/mentalhealthhpsaoverview.html. Accessed July 26, 2014.

16. Cecil G. Sheps Center for Health Services Research. North Carolina Health Professions Data System. Physician primary area of practice by county, 2011. Cecil G. Sheps Center for Health Services Research website. http://www.shepscenter.unc.edu/hp/prof2011.htm. Accessed July 25, 2014.

17. North Carolina Substance Abuse Professional Practice Board. Credentialing. North Carolina Substance Abuse Professional Practice Board website. http://www.ncsappb.org/credentialing/. Accessed July 25, 2014.

18. Centers for Disease Control and Prevention. Oral health: preventing cavities, gum disease, tooth loss, and oral cancers at a glance 2011. Centers for Disease Control and Prevention website. http://www.cdc.gov/chronicdisease/resources/publications/AAG/doh.htm. Published July 29, 2011. Accessed July 25, 2014.

19. Achembong LN, Kranz AM, Rozier RG. Office-based preventive dental program and statewide trends in dental caries. *Pediatrics.* 2014;133(4):e827-e834.

20. DeStefano F, Anda RF, Kahn HS, Williamson DF, Russell CM. Dental disease and risk of coronary heart disease and mortality. *BMJ.* 1993;306(6879):688-691.

21. Scannapieco FA, Ho AW. Potential associations between chronic respiratory disease and periodontal disease: analysis of National Health and Nutrition Examination Survey III. *J. Periodontol.* 2001;72(1):50-56.

22. Fraher E. The dental workforce in North Carolina: trends, challenges, and opportunities. Presented at: 2013 North Carolina Dental Public Health Educational Conference; March 5, 2013; Greensboro, NC. http://www.shepscenter.unc.edu/hp/presentations/PubHlthDentists_5Mar2013.pdf. Accessed June 3, 2013.

23. Health Resources and Services Administration. Dental HPSA designation overview. US Department of Health and Human Services website. http://bhpr.hrsa.gov/shortage/hpsas/designationcriteria/dentalhpsaoverview.html. Accessed July 25, 2014.

24. Heaton LJ, Smith TA, Raybould TP. Factors influencing use of dental services in rural and urban communities: considerations for practitioners in underserved areas. *J Dent Educ.* 2004;68(10):1081-1089.

25. Stitzenberg KB, Sheldon GF. Progressive specialization within general surgery: adding to the complexity of workforce planning. *J Am Coll Surg.* 2005;201(6):925-932.

26. Brown D. Rural areas facing dangerous shortage of general surgeons. *Washington Post.* January 1, 2009. http://www.washingtonpost.com/wp-dyn/content/article/2008/12/31/AR2008123103120.html. Accessed July 25, 2014.

27. Poley ST, Kasper EW, Lyons JC, Newkirk VR, Thompson K. North Carolina surgical workforce trends. *NC Med J.* 2011;72(3):249-251.

28. McEllistrem-Evenson A. *Informing Rural Primary Care Workforce Policy: What Does the Evidence Tell Us? A Review of Rural Health Reserach Center Literature, 2000-2010*. Grand Forks, ND: Rural Health Research Gateway; 2011. http://www.ruralhealthresearch.org/pdf/primary_care_lit_review.pdf. Accessed July 25, 2014.

29. Blake LR, Charlton M, Peal R, Ramos J, Kaboli P. *VISN 23: Rural Healthcare Provider Retention Strategies*. Washington, DC: Veterans Health Administration Office of Rural Health; 2012. http://www.ruralhealth.va.gov/docs/issue-briefs/rural-provider-retention.pdf. Accessed July 25, 2014.

30. Health Resources and Services Administration, Bureau of Health Professions; Office of Public Health and Science, Office of Minority Health. *Pipeline Programs to Improve Racial and Ethnic Diversity in the Health Professions: An Inventory of Federal Programs, Assessment of Evaluation Approaches, and Critical Review of the Research Literature*. Washington, DC: US Department of Health and Human Services; 2009. http://bhpr.hrsa.gov/healthworkforce/reports/pipelineprogdiversity.pdf. Accessed May 20, 2014.

31. Ogur B, Hirsh D, Krupat E, Bor D. The Harvard Medical School-Cambridge integrated clerkship: an innovative model of clinical education. *Acad Med.* 2007;82(4):397-404.

32. Fraher E, Spero J, Lyons J, Newton H; Cecil G. Sheps Center for Health Services Research. *Trends in Graduate Medical Education in North Carolina: Challenges and Next Steps*. Chapel Hill: University of North Carolina at Chapel Hill; 2013. http://www.shepscenter.unc.edu/hp/publications/GME_Mar2013.pdf. Accessed July 25, 2014.

33. Collins C. Physician recruitment and retention efforts. Presented at: North Carolina Institute of Medicine Task Force on Rural Health; February 5, 2014; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2013/11/Collins-for-2-5-14-NCIOM-Presentation-Final.pdf. Accessed July 25, 2014.

34. North Carolina State Education Assistance Authority. *Rules Governing the Forgivable Education Loans for Service Program*. Research Triangle Park, NC: North Carolina State Education Assistance Authority; 2012. http://www.cfnc.org/static/pdf/home/sc/pdf/FELS_Rules.pdf. Accessed May 14, 2014.

35. Pathman DE, Fannell J, Konrad TR, Pierson S, Tobin M, Jonsson M; Cecil G Sheps Center for Health Services Research. *Findings of the First Year Retention Survey of the Multi-State/NHSC Retention Collaborative*. Chapel Hill, NC: The University of North Carolina at Chapel Hill; 2012. http://healthinfo.montana.edu/MTHWAC/multi-state-nhsc-retention-collaborative-final-report.pdf. Accessed June 12, 2014.

36. Gaul K, Fraher E. Education models to cultivate the rural health workforce. Presented at: North Carolina Institute of Medicine Task Force on Rural Health; February 5, 2014; Morrisville, NC. http://www.nciom.org/wp-content/uploads/2013/11/Gaul_NCIOMrural_020513_final.pdf. Accessed July 25, 2014.

37. Fraher EP, Belsky DW, Carpenter JM, Gaul K; Cecil G. Sheps Center for Health Services Research. *A Study of Associate Degree Nursing Program Success: Evidence from the 2002 Cohort*. Chapel Hill, NC: University of North Carolina at Chapel Hill; 2008. http://www.shepscenter.unc.edu/hp/publications/NCCCS_ADN_Report.pdf. Accessed July 25, 2014.

38. Johnson P. The RIBN initiative: a new effort to increase the number of baccalaureate nurses in North Carolina. *NC Med J.* 2014;75(1):39,41-44.

39. Overton A. A postprofessional distance-education program in neurodiagnostics and sleep science. *NC Med J.* 2014;75(1):71-72.

Conclusion

Chapter 9

Approximately one in five North Carolinians, or almost 2.2 million people, live in a rural county.[1] Rural counties, particularly those that are economically distressed, face more significant health-related and economic challenges than more affluent or urbanized counties. People living in rural areas fare worse on many health related measures. They are more likely to engage in risky health behaviors and have a higher mortality rate than North Carolinians living in urban areas. Compounding this problem, rural communities often lack access to needed health services.

While rural communities face challenges, they also have many strengths and assets which can be harvested to address these challenges. People living in rural communities are often resilient, have a strong sense of place, and an understanding of community assets. While rural communities are often under-resourced, there is an abiding commitment to the community and to each other. Rural communities stand ready to partner with statewide and local partners to address problems facing their communities.

Rural communities stand ready to partner with statewide and local partners to address problems facing their communities.

The North Carolina Institute of Medicine Task Force on Rural Health convened 46 experts on rural health from statewide agencies and rural communities over a period of 15 months. The Task Force hosted 8 community forums with 256 participants to solicit feedback on a draft rural health plan, identify important omissions, describe successful strategies, and prioritize strategies for the final rural health plan. The work of the Task Force was funded by the Kate B. Reynolds Charitable Trust and carried out in partnership with the Trust and the North Carolina Office of Rural Health and Community Care.

This report, the *North Carolina Rural Health Action Plan*, contains evidence-based and evidence-informed strategies to improve the health, educational, and economic well-being of people living in rural communities. This plan provides a roadmap for policymakers, funders, educational leaders, business leaders, health professionals, the faith community, and nonprofits that work in, or have a commitment to, the health and well-being of people living in rural communities. Many of the recommendations that are identified as part of the *Rural Health Action Plan* will help provide the resources needed and enable rural North Carolinians to successfully improve health, economic, and educational needs in their communities.

By working together to implement these strategies, local rural leaders, state and local governmental agencies, funders, health care professionals, academic institutions, businesses, faith organizations, and other nonprofit organizations can make a positive impact on the health and well-being of people living in rural communities.

Table 9.1 is a consolidated list of the priority strategies for the *Rural Health Action Plan*.

Table 9.1 **Rural Health Action Plan Consolidated Priority Strategies** RECOMMENDATION	Governmental Agencies	Funders	Health Professionals	Others
PRIORITY STRATEGY 1: INVEST IN SMALL BUSINESSES AND ENTREPRENEURSHIP TO GROW LOCAL AND REGIONAL INDUSTRIES				
Priority Strategy 1a: Create a dedicated funding stream for rural communities to further investments in infrastructure, regional industry, manufacturing, and workforce development. Develop activities that capitalize on local strengths and resources and increase high value-added manufacturing and farming industries.	✓ NCDOC	✓		
Priority Strategy 1b: Promote local agriculture and the sale of agricultural produce to local businesses, schools, and other government agencies, as well as directly to consumers. Provide technical assistance to small farmers to help support GAPs certification (NCFB). Revise, as necessary, existing regulations of local farm rules to remove farm-to-table barriers.	✓ NCDOA, NCDOC, NCDPH	✓		✓ NCFB
Priority Strategy 1c: Support investments in renewable energy development. Encourage investments in renewable energy development through tax and other incentives.	✓ NCGA			
Priority Strategy 1d: Increase investments to rural health care. Invest in rural health care, including recruitment and retention of providers to rural communities.	✓ NCORHCC, NCDOC	✓		
Priority Strategy 1e: Increase partnerships between North Carolina Community College System and Local Educational Agencies and small businesses, rural entrepreneurs, and local economic development offices to develop the rural workforce. Enhance programs that offer college transfer credit to high school students proficient in college subjects and develop career readiness certificates.	✓ NCCCS, LEAs			✓ Local industry
Priority Strategy 1f: Prioritize the development of local leaders and the recruitment of talented leaders. Provide scholarship opportunities to talented youth leaders who agree to live and work in rural communities.		✓		

RECOMMENDATION	Governmental Agencies	Funders	Health Professionals	Others
PRIORITY STRATEGY 2: INCREASE SUPPORT FOR QUALITY CHILD CARE AND EDUCATION (AGES 0-8) AND PARENTING SUPPORTS TO IMPROVE SCHOOL READINESS				
Priority Strategy 2a: Revise the child care star rating system to promote evidence-based strategies and best practices. Re-evaluate the star rating system based on updated evidence and best practices that supports children's social and emotional development, executive function, language skills, and health.	✓ NCDCDEE			
Priority Strategy 2b: Change child care subsidies to incentive quality care. Enhance child care subsidies to facilities that receive the highest star ratings and consider adjustments to the funding formula to incentivize quality care in rural counties.	✓ NCGA			
Priority Strategy 2c: Seek additional funding to support evidence-based parenting programs. Seek additional funding from multiple sources to support evidence-based parenting programs to enhance school readiness and improve long-term educational success.	✓ NCDPH	✓		
Priority Strategy 2d: Support the development of high quality early care and education workforce Work toward adequate wages, wage support, benefits (especially health insurance), education and training, and career advancement opportunities for the early care and education workforce.	✓ NCDCDEE			✓ NCPC, NCCCS, CCR&R
Priority Strategy 2e: Choose and implement evidence-based strategies and best practices to improve school readiness. Choose and implement a range of evidence-based and best practices strategies for improving school readiness and long-term educational success and involve parent coalitions in their selection and implementation in local communities.	✓ NCDCDEE, NCDPI, LEAs			✓ Local Smart Start, NCPC, businesses

Table 9.1 **Rural Health Action Plan Consolidated Priority Strategies** RECOMMENDATION	Governmental Agencies	Funders	Health Professionals	Others
PRIORITY STRATEGY 3: WORK WITHIN THE FORMAL AND INFORMAL EDUCATION SYSTEM TO SUPPORT HEALTHY EATING AND ACTIVE LIVING				
Priority Strategy 3a: Implement evidence-based and evidence-informed strategies to promote healthy eating and active living in licensed child care settings. Implement evidence-based and evidence-informed strategies to promote and support healthy eating, increased physical activity, reduced screen time, and active learning environments in licensed child care settings.	✓ NCDCDEE	✓		✓ Local Smart Start, NCPC
Priority Strategy 3b: Develop and promote a model local wellness policy that includes evidence-based or evidence-informed strategies to reduce childhood overweight and obesity. Develop a model local wellness policy that includes evidence-based or evidence-informed age-appropriate strategies to reduce overweight and obesity among school-aged children and promote its use by all local education agencies.	✓ NCSBE LEAs			
Priority Strategy 3c: Require that schools implement and integrate evidence-based curricula for healthy eating and active living. Require that schools implement evidence-based educational curricula into different courses about healthy weight, good nutrition, and the importance of physical activity; give students the skills to make healthy choices; and update the Healthful Living curriculum.	✓ NCSBE			
Priority Strategy 3d: Increase partnerships between North Carolina foundations, the faith community, community-based organizations, and other agencies that work with rural communities to support healthy eating and active living. Support opportunities for healthy eating and active living and facilitate the implementation of evidence-based strategies that have been shown to improve healthy eating and active living among different rural populations.		✓		✓ Faith com, CBOs

RECOMMENDATION	Governmental Agencies	Funders	Health Professionals	Others
PRIORITY STRATEGY 4: USE PRIMARY CARE AND PUBLIC HEALTH SETTINGS TO SCREEN FOR AND TREAT PEOPLE WITH MENTAL HEALTH AND SUBSTANCE ABUSE ISSUES IN THE CONTEXT OF INCREASINGLY INTEGRATED PRIMARY AND BEHAVIORAL HEALTH CARE				
Priority Strategy 4a: Provide incentives to increase primary care medical homes to screen patients for mental health symptoms and substance abuse. Provide incentives to encourage primary care medical homes to screen patients (with treatment or referral when indicated) for mental health symptoms and substance abuse.	✓ NCDMA		✓ CCNC	✓ Private payers
Priority Strategy 4b: Increase provided technical assistance and promote integrated primary care and behavioral health practices. Provide technical assistance to increase integrated care in all practice settings. i. Evaluate payment policies to promote integrated primary care and behavioral health practices. ii. Develop a working group to best support integrated care under Medicaid reform (NCDMHDDSAS, CCNC, NCAFP, NCFAHP). iii. Toward Accountable Care Consortium should work with shared savings delivery models to identify and implement integrated care to improve quality and decrease cost.	✓ NCDPH, NCDMA, NCDMHDD SAS		✓ CCNC, NCPS, NCAFP, NCMS	✓ NCFAHP
Priority Strategy 4c: Develop local resources to identify, support, and treat people with mental health symptoms and substance abuse issues. Develop local resources and capacity for evidence-based and evidence-informed strategies to identify, support, and treat people with mental health symptoms and substance abuse issues.	✓ NCDMHDD SAS		✓ CCNC	✓ NAMI-NC, AA, NA
PRIORITY STRATEGY 5: EDUCATE THE PEOPLE IN RURAL COMMUNITIES ABOUT THE NEW HEALTH INSURANCE OPTIONS AVAILABLE UNDER THE ACA, THE MEDICAID EXPANSION STATE OPTION, AND EXISTING SAFETY NET RESOURCES				
Priority Strategy 5a: Promote collaboration to coordinate education, outreach, and enrollment efforts. Work collaboratively at the local level to coordinate education, outreach, and enrollment efforts, and to identify gaps in necessary resources.	✓ Local DSS, Local health depts.		✓ Safety net orgs	✓ In-person assisters, faith com, business, nonprofits

Table 9.1 **Rural Health Action Plan Consolidated Priority Strategies** RECOMMENDATION	Governmental Agencies	Funders	Health Professionals	Others
Priority Strategy 5b: Support local education, outreach, and enrollment activities by targeting rural communities with high unmet needs. Support local education, outreach, and enrollment activities by targeting rural communities with high unmet needs, and prioritize those communities that have a coordinated effort in place to examine the need, identify existing resources and gaps, and develop a plan for outreach to hard to reach rural populations.		✓		
Priority Strategy 5c: Assess potential impact of any changes to Medicaid payment and delivery models prior to implementation. Examine the potential impact of any changes to Medicaid payment and delivery models on rural communities before implementing major system reforms.	✓ NCGA, NCDHHS			
Priority Strategy 5d: Promote the availability of safety net resources across the state. Transition the maintenance of www.nchealthcarehelp.org to www.nc211.org to better promote the availability of safety net resources across the state, and encourage safety net grantees to review and update information on the site at least once annually.				✓ NCIOM, United Way
PRIORITY STRATEGY 6: EXPAND EFFORTS TO RECRUIT HEALTH PROFESSIONALS TO RURAL AND UNDERSERVED AREAS				
Priority Strategy 6a: Increase recruitment and retention of health professional students through the North Carolina Community College System. Identify, disseminate, and expand successful strategies to help recruit and retain health professional students into two-year and four-year degrees on or near the community college campus.	✓ NCCCS			
Priority Strategy 6b: Incentivize health professions in shortage areas. Place a priority in the admissions process on students who grew up in, and/or have a desire to practice in, health professional shortage areas and consider different methods of incentivizing schools to produce the mix of health professionals needed to address the unmet health needs of the state with a focus on rural and underserved areas.	✓ NCAHEC NCGA		✓ Academic health programs	

RECOMMENDATION	Governmental Agencies	Funders	Health Professionals	Others
Priority Strategy 6c: Identify best practices for rural clinical placement models and disseminate models statewide. Identify best practices for rural clinical placement opportunities and help to disseminate those models across the state. Such models may include, but not be limited to: i. Stipends to rural practitioners to pay for clinical supervision. ii. Development of rural longitudinal placement rotations. iii Expansion of the number of rural residency programs for primary care. iv. Provision of support for primary care practitioners to improve quality of care and implement new models of care.	✓ NCAHEC		✓ Academic health programs	
Priority Strategy 6d: Increase funding to the Office of Rural Health and Community Care to support recruitment and retention efforts of health professions. Appropriate $2.0 million in recurring funds to the Office of Rural Health and Community Care to: i. Support additional staff with responsibility to designate areas of the state as Health Professional Shortage Areas (HPSAs) to support the recruitment of health care providers. ii. Expand efforts and resources necessary to enhance recruitment and retention of primary care, general surgeons, behavioral health, and dental health professionals into HPSAs. iii. Expand the availability of state loan repayment or other incentive payments to recruit primary care, general surgeons, behavioral health, and dental health professionals into HPSAs.	✓ NCGA NCORHCC			
Priority Strategy 6e: Identify and disseminate model health professions recruitment strategies for rural areas. Identify and disseminate model recruitment strategies, including strategies which have been successful in matching potential recruits and their families with the broader community. Determine best retention practices and disseminate them across the state.	✓ NCORHCC		✓ NCMSF	

Key:

AA:	Alcoholics Anonymous
CBO:	Community-based organization
CCNC:	Community Care of North Carolina
CCR&C:	Child Care Resource and Referral Agencies
LEA:	Local educational agency
NA:	Narcotics Anonymous
NAMI NC:	National Alliance on Mental Illness, North Carolina
NCAFP:	North Carolina Academy of Family Physicians
NCAHEC:	North Carolina Area Health Education Centers
NCCCS:	North Carolina Community College System
NCDCDEE:	North Carolina Division of Child Development and Early Education
NCDHHS:	North Carolina Department of Health and Human Services
NCDMA:	North Carolina Division of Medical Assistance
NCDMHDDSAS:	North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services
NCDOA:	North Carolina Department of Agriculture
NCDOC:	North Carolina Department of Commerce
NCDPH:	North Carolina Division of Public Health
NCDPI:	North Carolina Department of Public Instruction
NCDSS:	North Carolina Division of Social Services
NCFAHP:	North Carolina Foundation for Advanced Health Programs
NCFB:	North Carolina Farm Bureau
NCIOM:	North Carolina Institute of Medicine
NCMS:	North Carolina Medical Society
NCMSF:	North Carolina Medical Society Foundation
NCORHCC:	North Carolina Office of Rural Health and Community Care
NCPC:	North Carolina Partnership for Children
NCSBE:	North Carolina State Board of Education

Reference

1. US Department of Commerce, US Census Bureau. State and County QuickFacts: North Carolina. US Census Bureau website. http ://quickfacts.census.gov/qfd/states/37000.html. Accessed February 24, 2014.

Complete List of Strategies Considered by the Task Force

Appendix A

Community and Environment Strategies

Increase Jobs and Economic Security

1. Invest in infrastructure (e.g. water, sewer, technology, transportation)
2. Develop regional industries and local resources (e.g. farm to table, fishing, tourism, agriculture, solar)
3. Recruit and retain industry
4. Create workforce development programs to support local economy

Improve Educational Outcomes

1. Increase support for quality childcare and education (birth-5) and parenting supports to improve school readiness
2. Better recruitment and retention of strong teachers
3. Increase technology/internet infrastructure
4. Increase K-12 parent engagement and involvement (e.g. PTA/PTO, classroom visits)
5. Promote innovative/non-traditional educational programs and strategies
6. Increase adult learning opportunities and professional development

Increase Leadership around Rural Health Issues

1. Encourage communication between community leaders (e.g., health, business, education, faith) to support local economic development, education, health care, and other important community issues.
2. Educate state and local leaders about health and health care issues, including the economics of health care and the impact of the health of the community on other areas of development. Encourage them to factor health data into their decision-making.
3. Support or build opportunities for local leaders to come together around health issues in a way that encourages collaboration and supports the implementation/replication of successful programs/policies/practices (e.g. Healthy Carolinians or Partnership for Children model)
4. Identify and support development of local leaders in all disciplines to strengthen rural communities.

Health Behaviors Strategies

Promote Healthy Eating and Active Living

1. Educate families to support physical activity and nutrition
2. Work within the education systems (including early education through college) to support physical activity and nutrition

Decrease Substance Abuse

1. Promote and educate doctors on the use of statewide controlled substance reporting system to improve the ability to identify people who abuse and misuse prescription drugs.
2. Use Project Lazarus (a community-based overdose prevention and opioid safety program) as a model to reduce the use of other substances.
3. Promote the use of drug treatment courts, an intervention program where non-violent addicted offenders enter court-supervised treatment, rather than prison.
4. Use school-based interventions for substance abuse prevention.

Improve Mental Health

1. Build/strengthen community supports to improve mental health
2. Use primary care and public health settings to screen for and, when appropriate, provide treatment for mental health problems
3. Educate communities about the signs and symptoms of mental health disorders and suicide

Access to and Availability of Services Strategies

Improve Access by Maximizing Insurance Opportunities

1. Work with employers to maximize insurance coverage
2. Advocate for Medicaid expansion to cover low-income adults
3. Leverage safety net resources to bridge the gaps in insurance coverage for individuals, with a focus on those who are not able to obtain affordable health insurance coverage.

Support New Models of Care to Expand Access to Health Services

1. Expand telehealth efforts
2. Support and expand school-based and school-linked health centers
3. Funders and policies should support new models leveraging leadership, coordination, and sustainability

Improve Recruitment, Retention, and Distribution of Health Professionals

1. Ensure adequate incentives to recruit health professionals into underserved areas, focused on primary care, dental providers, mental health professionals, and general surgeons
2. Involve broader segments of community (e.g., schools, business, community leaders) in recruitment efforts
3. Support health professionals new to rural communities

Table B.1
Healthy North Carolina Objectives

Objective	Data Source	Urban (95% CI)	Rural (95% CI)
Tobacco Use			
Decrease the percentage of adults who are current smokers*	BRFSS 2012	20.3% (19.1-21.5)	22.1% (20.4-23.9)
Decrease the percentage of high school students reporting current use of any tobacco product	Youth Tobacco Survey (YTS)	Not available	Not available
Decrease the percentage of people exposed to secondhand smoke in the workplace in the past seven days*	BRFSS 2012	7.5% (6.0-9.0)	11.7% (8.2-15.2)
Physical Activity and Nutrition			
Increase the percentage of high school students who are neither overweight nor obese	YRBS	Not available	Not available
Increase the percentage of adults getting the recommended amount of physical activity**	BRFSS 2009	47.4% (45.6-49.2)	43.8% (40.6-47.0)
Increase the percentage of adults who consume five or more servings of fruits and vegetables per day**)	BRFSS 2009	21.6% (20.3-22.9)	18.8% (16.5-21.0
Injury and Violence			
Reduce the unintentional poisoning mortality rate	Death Data 2011	10.2 (9.4-11)	15.6 (14.0-17.2)
Reduce the unintentional falls mortality rate	Death Data 2011	10.4 (9.6-11.2)	8 (7.0-9.0)
Reduce the homicide rate	Death Data 2011	5.5 (4.9-6.1)	7.1 (6.1-8.1)
Maternal and Infant Health			
Reduce the infant mortality racial disparity between whites and African Americans	Vital Statistics 2011	2.67 times greater for African Americans	2.21 times greater for African Americans
Reduce the infant mortality rate	Vital Statistics 2011	7.2 (6.6-7.6)	7.9 (6.9-8.9)
Reduce the percentage of women who smoke during pregnancy***	Birth Data 2012	8.7% (8.5-8.9)	16.1% (15.6-16.5)
STDs and Unintended Pregnancy			
Decrease the percentage of pregnancies that are unintended	PRAMS 2011	46.0% (37.8-54.4)	42.9% (35.9-50.3)
Reduce the percentage of positive results among individuals ages 15-24 tested for Chlamydia)	Infertility Prevention Program† 2011	11.0% (10.6-11.4)	10.5% (10.2-10.8
Reduce the rate of new HIV infection diagnoses	North Carolina Communicable Disease 2011	17.9 (16.9-18.9)	9.5 (8.4-10.6)
Substance Abuse			
Reduce the percentage of high school students who had alcohol on one or more of the past 30 days	YBRS	Not available	Not available
Reduce the percentage of traffic crashes that are alcohol related	North Carolina Crash Data 2011	5.1% (5.0-5.2)	5.8% (5.6-6.0)
Reduce the percentage of individuals ages 12 years and older reporting any illicit drug use in the past 30 days	SAMHSA NSDUH	Not available	Not available
Mental Health			
Reduce the suicide rate	Death Data 2011	12.8 (12.0-13.6)	13.4 (12.0-14.8)
Decrease the average number of poor mental health days among adults in the past 30 days*	BRFSS 2012	3.9 (3.6-4.1)	3.9 (3.6-4.2)
Reduce the rate of mental health-related visits to emergency departments	NC DETECT 2011	95.6 (94.8-96.3)	126.4 (125.1-127.7)

Table B.1 *continued*
Healthy North Carolina Objectives

Objective	Data Source	Urban (95% CI)	Rural (95% CI)
Oral Health			
Increase the percentage of children ages 1-5 years enrolled in Medicaid who received any dental service during the previous 12 months	Medicaid Data FFY2011	54.7% (54.5-54.9)	50.5% (50.2-50.8)
Decrease the average number of decayed, missing, or filled teeth among kindergartners	Oral Health Survey	Cannot be calculated	Cannot be calculated
Decrease the percentage of adults who have had permanent teeth removed due to tooth decay or gum disease	BRFSS 2010	44.8% (43.1-46.4)	50.9% (47.9-53.9)
Environmental Health			
Increase the percentage of air monitor sites meeting the current ozone standard of 0.075 ppm	Division of Air Quality	Not available	Not available
Increase the percentage of the population being served by community water systems with no maximum contaminant level violations	Public Water Supply Section 2011	97.1% (97.1-97.2)	98.2% (98.0-98.3)
Reduce the mortality rate from work-related injuries	BLS CFOI	Not available	Not available
Infectious Disease and Foodborne Illness			
Increase the percentage of children ages 19-35 months who receive the recommended vaccines	NIS	Not available	Not available
Reduce the pneumonia and influenza mortality rate	Death Data 2011	18.5 (17.5-19.5)	21.7 (20.1-23.3)
Decrease the average number of critical violations per restaurant/food stand	Environmental Health	Not available	Not available
Social Determinants of Health			
Decrease the percentage of individuals living in poverty	US Census Bureau SAIPE	16.8% (16.8-16.8)	20.8% (20.7-20.9)
Increase the four-year high school graduation rate	DPI 2011-2012	83.0% (82.3-83.6)	82.7% (81.7-83.7)
Decrease the percentage of people spending more than 30% of their income on rental housing	2012 ACS 1-Year Estimate (GCT2515)	46.3% (45.6-47.0)	39.6% (38.1-41.1)
Chronic Disease			
Reduce the cardiovascular disease mortality rate	Death Data 2011	228 (224.3-231.7)	255.6 (250.1-261.1)
Decrease the percentage of adults with diabetes*	BRFSS 2012	9.5% (8.7-10.3)	12.5% (11.3-13.7)
Reduce the colorectal cancer mortality rate	Death Data 2011	14.4 (13.4-15.4)	16.6 (15.2-18.0)
Cross-Cutting			
Increase average life expectancy	Death Data 2012	78.7 (78.6-78.7)	76.9 (76.8-77.0)
Increase the percentage of adults reporting good, very good, or excellent health*	BRFSS 2012	82.0% (80.9-83.0)	77.8% (76.2-79.4)
Reduce the percentage of non-elderly uninsured individuals	NCIOM	Cannot be calculated	Cannot be calculated

*In 2011, the BRFSS methodology changed, so results are not directly comparable to previous years' results.
**In 2011, the definition for recommended amount of physical activity and fruit and vegetable consumption changed. Therefore, comparable data for these measures are not available at this time.
***North Carolina implemented the revised US standard birth certificate during 2010. The methodology for collecting smoking data was modified; therefore values presented for 2011 are not comparable to prior years.
†Excludes Durham, Forsyth, Guilford, Mecklenburg, and Wake Counties.

Table C.1
North Carolina County Data

	Classifications			Economic Wellbeing						Education Outcomes			Physical Activity and Nutrition					SA (12)	MH (14)		Un-insured County Data	Healthcare Professional to Pop. Ratio (per 10,000)						
County	Urban/ Rural	Tier	Metro/ Micro/ Neither	Living in Poverty (1)	Unemp. Rate (Feb. 2014)	Median HHI (2012)	Stress (Housing Payment) (2)	% who spend more than 30% of income on rent (2006-2010)	Stress (Food Access) (3)	HS Grad Rate (4)	Some Post-sec. ed. (5)	% kids in 4/5 star child care (6)	Adult obesity (7)	Physical inactivity (8)	Limited food access (9)	Fast food entities (10)	Diabetes (11)	Alcohol rel traffic crashes (%)(13)	Poor MH days	Suicide rate (14)	% Un-insured under 65 (2012)	All physi-cians	Primary care physi-cians	NPs	PAs	Psych-iatrist	Surg-eons	Den-tists
Alamance	Urban	2	Metro	19.5	6.6	$41,394	18.0	45.2	10.1	78.1	57.8	66.3	34	27	11	50	12	5.81	3.6	10.7	20.3	17.2	6.4	1.8	2.2	12	8	4.2
Alexander	Urban	2	Metro	17.1	6.2	$39,655	15.5	39.2	9.0	85.2	41.9	51.8	27	23	2	41	11	7.14	4.6	20.0	19.4	4.0	3.2	1.6	2.4	2	0	1.9
Alleghany	Rural	1	Neither	21.0	8.3	$34,046	15.5	45.4	9.0	89.8	46.4	62.9	25	31	1	28	11	9.55	4.4	**	26.9	9.9	6.3	5.4	0.9	0	1	1.8
Anson	Urban	1	Metro	26.8	7.5	$32,339	17.3	40.2	9.9	77.4	37.7	62.5	35	29	3	50	13	5.74	**	**	18.7	8.5	5.4	0.8	0.8	0	1	1.9
Ashe	Rural	2	Neither	20.2	9.1	$34,080	15.5	39.2	9.0	84.8	47.3	100	23	28	2	42	10	6.36	3.5	20.6	24.2	8.8	6.2	4.0	1.1	0	3	2.6
Avery	Rural	2	Neither	22.7	8.0	$34,727	15.5	46.6	9.0	87.1	53.4	62.1	29	25	0	29	11	7.57	2.7	24.6	26.2	10.7	4.5	5.0	0.0	3	2	3.9
Beaufort	Rural	1	Micro	19.0	7.8	$38,256	16.0	40.9	8.0	78.8	52.6	70.3	34	31	5	43	15	5.08	2.4	11.7	20.1	13.2	5.6	3.8	2.1	2	5	3.6
Bertie	Rural	1	Neither	27.0	9.6	$30,414	16.0	55.5	8.0	78.2	40.7	47.2	35	32	5	58	15	4.48	2.3	**	17.4	3.8	2.9	1.9	3.8	0	0	0.5
Bladen	Rural	1	Neither	25.5	10.0	$32,766	14.8	35.2	8.2	78.9	51.4	51.4	36	33	3	63	15	3.91	4.2	**	23.0	5.1	3.7	3.1	2.3	0	2	1.7
Brunswick	Urban	3	Metro	15.8	8.0	$48,624	19.4	44.1	9.8	85.7	59.6	77.2	30	26	5	39	12	6.17	3.5	13.4	20.4	11.0	5.4	2.6	2.8	1	5	3.3
Buncombe	Urban	3	Metro	17.7	4.9	$43,146	16.6	42.6	12.3	80.5	68.7	68	24	21	9	42	10	6.11	3.8	15.7	20.4	35.4	11.9	6.9	6.4	46	11	6.4
Burke	Urban	1	Metro	19.1	7.0	$38,581	15.5	40.2	9.0	88.0	50.1	78.2	29	30	12	54	13	4.93	4.8	16.4	20.7	21.2	6.9	2.5	2.6	24	6	3.3
Cabarrus	Urban	3	Metro	13.2	5.9	$55,531	17.3	42.0	9.9	86.2	64.6	71.6	31	24	6	53	10	4.14	3.2	13.9	17.6	24.6	9.5	3.3	2.9	10	12	3.4
Caldwell	Urban	1	Metro	20.4	7.1	$35,127	15.5	40.4	9.0	89.4	50.8	80.1	30	29	16	61	12	7.32	3.8	16.7	18.4	9.7	5.5	2.4	1.1	2	2	2.4
Camden	Rural	1	Micro	9.7	7.2	$53,563	16.0	47.3	8.0	84.7	68.7	81.8	30	24	1	60	11	**	2.2	**	15.5	1.0	1.0	0.0	0.0	0	0	0.0
Carteret	Rural	3	Micro	15.4	6.8	$48,930	16.0	40.8	8.0	84.7	63.6	70.1	29	30	7	35	11	6.62	3.4	17.0	20.4	16.4	5.6	5.2	4.1	2	7	6.1
Caswell	Rural	1	Neither	20.8	6.9	$39,615	18.0	42.6	10.1	78.8	46.5	48.4	33	28	6	42	14	6.12	4.6	15.7	18.7	5.1	3.4	3.8	0.4	1	0	1.3
Catawba	Urban	2	Metro	18.5	7.2	$42,080	15.5	40.5	9.0	89.5	56.2	79.4	28	28	10	51	10	5.35	3.7	16.6	19.3	24.4	8.0	6.5	4.8	11	11	4.5
Chatham	Urban	3	Metro	12.7	4.5	$55,371	18.0	42.2	10.1	85.3	60.9	82.4	26	21	3	38	10	4.56	3.6	14.4	19.5	6.8	4.8	2.0	0.8	1	1	2.6
Cherokee	Rural	1	Neither	25.1	8.8	$31,370	16.6	30.8	12.3	91.7	57.9	56.6	28	30	0	52	14	8.14	3.1	15.9	21.6	14.7	5.5	2.6	3.7	2	2	3.3
Chowan	Rural	1	Neither	20.8	8.4	$37,458	16.0	35.4	8.0	81.5	47.2	36.9	30	29	7	55	14	5.58	3.8	**	18.2	23.0	10.8	4.1	1.4	1	3	4.1
Clay	Rural	1	Neither	18.5	6.7	$36,871	16.6	40.8	12.3	88.8	54.9	55.5	26	29	2	30	11	**	5.2	**	22.4	4.8	3.8	4.8	0.0	1	0	3.8
Cleveland	Rural	1	Micro	22.9	7.2	$38,265	17.3	43.4	9.9	83.3	53.8	61	30	31	6	53	14	5.63	5.0	18.0	18.2	17.1	7.5	3.7	2.5	5	4	3.6
Columbus	Rural	1	Neither	25.3	9.0	$33,765	19.4	43.0	9.8	83.6	56.2	70.4	32	28	1	60	13	4.52	4.5	13.1	21.3	11.8	5.9	3.1	3.8	2	5	1.6
Craven	Rural	2	Micro	16.4	7.5	$47,087	16.0	43.8	8.0	86.0	62.7	73.5	32	29	6	54	12	4.62	3.2	13.0	18.1	21.8	6.3	3.5	3.3	4	6	4.3
Cumberland	Urban	2	Metro	17.0	7.6	$45,110	14.8	43.1	8.2	81.7	69.3	46.8	34	30	13	56	12	4.76	4.0	14.4	17.1	16.6	5.9	3.4	7.6	23	20	4.2
Currituck	Urban	2	Metro	12.5	7.7	$54,822	16.0	46.4	8.0	87.7	58.7	25.3	29	26	3	44	11	5.9	**	**	17.9	3.8	1.7	0.4	0.8	1	0	2.1
Dare	Rural	2	Micro	10.7	13.5	$51,900	16.0	50.0	8.0	91.4	68.6	74.2	28	27	10	35	10	6.9	4.1	15.2	20.7	16.1	8.8	3.8	4.1	0	2	5.8
Davidson	Rural	2	Micro	16.5	6.8	$43,824	15.5	37.5	9.0	83.8	49.7	72.1	29	32	6	39	11	6.21	4.4	12.2	18.5	7.8	4.5	1.8	1.0	3	5	1.5
Davie	Urban	2	Metro	12.8	6.2	$49,984	15.5	33.8	9.0	83.2	53.8	60.3	28	26	3	47	12	5.97	2.9	14.2	18.1	8.2	4.6	2.4	1.7	1	0	2.9
Duplin	Rural	2	Neither	23.6	7.3	$36,075	19.4	33.8	9.8	79.9	44.4	41.8	36	34	1	50	14	4.96	2.5	14.6	26.4	5.5	3.9	2.2	1.7	1	1	2.0
Durham	Urban	3	Metro	19.3	5.1	$50,889	15.4	47.1	9.2	79.6	71.2	71	29	20	6	53	9	3.94	2.9	8.7	19.8	74.7	16.2	13.6	11.1	90	37	6.5
Edgecombe	Urban	1	Metro	28.1	11.6	$32,002	12.7	45.9	***	77.4	49.6	62.7	37	29	9	62	15	7.66	2.1	9.1	17.9	6.6	2.9	1.2	2.1	0	3	1.4
Forsyth	Urban	3	Metro	21.2	6.1	$43,049	15.5	46.1	9.0	82.1	63.2	52.2	26	22	12	47	10	5.2	3.0	11.5	19.5	47.0	12.7	7.0	9.1	58	40	5.1
Franklin	Urban	2	Metro	16.7	6.0	$42,346	15.4	41.3	9.2	80.8	51.0	38.3	33	29	2	68	11	5.52	4.4	15.7	20.9	3.6	1.9	1.3	0.8	0	1	1.1
Gaston	Urban	2	Metro	17.8	6.6	$41,614	17.3	44.8	9.9	81.2	57.0	63.8	27	29	11	55	12	5.83	4.5	15.3	19.4	19.2	7.1	3.0	3.1	13	11	3.9
Gates	Rural	2	Neither	17.4	6.7	$44,273	16.0	28.2	8.0	91.4	48.8	62.5	33	31	0	20	13	5	4.0	**	17.1	0.8	0.8	0.8	0.0	0	0	0.8
Graham	Rural	1	Neither	22.5	13.8	$32,883	16.6	43.1	12.3	86.5	44.4	87.6	30	28	2	50	12	**	3.7	**	22.0	3.4	3.4	3.4	1.1	0	0	2.2

Table C.1 *continued*
North Carolina County Data

	Classifications			Economic Wellbeing						Education Outcomes			Physical Activity and Nutrition					SA (12)	MH (14)		Un-insured County Data	Healthcare Professional to Pop. Ratio (per 10,000)						
County	Urban/ Rural	Tier	Metro/ Micro/ Neither	Living in Poverty (1)	Unemp. Rate (Feb. 2014)	Median HHI (2012)	Stress (Housing Payment) (2)	% who spend more than 30% of income on rent (2006-2010)	Stress (Food Access) (3)	HS Grad Rate (4)	Some Post-sec. ed. (5)	% kids in 4/5 star child care (6)	Adult obesity (7)	Physical inactivity (8)	Limited food access (9)	Fast food entities (10)	Diabetes (11)	Alcohol rel traffic crashes (%)(13)	Poor MH days	Suicide rate (14)	% Un-insured under 65 (2012)	All physi-cians	Primary care physi-cians	NPs	PAs	Psych-iatrist	Surg-eons	Den-tists
Granville	Rural	2	Neither	19.9	6.8	$46,303	15.4	36.8	9.2	77.1	51.5	45.9	30	30	3	63	13	6.18	3.9	13.6	18.7	19.2	7.1	2.8	4.1	37	2	3.1
Greene	Urban	1	Metro	27.1	7.1	$35,050	16.0	32.8	8.0	87.3	47.5	48.6	32	28	0	56	12	5.66	2.0	**	23.4	4.2	3.7	2.8	0.9	1	0	2.3
Guilford	Urban	3	Metro	18.1	6.8	$43,299	18.0	46.8	10.1	86.2	66.9	65.1	27	24	7	48	10	5.37	3.1	9.9	19.5	24.3	8.6	4.6	4.6	35	30	5.2
Halifax	Rural	1	Micro	29.2	10.2	$31,253	12.7	47.9	***	80.3	49.2	57.2	38	34	10	57	16	6.38	4.3	11.2	18.7	13.2	5.9	2.6	2.2	3	4	2.2
Harnett	Rural	2	Micro	18.9	7.6	$44,998	14.8	44.0	8.2	77.1	62.3	54.8	33	29	4	57	11	6.29	3.5	11.2	19.8	5.3	3.0	1.2	3.6	1	3	1.8
Haywood	Urban	2	Metro	16.1	6.3	$40,022	16.6	39.3	12.3	83.0	54.6	48.7	26	22	7	38	10	6.39	4.8	14.9	18.9	17.4	6.7	3.0	3.4	4	3	4.9
Henderson	Urban	3	Metro	14.2	5.1	$45,168	16.6	43.0	12.3	88.0	62.9	84.9	22	24	5	46	10	5.1	3.5	16.3	21.7	22.3	8.9	4.6	3.9	11	7	4.4
Hertford	Rural	1	Neither	30.5	7.8	$31,861	16.0	43.5	8.0	82.6	53.1	63.8	34	34	6	54	14	5.49	2.7	**	19.7	15.1	6.5	4.1	4.5	3	2	2.9
Hoke	Urban	2	Metro	20.7	6.7	$44,717	14.8	49.3	8.2	70.5	61.8	47	33	30	9	67	11	6.77	3.1	9.5	22.4	2.4	2.4	0.2	2.6	0	0	1.6
Hyde	Rural	1	Neither	24.3	12.9	$35,301	16.0	44.3	8.0	86.8	43.7	100	32	29	26	8	12	**	**	**	24.6	1.7	1.7	6.9	0.0	0	0	0.0
Iredell	Rural	3	Micro	14.4	6.5	$49,666	15.5	41.2	9.0	89.0	62.6	79	28	24	5	48	9	4.72	3.0	11.9	18.6	20.6	8.0	3.8	3.4	9	13	4.9
Jackson	Rural	2	Neither	22.4	6.5	$37,049	16.6	45.6	12.3	83.7	58.2	56.6	33	25	8	39	13	7.11	3.9	13.0	25.8	18.7	7.6	5.9	3.2	0	2	3.7
Johnston	Urban	3	Metro	16.8	5.7	$48,773	15.4	45.5	9.2	82.5	58.9	55.9	33	28	2	55	12	6.2	3.7	12.3	21.1	7.4	4.1	1.2	2.3	5	5	2.1
Jones	Rural	1	Micro	20.1	7.8	$35,159	16.0	27.3	8.0	81.0	55.4	69.8	34	33	0	60	15	6.85	6.2	**	21.2	14.5	8.7	2.9	1.0	0	0	1.0
Lee	Rural	2	Micro	17.8	8.3	$43,424	15.4	37.4	9.2	86.2	48.4	45	29	26	9	55	11	4.46	4.0	9.8	21.7	15.1	8.2	1.9	3.4	1	3	3.8
Lenoir	Rural	1	Micro	23.6	7.3	$35,634	16.0	50.3	8.0	77.9	50.8	53.1	34	36	5	60	15	5.02	4.7	10.6	20.6	16.4	6.1	1.7	3.2	3	2	3.7
Lincoln	Rural	3	Micro	14.6	6.5	$47,799	17.3	43.6	9.9	86.4	56.4	85.1	28	26	5	52	10	6.91	3.3	12.0	18.3	9.5	5.7	1.6	1.3	1	3	2.7
Macon	Rural	2	Neither	20.4	8.0	$36,438	16.6	35.8	12.3	86.1	49.5	44.4	25	26	2	36	11	5.5	3.9	20.2	25.6	21.2	9.3	2.9	1.2	0	5	4.4
Madison	Urban	1	Metro	19.9	5.5	$37,644	16.6	34.7	12.3	85.9	56.2	84.1	30	26	4	42	11	7.36	**	**	19.2	5.2	5.2	1.9	1.9	0	0	1.9
Martin	Rural	1	Neither	24.7	7.6	$33,159	16.0	46.3	8.0	76.3	54.0	65.7	34	30	1	55	15	4.83	**	16.1	19.2	7.9	5.4	0.4	1.2	1	2	2.5
McDowell	Rural	2	Neither	20.2	7.5	$36,584	16.6	28.6	12.3	78.2	51.6	53.5	34	32	3	47	13	4.81	4.5	16.4	19.4	8.8	6.4	2.6	2.6	0	3	1.8
Mecklenburg	Uban	3	Metro	16.1	6.5	$55,392	17.3	44.3	9.9	81.0	72.0	82	26	21	7	46	8	3.87	3.2	9.4	18.3	27.7	9.5	4.8	4.1	78	67	6.3
Mitchell	Rural	1	Neither	20.0	8.9	$36,210	16.6	25.9	12.3	88.0	52.3	36.3	29	29	3	41	12	**	4.7	**	18.0	18.1	12.3	3.9	1.9	0	1	3.2
Montgomery	Rural	1	Neither	23.6	7.3	$35,272	18.0	40.1	10.1	85.3	49.4	74.4	31	28	0	48	13	9.91	2.1	**	23.6	1.8	1.4	0.4	2.5	0	0	1.4
Moore	Rural	3	Micro	16.0	6.5	$49,670	14.8	37.7	8.2	81.7	69.6	48.6	29	28	6	34	11	5.01	3.1	16.9	18.2	31.4	8.2	4.5	5.7	10	6	6.2
Nash	Urban	2	Metro	20.8	8.6	$40,937	12.7	41.0	***	79.3	53.8	71.4	33	30	4	55	12	5.88	3.1	11.1	19.0	18.9	7.1	2.2	4.2	6	7	4.1
New Hanover	Urban	3	Metro	15.9	6.6	$50,890	19.4	51.0	9.8	82.4	74.9	62.7	26	21	8	43	11	5.12	3.4	14.3	18.5	32.4	10.1	6.3	8.1	31	19	7.1
Northampton	Rural	1	Micro	31.8	8.4	$31,217	12.7	35.4	***	80.8	39.1	57.4	31	34	3	31	14	5.22	3.6	**	17.3	2.3	2.3	0.5	0.9	0	0	0.5
Onslow	Urban	2	Metro	14.9	6.6	$44,263	16.0	40.5	8.0	97.2	67.7	64.8	28	24	11	56	9	6.99	3.8	12.9	16.9	8.3	3.6	3.1	2.7	9	8	3.0
Orange	Urban	3	Metro	16.4	4.4	$53,026	18.0	51.4	10.1	88.7	77.5	89.3	21	16	11	41	7	6.27	3.1	12.9	14.7	94.4	23.7	14.6	4.8	115	31	9.6
Pamlico	Rural	2	Micro	17.3	9.2	$41,004	16.0	33.6	8.0	92.9	52.0	18.4	30	29	2	53	13	8.33	**	**	19.3	6.1	4.5	2.3	1.5	0	0	3.8
Pasquotank	Rural	2	Micro	17.8	9.5	$43,935	16.0	46.5	8.0	83.9	60.0	29.7	33	29	9	44	12	5.19	3.3	**	18.5	25.7	8.4	4.0	4.7	2	6	2.7
Pender	Urban	3	Metro	19.3	7.6	$43,318	19.4	40.7	9.8	87.2	58.6	76.7	29	27	3	56	12	5.74	2.7	15.1	21.1	3.9	2.8	2.6	1.3	1	2	3.4
Perquimans	Rural	2	Micro	17.8	8.0	$42,494	16.0	53.8	8.0	89.0	55.4	0	32	28	1	33	14	5.76	2.0	**	18.5	2.2	1.5	0.0	1.5	1	0	1.5
Person	Urban	2	Metro	16.2	7.3	$42,546	15.4	32.3	9.2	77.5	57.0	61.6	33	30	3	68	14	4.52	2.8	14.9	17.9	10.6	4.3	3.3	2.3	2	2	2.3
Pitt	Urban	2	Metro	24.0	6.3	$39,343	16.0	53.2	8.0	77.6	69.0	51.1	36	24	3	56	9	4.48	3.2	8.5	18.7	45.4	13.8	8.8	7.0	34	26	4.1

Table C.1 *continued*
North Carolina County Data

	Classifications			Economic Wellbeing						Education Outcomes			Physical Activity and Nutrition					SA (12)	MH (14)		Un-insured County Data	Healthcare Professional to Pop. Ratio (per 10,000)						
County	Urban/ Rural	Tier	Metro/ Micro/ Neither	Living in Poverty (1)	Unemp. Rate (Feb. 2014)	Median HHI (2012)	Stress (Housing Payment) (2)	% who spend more than 30% of income on rent (2006-2010)	Stress (Food Access) (3)	HS Grad Rate (4)	Some Post-sec. ed. (5)	% kids in 4/5 star child care (6)	Adult obesity (7)	Physical inactivity (8)	Limited food access (9)	Fast food entities (10)	Diabetes (11)	Alcohol rel traffic crashes (%)(13)	Poor MH days	Suicide rate (14)	% Un-insured under 65 (2012)	All physi-cians	Primary care physi-cians	NPs	PAs	Psych-iatrist	Surg-eons	Den-tists
Polk	Rural	2	Neither	18.3	4.6	$41,719	16.6	51.6	12.3	82.6	52.1	15.8	23	26	0	30	10	6.55	3.9	**	20.6	13.2	6.4	2.9	2.9	2	1	4.4
Randolph	Urban	2	Metro	17.9	6.5	$41,815	18.0	43.6	10.1	88.4	48.0	79.1	29	29	7	49	10	5.81	3.7	16.1	21.6	9.4	4.6	2.0	1.9	6	6	2.6
Richmond	Rural	1	Micro	24.6	8.9	$30,726	14.8	38.7	8.2	74.1	48.2	59	31	33	5	50	13	6.64	5.7	14.1	21.4	11.6	6.9	2.6	1.5	3	3	2.4
Robeson	Rural	1	Micro	34.7	9.6	$29,965	14.8	39.7	8.2	**	42.5	52.6	41	37	6	55	16	6.32	3.7	11.9	26.3	12.0	6.2	2.7	4.2	6	4	2.0
Rockingham	Urban	1	Metro	19.1	8.2	$37,577	18.0	39.7	10.1	76.3	51.7	46	32	30	11	47	12	6.69	4.0	13.0	18.8	10.0	4.7	2.2	2.7	2	5	2.6
Rowan	Rural	2	Micro	19.2	6.7	$40,400	15.5	40.0	9.0	82.9	52.0	70.5	33	30	9	45	13	4.76	4.2	13.5	20.7	12.7	5.3	2.2	3.2	6	5	3.3
Rutherford	Rural	1	Micro	18.2	9.4	$34,193	16.6	39.1	12.3	77.7	56.0	62.4	30	29	10	45	12	6.16	4.8	15.0	19.4	11.6	5.3	2.6	1.5	4	3	2.5
Sampson	Rural	2	Neither	21.9	6.5	$37,420	14.8	40.9	8.2	77.2	44.8	53.2	37	28	2	54	13	6.35	2.3	12.5	23.2	9.3	5.8	1.9	2.0	1	2	2.2
Scotland	Rural	1	Micro	30.7	12.4	$31,704	14.8	45.1	8.2	72.8	43.8	51.6	36	29	8	58	14	6.61	4.3	**	20.2	18.0	8.0	2.8	4.7	0	2	2.2
Stanly	Rural	2	Micro	17.2	6.1	$42,816	17.3	31.5	9.9	82.3	56.0	71.5	27	31	3	49	12	4.7	5.5	16.4	17.8	13.5	6.1	3.0	1.5	7	2	2.6
Stokes	Urban	2	Metro	17.8	6.0	$42,272	15.5	30.1	9.0	86.8	48.9	49.4	26	26	6	44	10	6.29	5.3	18.4	17.8	4.4	2.3	2.5	0.8	2	0	1.3
Surry	Rural	1	Micro	18.6	7.1	$36,934	15.5	40.7	9.0	87.6	51.9	35.8	31	27	3	44	13	7.1	3.5	15.4	22.0	18.3	9.2	4.8	3.9	3	5	3.1
Swain	Rural	1	Neither	20.9	11.4	$36,280	16.6	39.1	12.3	80.8	56.3	58.1	34	30	3	49	15	4.68	3.6	**	24.2	17.5	13.3	3.5	9.1	0	0	3.5
Transylvania	Rural	2	Micro	15.8	7.3	$40,642	16.6	48.2	12.3	86.0	58.4	39.2	24	23	3	42	10	5.87	3.2	15.9	20.9	16.5	9.9	2.4	1.5	0	2	3.0
Tyrrell	Rural	1	Neither	28.9	9.4	$30,728	16.0	35.0	8.0	87.3	36.9	33	31	30	6	0	13	**	**	**	24.6	0.0	0.0	2.3	0.0	0	0	0.0
Union	Urban	3	Metro	11.6	5.6	$61,260	17.3	47.0	9.9	90.8	65.8	81	27	21	4	56	9	5.5	2.9	11.8	16.6	8.1	4.0	1.4	1.7	3	7	2.6
Vance	Rural	1	Micro	25.8	9.3	$34,371	15.4	51.2	9.2	64.9	43.1	61.1	33	32	5	57	14	5.58	3.1	15.4	19.9	16.2	7.7	2.4	5.3	2	3	2.6
Wake	Urban	3	Metro	11.6	5.0	$64,107	15.4	44.6	9.2	81.0	77.6	60.9	25	19	4	52	7	3.75	2.6	8.8	15.1	23.8	8.7	4.1	4.1	157	56	7.0
Warren	Rural	1	Neither	25.4	8.9	$33,068	15.4	43.6	9.2	75.3	43.5	60	35	31	4	58	16	7.54	3.9	**	21.8	1.0	0.5	1.0	1.0	0	0	2.4
Washington	Rural	1	Neither	27.4	8.2	$32,545	16.0	52.5	8.0	84.8	56.0	39.9	33	30	10	57	14	4.07	2.7	**	17.3	5.4	3.1	3.1	4.6	1	1	1.5
Watauga	Rural	3	Micro	29.5	6.2	$38,563	15.5	66.0	9.0	87.6	71.2	63	28	22	3	36	9	4.98	3.2	15.4	20.6	23.2	7.7	4.0	3.1	6	5	5.6
Wayne	Urban	2	Metro	23.4	6.6	$38,776	16.0	39.6	8.0	77.6	58.5	52.6	34	31	8	49	12	5.59	3.5	10.9	20.1	15.0	6.0	2.8	3.5	26	3	3.8
Wilkes	Rural	1	Micro	19.9	7.5	$35,362	15.5	40.0	9.0	90.1	49.4	59.4	29	32	6	40	13	6.43	4.4	12.9	21.6	11.2	5.7	2.4	2.2	3	5	2.7
Wilson	Rural	2	Micro	23.8	9.0	$37,440	12.7	50.0	***	79.7	52.1	62.2	35	31	3	53	14	4.38	3.1	7.3	20.9	14.7	5.0	3.3	3.8	4	6	3.2
Yadkin	Urban	2	Metro	19.3	5.5	$40,012	15.5	37.4	9.0	82.9	47.4	51.3	30	28	0	40	10	6.18	4.6	13.1	20.1	4.9	3.9	1.8	0.8	1	0	1.8
Yancey	Rural	1	Neither	20.3	7.8	$36,019	16.6	27.1	12.3	82.3	51.0	71.4	29	31	0	47	11	5.79	4.1	**	20.6	7.2	6.6	5.0	1.7	0	0	2.2

(1) Percent individuals living in poverty (2012)
(2) Percent adults who report being always or usually worried or stressed about having enough money to pay their rent/mortgage
(3) Percent adults who report being always or usually worried or stressed about having enough money to buy nutritious meals
(4) Four-year high school graduation rate (2012-2013)
(5) Percent of adults aged 25-44 years with some post-secondary education (2014)
(6) % Children in child care at a center with 4 or 5 star rating (e.g. higher quality centers) (2011)
(7) Adult obesity (percent of adults that report a BMI>=30)
(8) Physical inactivity (percent of adults aged 20 and over reporting no leisure time physical activity)
(9) Limited access to healthy foods (percent of population who are low-income and do not live close to a grocery store)
(10) Fast food restaurants (percent of all restaurants that are fast-food establishments)(2012)
(11) Diabetes (Percent of adults aged 20 and above with diagnosed diabetes)
(12) Substance Abuse
(13) Percentage of traffic crashes that are alcohol-related (2011)
(14) Mental Health
(15) Suicide rate (per 100,000 population 2008-2012)
(16) Health Care Professional to Population Ratio (Professionals per 10,000 population) (2011)

List of Resources that Provide Funding and/or Technical Assistance to Rural Communities

Appendix D

Economic Development

The Center for Environmental Farming Systems

Description: The Center for Environmental Farming Systems (CEFS) was established in 1994 through collaboration between NC State University, NC A&T State University, and the North Carolina Department of Agriculture and Consumer Services. The CEFS works to accomplish four objectives through high-quality interdisciplinary research, teaching, and extension programs. The four CEFS objectives include: providing new economic opportunities for North Carolina; developing technologies that promote a cleaner and healthier environment; educating the next generation of farmers, consumers, and scientists; and engaging communities in the food system. The CEFS website includes resources such as webinars, field notes for farmers, and guides.

Contact information:
Phone: (919) 513-0954
Email: cefs_info@ncsu.edu
Website: http://www.cefs.ncsu.edu/

The Conservation Fund

Description: The Conservation Fund was founded in 1985 and has saved more than 7 million acres across America. This 501(c)(3) organization's mission is to save land for future generations by balancing environmental and economic goals to maximize development. The Conservation Fund's team works with communities to strategically plan for development, provides loans to small green businesses, and works with companies to compensate for environmental impacts. The fund has headquarters in Arlington, VA with field offices nationwide including in Chapel Hill, NC.

Contact information:
Chapel Hill Field Office Phone: (919) 967-2223
National Phone: (703) 525-6300
Email: webmaster@conservationfund.org
Website: www.conservationfund.org

Golden LEAF Foundation

Description: The Golden LEAF Foundation was formed under a charter by the North Carolina General Assembly in 1999. Based in Rocky Mount, NC, the Golden LEAF Foundation's mission is to serve North Carolinians through promoting social welfare by using its funds to provide economic impact assistance to economically affected or tobacco-dependent regions of North Carolina. The Golden LEAF Foundation supports activities including education assistance and scholarships; job training and employment assistance; scientific research; health and human services; and community assistance to support economic development across North Carolina.

Contact information:
Phone: (252) 442-7474
Email: info@goldenleaf.org
Website: www.goldenleaf.org

Industrial Extension Service, NC State University

Description: Established in 1955, the Industrial Extension Services (IES) continues to help North Carolina industries grow and prosper by supporting industry and businesses in the workplace. IES aims to increase productivity, efficiency, safety, and quality through a host of tailored resources developed in partnership with the North Carolina State College of Engineering. These resources include on-site trainings and programs, online courses, and video tutorials and testimonials to provide ongoing mentorship and support.

Contact information:
Phone: (919) 515-2358
Email: ies_services@ncsu.edu
Website: http://www.ies.ncsu.edu/

Institute for Emerging Issues, NC State University

Description: The Institute for Emerging Issues (IEI) is a think-and-do tank at NC State University focused on solving important problems that affect North Carolina's future growth and prosperity. In particular, the Institute convenes stakeholders including state leaders in business, higher education, and government to address issues related to education, health, the environment, and the economy as early as possible. Most recently, the Institute has held forums on the importance of manufacturing and education on North Carolina's economy.

Contact information:
Phone: (919) 515-7741
Email: Inquiries may be made using the contact form on the IEI website: http://iei.ncsu.edu/about-us/contact-us/
Website: http://iei.ncsu.edu/

North Carolina Chamber

Description: The North Carolina Chamber is a nonpartisan business advocacy organization that works to proactively drive positive change to ensure that North Carolina is a leading place in the world to do business. Through an engaged business community, the North Carolina Chamber has established a three-tiered strategy to drive North Carolina's Jobs Agenda. The North Carolina Chamber Foundation envisions a long-term strategy for economic prosperity and advocates for the policies that move the state forward. The North Carolina Chamber Political Program analyzes and shapes the political landscape to make change possible. .

Contact information:
Phone: (919) 836-1400
Email: Email addresses for individual staff members can be found at http://ncchamber.net/about-us/staff/
Website: http://ncchamber.net/

North Carolina Cooperative Extension

Description: In 1914, county, state, and federal governments agreed that by joining together they could provide all citizens access to knowledge generated by public universities. Thus, NC State University, North Carolina Agricultural & Technical State University, and the US Department of Agriculture worked together to put forth the Cooperative Extension's programming in five key areas: sustaining agriculture and forestry, protecting the environment, maintaining viable communities, developing responsible youth, and developing healthy, strong, and safe families. The North Carolina Cooperative Extension's mission is to partner with communities to deliver education and technology that enrich the lives, land, and economy of North Carolinians.

Contact information:
Phone: (919) 515-2813
Email for Dr. Joe Zublena at NCSU: joe_zublena@ncsu.edu
Email for Dr. Fletcher Barber Jr. at NC A&T: fbarber2@ncat.edu
Website: http://www.ces.ncsu.edu/

North Carolina Department of Agriculture and Consumer Services

Description: The mission of the North Carolina Department of Agriculture & Consumer Services (NCDA&CS) is to provide services that promote and improve agriculture, agribusiness, and forests; protect consumers and businesses; and conserve farmland and natural resources for the prosperity of all North Carolinians. The NCDA&CS offers services for farmers, businesses, and homeowners. The NCDA&CS website provides information of the department's marketing programs, consumer programs, grower programs, guides, and publications.

Contact information:
Phone: (919) 733-7125
Email: Inquiries may be made using the contact form on the NCDA&CS website: http://www.ncagr.gov/htm/contactusform.htm
Website: http://www.ncagr.gov/

North Carolina Department of Commerce

Description: The North Carolina Department of Commerce is the state's leading economic development agency, working with local, regional, national, and international companies. The department's mission is to improve the economic well-being and quality of life for all North Carolinians. The mission is carried out by serving existing business and industry, including providing international trade assistance; recruiting new jobs and domestic and foreign investment; encouraging entrepreneurship and innovation; marketing North Carolina and its brand; supporting workforce development; strengthening communities; and promoting tourism, film, and sports development. The Department also provides data, statistics, information, and reports for state government and agencies that regulate commerce in the state.

Contact information:
Phone: (919) 733-4151
Email: info@nccommerce.com
Website: http://www.nccommerce.com/

North Carolina Regional Councils

Description: The North Carolina Regional Councils mission is mission is to provide "creative regional solutions" to relevant and emerging issues in North Carolina while providing a standard of excellence in the delivery of federal, state, and regional services for its member communities. North Carolina is served by 16 regional councils in a broad range of services to local governments including but not limited to: community and economic development; workforce development; state and federal program management; planning and GIS mapping services; grant writing; regional collaboration; and partnership building.

Contact information:
Phone for Betty Huskins, executive director: (828) 273-0276
Email for Betty Huskins: ncregions@ridgetopassociates.com
Website: http://www.ncregions.org/

North Carolina Rural Economic Development Center

Description: The North Carolina Rural Economic Development Center is a nonprofit organization whose mission is to improve the lives of North Carolinians through the development, promotion, and implementation of sound economic strategies. With business programs to support business capital, entrepreneurship, and microenterprise along with leadership and engagement programs to support leadership training, small towns, and youth initiatives, the Rural Center helps community leaders to recognize and embrace economic opportunities.

Contact information:
Phone: (919) 250-4314
Email: info@ncruralcenter.org
Website: http://www.ncruralcenter.org/

North Carolina Sea Grant

Description: North Carolina Sea Grant provides research, education, and outreach opportunities relating to current issues affecting the North Carolina coast and its communities. Since 1970, North Carolina Sea Grant has prided itself on being a valuable resource for scientists, educators, local officials, government agencies, coastal businesses, and the public to find unbiased, scientifically sound information about the state's coastal ecosystems. North Carolina Sea Grant facilitates funding for millions of dollars of research, outreach, and education programs each year. Their initiatives and projects touch a broad range of topics, including fisheries; seafood science and technology; water quality; aquaculture; community development; law and policy; and coastal hazards.

Contact information:
Phone: (919) 515-2454
Email: Inquiries may be made using the contact form on the North Carolina Sea Grant website: http://ncseagrant.ncsu.edu/contact-us/
Website: http://www.ncseagrant.org/

North Carolina Tobacco Trust Fund Commission

Description: The North Carolina Tobacco Trust Fund Commission was created to assist tobacco farmers, tobacco quota holders, persons engaged in tobacco-related businesses, individuals displaced from tobacco-related employment, and tobacco product component businesses in the state due to the effects of the Master Settlement Agreement. The Trust Fund can disburse funds through compensatory programs and qualified agricultural programs.

Contact information:
Phone: (919) 733-2160
Email: Inquiries may be made using the contact form on the Commission's website: http://www.tobaccotrustfund.org/contactus.htm
Website: http://www.tobaccotrustfund.org/

One North Carolina Small Business Program, North Carolina Department of Commerce

Description: The North Carolina Department of Commerce supports economic development in the state through various programs in business development, rural development, labor, economic analysis, science, and technology. Within the science and technology program, the North Carolina Department of Commerce offers the One North Carolina Small Business Program that provides incentive and matching funds to North Carolina businesses who submit proposals or are awarded a Federal Small Business Innovation Research program award or a Small Business Technology Transfer program award.

Contact information:
Phone: (919) 733-4151
Email: info@nccommerce.com
Website: http://www.nccommerce.com/st/grant-programs/one-nc-small-business-program

Rural Assistance Center

Description: The Rural Assistance Center has an Economic Impact Analysis (EIA) tool that can assess how a grant-funded project impacts the local economy. Based on the information you provide, the tool uses formulas to estimate economic impact as well as how the project's spending on staff, supplies, equipment, and other expenses benefit the community. These calculations help rural program grantees assess performance, and advocate for resources that contribute to program sustainability and improved health care for rural populations.

Contact information:
Phone: (800) 270-1898
Email: info@raconline.org
Website: http://www.raconline.org/econtool/

Rural Development Grant Assistance

Description: The US Department of Agriculture (USDA) offers many grant assistance services, including direct or guaranteed loans, grants, technical assistance, research, and educational materials. The website provides links to information on business and cooperative grant assistance; housing and community facilities grant assistance; and utilities grants. The website also directs viewers to state offices and resources.

Contact information:
Phone: For phone numbers for specific departments, please refer to the USDA contact list at http://www.rurdev.usda.gov/ContactUs.html; for phone numbers for state departments, please refer to the USDA list of state offices and directors at http://www.rurdev.usda.gov/StateOfficeAddresses.html
Website: http://www.rurdev.usda.gov/RD_grants.html

Small Business and Technology Development Center

Description: The Small Business and Technology Development Center (SBTDC) was founded in 1984 and serves as the business and technology extension service of the University of North Carolina System and is administered by NC State University. The mission of the SBTDC is to provide knowledge, education, and other supportive resources that enable existing small and mid-sized businesses, emerging entrepreneurs, and local/state leaders to innovate and succeed. With 10 regional service centers and 7 specialty programs such as Procurement and Technical Assistance Centers, the SBTDC is actively engaged with the state's economic development and future.

Contact information:
Phone: (919) 715-7272
Email: Inquiries may be made using the contact form on the SBTDC website: http://www.sbtdc.org/contact-us/
Website: http://www.sbtdc.org/

Early Education and Parenting Supports

Blue Cross Blue Shield of North Carolina Foundation

Description: The Blue Cross Blue Shield of North Carolina Foundation (BCBSNC Foundation) was founded in 2000. Since then, the foundation has invested more than $88 million into communities across North Carolina to support opportunities to promote the health of the state. The outcomes-focused grant-making approach supports initiatives in three main areas: health of vulnerable populations, healthy active communities, and community impact through nonprofit excellence. For example, the BCBSNC Foundation supports the Be Active Kids initiative, an effort to increase physical activity and healthy eating among four and five year olds.

Contact information:
Email: jill.mallatratt@bcbsncfoundation.org
Website: http://www.bcbsncfoundation.org/

North Carolina Department of Public Instruction

Description: The North Carolina Department of Public Instruction (NCDPI) website has links with resources to support safe and healthy schools. The mission of the Safe and Healthy Schools Support Division is to assist clients in achieving educational goals, a safe environment, and economy of operation, as well as to meet statutory requirements by providing leadership, training, and other needed services. Also online are resources for child nutrition, driver education, insurance, mental/allied health services, and school safety reporting/resources. In addition, there are resources from the Division of Healthy Schools. The goal of North Carolina Healthy Schools is to create a working infrastructure between education and health in order to enable schools and communities to create a coordinated school health program. A model school health program includes all eight components: comprehensive school health education; school health services; a safe physical environment; school counseling, including psychological and social services; physical education; nutrition services; school-site health promotion for staff; and family and community involvement in schools.

Contact information:
Email: For specific contacts, please see the following directory http://www.ncpublicschools.org/safehealthyschools/directory/
Website: http://www.ncpublicschools.org/, http://www.nchealthyschools.org/

North Carolina Division of Child Development and Early Education

Description: ***As a division within the North Carolina Department of Health and Human*** Services, the North Carolina Division of Child Development and Early Education (NCDCDEE)'s responsibility is to protect and serve North Carolina's young children. The mission of the NCDCDEE is to support licensing enforcement, policy changes, trainings, and services that promote child well-being. The NCDCDEE website provides important information and resources for parents, child care providers, and county staff.

Contact information:
Phone: (919) 527-6500
Email: webmasterdcd@dhhs.nc.gov
Website: http://ncchildcare.nc.gov/

Prevent Child Abuse North Carolina

Description: Prevent Child Abuse North Carolina (PCANC) believes that all North Carolina's children will lead purposeful lives through growing up in nurturing families and supportive communities. Therefore, PCANC supports the development of safe, stable, and nurturing relationships for children in their families and communities to prevent child abuse and neglect. PCANC provides resources on evidence-based programs to promote child well-being including Circle of Parents, The Incredible Years Parenting Program, Nurse-Family Partnership, and others. PCANC offers trainings on their website in addition to links to related research studies.

Contact information:
Phone: (919) 829-8009
Email: info@preventchildabusenc.org
Website: http://www.preventchildabusenc.org/

Smart Start and The North Carolina Partnership for Children, Inc.

Description: Smart Start was created in 1993 as a public/private partnership. Independent, private organizations work in all 100 North Carolina counties through the North Carolina Partnership for Children and have established 77 local partnerships. Smart Start's mission is to advance a high quality, comprehensive, accountable system of care and education for every child beginning with a healthy birth. Smart Start is unique because it delivers outcomes by giving communities local control to determine the best approach to achieving them.

Contact information:
Phone: (919) 821-7999
Email: info@smartstart.org
Website: http://www.smartstart.org/

Healthy Eating, Active Living

Blue Cross Blue Shield of North Carolina Foundation

See **Early Childhood and Parenting Services** resources above.

The Center for Environmental Farming Systems

See ***Economic Development*** resources above.

Center for Health Promotion and Disease Prevention, UNC Chapel Hill

Description: The Center for Health Promotion and Disease Prevention at UNC Chapel Hill works in partnership to bring public health research findings to the daily lives of individuals and their communities with a special focus on North Carolina populations vulnerable to disease. The Center's mission is to collaborate with research and community partners to enhance the ability of public health practitioners, as well as individuals, groups, and communities to promote health and prevent disease; identify funding opportunities and support high quality research; conduct, evaluate, and disseminate innovative, community-based research; and develop education and training programs to translate research into public health practice.

Contact information:
Phone: (919) 966-6080
Email: hpdp@unc.edu
Website: http://hpdp.unc.edu/

The Duke Endowment

Description: The Duke Endowment has worked to help people strengthen communities in North Carolina and South Carolina by nurturing children, promoting health, educating minds, and enriching spirits. Since 1924, the Endowment has invested almost $1.4 billion to support efforts in higher education, health care, rural churches, and child care. Within health care, the Endowment offers grant funding for programs that improve the quality and safety of health care, access to health care, prevention, and health equity. Within child care, the Endowment funds programs that aim to improve prevention and early intervention for at-risk children and out-of-home care for youth.

Contact information:
Phone: (704) 376-0291
Email: Inquiries may be made using the contact form on the Duke Endowment website:
http://dukeendowment.org/about/contact-us
Website: http://dukeendowment.org/

Eat Smart, Move More North Carolina

Description: Eat Smart, Move More North Carolina (ESMMNC) is a statewide movement that increases opportunities for healthy eating and active living for North Carolinians wherever they live, learn, earn, and pray. The ESMMNC movement aims to create an environment in North Carolina where healthy eating and active living are the norm rather than the exception. Its mission is to reverse the increased rates of obesity and chronic diseases among North Carolinians by helping them to eat smart and move more to achieve a healthy weight. ESMMNC's work is guided by the North Carolina Obesity Prevention Plan and its website provides program information and tools for different stakeholders including community members, families, leaders of the faith community, policymakers, and school leaders.

Contact information:
Phone: (919) 707-5224
Email: Lori Rhew, ESMMNC coordinator at Lori.Rhew@EatSmartMoveMoreNC.com.
Website: http://www.eatsmartmovemorenc.com/

Kate B. Reynolds Charitable Trust

Description: The Kate B. Reynolds Charitable Trust (KBR) was established in 1947 with a mission to improve the quality of life and quality of health for the financially needy of North Carolina. Divided into two divisions, KBR is comprised of the Health Care Division (which receives three-fourths of the funds distributed) and the Poor and Needy Division (which receives one-fourth of the funds distributed). Since it began, KBR has invested over $500 million dollars towards improving the health and well-being of North Carolinians. Recent KBR efforts such as Healthy Places North Carolina and the Innovations in Rural Health Award have focused on rural counties in North Carolina.

Contact information:
Phone: (336) 397-5500
Email: Inquiries may be made using the contact form on the Kate B. Reynolds website: http://kbr.org/contact
Website: http://kbr.org/

North Carolina Agromedicine Institute

Description: Through collaboration between the University of North Carolina System, NC State University, NC A&T State University, and ECU, the North Carolina Agromedicine Institute conducts and promotes research, intervention, outreach and education to improve the health and safety of the agricultural community including farmers, farm workers, foresters, fishers and their families. The North Carolina Agromedicine Institute's goal is to reduce injury and illness by conducting research that leads to practical solutions and developing effective educational approaches that can be of benefit daily to the end user. The website offers training materials, project updates, and additional resources.

Contact information:
Phone number for Robin Tutor-Marcom, director, North Carolina Agromedicine Institute: (252) 744-1045
Email for Robin Tutor-Marcom: tutorr@ecu.edu
Website: http://www.ecu.edu/cs-dhs/agromedicine/

North Carolina Center for Health and Wellness, UNC Asheville

Description: The North Carolina Center for Health and Wellness (NCCHW) is a leading catalyst for the prevention of chronic health conditions through promotion of healthy living among North Carolinians of all ages, with an emphasis on groups with health disparities. The NCCHW partners with dozens of organizations including the Blue Cross Blue Shield of North Carolina Foundation and the North Carolina Department of Public Instruction to provide health promotion resources. The NCCHW website has many resources to support nutrition and physical activity.

Contact information:
Phone: (828) 258-7712
Email: ebland@unca.edu
Website: http://ncchw.unca.edu/

North Carolina Cooperative Extension

See E***conomic Development*** resources above.

North Carolina Council of Churches

Description: The North Carolina Council of Churches was founded in 1935 and works to promote Christian unity in addition to a more just society. The Council's mission is to enable denominations, congregations, and people of faith to individually and collectively impact important state issues such as economic justice and development, human well-being, equality, compassion, and peace, while following the example and mission of Jesus Christ. The Council supports programs in the following areas related to health: farm workers, food, health care reform, obesity, tobacco use prevention, and rural life.

Contact information:
Phone: (919) 828-6501
Email: info@ncchurches.org
Websites: http://www.ncchurches.org/, http://www.healthandwholeness.org/

North Carolina Department of Agriculture and Consumer Services

See ***Economic Development*** resources above.

North Carolina Division of Public Health

Description: The North Carolina Division of Public Health (NCDPH) is within the North Carolina Department of Health and Human Services. The NCPDH website has links to its subdivisions including Chronic Disease and Injury, Environmental Health, Epidemiology, Minority Health, Oral Health, and Women's and Children's Health. The NCDPH website also has links to important data sources including the Division of Health Statistics and the Division of Vital Records.

Contact information:
Phone: (919) 707-5000
Email addresses for specific contacts can be found here:
http://publichealth.nc.gov/contacts.htm
Website: http://publichealth.nc.gov/, to find your local health department, visit
http://www.ncalhd.org/county.htm.

Prevention Partners

Description: The nonprofit Prevention Partners focuses on the leading health issues: decreasing tobacco use, increasing physical activity, promoting good nutrition, and reducing obesity. Prevention Partners' web-based products guide decision makers to transform workplaces, schools, hospitals, clinics, and other settings by changing policies, environments, and cultures from the top down.

Contact information:
Phone: (919) 969-7022
Email: Inquiries may be made using the contact form on the Prevention Partners website:
http://forprevention.org/p2/about-us/contact-us/
Website: http://www.forprevention.org/

Smart Start and the North Carolina Partnership for Children, Inc.

See E***arly Childhood and Parenting Services*** resources above.

Primary Care

Blue Cross Blue Shield of North Carolina Foundation

See ***Early Childhood and Parenting Services*** resources above.

Community Care of North Carolina

Description: Community Care of North Carolina (CCNC) is changing the health care experience by changing the way health care is delivered. CCNC strongly believes that the best system is rooted in the communities it serves and knows that efforts directed by doctors and focused on local patients make quality care more efficient and cost effective. Through a public-private partnership, CCNC has brought together regional networks of physicians, nurses, pharmacists, hospitals, health departments, social service agencies, and other community organizations. These professionals work together to provide cooperative, coordinated care through the Medical Home model. This approach matches each patient with a primary care physician who leads a health care team that addresses the patient's health needs.

Contact information:
Phone: (919) 745-2350
Email for Paul Mahoney, Director of Communications: pmahoney@n3cn.org
Website: http://www.communitycarenc.com/

The Duke Endowment

See ***Healthy Eating, Active Living*** resources above.

Kate B. Reynolds Charitable Trust

See ***Healthy Eating, Active Living*** resources above. KBR is also supporting efforts led by the North Carolina Foundation for Advanced Health Programs to develop a statewide integrated care assistance model.

Governor's Institute on Substance Abuse, Inc.

Description: The Governor's Institute on Substance Abuse started in 1986 as a task force that was convened to make recommendations about an organizational approach to getting the health care professions more involved in preventing, identifying, and treating substance abuse. The Institute was officially incorporated as a 501(c)(3) non-profit corporation in 1990. Twenty years later, the Governor's Institute remains an important partner and resource for the community and state by providing networking opportunities and other connections among research and educational programs, professional organizations, clinics and hospitals, treatment facilities, consumer groups, and the substance abuse field. The Governor's Institute primarily serves North Carolina, but will expand into neighboring states as funding allows.

Contact information:
Phone: (919) 990-9559
Email: Email addresses for individual staff members can be found at:
http://www.governorsinstitute.org/contact-us/
Website: http://www.governorsinstitute.org/

North Carolina Area Health Education Centers

Description: The mission of the North Carolina AHEC Program is to meet the state's health and health workforce needs by providing educational programs in partnership with academic institutions, health care agencies, and other organizations committed to improving the health of the people of North Carolina. AHEC educational programs and information services are targeted at improving the distribution and retention of health care providers, with a special emphasis on primary care and prevention; improving the diversity and cultural competence of the health care workforce in all health disciplines; enhancing the quality of care; improving health care outcomes; and addressing the health care needs of underserved communities and populations.

Contact information:
Phone: (919) 966-2461
Email: ncahec@med.unc.edu
Website: http://www.med.unc.edu/ahec/

North Carolina Center of Excellence for Integrated Care, North Carolina Foundation for Advanced Health Programs

Description: The North Carolina Center of Excellence for Integrated Care (ICARE) aims to integrate patients' physical and behavioral health care, whether the care is delivered in an office, clinic, hospital, or mental health agency. The Center works with stakeholders across North Carolina to determine best practices in clinical assessment, clinical tools, and techniques. The ICARE Partnership is committed to creating a health care system that is integrated, collaborative, accessible, respectful, and evidence-based by offering customized training based on the needs of providers; collaborative learning for groups of providers to allow them to test integrated care tools and techniques within their own quality assurance programs; technical assistance and troubleshooting to help providers initiate and implement integrated care techniques; and resources for providers to investigate evidence-based tools and techniques in integrated care. Currently, the North Carolina Foundation for Advanced Health Programs is developing a statewide integrated care assistance model with support from the Kate B. Reynolds Charitable Trust.

Contact information:
Phone: (919) 821-0485
Email: Email addresses for individual staff members can be found at:
http://www.ncfahp.org/staff.aspx
Website: http://www.ncfahp.org/icare.aspx

North Carolina Division of Public Health

See ***Healthy Eating, Active Living*** resources above.

North Carolina Office of Rural Health and Community Care

Description: Since 1973, the North Carolina Office of Rural Health and Community Care (ORHCC) has been a part of the North Carolina Department of Health and Human Services. The Office empowers communities and populations by developing innovative strategies to improve access, quality, and cost-effectiveness of health care for all. In 2013, the Office spent $36.5 million from state, federal, and philanthropic sources on a variety of programs to support North Carolinians including designating federal Health Professional Shortage Areas; loan repayment and incentives for qualified providers practicing in underserved areas; and work to support access to preventive and primary care for underserved residents by strengthening the safety net infrastructure through programs such as rural health operations, community health, HealthNet, and Farmworker Health. The Office assists providers in caring for their uninsured patients with access to software that secures free medications, and also supports Critical Access Hospitals with efforts to improve quality and financial viability. The Office provides services in every county in North Carolina.

Contact information:
Phone: (919) 527-6440
Email for Chris Collins, director: Chris.Collins@dhhs.nc.gov
Website: http://www.ncdhhs.gov/orhcc/

North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services

Description: The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMHDDSAS) is designed to implement the public mental health, developmental disability, and substance abuse service system. The Division's goals and objectives will guide the development of the workings of the Division and the Division's central administration consists of the director's office and five sections organized along functional lines. The five sections of the Division are Community Policy Management, Resource/Regulatory Management, Advocacy and Customer Service, Operations Support, and Clinical Policy. The DMHDDSAS website offers resources for North Carolinians, LMEs (local management entities), government, and providers in addition to statistics and publications including consumer fact sheets, manuals, presentation, and publications.

Contact information:
Phone: Phone numbers for individual staff members can be found at
http://www.ncdmh.net/staff/
Email: Email addresses for individual staff members can be found at
http://www.ncdmh.net/staff/
Website: http://www.ncdhhs.gov/mhddsas/

North Carolina Office of Minority Health and Health Disparities

Description: The Office of Minority Health and Health Disparities (OMHHD) was established by the North Carolina General Assembly in 1992. OMHHD's vision is for all North Carolinians to enjoy good health regardless of race/ethnicity, disability, or socioeconomic status. Its mission is to promote and advocate for the elimination of health disparities among all racial and ethnic minorities and other underserved populations in North Carolina, and its major focus areas include improving the quality and availability of health information, data collection, and analysis; providing cultural diversity and interpreter training to health and human services professionals; and advocating for language services, supporting policies, and legislation that improve the health and well-being of all North Carolinians. OMHHD collaborates with others to improve minority health programs and services, and disseminates information to increase awareness of minority health and health disparities.

Contact information:
Phone: (919) 707-5040
Email: OMHHD@dhhs.nc.gov
Website: http://www.ncminorityhealth.org/

Insurance Coverage and Safety Net

Blue Cross Blue Shield of North Carolina Foundation

See ***Early Childhood and Parenting Services*** resources above.

Care Share Health Alliance

Description: Care Share Health Alliance's mission is to work with state and local partners to facilitate and foster collaborative networks that improve the health of underserved people in North Carolina. Care Share's vision is that by 2019, North Carolina will have collaborative networks across the state that support locally driven, coordinated systems of health services and health improvement for underserved residents. These local systems will improve quality, access, and population health, while reducing unnecessary health care costs. Right now, Care Share offers technical assistance to develop collaborative networks and Collective Impact initiatives through community-wide planning, network development, facilitation, and program implementation. Additionally, Care Share works to strengthen communities through webinars, listservs, and committees. The Care Share website offers specific information on how to start a collaborate network to improve health.

Contact information:
Phone: (919) 861-8353
Email: info@caresharehealth.org
Website: http://www.caresharehealth.org/

Community Care of North Carolina

See ***Primary Care*** resources above.

Community Practitioner Program, North Carolina Medical Society Foundation

Description: Since 1989, the Kate B. Reynolds Charitable Trust and the Blue Cross Blue Shield of North Carolina Foundation have supported the Community Practitioner Program (CPP) to help medically underserved communities across North Carolina attract and retain needed medical practitioners. To date, 388 physicians, physician assistants, and nurse practitioners have participated in the CPP and $14 million dollars of educational loads have been repaid through the program. The CPP website outlines the eligibility criteria for health professionals and also links to the CPP alumni directory, an online community that connects health care providers in predominantly rural communities across North Carolina.

Contact information:
Phone: (919) 833-3836
Email: Inquiries may be made using the contact form on the North Carolina Medical Society Foundation website: http://www.ncmedsoc.org/contact-us/
Website: http://www.ncmedsoc.org/about-ncms/partner-organizations/ncms-foundation/community-practitioner-program/

The Duke Endowment

See ***Healthy Eating, Active Living*** resources above.

Kate B. Reynolds Charitable Trust

See ***Healthy Eating, Active Living*** resources above.

North Carolina Area Health Education Centers

See ***Primary Care*** resources above.

North Carolina Community Health Center Association

Description: The North Carolina Community Health Center Association (NCCHCA) is the state's primary care association. Formed in 1978 by the leadership of community health centers, NCCHCA was created to advance the common mission of health centers across the state. NCCHCA represents the interests of North Carolina's health centers to federal, state, and local agencies and officials. The Association also seeks support from foundations, corporations, and other private entities to increase access to primary health care for all North Carolinians. NCCHCA is a valuable resource to health centers, providing training and technical assistance in areas such as clinical service delivery, governance, workforce development, and administration. NCCHCA regularly presents workshops, trainings, and conferences to keep health center staff on the cutting edge of effective and cost-efficient service delivery.

Contact information:
Phone: (919) 469-5701
Email: Inquiries may be made using the contact form on the NCCHCA website:
http://www.ncchca.org/general/?type=CONTACT
Website: http://www.ncchca.org/

North Carolina Association of Free Clinics

Description: The North Carolina Association of Free Clinics was founded in 1998 and is a private, nonprofit, 501(c)(3) organization that conducts advocacy, research, public relations, resource development, training, and technical assistance on behalf of its member free clinics and the people they serve. With regards to its core values, the Association believes that inability to pay should not prevent people from receiving health care, that all health care is local, and that community-based planning, governance, and collaboration are critical. The Association also believes that good stewardship of resources means obtaining donated equipment, supplies, and services whenever possible, and that all persons deserve to be treated with dignity and respect. The Association works towards its mission and vision by providing educational opportunities for member clinic staff and board members and providing technical assistance to member clinics and those interested in starting new clinics.

Contact information:
Phone: (336) 251-1111
Email: katie@ncfreeclinics.org
Website: http://www.ncfreeclinics.org/

North Carolina Foundation for Advanced Health Programs

Description: The North Carolina Foundation for Advanced Health Programs (NCFAHP) develops and supports innovative programs that advance affordable and sustainable quality health services to improve the health for the people of North Carolina. The NCFAHP strives to provide greater access to affordable, high quality health care for all North Carolinians, especially the poor and those in rural areas. The Foundation will support innovations that improve on existing strategies or systems, collaborate with other organizations whose goals complement theirs in developing and administering advanced health programs, and promote leadership through the Bernstein Fellow Program across the state and especially in rural areas.

Contact information:
Phone: (919) 821-0485
Email: Email addresses for individual staff members can be found at http://dev.ncfahp.org/staff.aspx
Website: http://dev.ncfahp.org/

North Carolina Office of Rural Health and Community Care

See ***Primary Care*** resources above.

North Carolina Center for Rural Health Innovation and Performance, North Carolina Hospital Association

Description: The North Carolina Center for Rural Health Innovation and Performance was created by the North Carolina Hospital Association in 1996 as a rural health resource center, providing expert technical assistance and professional consultation. The Center's mission is to lead and organize the development of innovative, collaborative, community-focused health initiatives that improve the health status of North Carolina's rural residents and communities. The Center is dedicated to developing and spreading nation-leading improvements in performance, leadership, quality, patient safety, operational management, and community health for rural hospitals and rural health organizations throughout North Carolina. In order to do so, the Center aims to be a statewide resource for rural health organizations and communities by advising rural health organizations, communities, and leaders regarding community health improvement, collaboration, and strategic planning, and promoting leadership and collaboration among rural health organizations and communities in their common mission to achieve a healthy community.

Contact information:
Phone: (919) 677-2400
Email: Inquiries may be made using the contact form on the North Carolina Hospital Foundation website: https://www.ncha.org/auth/contact-us
Website: https://www.ncha.org/ruralhealth

Recruitment and Retention of Health Professionals into Underserved Areas

Blue Cross Blue Shield of North Carolina Foundation

See ***Early Childhood and Parenting Services*** resources above.

Community Practitioner Program, North Carolina Medical Society Foundation

See ***Insurance Coverage and Safety Net*** resources above.

The Duke Endowment

See ***Healthy Eating, Active Living*** resources above.

Kate B. Reynolds Charitable Trust

See ***Healthy Eating, Active Living*** resources above.

North Carolina Office of Rural Health and Community Care

See ***Primary Care*** resources above.

North Carolina Community Health Center Association

See ***Insurance Coverage and Safety Net*** resources above.

Rural Health Center (part of the North Carolina Hospital Association)

See ***Insurance Coverage and Safety Net*** resources above.