ISSUE BRIEF

Social Determinants of Health

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In spite of improvements in its health care delivery systems and in local and state public health infrastructure, North Carolina continues to face significant challenges in improving the health of its citizens. The state lags behind almost two-thirds of the nation in overall health status, and racial and ethnic disparities exist across multiple indicators of health outcomes. A growing body of knowledge is emerging regarding the effects of various social, environmental, and economic factors on health status. The commentaries published in this issue of NCMJ address the relationships between health status or health outcomes and such factors as education, income, race or ethnicity, housing, and neighborhoods. Success stories and promising practices and projects in North Carolina are also featured.

North Carolina is a recognized leader in many aspects of health. The state is home to innovative health care delivery models, world-class health care systems, and a public health infrastructure that frequently shares its best ideas across the nation. However, in spite of North Carolina's enviable position in these aspects of its health system, 31 other states evaluated by the United Health Foundation have better actual health outcomes: Nationally, North Carolina is currently ranked 32nd in overall health status [1]. Many strategies have been deployed over the years to improve health outcomes in the state, with some success—our current ranking is the highest the state has ever attained. But North Carolina has repeatedly set the goal of being among the healthiest states in the nation. Why then is a state with so many advantages within its health systems consistently ranked so low in health outcomes? What would it take for the state to rank among the healthiest in the nation?

There is growing recognition among providers, researchers, academics, policymakers, and public health professionals that the factors that ultimately determine health outcomes are complex and, more importantly, that they are not likely to be adequately addressed within the health care delivery system. If health is not solely determined by individual health behaviors, genes, and the quality of care that is received in hospitals and physicians' offices, then what are the other influences?

A 2008 report of the Robert Wood Johnson Foundation titled "Overcoming Obstacles to Health" makes it clear that current evidence indicates that social factors such as level of education, income, and the quality of neighborhood environments greatly influence a person's health [2]. Such factors are referred to as social determinants of health. The report notes that differences in health along social, economic, and racial or ethnic lines, known as *health disparities* or *social disparities in health*, are keeping America from reaching its full potential in terms of quality of life and productivity as a nation. The report goes on to task the Commission to Build a Better America with seeking solutions, outside the health field if necessary, and with finding ways to achieve a healthier nation [2]. The realizations and approaches noted in the report are not confined to institutions within the United States. The World Health Organization established a Commission on Social Determinants of Health in 2005 to foster a global movement to achieve health equity [3].

So how does North Carolina fare in these social factors that have a role in determining health status, and how important are they relative to one another? Although state-level data are not available for all social factors that influence health, some key indicators can be examined (Table 1). One important factor is income. US Census Bureau data from 2006-2010 [4] showed that 15.5% of North Carolinians lived in poverty, compared with a national average of 13.8%. The

TABLE 1.
Comparison of North Carolina Economic Indicators with National Data

Economic Indicator	North Carolina	United States
Percent of persons age 25+ who did not graduate from high school (2006-2010)	16.4%	15%
Rate of home ownership (2006-2010)	68.1%	66.6%
Median home value (2006-2010)	$149,100	$188,400
Median household income (2006-2010)	$45,570	$51,914
Percent of persons below poverty level (2006-2010)	15.5%	13.8%

Note: Data are from the US Census Bureau [4].

Electronically published October 12, 2012.

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N C Med J. 2012;73(5):353-357.
0029-2559/2012/73504

TABLE 2.
Progress with Regard to Healthy North Carolina 2020 Objectives for Social Determinants of Health

Healthy NC 2020 Objective	Baseline data	More recent data	2020 target
Decrease the percentage of individuals living in poverty	16.9% (2009)	17.4%(2010)	12.5%
Increase the 4-year high school graduation rate	71.8% (2008-09)	77.9% (2010-11)	94.6%
Decrease the percentage of people spending more than 30% of their income on rental housing	41.8% (2008)	45.6% (2009)	36.1%

Note. Data are from the North Carolina Division of Public Health [8].

median household income in North Carolina of $45,570 was below the national average of $51,914. In the area of education, 16.4% of North Carolinians over age 25 did not graduate from high school, compared with 15% nationally. In examining housing, which represents additional economic indicators, census data revealed that the rate of home ownership in North Carolina (68.1%) was higher than the national average (66.6%); however, the median value of owner-occupied homes in North Carolina ($149,100) was lower than the national median ($188,400) [4].

The importance of socioeconomic factors to health status is increasingly emphasized. Frieden [5] provides a pyramid framework for public health action that describes the relative health impacts of multiple factors. At the top levels of the pyramid are actions such as counseling, education, and clinical interventions, which no doubt affect both individual health behavior and health outcomes. However, the broader areas of the pyramid identify those actions that have the greatest impact on health. They include long-term changes that can be achieved through influence on policy and the built environment (defined as all buildings, spaces, and products that are created or modified by people, including homes, schools, workplaces, parks, recreation areas, greenways, business areas, and transportation systems)—changes designed to make sure that the default decisions of individuals are healthy decisions. At the base of the pyramid are the factors with the greatest impact, the social determinants of health. Significant improvements in the health of North Carolinians are unlikely without effective strategies for influencing fundamental socioeconomic factors such as poverty and education.

With such significant challenges in mind, the North Carolina Institute of Medicine convened a Task Force on Prevention in 2008. The report that resulted, *Prevention for the Health of North Carolina* [6], serves as an action plan to refocus state resources and efforts in order to prevent poor outcomes in a variety of areas believed to have the greatest influence on the leading causes of death and disability in the state. The report includes a chapter on socioeconomic determinants of health, examines a number of key factors, and makes recommendations for improvement. Further, although the report recognizes the complex and challenging nature of the problems we face, it does not deem the state's poor health performance to be intractable. With appropriate interventions and redirection of resources, significant progress is achievable.

In an effort to build on and track progress toward the recommendations outlined in this prevention action plan, a diverse group of state leaders developed Healthy North Carolina 2020, a set of 40 ambitious yet attainable objectives or goals across 13 focus areas [7]. The North Carolina Division of Public Health (DPH) is the state agency tasked with protecting and improving the health of North Carolinians. DPH serves as the lead agency to implement activities related to Healthy North Carolina 2020 and has committed to tracking and reporting on progress toward these goals annually. At the end of the first year of this surveillance, North Carolina reported mixed results on those objectives that addressed social determinants of health (Table 2). The most significant progress was in the state's 4-year high school graduation rate, although the rate remains far short of the 2020 goal. Both the percentage of individuals living in poverty and the percentage of people spending more than 30% of their income on rental housing were found to have worsened from baseline [8].

DPH, in partnership with North Carolina's 85 local health departments, has initiated several interventions over the years to address social determinants of health. One of the most recent promising approaches is exemplified by the Community Transformation Grants (CTG) program, which was created by the Affordable Care Act. Late in 2011, DPH was awarded CTG funding by the US Department of Health and Human Services, to be used over a 5-year period to address tobacco-free living, healthy eating, physical activity, and evidence-based preventive services. DPH and local health departments will use this funding to work in local communities across the state with additional overall goals of reducing health disparities and controlling health care costs. This effort, while worthy, is underfunded for the scope of the problems in our state, and the funding stream is already being challenged in Congress. Although effective initiatives such as this one are clearly part of the solution, the activities of a single state agency could never be enough to achieve the breadth and reach of interventions that are necessary to improve the health of all North Carolinians. Extensive collaborations and significant investments over the long term are required—a tough task under the best of conditions, made even more challenging by the significant economic pressures currently facing the state. Such solutions require the full attention of the state and the active involvement of leading statewide and local institutions, business leaders, and elected officials.

NCMJ is an appropriate vehicle for drawing statewide attention to such complex problems and is to be applauded for devoting this issue to social determinants of health. A comprehensive examination of all contributing factors is beyond the scope of a single issue of journal. However, the articles in this issue do address some of the key connections between health and educational achievement, income, housing, neighborhoods, and racial or ethnic status; information about these relationships is increasingly reported in scientific literature, although the causal directions and exact mechanisms of action are not fully known. The invited commentaries in this issue describe what is known about each of these key areas, and sidebars and additional articles examine some of the strategies and initiatives that are being implemented in North Carolina with promising results.

Educational Achievement and Health

Telfair and Shelton discuss the correlation between education and health in a commentary in this issue [9]. Reynolds [10], Pegram [11], and Pungello and Maxwell [12] further describe interventions with proven results in North Carolina. Tremendous progress has been made through the work of the State Board of Education in passing policy directives regarding physical activity in schools. In addition, nutrition standards and policies in schools continue to improve in North Carolina, thanks to legislative action, although more needs to be done. Building an adequate school nurse presence in our schools also remains a significant challenge.

Although school-based interventions can positively affect health, in order to achieve desired long-term outcomes, the importance of starting before a child enters the school system is increasingly emphasized. Early childhood development and intervention efforts remain critical to children's success in schools. High-quality prekindergarten programs, especially for disadvantaged children, have been shown to have lasting long-term benefits. The Abcedarian program study found that 67% of those who participated in the early childhood program graduated from high school, compared with 51% of those in the control group, and that 36% attended college, compared to 13% in the control group [13]. The HighScope Perry Preschool Study showed that 65% of the children who received high-quality early education graduated high school, compared with 45% of those in the nonprogram group [14]; also, 76% of those who received the high-quality early education were employed at age 40, compared with only 62% of those in the nonprogram group [14]. As more is being learned about early brain development and the importance of supporting families with young children, the opportunities to make certain that all children are ready to learn are becoming even more significant.

Income, Wealth, and Health Outcomes

According to the aforementioned Robert Wood Johnson Foundation report, being poor in America does not just mean having less access to goods and services, it also means having a greater likelihood of being in poor health [2]. People with lower incomes tend to have higher rates of diabetes and coronary heart disease, and they are more likely to have chronic disease that limits their activity. However, even middle-class Americans are less healthy than are Americans with even higher incomes. This predictable influence of income is referred to as the socioeconomic gradient in health [2]. These facts may lead health leaders into partnerships with others seeking economic policy development for our state.

Mansfield and Novick [15] discuss the mounting evidence for a relationship between income and health in their commentary. Efforts under way in 2 urban areas of North Carolina are also described in this issue. Cohen [16] outlines efforts in Mecklenburg County to give unemployed individuals temporary employment using federal American Recovery and Reinvestment Act (ARRA) funds. Austin and Bell [17] discuss efforts in Guilford County to increase access to postsecondary education through the community college system.

Place Matters: The Relationship of Health Outcomes to Communities, Neighborhoods, and Housing

A 2011 study published in the *New England Journal of Medicine* [18] dramatically demonstrated the relationship between neighborhoods and obesity and diabetes. In a randomized social experiment, subjects who took advantage of an opportunity to move from a high-poverty neighborhood to a lower-poverty one experienced modest but potentially important reductions in the prevalence of obesity and diabetes [18]. Although exact causal relationships were not determined, the results certainly warrant further study. This study also contributes to growing evidence that policies and programs that improve housing options can affect health. In this issue, Rohe and Han [19] discuss the health-related problems associated with inadequate housing, and Chaney [20] and McKee-Huger and Loosemore [21] describe how these effects can be mitigated through model building programs and better enforcement of inspection codes. Richard and Keifer [22] focus on particular housing concerns and on programs aimed at improving conditions for people with disabilities.

Dulin and Tapp [23] further examine the role of place in determining health outcomes in his commentary on the impact of neighborhood and health status. Some researchers and program planners are examining successful examples from across the country and using the information gleaned to inform local efforts. Martinie and colleagues [24] describe Mebane on the Move, a project modeled after a program in Somerville, Massachusetts. The initiative focuses on improving access to healthy foods and access to safe places to exercise. Ammerman [25] elaborates on other successful initiatives throughout the state that are expanding healthy food options in low-income neighbor-

hoods. Hardison-Moody and Stallings [26] address the role that faith communities play in improving health and wellness in surrounding neighborhoods.

Racial and Ethnic Inequalities in Health

Members of racial and ethnic minority groups consistently demonstrate health differences, and generally their health outcomes are worse than those of the population as a whole. Although many people point to the greater prevalence of poverty or low socioeconomic status within minority communities as the culprit, evidence indicates that there are independent factors related to race and ethnic status that may result in poorer health outcomes. Efforts to eliminate health inequities must address some of society's toughest problems, including racism, the effects of chronic stress, and the systemic and institutionalized disadvantages experienced by these groups.

In this issue, Bell [27] explains some of what we know about health disparities among different racial and ethnic groups, and how social determinants of health factor into health disparities. The interplay among and interactions of many of these social determinants are complex and incompletely understood. For example, infant mortality, a health indicator for which marked differences in subpopulations persist, is known to correlate with income and educational level. However, even when these differences in socioeconomic status are accounted for, racial minority status alone does appear to be an independent risk factor for higher infant mortality rates. State and local strategies to address health disparities are almost too numerous to count, but in this issue Michael [28] describes local efforts on the part of a public health department and community to address infant mortality. Moore and colleagues [29] highlight the successful use of lay health advisors to address health disparities in low-income populations and communities of color.

The Role of Government

Although the specific role that government should play and the extent to which public resources should be expended to improve conditions for some is a matter of debate, it is clear that increased collaboration among government agencies and with other sectors of society is essential in order to achieve more efficient use of resources and better health outcomes. In this issue Nichol [30] and Hood [31] debate the proper role of government in health.

The Healthy Environments Collaborative (HEC) is an example of government collaboration that could significantly improve health outcomes and make positive changes in social determinants of health [32]. The HEC was formed in 2006 when the North Carolina Departments of Health and Human Services, Transportation, Commerce, and Environment, Health, and Natural Resources agreed to work together on goals and interests focused on the intersections of public health, the natural environment, the built environment, and economic prosperity. The mission of this interagency group is to integrate and align departmental efforts to improve the health and environments of North Carolina's people and the state's economy. With funding support from the Centers for Disease Control and Prevention, the HEC agencies work together to develop individual and collaborative agency strategies and action items that will help local communities provide an environment that is more conducive to improved public health outcomes.

The Sustainable Communities Task Force (SCTF) is a more recent and expanded partnership among state agencies and other stakeholders that are working to support the integration of health considerations into community design [32]. The governor and the North Carolina General Assembly established the SCTF in July of 2010 in recognition of the need to use resources strategically to plan for and accommodate the rapid growth of the state, given the economic challenges facing North Carolina. The goal of the SCTF is healthy and equitable development that does not compromise natural systems or the needs of future generations of North Carolinians.

The state is leading the way in exploring the role of government in improving health outcomes. Such collaborations receive national attention and have made North Carolina more competitive for federal funding, such as Community Transformation Grants. In addition, state agencies such as the Department of Transportation are incorporating health impact assessments into their statewide strategic planning for transportation. The agency also added health to its mission statement and will be developing policies and strategies that reflect this addition. Such partnerships within state government are increasing the practice of considering health in all policies, which is a critical goal if complex social problems that determine health are to be adequately addressed.

Conclusions

Americans are currently in the middle of a debate over health care reform that is primarily focused on health insurance and delivery systems. Inevitably, more and more incentives and budgetary pressures will continue to drive those systems to ensure a healthy population. However, the health care delivery system cannot ever encompass or influence many of the most impactful determinants of health, those social and economic conditions that influence patients' lives for the remaining 99% of the time that they are not interacting with the health care delivery system.

The Robert Wood Johnson report *Overcoming Obstacles to Health* [2] asserts that the greatest potential for addressing the root causes of social differences in health lies in creating solutions that will help people choose health and in removing obstacles to choosing health. It is becoming increasingly clear that people's health improves when their lives improve. The efforts enlisted to achieve such aims are part of the social and moral development of a society. Determining what sorts of collaborations and policy changes will be necessary

to foster that achievement remains a challenge for the state, the nation, and indeed the world. Although the challenges are great, North Carolina can lead the way in developing and successfully implementing innovative and proven strategies that address some of society's biggest problems. NCMJ

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Acknowledgment

Potential conflicts of interest. L.G. has no relevant conflicts of interest.

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