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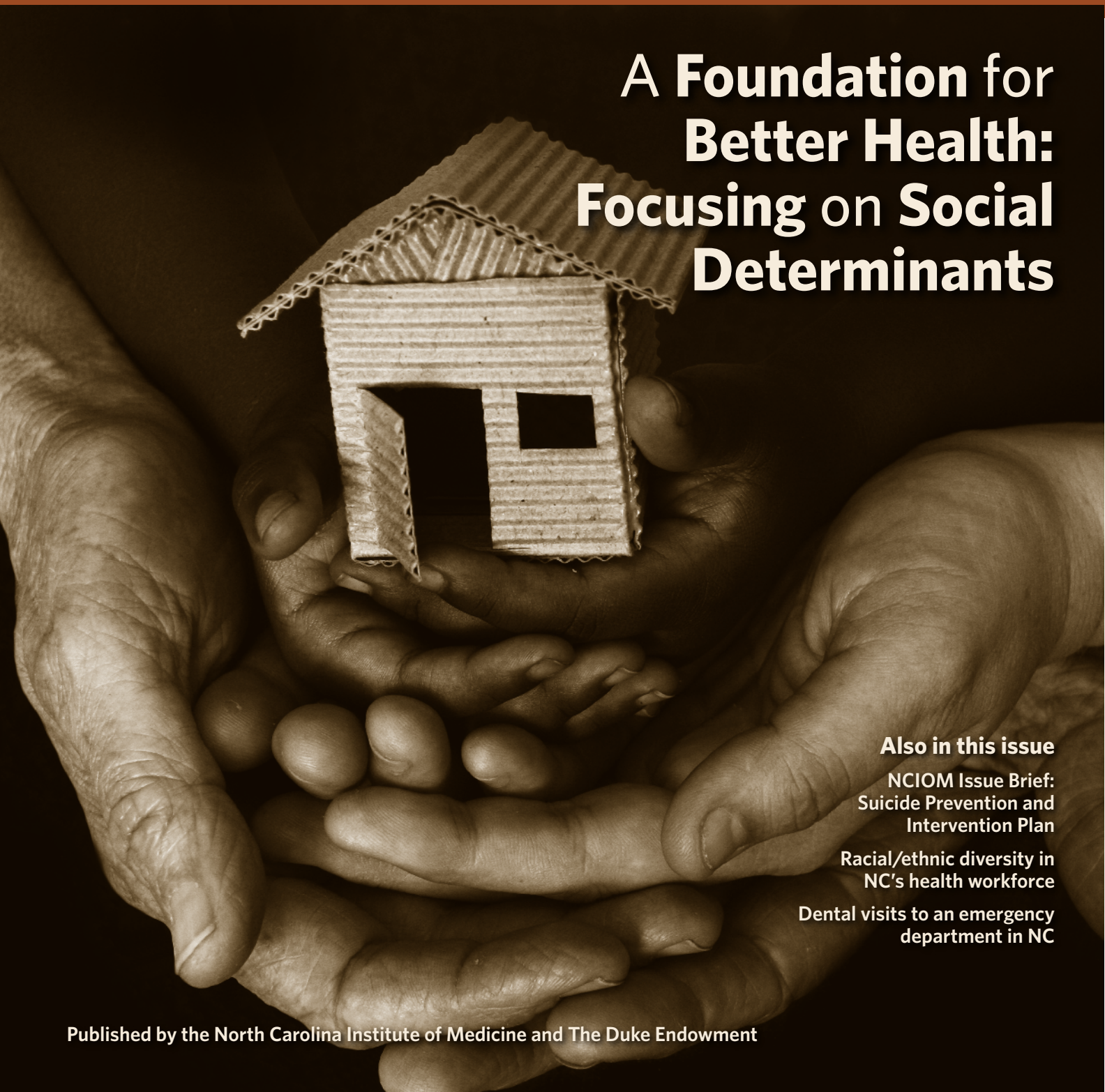

A **Foundation** for **Better Health: Focusing** on **Social Determinants**

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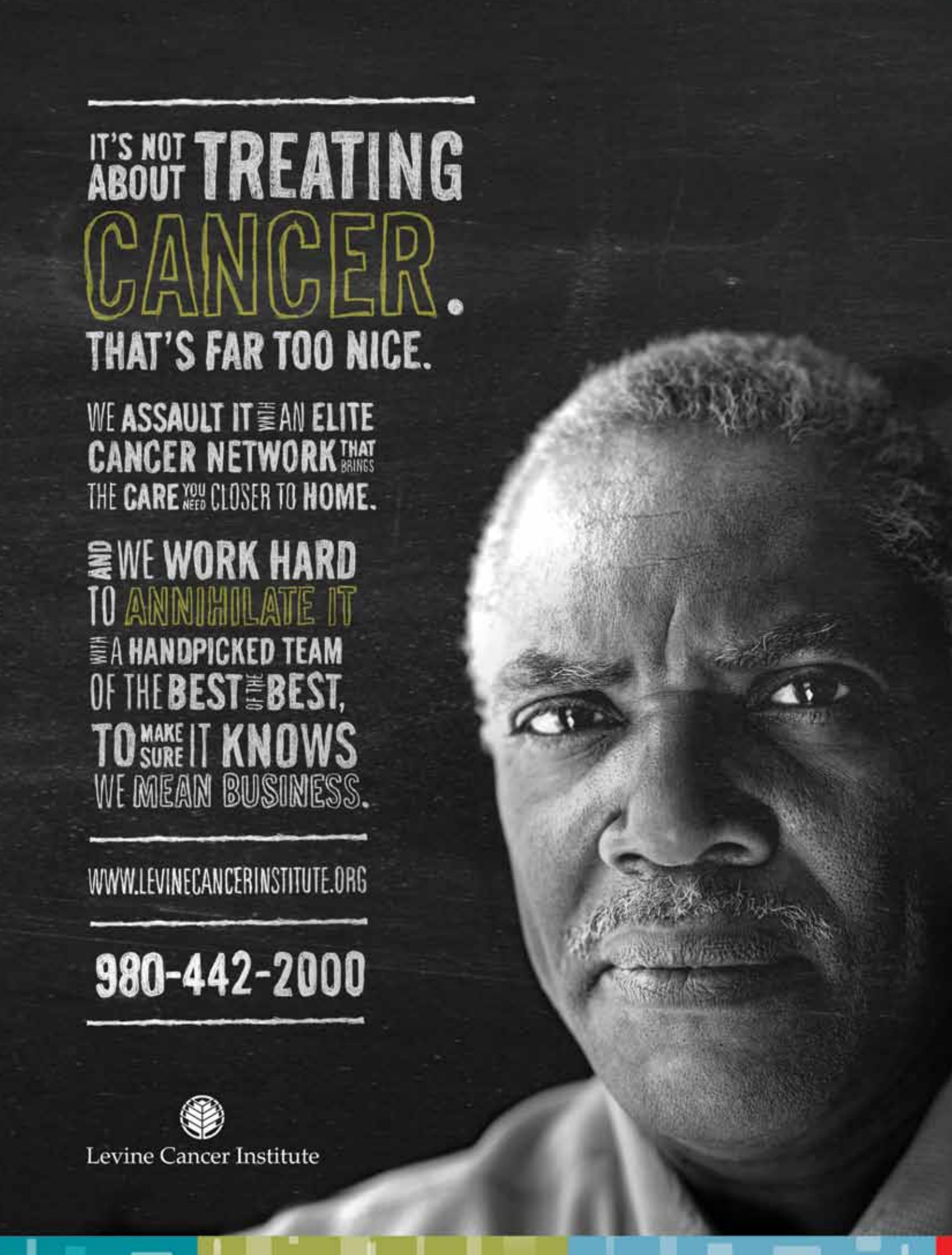
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INTRODUCTION

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From the NCIOM

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EQUAL HOUSING LENDER

Tar Heel Footprints in Health Care

A periodic feature that recognizes individuals whose efforts—often unsung—enhance the health of North Carolinians

Gayle Harris, MPH

Socioeconomic factors such as income, education, and community environment can have a profound impact on individuals' health. Gayle Harris, MPH, recognizes the importance of addressing these social determinants of health and has worked hard as the director of the Durham County Health Department to mobilize the Durham community around health issues, even when they fall outside the traditional health system. Harris argues that, "We cannot blame poor health or credit good health because health outcomes are so often dictated by context. We need to deliberately look at improving the context in order to have a positive health impact."

A Durham native, Harris received a Bachelor of Science degree from Duke University School of Nursing and a Master of Public Health degree from the School of Public Health at the University of North Carolina at Chapel Hill. She began her career at the Durham County Health Department in 1972 as a public health nurse, inspired by the patients she encountered as a nursing student. After 40 years at the Durham County Health Department, Harris says she feels blessed every day to have the opportunity to work with great people and give back to her community.

Kimberly Monroe, MPA, a program manager for the Duke University Health System Office of Community Relations and co-chair for Partnership for a Healthy Durham commends Harris' commitment to listening to the community and taking appropriate steps to address priorities. While conducting the most recent community health assessment, the Durham community identified important social issues including education, poverty, and housing. Monroe says, "Gayle listens to the community and brings the issue of social determinants of health to the forefront in group discussions. She has succeeded in getting a high level of attention devoted to the issues and maintaining positive community momentum." This often includes educating community groups on the health impact of the work they do, underscoring the importance of socioeconomic factors, and framing the impact of community efforts on issues such as homelessness on health outcomes.

A number of strategic partnerships and coalitions have formed in Durham to better utilize existing local resources and skills to meet the needs and improve the health of the county's residents. Partnership for a Healthy Durham and Durham Health Innovations, the latter of which Gayle co-chairs, are 2 coalitions that strive to increase collaboration in order to create positive change in Durham, alongside less formal partnerships between local government agencies and community entities. Efforts to alleviate socioeconomic factors of poor health have included improving access to care and access to healthy foods, an expanded smoking ban, health impact assessment trainings, and the placement of public health nurses in schools.

Colleagues and community partners value Harris' expertise, community-oriented perspective, and leadership. David Reese, MBA, executive director of East Durham Children's Initiative and co-chair for Partnership for a Healthy Durham praised Harris' ability to engage the community,

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saying, "Gayle is an excellent leader and a visibly active participant in community efforts, continually demonstrating her commitment and sincerity. Her down-to-earth demeanor and collaborative leadership approach are valuable in increasing community engagement."

Lloyd Michener, MD, the Community and Family Medicine department chair at Duke University Health System also praises Harris as a fantastic partner in improving the health of Durham residents. Michener says, "She knows Durham and serves as an articulate spokesperson for the community. She is able to speak from a number of perspectives as a community member and advocate, nurse, and public health partner and consistently finds common ground and opportunity for collaboration in the community."

There is growing recognition in the field of public health of the importance of addressing social determinants of health in order to achieve positive health impacts. Under Harris's guidance, Durham County has become a leader in North Carolina in tackling social determinants as a community health priority. NCMJ

ORIGINAL ARTICLE

The State of Racial/Ethnic Diversity in North Carolina's Health Workforce

Victoria McGee, Erin Fraher

BACKGROUND Increasing the racial and ethnic diversity of the health care workforce is vital to achieving accessible, equitable health care. This study provides baseline data on the diversity of health care practitioners in North Carolina compared with the diversity of the state's population.

METHODS We analyzed North Carolina health workforce diversity using licensure data from the respective state boards of selected professions from 1994-2009; the data are stored in the North Carolina Health Professions Data System.

RESULTS North Carolina's health care practitioners are less diverse than is the state's population as a whole; only 17% of the practitioners are nonwhite, compared with 33% of the state's population. Levels of diversity vary among the professions, which are diversifying slowly over time. Primary care physicians are diversifying more rapidly than are other types of practitioners; the percentage who are nonwhite increased by 14 percentage points between 1994 and 2009, a period during which 1,630 nonwhite practitioners were added to their ranks. The percentage of licensed practical nurses who are nonwhite increased by 7 percentage points over the same period with the addition of 1,542 nonwhite practitioners to their ranks. Nonwhite health professionals cluster regionally throughout the state, and 79% of them practice in metropolitan counties.

LIMITATIONS This study reports on only a selected number of health professions and utilizes race/ethnicity data that were self-reported by practitioners.

CONCLUSION Tracking the diversity among North Carolina's health care practitioners provides baseline data that will facilitate future research on barriers to health workforce entry, allow assessment of diversity programs, and be useful in addressing racial and ethnic health disparities.

Increasing the racial and ethnic diversity of the health care workforce is vital to achieving high-quality health care that is accessible, equitable, and culturally competent [1,2,3,4]. Cultural competence is defined by the Office of Minority Health as "a set of congruent behaviors, attitudes, and policies . . . that enables effective work in cross-cultural situations" [5]. The provision of culturally competent health care requires a health care workforce that is prepared to interact with the variety of cultures represented in North Carolina's population and is also representative of the population and of the communities that it serves.

An adequate pipeline of workers from all racial and ethnic backgrounds will be needed to fill projected health workforce shortages [6-9]. It is projected that nonwhite racial/ethnic groups will constitute 54% of the US population by 2050 [10], and research has shown that practitioners who themselves belong to underrepresented minorities (African American/black, Hispanic/Latino, and Native American/Alaska Natives) disproportionately serve minority and underserved populations [3, 11, 12]. Increasing diversity among the health professions could, among other benefits, increase access to and use of health care services by underserved populations, lead to greater trust in the health care system, and improve patient health outcomes [3].

National figures show that health care practitioners are less racially and ethnically diverse than is the patient population [12]. There are some caveats to this generalization: in some health care professions, Asian/Pacific Islander practitioners have greater representation among health professionals than in the patient population; and levels of diversity vary from profession to profession [13]. Although the racial/ethnic diversity of the workforce has increased over time, a lack of national data makes it difficult to compare North Carolina with the nation.

In response to the lack of diversity among health professionals, a wide variety of pipeline programs have been implemented that are aimed at increasing the racial and ethnic diversity of the health professions. There are federally funded and state-funded programs, such as those run by the Health Careers Opportunity Program and by the North Carolina Area Health Education Centers Program, as well as other programs sponsored by the schools that train health professionals and by private donors [14]. Even though data highlight the need to increase the diversity of the health care workforce in North Carolina [14], and steps have been taken to increase the number of health care professionals in the state from minority groups, there are significant barriers to evaluating the success of diversity programs; the most important of these is the lack of regular and systematic data

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collection and reporting on the supply of health professionals at the national, state, and local levels. This study begins to fill this gap by providing baseline data on the diversity of health care practitioners in North Carolina compared with that of the state's population.

Methods

We analyzed North Carolina health workforce diversity using data from state licensure boards that are stored in the North Carolina Health Professions Data System. The data used in this analysis were self-reported by health professionals at the time of their initial licensure to practice in North Carolina or at the time of their subsequent renewal of that license. The data for a given year includes all health professionals licensed to practice as of October 31 of that year.

The following health care professions were included in the study: physicians (categorized as all physicians, primary care physicians, and surgeons), physician assistants, nurse practitioners, certified nurse midwives, certified registered nurse anesthetists, registered nurses, licensed practical nurses, physical therapists, physical therapy assistants, occupational therapists, occupational therapy assistants, respiratory therapists, dentists, dental hygienists, and pharmacists. Data include all active physicians working in North Carolina who are not residents in training and are not employed by the federal government, and all active practitioners in the other professions who are working in North Carolina. Physicians categorized as primary care physicians were those in general practice, family practice, general internal medicine, pediatrics, or obstetrics and gynecology.

North Carolina population data were obtained from the North Carolina Office of State Planning, and US population data were obtained from the US Census Bureau. Population data are dependent on the year and are corrected census counts (as of April 1, 1970, 1980, 1990 or 2000) or are estimates or projections from the data source (as of April 1, 2010, or as of July 1, for other years).

The status of an area as metropolitan or nonmetropolitan is based on the Office of Management and Budget's Core Based Statistical Areas (CBSA) as of the November 2008 update. Nonmetropolitan counties include not only those that are outside of any CBSA but also those that are considered micropolitan statistical areas because they contain an urban core of at least 10,000 but have a total population of less than 50,000.

Results

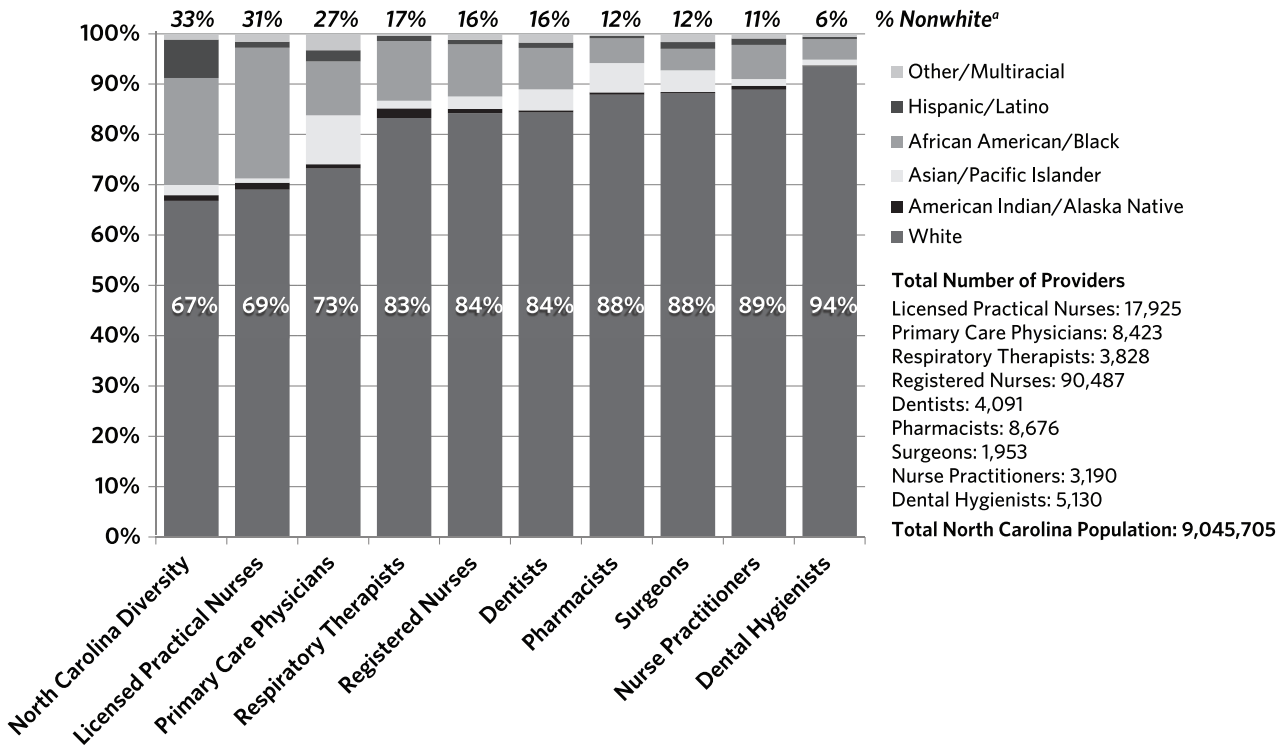
North Carolina's health care practitioners are less diverse than is the state's population. Compared with the state's population, North Carolina's health professionals are not very diverse. Only 1 in 6 health professionals is nonwhite, compared with 1 in 3 North Carolina residents. There are 28,648 nonwhite health professionals. For purposes of this analysis, nonwhite practitioners are defined as those who self-identify as African American/black, American Indian/Alaska Native, Asian/Pacific Islander, Hispanic/Latino, multiracial, or other, rather than as Caucasian. Although Hispanic/Latino is considered an ethnic designation and not a race, data from North Carolina licensure boards classify Hispanic/Latino as a racial group, making it necessary to consider it as such in this analysis.

Despite the fact that health workforce diversity in North Carolina has not caught up with population diversity, there are a couple of professions that could be considered "best practice" professions with regard to their diversity, based on the relatively high percentage of their members who are nonwhite practitioners: licensed practical nurses (31% of whom are nonwhite) and primary care physicians (27% of whom are nonwhite). Figure 1 shows a sample of professions with high, moderate, and low levels of diversity in North Carolina in 2009.

Table 1 shows the diversity of North Carolina's health professions compared with the diversity of the state's population. Relative to their presence in the state's population, whites are overrepresented in all of the health care professions except among licensed practical nurses. Although Asian/Pacific Islander practitioners are overrepresented among physicians, pharmacists, dentists, registered nurses, physical therapists, and occupational therapists, they make up less than 2% of the workforce in each of the remaining professions. American Indian/Alaska Native health professionals are underrepresented among all types of practitioners except respiratory therapists, certified nurse midwives, licensed practical nurses, and physician assistants; in each of the other professions, they make up less than 1% of the practitioner population. It is striking that the 2 largest nonwhite racial/ethnic groups in North Carolina—Hispanic/Latinos and African American/blacks—are underrepresented in all professions, with only 1 exception: African American/blacks are well represented among licensed practical nurses.

North Carolina's health professions are diversifying at different rates. Longitudinal trends show that North Carolina's health care professions are diversifying slowly over time and at different rates. The population of the state has also slowly been diversifying, with the proportion of residents who are nonwhite increasing from 26% in 1994 to 33% in 2009—an increase of 7 percentage points. Figure 2 shows the percentage of the workforce that was nonwhite for a selection of health care professions from 1994-2009. Of the professions that had the highest level of diversity in 2009, the percentage of the state's workforce made up of nonwhite practitioners increased the most among primary care physicians, going from 13% in 1994 to 27% in 2009 (+14 percentage points) with the addition of 1,630 nonwhite practitioners. Of the professions high in diversity, the percentage of licensed practical nurses who were nonwhite increased by the second greatest amount, going from 24% to 31% (+7 percentage points) with the addition of 1,542 nonwhite practitioners. Note that if a profession did not have reliable race data for any given year, it was excluded from analysis.

FIGURE 1.
Racial/Ethnic Diversity of North Carolina's Population Versus Selected Health Professions, 2009



Note. Data include all active, in-state health care professionals and active, in-state, non-residents in training, non-federal physicians working in North Carolina who were licensed in the state as of October 31, 2009.
[a]The term "nonwhite" refers to those who self-identify as African American/black, Asian/Pacific Islander, American Indian/Alaska Native, Hispanic/Latino, multiracial, or other.
[b]Data for this profession were collected beginning in 2004, but 2007 was the first year for which reliable race data were available.
[c]2004 data for physical therapy assistants interpolated due to high percentage of missing data.
Sources: North Carolina Health Professions Data System, with data derived from the North Carolina Boards of Medicine, Nursing, Pharmacy, Dentistry, Physical Therapy, Occupational Therapy, and Respiratory Therapy in 2010; and US Census Bureau, American Factfinder, http://factfinder.census.gov, accessed August 24, 2011. Produced by North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

Among those professions with moderate levels of diversity in 2009, dentists saw the greatest gain—the proportion of dentists who were nonwhite increased from 7% to 16% (+9 percentage points) with the addition of 434 nonwhite practitioners. The proportion of registered nurses who were nonwhite increased from 10% to 16% (+6 percentage points) with the addition of 8,194 nonwhite practitioners. (Because registered nurses are such a large workforce, they saw the largest gain in the number of nonwhite practitioners of any profession examined.) Reliable data about the proportion of respiratory therapists who were nonwhite were not available until 2007, but between 2007 and 2009 that proportion increased by 2 percentage points, going from 15% to 17% with the addition of 132 nonwhite practitioners.

Among the professions with low to moderate levels of diversity in 2009, pharmacists saw the largest increase in the proportion of practitioners who were nonwhite, going from 4% to 12% (+8 percentage points) with the addition of 796 nonwhite practitioners. The main factor contributing to that sharp increase was a big jump in the number of Asian/Pacific Islander pharmacists; removing those practitioners from each year's count reduces the change in the proportion of pharmacists who were nonwhite to an increase of 3 percentage points (from 3% to 6%). Surgeons had the next-largest increase—the proportion of surgeons who were nonwhite went from 9% to 12% (+3 percentage points) with the addition of 96 nonwhite practitioners. The percentage of physical therapy assistants who were nonwhite was the same in 2009 (12%) as it had been in 1994, despite a temporary drop to 9% in 1999. Reliable data about the proportion of occupational therapy assistants who were nonwhite were not available until 2007. That proportion decreased from 12% in 2007 to 11% in 2009 (-1 percentage point) with the departure of 5 nonwhite practitioners from the workforce.

Among the professions that were least diverse in 2009, the percentage of the workforce made up of nonwhite practitioners increased the most among dental hygienists, going from 3% to 6% (+3 percentage points) with the addition of 238 nonwhite practitioners. The proportion of certified registered nurse anesthetists who were nonwhite increased from 4% to 6% (+2 percentage points) with the addition of 74 nonwhite practitioners.

Where were these nonwhite health care practitioners educated? Examining whether nonwhite health care practitioners were educated within the state or outside it is a valuable step in determining whether North Carolina is "importing" or "growing" diversity in the workforce. Among the best-practice professions, licensed practical nurses have the highest percentage of nonwhite practitioners graduating from North Carolina schools (65%, 3,578), whereas only 18% (397) of nonwhite primary care physicians completed their undergraduate medical education in a North Carolina school. Of the 397 nonwhite primary care physicians educated in North Carolina medical schools, 202 (51%) graduated from the School of Medicine at the University of North Carolina at Chapel Hill; 88 (22%) graduated from the Brody School of Medicine at East Carolina University, 67 (17%) graduated from Wake Forest School of Medicine, and 40 (10%) graduated from Duke University School of Medicine.

Although primary care physicians have the second-highest percentage of nonwhite practitioners, the majority of them were educated outside the state: 946 (42%) of them graduated from international medical schools (those outside the United States), and 832 (37%) graduated from medical schools elsewhere in the United States. The largest numbers of nonwhite primary care international medical graduates in North Carolina completed their medical school training in India (349, 36%), Nigeria (98, 10%), the Philippines (74, 8%), or Pakistan (64, 7%). The high percentage of international medical graduates among North Carolina's primary care physicians indicates that, despite high levels of diversity, the racial/ethnic makeup of this group does not reflect that of the state's population.

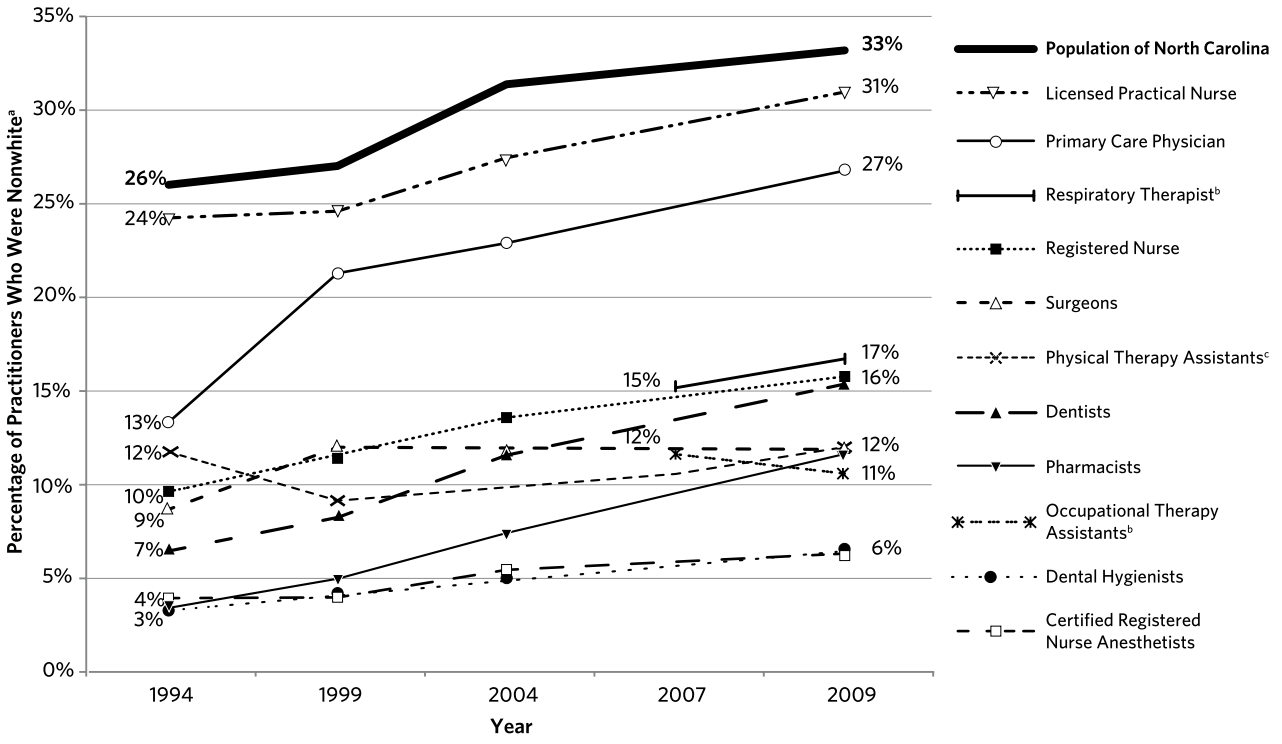
In 2009, among the professions with moderate levels of diversity, registered nurses had the highest percentage of active, in-state, nonwhite practitioners educated in North Carolina. Of the 12,549 nonwhite registered nurses for whom there are both race/ethnicity data and school data, 8,948 (71%) were educated in North Carolina programs. Of these, 4,363 (49%) were educated in the North Carolina Community College System, and another 2,245 (25%) were educated at historically black colleges or universities. Other professions with moderate levels of diversity were respiratory therapists and dentists. Respiratory therapists had the highest percentage of practitioners educated in North Carolina (63%, 393), followed by dentists (37%, 232). Almost all nonwhite North Carolina–educated respiratory therapists graduated from a school in the North Carolina Community College System. Respiratory therapists also have one of the highest percentages of American

TABLE 1.
Diversity Scorecard for North Carolina Health Professions, 2009: Proportion of Practitioners Belonging to Various Ethnic or Racial Groups

		Type of Practitioner															
Racial or ethnic group	Percentage of state population	Physical therapists	Physical therapy assistants	Occupational therapists	Occupational therapy assistants	Respiratory therapists	Nurse practitioners	Certified nurse midwives	Certified registered nurse anesthetists	Dentists	Dental hygienists	Registered nurses	Licensed practical nurses	Physician assistants	Physicians (all)	Surgeons	Primary care physicians	Pharmacists
White																		
American Indian/Alaska native																		
Asian/Pacific Islander																		
African American/black																		
Hispanic/Latino																		
Multiracial/other																		

Key to shading:
White: Percentage of people belonging to this racial or ethnic group is higher in this profession than in the state's population.
Light Gray: Percentage of people belonging to this racial or ethnic group is lower in this profession than in the state's population.
Dark Gray: Percentage of people belonging to this racial or ethnic group is about the same in this profession as in the state's population.
Note. Data include all active, in-state health care professionals and active, in-state, non-residents in training, non-federal physicians working in North Carolina who were licensed in the state as of October 31, 2009.
Sources: North Carolina Health Professions Data System, with data derived from the North Carolina Boards of Medicine, Nursing, Pharmacy, Dentistry, Physical Therapy, Occupational Therapy, and Respiratory Therapy in 2010; and US Census Bureau, American Factfinder, http://factfinder.census.gov, accessed August 24, 2011.

FIGURE 2.
Percentage of North Carolina Practitioners in Selected Professions Who Were Nonwhite, 1994-2009



Note. Data include all active, in-state health care professionals and active, in-state, non-residents in training, non-federal physicians working in North Carolina who were licensed in the state as of October 31, 2009.
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Indian/Alaska Native practitioners (2%, 73) of all of North Carolina's health professions, and more than half (58%, 42) of the American Indian/Alaska Native respiratory therapists were educated at Robeson County Community College. Of the 635 nonwhite dentists currently in active practice in North Carolina in 2009, 127 (20%) were educated at a historically black college or university, 232 (37%) were educated at the University of North Carolina School of Dentistry, and 276 (43%) were educated at other dental schools in the United States. Although the percentage of North Carolina's African American/black dentists who had been educated at historically black colleges or universities remained relatively high in 2009, that percentage had been steadily declining, from 54% in 1994 to 36% in 2009.

Professions found to have low to moderate levels of diversity were pharmacists, surgeons, nurse practitioners, physical therapy assistants, and occupational therapy assistants. Of these, physical therapy assistants had the highest percentage of nonwhite practitioners who had been educated in North Carolina schools (71%, 186), followed by nurse practitioners (70%, 250), occupational therapy assistants (63%, 69), pharmacists (32%, 332), and surgeons (16%, 37). Among nonwhite nurse practitioners educated in North Carolina schools, 25% (62) were educated at the University of North Carolina at Chapel Hill, 20% (51) were educated at Duke University, and 18% (46) were educated at Winston-Salem State University. Of North Carolina's nonwhite pharmacists, 45% (476) were imported from other parts of the United States, and 23% (242) came from outside the United States. Asian/Pacific Islanders are the largest subgroup of nonwhite North Carolina pharmacists (48%, 505), followed by African American/black pharmacists (41%, 427); 43% of those in each subgroup were educated in North Carolina. Surgeons had the lowest proportion of nonwhite practitioners educated in North Carolina (16%, 37). Of the 37 nonwhite surgeons educated in the state, 16 (43%) received their undergraduate medical education at Duke University School of Medicine, 9 (24%) received it at University of North Carolina School of Medicine, 7 (19%) received it at Brody School of Medicine at East Carolina University, and 5 (14%) received it at Wake Forest School of Medicine.

In 1 of the least diverse professions, dental hygienists,

84% (279) of nonwhite practitioners had graduated from a program in North Carolina, making dental hygiene the profession with the highest proportion of North Carolina–educated nonwhite practitioners. About 39% (108) of North Carolina-educated dental hygienists received their education at the University of North Carolina at Chapel Hill, and the remaining 61% (171) graduated from a school in the North Carolina Community College System. Among certified registered nurse anesthetists, a profession that is also very low in diversity, only 40% (44) of nonwhite practitioners graduated from North Carolina schools.

Where do North Carolina's health practitioners belonging to underrepresented minorities practice? Nonwhite health care professionals in North Carolina tend to cluster regionally. In 2009, half were located in Mecklenburg, Wake, Durham, Guilford, Forsyth, Pitt, and Cumberland counties, and 79% were located in metropolitan counties. Higher concentrations of underrepresented minority practitioners were found in counties that had higher population concentrations of people who were of the same race or ethnicity as the practitioner.

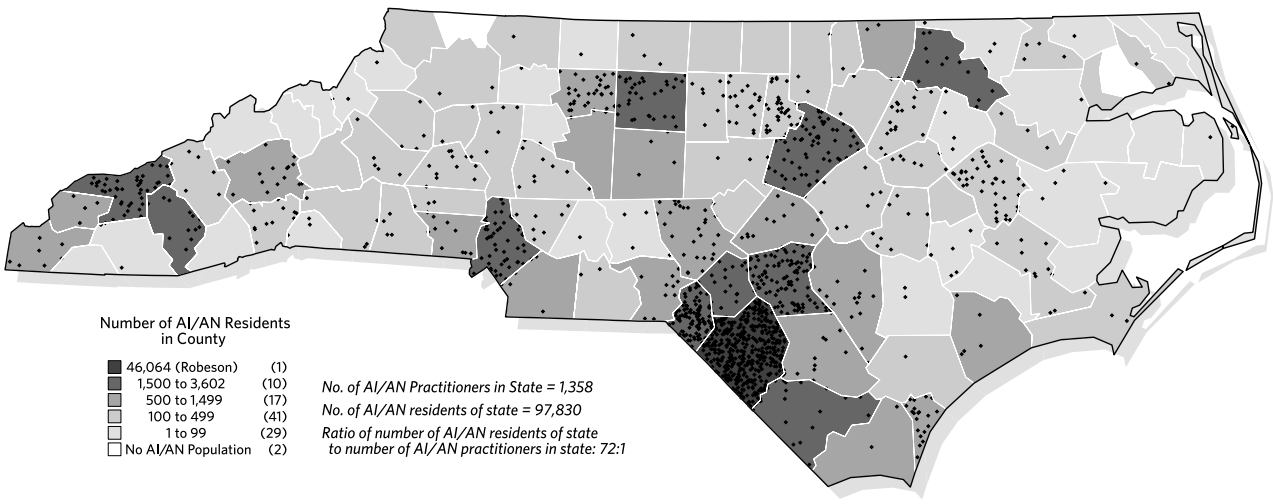
Figures 3, 4, and 5 show the geographic distribution of health care practitioners of a particular race or ethnicity among North Carolina's counties in 2009, along with the number of residents of that race or ethnicity in each county, with darker shading of a county representing a higher number of residents of the race or ethnicity in question. Practitioner locations are indicated by dots.

Figure 3 shows the geographic distribution of American Indian/Alaska Native health care practitioners in the state and the number of American Indian/Alaska Native residents in each county. A little more than half (51%) of American Indian/Alaska Native practitioners were located in 1 of 4 counties—Robeson, Scotland, Swain, or Cumberland—and 57% of North Carolina's American Indian/Alaska Native population lived in those 4 counties; nearly a third (32%, 437) of the state's American Indian/Alaska Native health care practitioners were located in Robeson County, where the proportion of residents who were American Indian/Alaska Natives (36%) was higher than in any other county in the state.

Figure 4 shows the geographic distribution of African American/black health care practitioners in the state and the number of African American/black residents in each county. Fifty-eight percent (10,372) of African American/black practitioners were located in counties with major urban areas (Mecklenburg, Forsyth, Guilford, Durham, Wake, and Cumberland counties). However, the counties with the highest percentages of African American/black practitioners and the greatest number of African American/black residents were located in the northeastern and southeast central regions of the state.

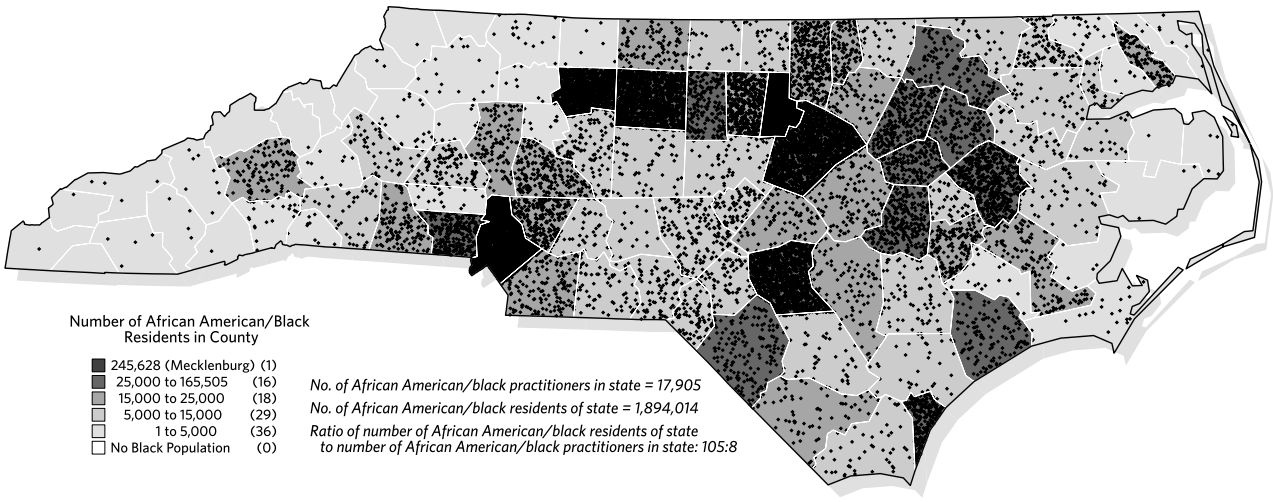
Figure 5 shows the geographic distribution of Hispanic/Latino health care practitioners and the number of Hispanic/Latino residents in each county. In 2009, Hispanic/Latino practitioners made up the second smallest percentage of

FIGURE 3.
Geographic Distribution of American Indian/Alaska Native (AI/AN) Healthcare Practitioners and Number of AI/AN Residents in North Carolina Counties, 2009



Note. Each dot represents an active health care professional working in North Carolina who self-reported his or her race/ethnicity as American Indian/Alaska Native and was licensed in the state as of October 31, 2009. The following professions were included: physicians (with the exception of those who were residents in training or were federal employees), nurse practitioners, registered nurses, certified nurse midwives, licensed practical nurses, physical therapists, physical therapy assistants, occupational therapists, occupational therapy assistants, respiratory therapists, dentists, dental hygienists, and pharmacists.
Sources: North Carolina Health Professions Data System, with data derived from the North Carolina Boards of Medicine, Nursing, Pharmacy, Dentistry, Physical Therapy, Occupational Therapy, and Respiratory Therapy in 2010; and US Census Bureau, American Factfinder, http://factfinder.census.gov, accessed August 24, 2011.
Produced by North Carolina Health Professions Data System, Cecil G. Sheps Center for Health Services Research, University of North Carolina at Chapel Hill.

FIGURE 4.
Geographic Distribution of African American/Black Healthcare Practitioners and Number of African American/Black Residents in North Carolina Counties, 2009



Note. Each dot represents an active health care professional working in North Carolina who self-reported his or her race/ethnicity as African American/black and was licensed in the state as of October 31, 2009. The following professions were included: physicians (with the exception of those who were residents in training or were federal employees), nurse practitioners, registered nurses, certified nurse midwives, licensed practical nurses, physical therapists, physical therapy assistants, occupational therapists, occupational therapy assistants, respiratory therapists, dentists, dental hygienists, and pharmacists.
Sources: North Carolina Health Professions Data System, with data derived from the North Carolina Boards of Medicine, Nursing, Pharmacy, Dentistry, Physical Therapy, Occupational Therapy, and Respiratory Therapy in 2010; and US Census Bureau, American Factfinder, http://factfinder.census.gov, accessed August 24, 2011.
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North Carolina's health care workforce of any racial or ethnic group, despite being the second largest nonwhite population group in the state and the fastest-growing population group in the state. About half (54%, 984) of the state's Hispanic/Latino practitioners were in counties with major urban areas: Mecklenburg, Forsyth, Guilford, Durham, Wake, and Cumberland. Even in these areas, however, the percentage of practitioners who were Hispanic/Latino practitioners fell well short of matching the percentage of residents who were Hispanic/Latino in either the county or the state.

Discussion

This study found that North Carolina's health workforce has been slowly diversifying over time but still lags behind the state's population in diversity. African American/blacks make up the largest nonwhite racial/ethnic group in the state, but they are not well represented in the health professions. Hispanic/Latinos are the second largest nonwhite racial/ethnic group; they are fastest-growing ethnic group in the state but are present in smaller numbers in the health workforce than are members of other nonwhite groups. Considering that North Carolina's Hispanic/Latino population increased more than 111% between 2000 and 2010 [15], the state's very low numbers of Hispanic/Latino health care practitioners may be problematic in the context of achieving the cultural and linguistic competence required to meet patients' health care needs.

North Carolina's health care professions are diversifying at different rates. It is striking that physical therapy assistants and occupational therapy assistants have relatively low levels of diversity and that these have remained stagnant longitudinally, especially since the job market in the allied health professions is rapidly growing [16]. A deeper investigation into the question of why some professions (eg, licensed practical nurses) have diversified more quickly than others (eg, dental hygienists and other allied health professions) might help to identify which programs and strategies aimed at increasing workforce diversity have been successful and might help to further identify barriers preventing nonwhite professionals from entering the health workforce. Research could focus on such factors as the effect of low matriculation rates and high attrition rates [17], limited career awareness, program cost, and inadequate K-12 preparation. Tracking underrepresented minorities during and after their educational careers would also be helpful in identifying best-practice programs and strategies for increasing the racial and ethnic diversity of North Carolina's health professions.

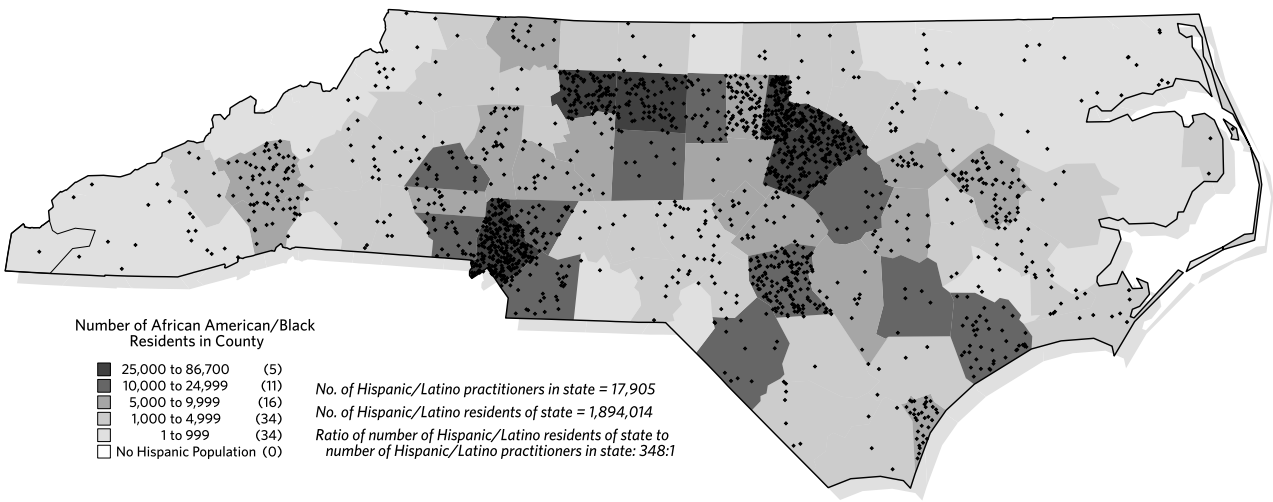
Education patterns among nonwhite practitioners vary from profession to profession. Among North Carolina's primary care physicians, a large number of racially/ethnically diverse practitioners are international medical graduates or graduates of out-of-state US schools. Although importing these professionals may seem to be a viable way of increasing health workforce diversity, these practitioners may not be familiar enough with the varieties of cultures

and customs present among North Carolina's diverse citizens, and thus they may struggle to provide the culturally competent care called for by new and emerging models of care. By contrast, large percentages of North Carolina's nonwhite registered nurses, nurse practitioners, licensed practical nurses, respiratory therapists, and dental hygienists are educated at in-state schools. In particular, the state's historically black colleges and universities and the schools in the North Carolina Community College System have educated a large number of the state's nonwhite health care workforce, as exemplified by the large number of American Indian/Alaska Native respiratory therapists graduating from Robeson County Community College and by the large numbers of nonwhite registered nurses and African American/black dentists graduating from historically black colleges or universities in the state. Valuable lessons may be gleaned in examining why and how these programs have been able to graduate so many individuals who have stayed in the state and joined the North Carolina workforce. Useful investigations might include an examination of the organizational structure and distribution of funding among diversity initiatives in these programs, as well as an examination of how they connect with K-12 pipeline programs and provide support for practitioners once they are in the workforce.

In North Carolina, studies have shown that underrepresented-minority practitioners are more likely to serve in areas that have chronic shortages of health care practitioners [18], most of which are predominantly rural areas. In our analysis, the majority of nonwhite health care practitioners (79%) were found to be practicing in metropolitan counties, which is characteristic of the state's health care workforce as a whole. Outside major urban centers, underrepresented-minority practitioners cluster in regions with high percentages of citizens of the same race or ethnicity. Areas where there are higher levels of concordance in numbers of underrepresented-minority practitioners and nonwhite citizens would be prime locations in which to examine the success or failure of patient/practitioner racial and ethnic concordance in encouraging use of health care services or helping to reduce health disparities [19].

Increasing the numbers of nonwhite health care practitioners may help ease impending workforce shortages, increase patient trust in the health care system, and decrease health disparities between different racial/ethnic groups. Studies have shown that there is greater use of health care services and greater satisfaction with care when there is racial/ethnic concordance between the patient and practitioner [20-24]. This does not mean that racial/ethnic concordance is the only possible solution to the issues of racial/ethnic health disparities or impending health workforce shortages. Education that focuses on improving practitioner cultural competence is also important [25], because increased cultural competence of practitioners, regardless of their race or ethnicity, has been shown to be positively linked with patient satisfaction with care [26] and may translate into higher rates of use of health care services by underserved

FIGURE 5.
Geographic Distribution of Hispanic/Latino Healthcare Practitioners and Number of Hispanic/Latino Residents in North Carolina Counties, 2009



Note. Each dot represents an active health care professional working in North Carolina who self-reported his or her race/ethnicity as Hispanic/Latino and was licensed in the state as of October 31, 2009. The following professions were included: physicians (with the exception of those who were residents in training or were federal employees), nurse practitioners, registered nurses, certified nurse midwives, licensed practical nurses, physical therapists, physical therapy assistants, occupational therapists, occupational therapy assistants, respiratory therapists, dentists, dental hygienists, and pharmacists.
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populations. Practitioners of all races and ethnicities who were exposed to patients from a variety of racial/ethnic and socioeconomic groups during their training felt better prepared to care for patients later on in their careers [27]. This finding reinforces the utility of this type of education, which prepares the health care workforce to provide care to an increasingly diverse patient population. With the recent increase in focus on patient-centered care and on racial/ethnic health disparities, tracking the diversity of North Carolina's health care practitioners will provide baseline data that facilitates future research on barriers to workforce entry, assessment of diversity programs, and reduction of racial/ethnic health disparities. NCMJ

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ORIGINAL ARTICLE

Dental Visits to a North Carolina Emergency Department:
A Painful Problem

Michael B. Hocker, John J. Villani, Joseph B. Borawski, Christopher S. Evans, Scott M. Nelson, Charles J. Gerardo, Alex T. Limkakeng

BACKGROUND Emergency departments (EDs) act as the safety net and alternative care site for patients without insurance who have dental pain.

METHODS We conducted a retrospective chart review of visits to an urban teaching hospital ED over a 12-month period, looking at patients who presented with a chief complaint or ICD code indicating dental pain, toothache, or dental abscess.

RESULTS The number of visits to this ED by patients with a dental complaint was 1,013, representing approximately 1.3% of all visits to this ED. Dental patients had a mean age of 32 (± 13) years, and 60% of all dental visits were made by African Americans. Dental patients were more likely to be self-pay than all other ED patients (61% versus 22%, P<0.001). At the vast majority of dental ED visits (97%), the patient was treated and discharged; at most visits (90%) no dental procedure was performed. ED treatment typically consisted of pain control and antibiotics; at 81% of visits, the patient received an opiate prescription on discharge, and at 69% of visits, the patient received an antibiotic prescription on discharge.

LIMITATIONS This retrospective chart review covered a limited period of time, included only patients at a large urban academic medical center, and did not incorporate follow-up analysis.

CONCLUSION Although they make up a small percentage of all ED visits, dental ED visits are more common among the uninsured, seldom result in definitive care or hospital admission, and often result in prescription of an opioid or antibiotic. These findings are cause for concern and have implications for public policy.

Emergency departments (EDs) act as the safety net for the nation's health care system. With increasing unemployment and subsequent lack of health and dental insurance, many patients have few options outside of EDs to obtain care. As a result, the ED has become an alternative care site for patients without insurance who have toothaches or other dental pain [1, 2, 3]. In 2006 alone, dental caries accounted for an estimated 330,757 visits to EDs across the United States. These visits, 45% of which were made by uninsured patients, accounted for approximately $110 million in charges [1]. ED visits for dental complaints have been shown to make up 0.7%-0.9% of all ED visits; the highest utilization is by those 19-35 years of age; dental visits constitute 1.3% of all ED visits by patients in that age group [2].

Previous studies have demonstrated that being uninsured is a significant factor promoting utilization of EDs for dental-related complaints [2]. In North Carolina, only 2 of the 5 academic medical centers have an affiliated dental school. In addition, most hospitals do not have an on-call dentist readily available. Follow-up care is virtually impossible for the uninsured to find if they do not have any financial resources. Further compounding this problem is the fact that only 58% of federally qualified health centers offer any dental services [4]. Additionally, as many states attempt to reconcile large health care budgets, many are considering reducing or eliminating optional benefits such as dental care from their Medicaid covered services [5, 6]. In Maryland, ED visits for dental complaints increased 12% the year after Medicaid stopped dental reimbursement [6].

The profile of patients presenting to the ED with dental complaints in the state of North Carolina is poorly characterized. Prior reports have suggested that nontraumatic dental disease is preventable and usually has limited morbidity, and that the most cost-effective care model is early intervention and treatment [7]. What remains unclear is the role that North Carolina EDs currently play in dental care. The goal of this paper is to provide a description of patient visits to the ED of a North Carolina academic health center for dental related complaints.

Methods

The study involved examining the medical records of all patients who presented to the ED of a major urban teaching hospital between 7/1/10 and 6/30/11. Institutional Review Board review and approval was obtained according to institution policy.

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0029-2559/2012/73502

This ED uses an electronic medical record system that feeds all information into a central data repository, where it is stored. We identified dental patients in the database in 2 ways. All patients at the time of arrival to the ED are assigned a "triage impression" from a fixed list. So first, we captured the records of all patients with a triage impression of "dental" as potentially being patients with a primary dental complaint. After these patients' records were removed from the database, another set of dental patients was identified using discharge diagnosis ICD-9 codes 520-525 (generalized atraumatic dental disorders) and ICD-9 code 873.63 (dental trauma).

All of these digital charts were then reviewed manually by at least 1 of the 4 authors involved in conducting the chart review, and 15 distinct items were abstracted from each chart. All abstractors were trained in chart abstraction methods and data element definitions, and they used a standard abstraction form. Missing data elements and instances of conflicting information were reviewed by the principal investigator, who decided in conjunction with the individual data abstractor how they should be handled.

For 10% of charts, double abstraction was performed, and interrater reliability was assessed for the following variables: "opiates in the ED," "opiate prescription given," "discharge medication," and "procedure in ED." Interrater kappa, a measure of agreement corrected for chance, was calculated [8, 9]. The kappa statistic may range from -1 (perfect disagreement beyond chance) to 1 (perfect agreement beyond chance).

For visual analysis, we graphed simple histograms showing the observed number of visits on each day of the week and the observed number of visits for each of the 24 hours of the day. The resulting database was analyzed using standard summary statistic techniques using Microsoft Excel. A z-test for proportions was used to calculate P values where relevant, with no adjustments for multiple comparisons.

TABLE 1.
Characteristics of Emergency Department (ED) Patients with Dental Complaints

Characteristics	Patients, No. (%) (n = 760)
Sex	
Male	394 (52%)
Female	366 (48%)
Age group, y	
0-9	34 (4%)
10-19	35 (5%)
20-29	288 (38%)
30-39	197 (26%)
40-49	126 (17%)
50-59	61 (8%)
≥60	19 (2%)
Race (on triage report)	
Black	477 (60%)
White	234 (31%)
Other	49 (6%)
Health insurance status	
Private health insurance	82 (11%)
Medicare	41 (5%)
Medicaid	166 (22%)
Uninsured/self pay	464 (61%)
Other	5 (<1%)
Unknown	2 (<1%)
Number of dental ED visits	
1	627 (79%)
2	79 (10%)
3	24 (3%)
4	14 (2%)
5	7 (1%)
≥6	9 (1%)

Note. These 760 patients were seen for dental complaints in the ED of a major urban teaching hospital, some of them on more than 1 occasion, between July 1, 2010 and June 30, 2011.

Results

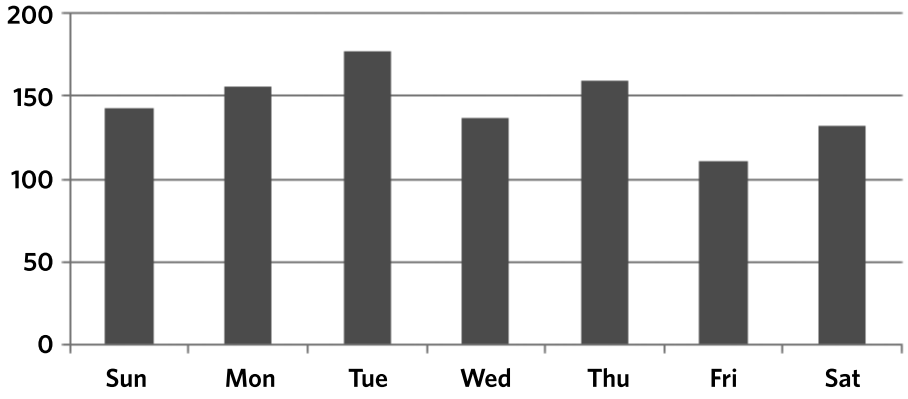
During the study year, there were 1,013 visits for dental complaints in this ED, constituting about 1.3% of the ED's overall patient volume of 77,365. These 1,013 visits were associated with 760 individual patients (Table 1); 133 patients had multiple visits totaling 386 encounters. There was no discernible pattern in day of the week on which patients visited the ED (Figure 1). Patients presented to the ED at all times of day, predominantly during the late morning and early afternoon hours (Figure 2).

Table 1 provides basic characteristics of the dental patients presenting to this ED. There was a nearly even distribution of male and female patients (52% were male). Approximately 60% of the patients were African American. The average age of ED dental patients was 32 ± 13 years. The proportion of patients lacking health insurance was greater among ED patients with dental complaints than among general ED patients (61% versus 22%, P < 0.001). The proportion of patients covered by Medicaid was about the same for both groups (22%), but the proportion of patients covered by Medicare was significantly lower among dental ED patients than among the general ED population (5% versus 25%, P < 0.001). Finally, 11% of the dental ED patients had private medical insurance.

Table 2 summarizes the evaluation, treatment, and disposition of dental patients in the ED. Of the 1,013 dental visits to the ED during the study period, 46 (4.5%) ended with the patient leaving the ED before receiving evaluation and treatment. Of the 967 visits on which the patient stayed for treatment, only 4 (0.4%) resulted in admission to the hospital for inpatient management. On 18 visits (1.9%), the patient was sent from the ED to a short-stay observation unit for less than 24 hours. On the vast majority of visits (942), the patient was treated in the ED and discharged.

ED treatment consisted primarily of pain management

FIGURE 1.
Emergency Department Visits for Dental Complaints, by Day of Week



Note. Data are for 1,013 visits to the emergency department of a major urban teaching hospital for dental complaints between July 1, 2010, and June 30, 2011.

and infection control. Only 4% of visits included a radiological study in the ED, and only 6% of visits included a blood draw for laboratory studies. Dental procedures were performed during only 10% of the ED visits.

Although many ED visits included the administration of nonopioid pain medication, about half of ED dental visits also included intravenous or oral administration of opioid pain medication. Most patients did not receive antibiotics in the ED as part of their visit. However, a large majority of ED dental visits resulted in outpatient prescriptions for oral opioid pain medication, oral antibiotics, or both.

For the 10% of visits that were abstracted by more than 1 rater, interrater agreement was calculated for the manually abstracted items. For "discharge medication" and "procedure in ED," interrater kappa was 0.95, and for "opiates in the ED" and "opiate prescription given," interrater kappa was 0.97, indicating a high level of agreement.

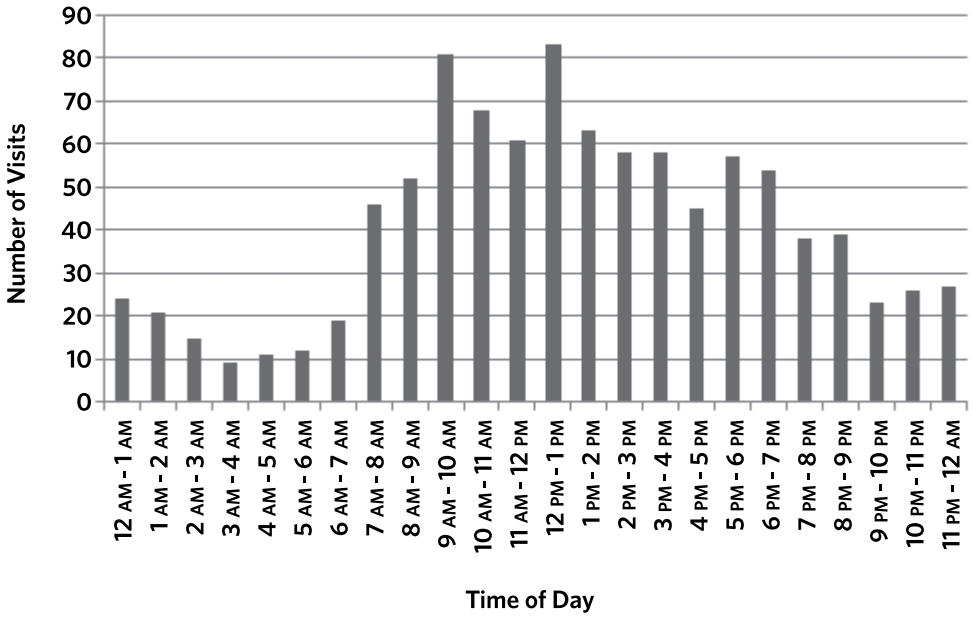
Discussion

The reasons for patient visits to the ED for nontraumatic dental pain are complex. Multiple contributing factors have been proposed, including a lack of after-hours and weekend coverage for dental care. A previous study found that in contrast to their general population, 36.2% of ED dental visits occurred on the weekend and another 39.3% occurred after hours on a weekday [2]. In our study we found that dental patients were presenting in a pattern that is similar to the pattern for all visitors to the ED, and that weekend and after-hours visits were less common. We found no evidence that patients were presenting primarily at times when most dental offices are closed.

Another claim is that many dental ED patients do not have insurance and cannot afford to pay out of pocket for acute dental care. Behavioral Risk Factor Surveillance System data for 1995 indicated that 44% of Americans lacked dental insurance and had significant difficulty accessing dental care [10]. Census data shows that the number of uninsured people in North Carolina has risen from 12% in 1999 to 17% in 2010 [11]. Because the number of uninsured patients has increased, it follows that the number of those without dental insurance would also be higher. Previous studies have shown that uninsured and Medicaid patients were more likely to utilize the ED for dental complaints than were patients with insurance [2]. Our study found that 61% of patients with dental complaints are self-pay patients. This is dramatically higher than our self-pay population that was noted to be 22% for all patient ED visits regardless of complaint. We found that dental ED patients were no more likely than all ED patients to have Medicaid coverage (22% of each group was covered) but were less likely to have Medicare coverage (5% vs. 25%). This study clearly highlights that lack of insurance is one of the most compelling reasons that many dental patients are visiting the ED. If they cannot afford acute dental care, then they are likely not getting routine preventive care, exposing them to risk for much greater long-term dental and health complications. Previous studies have shown that ED dental visits were more common in single-parent families, the poor, and minority groups [6, 12]. Our finding that 60% of all dental ED visits were made by African-American patients warrants further investigation.

North Carolina has been considering limiting or eliminating Medicaid dental coverage for adults as it attempts to balance its health care budget [13]. Medicaid is required by federal law to provide dental coverage for children; however, adult coverage is not guaranteed. In 2007, 6 states had no dental coverage for adult Medicaid patients, 16 had emergency-only coverage, and 13 had coverage that excluded at least 1 category of service. Only 16 states, including North Carolina, had all-service dental coverage for Medicaid patients [14]. In the event that North Carolina removes den-

FIGURE 2.
Emergency Department Visits for Dental Complaints, by Time of Day



Note. Data are for 1,013 visits to the emergency department of a major urban teaching hospital for dental complaints between July 1, 2010, and June 30, 2011.

tal coverage from the coverage agreement, then all of the state's Medicaid patients will become self-pay patients for their dental coverage. This would likely result in diminished preventive dental care, which would in turn result in an increased frequency of ED visits, dental complaints of higher complexity, and more dental complications.

Preventive dentistry could eliminate many ED visits for dental complaints and the sorts of dental complications that lead to hospital admission. Admissions for dental complaints are extremely costly [15], and most such admissions are preventable. Our study confirmed previously reported data indicating that the relative acuity of this population is very low [2]; the inpatient admission rate for the patients with dental complaints in our study was less than 1%, and only 1.9% of patients were sent to the observation unit. The ED is an appropriate place for triage, diagnosis, stabilization, basic treatment, and after-hours care. In most instances, definitive care was not provided during ED dental visits; the majority of care involved the provision of analgesia and antibiotics; procedures, ancillary studies, and imaging were seldom performed.

Prescription drug abuse is increasing [16], and some patients may be using dental complaints to obtain opioids. Previous research has shown that dental patients presenting to the ED are more likely to receive pain medication than is the average patient who visits the ED: in one study, 72.4% received some analgesic and 37.8% received some form of an opioid [2]. In our study, 48% of patients received a dose of opioid in the ED, and 81% received an opioid prescription.

A majority of patients in our study (627) visited the ED just once during this 12-month period for a dental complaint. However, recurrent utilization of the ED for dental complaints is becoming more pronounced, and it has become difficult to determine whether patients are returning because they cannot procure dental care elsewhere or whether they are experiencing some sort of secondary gain. In our study, 133 patients had multiple visits, for a total of 386 encounters. One of these patients accounted for 8 visits, and another had 12 visits for the same complaint. We did not try to determine whether these frequent visitors also had pain-related visits for nondental complaints, although North Carolina does have a controlled substances reporting system (http://www.ncdhhs.gov/mhddsas/controlledsubstance/) that can identify patients receiving a large number of opiate prescriptions.

We would like to acknowledge the limitations of our study. The most important is that this was a retrospective, descriptive study looking only at a 12-month period; it did not incorporate follow-up. And the results for an ED in an urban academic health center without an affiliated dental school may not be representative of what is happening at other EDs within North Carolina or beyond. However, our results resemble previously reported data for both dental-related complaints in the ED and insurance status patients making ED dental visits. Another limitation is that our investigation relied on a large database, and it is possible that some procedures, diagnoses, and end points were miscoded. For this reason we included both triage impressions as well as final

TABLE 2.
Evaluation, Treatment, and Disposition of Patients Visiting the Emergency Department (ED) for Dental Complaints

Component of Care	Visits, No. (%) (n = 967)[a]
Evaluation[b]	
History and physical exam only	886 (92%)
Radiology studies	42 (4%)
Laboratory studies	61 (6%)
Treatment	
Procedures[b]	
Dental block	59 (6%)
Incision and drainage	37 (4%)
Cavity/socket packing	5 (<1%)
Other	1 (<1%)
None	869 (90%)
Oral/IV medication[c]	
Opioid pain medication	468 (48%)
Nonopioid pain medication	150 (16%)
Antibiotic	230 (24%)
None	348 (36%)
Disposition	
Admission to hospital	4 (<1%)
Observation unit	18 (2%)
Discharge	942 (97%)
Other	3 (<1%)
Outpatient prescriptions[c]	
Opioid pain medication	779 (81%)
Antibiotic	665 (69%)
Neither	87 (9%)

[a]There were 1,013 visits made to this major urban teaching hospital ED for dental complaints between July 1, 2010, and June 30, 2011; however, 46 patients left the ED before they were seen by a provider and thus are not included in this summary.
[b]Numbers do not add up to 967 because some patients underwent both radiology studies and laboratory studies.
[c]Numbers do not add up to 967 because some patients were given or prescribed both opioid pain medication and an antibiotic.

ICD-9 codes in our query. In addition, because multiple individuals performed data abstraction, it is possible that there was interobserver variability, even though the kappa statistic for the manually abstracted items was high and abstraction was based on sound methodology as outlined by Gilbert and Lowenstein [17].

In conclusion, our findings may have important health care and health policy implications. It can be stated with confidence that the number of patients with dental-related complaints seen in the ED could be dramatically reduced if more affordable and accessible dental care were available. This and other studies have shown that patients seek acute dental care in the ED despite the unavailability of definitive care there. Although emergency physicians continue to provide appropriate safety net care—initial evaluations that exclude more severe conditions, pain control, and infection treatment—definitive care is seldom provided. It is clear that patients deserve more cost-effective therapies for acute dental-related complaints, including preventive and definitive care. NCMJ

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POLICY FORUM

Social Determinants of Health

Introduction

There are powerful determinants of health that escape the clinical exam, the sphygmomanometer and stethoscope, the venipuncture and the lab, and even the newest imaging equipment. And although these determinants can be captured through a carefully obtained family and social history, they often go unrecorded or unaddressed. Moreover, when these determinants are recognized, clinicians may throw up their hands in frustration and in defeat, as the balm of medicine rarely penetrates these wounds.

Social determinants of health such as poverty, education, housing, and community structure are typically the purview of economists, educators, human and social service professionals, business professionals, and elected and appointed government officials. They are the stuff of morning newspapers and evening news, of experts and commentators and pundits, not clinicians.

In the issue brief, Gerald and colleagues present the paradox that although North Carolina receives both national and international recognition for its innovative health care delivery systems, public-private collaborations, and public health infrastructure, the state continues to trail many other states in many health outcomes. We continue to improve our health care system making it more affordable, accessible, acceptable, accountable, and of the highest quality. Why then, do outcomes lag?

Hood and Nichol each cite the disadvantages conferred by inequities in educational, economic, and social capital. They agree that inequities in the distribution of social determinants must be addressed if disparities in health outcomes are to be narrowed. However, they debate the benefits of public or private policy initiatives and strategies. Does government intervention make a difference? And if so, should government intervention focus on programs that strengthen the social safety net or on those that lead to a more effective market?

In this issue, rather than focus exclusively on the role of government in addressing these underlying social determinants of health, we chose to highlight the science behind 3 major social determinants of health and then narrow the lense further to focus on existing initiatives in the state that are making—or have the potential to make—a real difference. The articles in this issue share the facts and tell the story of poor health status as it relates to poverty, education, and housing.

We can make improvements. Educational outcomes can be improved by early interventions that provide a smart start and by sustained educational support that improves high school graduation rates. Poverty can be addressed, at least in part, by improving job readiness and employment opportunities through enhanced training and mentoring. Safe and affordable housing can be just that—safe and affordable. Neighborhoods and communities can be engaging social networks. Last, but not least, our health care system can be more responsive to people who historically have had worse health outcomes or problems accessing health services. NCMJ

Peter J. Morris, MD, MPH, MDiv
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ISSUE BRIEF

Social Determinants of Health

Laura Gerald

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].

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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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Educational Attainment as a Social Determinant of Health

Joseph Telfair, Terri L. Shelton

A review of the current literature on the relationship between health outcomes and level of education provides points for consideration by providers and policymakers wishing to address social and economic determinants of health and health disparities.

Historically, certain groups of people (mostly minorities, poor people, and those living in regions where care is geographically sparse) have had less access to health care and have been less likely to utilize the care available to them. Figuring out how best to address such disparities in health care continues to be of importance to providers, administrators, scientists, and policymakers. Knowledge of the social and economic determinants of the disparities is critical for building evidenced-based solutions for their mitigation [1]. The Centers for Disease Control and Prevention, drawing on a World Health Organization report [2], explains that the social determinants of health are the

> complex, integrated, and overlapping social structures and economic systems that are responsible for most health inequities. These social structures and economic systems include the social environment, physical environment, health services, and structural and societal factors. Social determinants of health are shaped by the distribution of money, power, and resources throughout local communities, nations, and the world [3].

The North Carolina Institute of Medicine (NCIOM) Task Force on Prevention in a 2009 report recognized that a person's level of educational attainment is strongly related to his or her well-being and health status [4]. David M. Cutler and Adriana Lleras-Muney summarized the evidence in a policy brief for the National Poverty Center (2007) [5]: they noted that the research showed that better-educated people have lower death rates from common chronic and acute conditions, even after adjusting for demographic and employment factors. Further, the differences in life expectancy for those with and without a college education has widened over time. Differences in health behavior cannot account for all of the differences in health outcomes between those with more education and those with less. The ways in which education affects health are complex and include

> interrelationships between demographic and family background indicators, effects of poor health in childhood, greater resources associated with higher levels of education, a learned appreciation for the importance of good health behaviors, and one's social networks [5].

Unfortunately, our system of mass public education does not work equally well for everyone. Those with poor academic performance are likely to have lower educational attainment. This in turn decreases upward mobility and affects a person's health status.

Early childhood education can instill lifelong beliefs and behaviors that promote good health outcomes. However, the likelihood that a child will experience interventions designed to instill those beliefs and behaviors depends on his or her social, educational, and economic circumstances [6]. Challenges to the development and implementation of effective early intervention programs and services are complex and multifactorial, but they can be mitigated by programs such as the Healthy Start program of the Department of Health and Human Services [7] and North Carolina Smart Start [8]. Access to such programs varies, and efforts to encourage greater participation are needed.

The health disparities between the more and the less educated are significant. In 1999, the age-adjusted mortality rate of high school dropouts ages 25 to 64 was more than twice that of those with some college [9]. Using data from the National Health Interview Survey and matching respondents with death certificates obtained through the National Death Index, Cutler and Lleras-Muney found that individuals with higher levels of education were less likely to die within 5 years of having been interviewed [10]. This association remained substantial and significant even after controlling for job characteristics, income, and family background. This suggests that policies that improve educational outcomes for individuals have the potential to substantially improve health.

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Positive Behavior Intervention and Support:
Improving School Behavior and Academic Outcomes

Heather R. Reynolds

As a student, did you ever get into trouble for your behavior? For a number of students, the irritation and anxiety of being "in trouble" are a reality of school. Whether as a result of cultural differences, behavioral health challenges or just a lack of experience in a new setting, many students in our public schools experience these unpleasant feelings every day, in a place they are mandated to go. The stress this produces can further exacerbate school difficulties.

Schools are constantly looking for ways to improve outcomes for students, and over the years teachers and administrators have tried a myriad of interventions to improve students' academic and social behavior. One strategy currently being employed in North Carolina is Positive Behavior Intervention and Support (PBIS). PBIS is an evidence-based framework for school improvement based on a structured problem-solving model [1]. Schools implementing PBIS are taught to collect and analyze data, especially data related to student behavior, in order to identify areas needing improvement. Once challenges have been identified, school teams work to identify, teach, and reinforce desired behaviors and to extinguish problem behaviors. Throughout this process, schools use their own data to inform the ongoing implementation of strategies and systems to improve school climate and academic performance. By improving student behavior, schools decrease disruptions in the learning environment, thereby giving teachers and students more high-quality instructional time. When PBIS is paired with the use of effective instructional strategies, schools experience improvements in student academic performance in addition to improvements in student behavior and overall school climate [2].

One of the hallmarks of PBIS is its emphasis on providing direct instruction regarding schoolwide behavior expectations. Rather than assuming that students arrive already in possession of the behavioral skills necessary to successfully function in a school environment, schools teach socially appropriate behavior to all students. When there is a uniform standard for behavior across school environments, consistency is improved, which further aids student success. Increased consistency and clear expectations serve to decrease anxiety and stress by making the environment predictable. Once school-wide behavior expectations are firmly established, schools are able to identify students who may need additional behavioral support to be successful. School teams identify the specific behavioral skills that students need to improve by reviewing data about these students' behaviors. Once the particular skills are identified, school staff may provide differentiated behavior instruction, opportunities to practice the needed skills through role play, or additional cues or reminders to the students about when they should use particular skills. Such support may take any of a variety of forms, including behavioral instruction in small groups, more frequent behavior coaching from adults, or a highly specific individualized plan tailored to address the support needs of one student. This type of multitiered instruction is considered best practice in schools across the country.

Schools in North Carolina that have implemented PBIS have experienced changes in school climate and student outcomes that are in keeping with national trends for PBIS implementation [2]. PBIS schools have realized reductions in office discipline referrals (trips to the principal's office for a behavior problem) and suspensions as well as improvements in academic performance [3].

There is a relationship between educational level and health for both chronic conditions and acute ones, but the magnitude of the relationship is generally greater for chronic conditions [1]. Among adults 25 years of age or older, an additional 4 years of education lowers 5-year mortality by 1.8 percentage points (from 11% to 9.2%); it also reduces the risk of heart disease by 2.2 percentage points (from 31% to 28.8%) and the risk of diabetes by 1.3 percentage points (from 7% to 5.7%) [5].

As we have noted, better-educated persons have lower morbidity from the most common acute and chronic diseases (heart condition, stroke, hypertension, high cholesterol, emphysema, diabetes, asthma, and ulcers) [5, 10]. Educational attainment has been shown to have a significant protective effect on the risk for stroke and myocardial infarction, independent of socioeconomic status and other cardiovascular risk factors. Researchers in the Department of Neurosurgery and Toshiba Stroke Research Center at State University of New York, Buffalo, evaluated the relationship between education level (12 years or more of education versus less than 12 years) and the incidence of fatal stroke, ischemic stroke, intracerebral hemorrhage, and myocardial infarction [11] in a cohort of 21,443 United States adults who had participated in 1 of 2 large survey follow-up studies. During a mean follow-up period of 15.2 years, the risk for all fatal strokes increased in persons who reported less than 12 years of education; those with less education also had higher risks of myocardial infarction and of fatal intracerebral hemorrhage [11]. In combination with higher income, higher levels of education can also protect against risk factors for atherothrombotic (coronary, cerebrovascular, and/or peripheral arterial) disease: In a large multinational study, Goyal and colleagues [12] found that attained education level was protective against risk factors such as obesity, smoking, hypertension, and baseline burden of vascular disease in high-income countries such as the United States, but not in countries where income was low or moderate.

PBIS schools in North Carolina have documented reductions in suspension rates over a 7-year period [3, 7]. After office discipline referrals for 1 outlier school in North Carolina were removed, during the 2010-2011 school year the mean office discipline referral rate was lower in PBIS schools in North Carolina than in PBIS schools nationally [3-6]. For North Carolina schools implementing PBIS with high levels of fidelity, the average achievement rate on end-of-year academic performance measures was higher in 2011 than it had been at the same schools in previous years [3]. And in 2011 the average graduation rate for high schools that had been implementing PBIS for at least 4 years was higher than the statewide graduation rate, not only for the general student population but also for students with disabilities [3]. Other schools implementing PBIS have shown improvements both in overall academic performance and in closing the achievement gap for underperforming groups [3]. More than 40% of schools across the state have received PBIS training, and as this proportion increases, these data trends are expected to continue. As implementation spreads and improves, schools will become places where students can thrive and grow because they no longer need to worry about getting into trouble. NCMJ

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People with more education are less likely to have diabetes [5, 10]. Diabetes is especially common among disadvantaged groups, including persons without a high school diploma. A study by Reither and colleagues [13] using Utah data from the Behavioral Risk Factor Surveillance System between 1996-1999 and 2004-2007 found significant inverse associations between educational attainment and the odds of having diabetes. Women with a college education were found to be 27% less likely than women with a high school education to have diabetes. Well-educated men and women exhibit lower rates of diabetes than those with less education, and these disparities have not changed appreciably over the past decade [13].

Those with more education are healthier both mentally and physically. They are substantially less likely to report that they are in poor health or are experiencing anxiety or depression [5]. Having an additional 4 years of education lowers the probability of reporting oneself to be in fair or poor health by 6 percentage points (from 12% to 6%) and reduces the number of days of work lost to sickness each year by 2.3 days (from 5.2 days to 2.9 days) [5]. Better-educated people report spending fewer days in bed or not at work because of disease, and they have fewer functional limitations [10]. In short, higher levels of education yield better health, and with each increase in level of education (eg, from high school to college, or college to graduate school), there appears to be a positive change in health status [5].

The fact that people who are better educated have lower morbidity rates from the most common acute and chronic diseases is due in part to the fact that education level and educational achievement play a role in determining what sort of job or career one has, which in turn directly correlates with one's financial or socioeconomic status. Education is perhaps the most basic component of socioeconomic status, because it shapes future occupational

Personalization to the Highest Power

Colleen C. Pegram

SandHoke Early College High School (SHECHS), nestled between a turkey plant and a hatchery off Highway 401 Business in Raeford, North Carolina, is 1 of 2 high schools in Hoke County. SHECHS is innovatively designed, and the other school is traditionally designed, but both have the same mission: that every student graduate from high school ready for college or a career in a globally competitive world and prepared for life in the 21st century. Both schools have high expectations of faculty to ensure that this educational mission is achieved, and both expect students to be active participants in their education.

There are distinct physical differences between the 2 schools. The traditional high school is sprawled across 2 city blocks and is attended by nearly 2,000 students, whereas SHECHS occupies only 1 of 3 buildings on a satellite campus of Sandhills Community College; students must apply for entrance, and total freshman enrollment each year is limited to 75 students. The total SHECHS enrollment in the 2012-2013 school year is 256 students. (Freshman enrollment originally was limited to 55 students and increased over time to the present limit of 75 students). Required high school classes are taught in 1 building, housing 9 classrooms, and students also take some college classes on the main Sandhills campus. The small satellite campus, small number of students, and small staff facilitate increased personalization—the tailoring of teaching methods, curriculum, and learning environment to meet the needs of individual learners.

State Superintendent of Public Schools June Atkinson has identified instructional improvement as one of the comprehensive strategies for remodeling public education in North Carolina in order to move the state forward. The North Carolina New Schools Project has identified personalization as 1 of 6 design principles that are essential for school success. SHECHS is using personalization as a launching pad to achieve its vision and accomplish its mission.

SHECHS recruits students whose caretakers, parents, or guardians have not earned a 2-year or 4-year college degree, and for the past 4 years such students have made up 77% of the freshman class at SHECHS on average. These students have been targeted with an eye to increasing their chances of graduating from high school and college. In the Early College program—a 5-year program that begins in 9th grade and includes a second senior year—students are given the opportunity to earn a 2-year college degree free of charge while they are earning their high school diploma.

To persuade SHECHS students that they can go to college and be successful, staff members must connect with them in ways that go beyond textbooks, test scores, and grades. Purposeful personalization is the best way to reach students. Staff members must be innovative in developing and sustaining positive relationships with students by providing them with effective academic support, using a variety of strategies for increasing students' academic success.

An intervention professional learning community has been set up at SCHECH, and the school's teachers and counselors participate in its monthly meetings, where the focus is on finding effective academic interventions for students needing additional help. The professional learning community looks for early warning signs that a student may not succeed, and as a team, the teachers and

opportunities and earning potential. Education also provides knowledge and life skills that allow better-educated persons to more readily gain access to information and resources that promote health [9].

Individuals 25 years of age or older who have an additional 4 years of education also report more positive health behaviors [5]. Cutler and Lleras-Muney note that having an additional 4 years of education reduces the risk that one will smoke from 23% to 12%. People with the additional education also are less likely to report excessive drinking (5 or more drinks in 1 day). Those with more education report drinking to excess 4 days per year on average, compared with 11 days per year for those with less education. The risk of obesity is also reduced for those with more education, from 23% to 18%, and they are at slightly less risk of using illegal drugs (4.9% versus 5.0%) [5]. The authors note that differences in health behaviors alone cannot explain all of the disparities in health outcomes between the better educated and the less educated. Nevertheless, Cutler and Lleras-Muney point out, "an almost linear negative relationship exists between mortality and years of schooling and between self-reported fair/poor health status and years of schooling" [5]. And for some outcomes (functional limitations and obesity, for instance) the positive impact of education is even greater for those with some postsecondary education [5].

The correlation between educational achievement and health declines after a person reaches about age 50 or 60 [5, 10]. Cutler and Lleras-Muney suggest several possible reasons for this [5, 10]. Although less educated people are less likely to survive into older age, those who do survive are relatively healthy. Therefore, they may have been more similar to those who are better educated. It is also possible that education has become more important to health outcomes only in recent years. Further, the association between education and health may decrease after adults retire.

There are multiple reasons for these associations between level of education and health outcomes, although it is likely that they are in part the result of differences in

counselors look for the root causes contributing to the lack of success and devise viable strategies for assisting the student and increasing effective student behaviors. An intervention pyramid, consisting of 4 tiers of intervention ranging from basic to intensive, is employed. For example, tier 1 includes teacher-student conferences and student reflection and goal setting; tier 2 includes peer tutoring and counselor consultation; tier 3 includes intervention team conferences and continued enrollment in high school courses but no college courses; and tier 4 includes a focus on high school diploma completion and graduation. Most students initially perceive intervention as "being fussed at" by the faculty. Only later on, when they become successful, do these students realize that the intervention was carried out because adults cared. SHECHS students are expected to do more than "just get by." Faculty do not allow students to fall through the educational cracks!

Intervention strategies are essential, and so is recognition of student achievement. Every month one "College-Ready Student of the Month" is selected in each grade 9 through 11. Similarly, a student in grades 12 and 13 is selected as "College Student of the Month." The bulletin boards are filled with news articles on student achievement. Recognition is a priority, not an afterthought.

Student involvement in the school decision-making process is also important. Students are included in the school improvement process. They provide input when teachers are hired. And students are allowed to select their afterschool activities.

The simplest personalization strategy is for all of the staff members (including the principal, administrative staff, teachers, counselors, college liaison, child nutrition staff, and custodian) to get to know all of the students. SHECHS accomplishes this with seminars, clubs, and tutoring. In addition, staff members greet students with a smile every day. Sitting down and talking with students at breakfast or lunch, playing a game of basketball with them, or strolling along the campus talking with them achieves more positive results than disciplinary measures such as suspensions or detentions could ever accomplish.

The focus on personalization at SHECHS has resulted in measurable student achievement. SHECHS has graduated 2 classes totaling 73 students. Of those who graduated, 52 earned both a high school diploma and an associate degree; 43 transferred to a 4-year university in North Carolina; 14 continued their studies at Sandhills Community College; 2 transferred to Fayetteville Technical Community College; 1 transferred to a dentistry career program; and 5 entered the workforce or enlisted in the military.

Is personalization everything? No—there are 5 additional New Schools Project design principles (www.newschoolsproject.org), and the North Carolina remodeling plan for public education includes 3 additional comprehensive instructional improvement strategies, all of which contribute to student success (www.ncpublicschools.org/ready/). At SHECHS, however, personalization is the foundation for continued student success. Personalization strategies have created a learning environment there in which everyone thrives and students are empowered to succeed. NCMJ

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behavior across education groups. The relationships that have been found between level of education and various health risk factors—smoking, drinking, diet/exercise, use of illegal drugs, household safety, use of preventive medical care, and care for hypertension and diabetes—suggest very strongly that people who are better educated have healthier behaviors, although some of these healthier behaviors may also reflect differential access to care. As we have mentioned, those with more years of schooling are less likely to smoke, to drink heavily, to be overweight or obese, or to use illegal drugs [5]. Interestingly, although they report having tried illegal drugs more frequently than do the less educated, they also report having given up using illegal drugs more readily [9, 10].

The effect of level of education on health seems to be the same for both men and women across most outcomes; depression is one of the few exceptions [5]. It is not known whether such exceptions are the result of biological sex differences, or of differences in the behavior of men and women. The effect of level of education on health also appears to the same for both whites and blacks, again with a few exceptions. Whites tend to experience more positive health benefits from educational advancement in reported health status; they are less likely to report being in fair or poor health than are blacks with the same level of education. Cutler and Lleras-Muney also found that the impact of additional years of education was greater for those not living in poverty than for those who were poor [5]. This highlights the interrelationships among those variables considered to be social determinants. Educational attainment alone is not an independent driving factor for improved health status. An individual with a 4-year college degree who is living in poverty might have considerably worse health than an individual with such a degree who is well off financially.

Many of the social factors that affect health have both independent and interactive effects. For example, people with higher incomes are more likely to live in safe, healthy

Links Between Early Educational Experiences and Later Achievement Outcomes

Elizabeth Pungello, Kelly Maxwell

The evidence is in: High-quality early learning experiences in childcare and preschool settings can have very long-lasting effects on educational achievement for individuals at risk for poor outcomes due to poverty—effects that persist all the way to graduation from college. Some of the best evidence for this was obtained in a study conducted here in North Carolina; it began in the early 1970s, and follow-up is still ongoing.

The Carolina Abecedarian Project is a randomized control trial of the effects of early education in a childcare setting for children raised in poverty. Half of the children in the trial were assigned to a group that participated in an early childhood program from infancy through age 5, and half were assigned to a control group; children in the control group experienced any combination of home and/or community childcare that their families needed and were able to obtain [1]. Four cohorts of children born between 1972 and 1977 participated. A total of 111 children were enrolled and randomly assigned to the treated or control group. The childcare program, housed at the Frank Porter Graham Child Development Institute in Chapel Hill, had many of the features that constitute high-quality care, such as good caregiver-to-child ratios, well-trained and well-compensated teachers, and a developmentally appropriate, individualized curriculum. The children who were in the program and control groups have been assessed in a series of follow-up studies—at age 12, age 15, age 21, and most recently age 30—which demonstrated that the early learning experiences offered to the children in the program group have produced long-term positive effects. Of the 111 originally enrolled, 57 were randomly assigned to the treated group and 54 were assigned to the control group. By age 5 (end of the program), 105 children were still participating in the study (4 were deceased, 1 was withdrawn, and 1 was found to be ineligible due to biological conditions not apparent at birth). At age 21, all 105 living and eligible study participants were located, 104 agreed to participate. In the most recent age 30 follow-up, 2 more participants had died, leaving 103 living and eligible. Of these, 101 participated at age 30 (52 in the treated group and 49 in the control group). The strong scientific features of the study (eg, randomized assignment, low attrition) allow for greater confidence in the findings.

Children in the program group entered elementary school with higher cognitive abilities than those of children in the control group [1] and also appeared to be more engaged with people and objects in their environment [2]—that is, they were more "ready" for school success. Then in primary and secondary school they consistently demonstrated higher academic achievement in both reading and math than did children in the control group [3], a difference that was maintained through young adulthood. Furthermore, when individuals who had been in the program group reached early adulthood, they were more likely to attend a 4-year college or university [4]. Exciting findings recently reported from the age 30 follow-up showed that not only were those who participated in the childcare program more likely to attend college, they were also 4 times more likely to remain in college and graduate than were those in the control group [5].

Given this evidence that early learning experiences can influence educational achievement for poor children, what are we doing now in North Carolina to increase the opportunities of young children living in poverty to receive high-quality early learning experiences? And what outcomes have been associated with those efforts?

One major initiative is the North Carolina Pre-Kindergarten (Pre-K) Program (formerly known as More at Four). The purpose of this state-funded program is to provide a high-quality educational experience in a class-

homes in good communities with high-quality schools. Persons who are poor are more likely to live in substandard housing or in unsafe communities. Their communities may lack grocery stores that sell fresh fruits and vegetables or lack access to outdoor recreational facilities where people can exercise. Children who grow up in poverty generally fare worse in school and end up, on average, with fewer years of education than those in families with higher incomes [1]. Health-related factors such as hunger, physical and emotional abuse, and chronic illness can lead to poor school performance [14]. All of these factors combine to shape a person's health experience across the lifespan.

What is known is that mitigation of many of the social determinants of health disparities and their consequences results from ongoing proactive efforts aimed at improving the overall quality of life of persons in at-risk groups, beginning early in life [15-17]. Some types of improvement efforts, such as the creation of jobs or the placement of parks or grocery stores, are beyond the scope of clinicians and other health care providers. However, ongoing efforts are being made to improve access to health care. For example, resources can be provided to expand health insurance coverage and health care in under-resourced communities.

Academic success is an excellent indicator for the overall well-being of youth and is a primary predictor and determinant of adult health outcomes [18-20]. Addressing the role of educational attainment early in a person's life is critical, and the earlier this begins the better. The Community Preventive Services Task Force, created by the US Department of Health and Human Services to evaluate evidence and make recommendations about effective community-based interventions, has recommended the

room setting the year before entry into kindergarten for children at risk of reduced school readiness because of such factors as low family income, low English proficiency, disability, or chronic health condition [6]. To date, more than 167,000 children have participated. A recent study conducted at the Frank Porter Graham Child Development Institute investigated the early school-readiness skills associated with participation in the Pre-K Program using a quasi-experimental study design and found that program participation is associated with higher school-readiness skills at kindergarten entry [6]. Children who participated in the Pre-K Program had better language/literacy skills (ie, knowledge of letters and words, phonological awareness, print knowledge) and better math skills (counting abilities and the ability to solve applied math problems) than did children who had not participated. These results demonstrate that this initiative to provide high-quality early learning experiences to North Carolina children at risk for poor achievement outcomes is improving the school-readiness skills of those children.

North Carolina has also emphasized quality by integrating a Quality Rating and Improvement System into its childcare licensing system (the North Carolina Star Rated License system). In addition, the state uses a range of resources and supports (eg, Smart Start, T.E.A.C.H. [Teacher Education and Compensation Helps] Early Childhood®) to promote quality improvement in early care and education settings. Last year's legislation changing the policy regarding which early care and education programs are eligible to receive childcare subsidy funding also emphasized quality, ensuring that children from low-income families receive high-quality early care and education [7].

North Carolina is a national leader in its work to ensure that young children have access to high-quality early learning opportunities. The Early Learning Challenge grant recently awarded to the state will help North Carolina continue to strengthen its early childhood system so that all children, particularly those with high needs, have access to high-quality early learning environments. Continuing efforts are needed to provide the high-quality early opportunities that will help *each* child in North Carolina grow up to be a productive, successful citizen of the state. NCMJ

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establishment of comprehensive, center-based programs for low-income children ages 3 to 5 years. Effective and evidence-based early childhood programs that support early learning opportunities result in improved school readiness, less grade retention, and fewer placements in special education classes [21]. Cutler and Lleras-Muney [10] and others [22, 23] also recommend that the quality of schools be improved. In addition, Cutler and Lleras-Muney promote policies to expand college attendance [5].

Schools can play an important role in promoting the health and safety of young people and helping them establish lifelong healthy behaviors. Studies suggest that school health programs can have positive effects on educational outcomes, health-risk behaviors, and health outcomes [22, 24]. Similarly, programs that are primarily designed to improve academic performance are increasingly recognized as being important public health interventions [11, 13]. Leading national education organizations recognize the close relationship between health and education, as well as the need to foster health and well-being within the educational environment for all students [19-21, 25, 26]. NCMJ

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Poverty and Health:
Focus on North Carolina

Christopher Mansfield, Lloyd F. Novick

The association between poverty and poor health is substantial and the effects are experienced over a lifetime; they are borne most heavily by children. Mitigation requires a public health approach, intervening upstream to increase economic opportunity and invest in early childhood development, healthy communities, education, nutrition, and preventive health services.

The relationship between poverty and health has long been documented in the literature of medicine. In 1848, Rudolph Virchow, the father of pathology, compared mortality rates of the aristocracy in Berlin with those of the poor. Speaking of the poor, he said,

> They are supposed to pray daily "and give us this day our daily bread and a long life on earth," but they are not to know that long life is a monopoly of princes and counts and of the fanatics of tranquility [1].

The relationship between poverty and health in the United States was highlighted in the 1960s as part of the War on Poverty and has been studied for the past 50 years [2, 3, 4].

Americans living in poverty have poorer health outcomes than do other Americans. Despite high levels of spending on health care, the United States is at the bottom of the list of developed nations with respect to key health measures such as life expectancy and infant mortality [5]. What accounts for the paradox of a high monetary investment in health care not being matched by high marks for health status? To a large extent, this state of affairs is attributable to the adverse effects on health of poverty and the inequitable distribution of wealth.

The phenomenon of poverty being associated with poor health outcomes is particularly evident in North Carolina, as we will document by analyzing vital statistics, census data, and what residents have reported in surveys about their health. The national recession of 2008-2009 brought increased joblessness and income inequality to North Carolina, which had the fourth highest unemployment rate in the nation in May of 2012 [6]. The economic situation in the state continues to be unsatisfactory and has accentuated wealth inequality, leading to adverse health effects.

A 2002 report from the Institute of Medicine of the National Academies concluded that Americans today "are healthier, live longer, and enjoy lives that are less likely to be marked by injuries, ill health or premature death" [7]. However, these gains have not been shared fairly by all members of society. Elevated death rates for the poor are evident for almost all of the major causes of death and for each major category of health problem, including infectious, nutritional, cardiovascular, and metabolic diseases, as well as cancers and injuries [8]. National Health Interview Survey (NHIS) data show that the prevalence of nearly every measured acute or chronic condition is higher in low-income children than in other children [9]. Larson and Halfon analyzed data from the 2003 National Survey of Children's Health, controlling for race/ethnicity, age and sex of child, family structure, and health insurance coverage, and found that children in the lowest-income families were at least twice as likely as those in the highest-income families to have diabetes, headaches, ear infections, learning disabilities, behavior or conduct problems, and speech problems [10].

Superior health among the affluent is evident within various population groups at birth and continues throughout adulthood. For adults in the United States who are 45-64 years of age, there is a sharp gradient, with those at higher income levels being less likely to have 2 or more chronic conditions [11].

What explains the relationship between poverty and ill health? The poor get sick and the sick get poor. The mechanisms by which poverty affects health include a lack of sufficient resources with which to obtain food and shelter; financial, geographic, and cultural barriers to access to care; unhealthy behaviors such as unhealthy food choices, physical inactivity, smoking, and alcohol or drug abuse; social ordering and psychological characteristics, including stress, depression, and hostility; lack of education; unhealthy social and physical environments; and high costs of care that can impoverish any but the ultra-wealthy. Explanatory factors include unhealthy eating habits (because of the expense or

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The Job Boost II Subsidized Employment Program

Gwendolyn H. Cohen

Over the last three years, Mecklenburg County created various subsidized employment programs to assist Work First participants with obtaining jobs. Work First is part of the Temporary Assistance to Needy Families (TANF) program. A subsidized employment program offers its participants an opportunity to discover or enhance occupational skill sets and to establish a viable work history. It also prepares them to secure unsubsidized employment with the goal of attaining sustainable self-sufficiency. Participating employers receive payroll assistance in return for developing and mentoring an underemployed workforce.

As a result of the success of Mecklenburg County's initial subsidized employment initiatives—the Opportunity Project (2009) and Job Boost I (2010)—the North Carolina Department of Health and Human Services expanded the program to Job Boost II. Like its predecessors, Job Boost II offered valuable employment experience in real work environments to Work First participants whose income was less than 200% of the federal poverty guidelines and who were considered work-ready. These subsidized employment programs operated in other counties as part of their TANF programs in addition to Mecklenburg county.

The objectives of the program were 2-fold. Job Boost II gave eligible individuals a chance to acquire or enhance viable skill sets and to establish a credible work history over a 20-week period. The program also assisted clients in moving toward self-sufficiency. The long-term goal was for citizens receiving state-supported financial assistance to become self-sufficient. The average wage of a Job Boost II participant was $8.18 per hour. The Job Boost II Program was implemented from July 2011 through May 2012. The program ended as funding was not allocated in the recent state budget.

Originally, the entire program budget was $1.32 million, and the goal was to find placements for 200 individuals. However, 200 placements were made within the first 3 months, so Mecklenburg County was awarded an additional $660,000 to fund another 100 placements. Ultimately 453 placements were made, and 93 participants were permanently hired when their placement ended. After covering administrative costs, Job Boost II used all of its resources to fund 75% percent of the wages of program participants; participating employers were responsible for paying the remaining 25% of each participant's salary. Administrative costs included the salaries of the Job Boost Team, which consisted of a program manager, a social worker, an administrative assistant, and a part-time research/data analyst.

Job Boost II was housed in the Community Resources Division of Mecklenburg County's Division of Social Services (DSS). The program's success relied heavily on the collaborative efforts between the Job Boost II staff, DSS Work First teams, community partners, and 2 staffing agencies (referred to as "job developers"). Program participants were given practical occupational experience and a chance to boost their overall quality of life. Community partners helped participants acquire the skills needed for job readiness and job preparedness. Job developers located employers willing to invest in the development of a less skilled workforce. The DSS Job Boost II and Work First teams assisted clients with support services and interventions.

Participating in Job Boost allowed clients to see

unavailability of wholesome food) and the absence of safe public recreation, which encourages a sedentary life style. In their study of neighborhood of residence and coronary heart disease, Diez Roux and colleagues list the following as characteristics of poor neighborhoods: danger, high crime rates, substandard housing, few or no decent medical services nearby, low-quality schools, little recreation, and almost no stores selling wholesome food [12]. Income, education, and environment do influence health disparities. The life expectancy of residents of Montgomery County, Maryland, a wealthy suburb of Washington, DC, is 9 years greater than that of residents of Washington, DC [13].

Children are more likely than other age groups to be members of families with incomes at or below the federal poverty guidelines [14]. The Adverse Childhood Experiences (ACE) study demonstrated a relationship between severe adverse experiences in childhood and the risk behaviors and diseases that are the leading causes of death in adult life, including ischemic heart disease, chronic lung disease, cancer, depression, alcoholism, and smoking [15]. Food insecurity is another factor that has an adverse effect on the health of young children [16].

Importantly, Marmot and Bell emphasize that although much of the discussion about health disparities in the United States centers on racial/ethnic differences, those health disparities are actually more the result of disparities in socioeconomic level and fairness in distribution of societal resources [13]. Both Marmot and Bell [13] and Wilkinson and Pickett [17] have postulated that the prevalence of poor health is related to inequality in wealth rather than to absolute levels of wealth. They contend that the problem is not caused by lack of income but where one's income stands in relation to that of others. Despite the high per capita income of the United States, it does not have fewer health problems than do many less well-off countries. Poorer people in developed countries have death rates 2 to 4 times greater than those of affluent people in the same country [18].

Median household income, median net worth, metrics of income inequality, and the poverty rate are all useful measures. The poverty rate is widely used. Poverty is a relative term, generally meaning an insufficiency of means for subsistence. The federal poverty guidelines for 2012 is $11,170 per year for an individual and $23,050 for a family of four [19].

themselves as having the ability to be self-sufficient and independent. After obtaining her goal of permanent employment, a client said that being in the subsidized employment program had enabled her to stop being dependent on government assistance and to take care of her children and pay her bills.

One unique component of the Mecklenburg County Job Boost II Program was built-in case management for its participants: The program employed a full-time Job Boost social worker whose primary objective was to help clients. In collaboration with Work First and employment social workers, the Job Boost social worker helped clients overcome such barriers to success as problems with transportation or child care or a domestic situation; supported clients and employers through site visits and on-site interviews regarding client performance, attendance, and attitude; and provided positive reinforcement throughout the client's Job Boost II work experience. For many clients, the case management component was crucial to their success.

A client who is now taking classes that will count toward an Associate Degree in Human Services stated that being placed in subsidized employment through Job Boost had helped her realize what she wanted to pursue as a career, adding,

> I am now more comfortable in talking with others and sharing information about my life experiences. I am also in a position to take care of my own financial responsibilities.

Community partners, job developers, and the Job Boost II team had access to Sepweb, a database designed specifically to store and process the demographic, personnel, eligibility, and program history of individuals who qualified for subsidized employment. Sepweb matched potential clients with employment openings, which according to one job developer made the job placement process "more targeted and effective." Data from Sepweb was used to produce weekly reports for the respective DSS teams and monthly reports for the North Carolina Division of Social Services.

Job Boost II received 2 awards from the National Association of Counties—an Achievement Award and Best of Achievement Category for 2011-2012. NCMJ

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Editor's Note: When we first invited Ms. Cohen to submit this sidebar, the Job Boost II program was in operation. As noted, funding no longer exists for the program and it has since ceased. However, we decided to publish this sidebar as an example of a subsidized employment program because of the potential such programs have to help low-income people gain employment.

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In 2010, 17.5% of the population of North Carolina had an income below the federal poverty guidelines [20], compared with 15.3% of the US population [21]. The poverty rates for both the state and nation had increased over the preceding decade, up from 13.2% and 11.3%, respectively, in 2000 [22]. There is great disparity across the state. Current comparable estimates of poverty rates by county in North Carolina range from 8.5% to 30.2% [23]. Wealth, a corollary to poverty, is not accurately or regularly measured at the state or county level. However, at the national level, median net worth dropped by more than 39% between 2007 and 2010, from $126,400 to $77,300 [24].

Median household income is known to be an important health risk factor, irrespective of race or ethnicity [25]. The median household income in North Carolina was $43,326 in 2010 [26]; that figure is 13% lower than national median household income of $50,046 and is 6.9% lower than the $46,549 that it was in North Carolina in 2008, a peak before the recession [27]. The relationship of household income to health has been found to be substantial using both subjective and objective health outcome measures. Data from the 2010 Behavioral Risk Factor Surveillance System (BRFSS) show that 46.3% of North Carolinians in households earning less than $15,000 a year reported themselves to be in fair to poor health, compared with 10% of those earning $50,000-$74,999 per year and 5% of those earning $75,000 or more per year. The gradient is linear (see Figure 1).

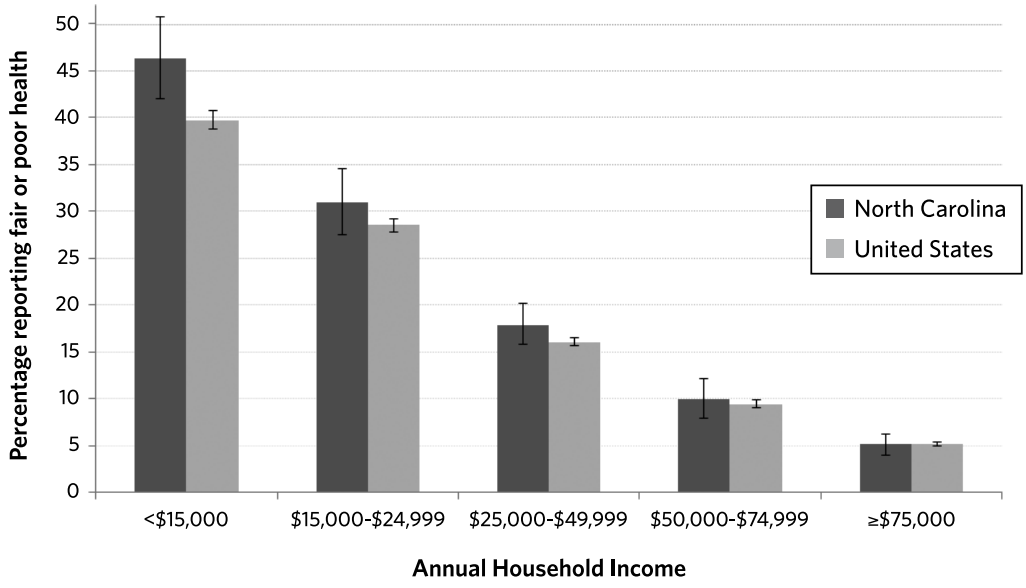
Median household income and the poverty rate are the 2 most useful measures to weigh against health outcomes such as mortality rates. The premature mortality rate—the number of years of life lost before age 75 per 10,000 population—is a particularly good summary measure. North Carolina ranks 36th among the states in premature mortality [28].

The associations between various types of mortality and economic risk factors observed across the 100 North Carolina counties are presented in Table 1. Using Pearson product moment correlation, all of the types of mortality shown in the table were found to correlate with the poverty rate and with median household income. The strongest correlations were between premature mortality rate (using 2009 data) and poverty rate (a positive correlation, $r = .599$, significant at the 0.01 level, 2-tailed) and between premature mortality and median household income (a negative correlation, $r = -.646$, significant at the 0.01 level, 2-tailed).

As Figure 2 shows, as the poverty rate (the percentage of the population with a household income below the federal

poverty threshold) for counties in North Carolina increases, so does the premature mortality rate; and as the median household income for a county goes up, the premature mortality rate goes down. The relationships between poverty and premature mortality in the North Carolina counties are evident in the scatter plot and the maps of the 2 variables in Figure 2. Higher poverty rates and higher premature mortality rates are indicated by progressively darker shading of counties on the maps. The data points in the scatter plot indicate the values for each county for each of the measures.

FIGURE 1.
Percentage of Adults Reporting Themselves To Be in Fair or Poor Health in 2010, by Household Income



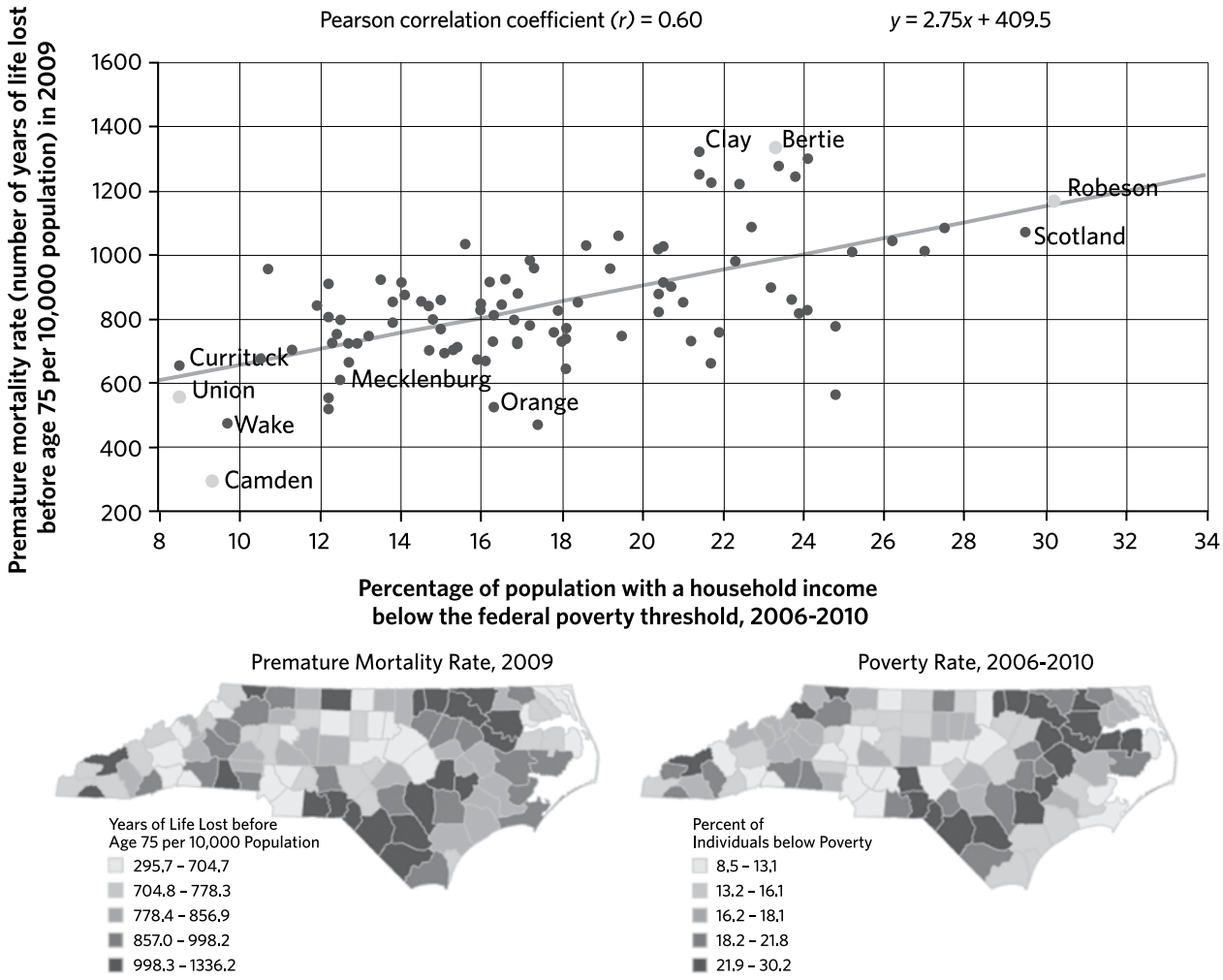
Note: Error bars indicate 95% confidence intervals.
Source of data: 2010 Behavioral Risk Factor Surveillance System, Centers for Disease Control and Prevention.

TABLE 1.
Correlations among Poverty, Median Household Income, Health Insurance Coverage, and Mortality Rates in North Carolina

Factor	Median house-hold income[a]	% of population 18 to 65 yrs old without health insurance[b]	Premature mortality[b]	All-cause mortality[c]	Heart disease mortality[c]	Cancer mortality[c]	Stroke mortality[c]	Diabetes mortality[c]	Infant mortality[d]
% of population with income below federal poverty threshold	-.816**	.497**	.599**	.572**	.596**	.274**	.462**	.477**	.373**
Median household income		-.590**	-.646**	-.487**	-.478*	-.167	-.405**	-.314**	-.308**
% of population 18 to 65 yrs old without health insurance			.302**	.227*	.276**	.018	.130	.250*	-.054

Note. Data are *r* correlation coefficients obtained using Pearson product moment correlation.
[a]Median household income data are from years 2006-2010.
[b]Health insurance coverage data and premature mortality data are from year 2009.
[c]Mortality data for heart disease, cancer, stroke, and diabetes are from years 2003-2007.
[d]Infant mortality data are from years 2005-2009.
**Significant at 0.01 level (two-tailed).
*Significant at 0.05 level (two-tailed).
Source: Correlations were calculated using SPSS 19 with data from North Carolina Health Data Explorer, which was created at the Center for Health Systems Research and Development at East Carolina University in Greenville, North Carolina. http://www.ecu.edu/cs-dhs/chsrd/InstantAtlas/NC-Health-Data-Explorer.cfm.

FIGURE 2.
Relationship of Premature Mortality to Poverty in North Carolina Counties



Note. Data were produced using North Carolina Health Data Explorer, which was created at the Center for Health Systems Research and Development at East Carolina University in Greenville, North Carolina. Values for all counties can be found at http://www.ecu.edu/cs-dhs/chsrd/InstantAtlas/NC-Health-Data-Explorer.cfm.

A strong positive linear relationship is evident. The counties with the highest poverty rates, Scotland and Robeson, also had premature mortality rates that were high, and the counties with the lowest poverty rates, Union, Wake, Camden, and Currituck, had low premature mortality rates. The very highest premature mortality rates were found in Bertie and Clay counties. (Data for all counties can be found using the North Carolina Health Data Explorer at http://www.ecu.edu/cs-dhs/chsrd/InstantAtlas/NC-Health-Data-Explorer.cfm).

Returning to the data in Table 1, the associations of the poverty rate with other types of mortality rates are also strong. The correlation coefficients are r = .572 for all-cause mortality, r = .596 for heart disease mortality, r = .274 for cancer mortality, r = .462 for stroke mortality, r = .477 for diabetes mortality, and r = .373 for infant mortality; all of these correlations are significant at the 0.01 level (2-tailed). The associations of mortality with median family income are similarly strong, except in the case of cancer mortality.

Health insurance coverage is another economic factor related to health outcomes; and whether one has health insurance or not is, of course, related to poverty and income. The correlation between lack of health insurance and mortality is most substantial with regard to premature mortality (r = .302) and heart disease mortality (r = .276), both of which correlations are significant at the 0.01 level (2-tailed), as well as diabetes mortality (r = .250) and all-cause mortality (r = .277), both of which correlations are significant at the 0.05 level (2-tailed).

With incomes declining, a serious concern for the future is that improvement in health outcomes as envisioned in the state's Healthy People 2020/Healthy Carolinians plans may not occur. The effects of poverty will be experienced over a lifetime by more than 1.5 million North Carolinians, and children will carry the effects of their parents' misfor-

Bundling Economic Supports to Help Low-Income Students Obtain Postsecondary Credentials and Find a Career

Colin Austin, Ulysses Bell

Higher education is increasingly seen as a critical gateway out of poverty. At the same time, fewer than half of all students who enter community colleges achieve a degree or credential. Low-income and minority students, in particular, face multiple financial hurdles [1]. Many simply cannot afford to stay in school, because doing so would conflict with keeping a job, paying the bills, or responding to a crisis.

Bridging the education and employment gap is a major focus for MDC, a nonprofit organization based in Durham, North Carolina, which develops programs to expand opportunity, reduce poverty, and address structural inequity. MDC's research and practice provide support for the claim that material well-being is a decisive factor in health outcomes for individuals and communities (C.A., unpublished data). The social determinants of health are strongly connected to economic security, and over the past 10 years that idea has served as a framework when MDC has considered issues of family economic success, career pathways, and disconnected youth.

MDC currently promotes an approach called Center for Working Families (CWF), which brings together—or bundles—access to a range of essential economic supports that help families build self-sufficiency, stabilize their finances, and move ahead. With support from the Annie E. Casey Foundation, whose funding pioneered CWF in communities around the nation, MDC introduced and supported the CWF approach in community colleges [2].

One early adopter of the CWF approach has been Guilford Technical Community College (GTCC), where the student population served by the program is extremely low-income, with the vast majority eligible for assistance of some sort, such as the Supplemental Nutritional Assistance Program (SNAP, formerly known as food stamps). The CWF reaches these students in a variety of ways. One is through employment training. In addition to providing instruction in basic skills, GTCC works with students to move them toward a career readiness certificate, a basic credential that can give individuals a leg up when they enter the workforce. The school also offers one-on-one financial training. Achievement "coaches" at the CWF work closely with students, helping them plan their household budgets and understand how to cope with the immense financial pressures they face, including paying for such nonschool expenses as transportation and child care. In addition, CWF staff members help students access public benefits that they might not have known how to obtain, such as food and nutrition programs, financial aid, and earned income tax credits. The CWF also provides financial assistance to students who need transportation in order to attend class on campus.

The CWF occupies a physical space on the High Point campus, providing a central place for students to drop by and talk with their financial coaches as they head to their classes. And the intense coaching model allows students the opportunity to develop individualized plans aimed at

tune long into the future. Mitigating the effects of poverty on health requires a public health perspective and consideration of equity in the distribution of resources. Priority should be given to legislation and administrative policies that have the most positive upstream effect on the cascade of negative effects of poverty on development of children. The North Carolina Institute of Medicine (NCIOM) has identified the relationship between economic insecurity and food insecurity as a serious problem and has recommended increased outreach by the state and localities to encourage low-income individuals and families to enroll in the Supplemental Nutrition Assistance Program (formerly known as the food stamp program) [29].

Future approaches to this issue in North Carolina can be informed and energized by ongoing efforts elsewhere in the United States and in England. The important recommendations of the Robert Wood Johnson Foundation Commission to Build a Healthier America are well summarized in the following statement [30]:

> Although medical care is important, our reviews of research and the hearings we've held have led us to conclude that building a healthier America will hinge largely on what we do beyond the health care system. It means changing policies that influence economic opportunity, early childhood development, schools, housing, the workplace, community design and nutrition, so that all Americans can live, work, play and learn in environments that protect and actively promote health.

These recommendations and those of the NCIOM should be considered along with those of a recent commission in England chaired by Sir Michael Marmot, which was charged with recommending the most effective evidence-based strategies for reducing health inequalities. The following policy objectives emerged [31]:

- Give every child the best start in life.
- Enable all children, young people and adults to maximise their capabilities and have control over their lives.
- Create fair employment and good work for all.
- Ensure healthy standard of living for all.
- Create and develop healthy and sustainable places and communities.
- Strengthen the role and impact of ill-health prevention.

There are differences and commonalities between the approach of the Robert Wood Johnson Foundation commis-

meeting their own specific financial challenges and helping them reach their personal educational goals.

The CWF's impact is significant. In 2010, the first full year of the program's operation at GTCC, 260 students received services. All 260 received financial education and employment training services, and 60% of them received assistance in obtaining public benefits that supplemented their income. Student retention results are just as impressive. Eighty percent of students receiving CWF services enrolled at GTCC the following semester, a much higher retention rate than in most community college environments. Greater retention rates mean that more students are achieving their academic goals, and more students maintaining enrollment translates to more funding for the school. In essence, CWF has been shown to pay for its own operation.

Building on the CWF experience, in 2012 MDC launched the North Carolina JobsNOW Employment and Training demonstration project, which connects students with an online expert service called The Benefit Bank®, which helps families apply for tax credits, public benefits, and student financial aid.

The JobsNow Employment and Training project deploys Success Coaches to help low-income and first-generation students navigate through community colleges. The coaches provide students with career and employment advice, connections to community resources, financial education, financial counseling, and strategies for saving and for building assets. MDC is also planning to take steps to help students who are eligible for SNAP to access federal employment and training funds to pay for half of their out-of-pocket education expenses. Currently, 16 community colleges in North Carolina participate in the project, 56 community college staff members have been trained as Success Coaches, and approximately 80 community college staff members have been trained as Benefit Bank counselors. NCMJ

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sion and that of the Marmot Review. The latter's focus on creating a "Fair Society" more directly addresses the social gradient in health. Both approaches outline bold steps in the right direction and complement current planning by the NCIOM Task Force on Implementing Evidence-Based Strategies in Public Health. NCMJ

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Housing and Health:
Time for Renewed Collaboration

William M. Rohe, Hye-Sung Han

This article reviews the evidence linking housing affordability, overcrowding, and dilapidation to both physical and mental health. It also presents several ways that public health and city planning professionals can work together to address those housing-related health problems.

In the 19th century, the interests of the public health and city planning professions were closely aligned. Both fields focused on the effects that poorly designed and maintained housing had on the health of city dwellers. But in the 20th century, once some of the worst housing conditions had been addressed through the adoption of new building and sanitation codes and other improvement efforts [1], the 2 fields diverged. Since the 1990s, however, they have been growing closer once more, as both have begun again to focus on the effects of housing on health.

This paper provides an overview of recent research on the impact of housing on both physical and mental health. Three dimensions of housing are considered: affordability; overcrowding; and condition of housing. Each of these affects health in a different way.

Housing Affordability

US Department of Housing and Urban Development guidelines consider housing to be "affordable" when it is occupied by a homeowner who spends no more than 30% of his or her income on housing costs (mortgage payments, insurance, property taxes, and utilities) or by a renter who spends no more than 30% of his or her income for rent and utilities. At the time of the 2010 US Census, there were more than 3.7 million occupied housing units in North Carolina, 66.7% of which were owner-occupied; the remaining 33.3% were occupied by renters [2]. Census data also indicates that the percentage of homeowners paying 30% or more of their incomes for housing (see Figure 1) rose between 2000 and 2010 from 20.7% to 32.2% [3, 4]. During the same time period, the percentage of renters paying 30% or more of their incomes for rent (see Figure 2) rose from 33.4% to 48.9%. In 2010, 645,006 homeowners and 509,691 renters in North Carolina were living in unaffordable housing.

Lack of affordable housing can have serious health consequences, especially for low-income families. Researchers have studied both the direct and indirect effects of high housing costs on the health of low-income families. Mental health is directly affected. The indirect effects are related to the trade-offs families make as they compensate for high housing costs. Financial burdens force low-income families to choose between paying for health care and paying for food, heating, or other things they need; having to sacrifice any of these because of inability to pay can threaten the health of these families [5]. Many low-income families who have to spend excessive amounts of their income on housing cannot afford health insurance or adequate medical care and are more likely to experience food insecurity (defined as having to reduce the size or quality of meals or skip meals entirely). All of these things can in turn have short- and long-term health consequences.

A substantial body of literature has demonstrated that lack of affordable housing can contribute to poor health. Studies support a strong link between high housing costs and lack of health insurance or lack of medical care [6]. One national study found, for example, that low-income adults living in unaffordable housing were more likely to lack health insurance than were low-income adults living in affordable housing [7]. Another study found that low-income families who have difficulty paying their mortgages or rents were less likely to have adequate medical care and were more likely to postpone medical treatments [5].

High housing costs have also been found to be associated with food insecurity. A recent study in the state of Washington demonstrated a clear association between lack of affordable housing and food insecurity. Although the state has a relatively low poverty rate, 20% of renters there reported that they had difficulty meeting basic needs—by purchasing food, for example [8]. In addition, a number of studies have found that children in low-income families without housing subsidies are more likely to suffer from iron deficiencies, malnutrition, and underdevelopment compared with children in similar families receiving housing assistance [9].

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Building Healthy, Affordable Housing in North Carolina

Gregg Warren, Bethany E. Chaney

When most people hear the words *affordable housing*, they picture old-style urban public housing with apartments stacked end-to-end, replete with graffiti and shady-looking characters, unkempt and marked by a general malaise. Nothing seems healthy about it.

But today's affordable housing is different. Successful projects are well-designed, built to a reasonable scale, and have landscaping and amenities similar to those of other apartment communities or subdivisions. Although the public sector is essential for financing projects, many municipalities prefer to partner with private nonprofit and for-profit developers who have a mission of ensuring that their projects add value to and promote socioeconomic diversity in the communities in which they are located, recognizing that it is in their business interest to do so.

North Carolina is fortunate to have built strong public and private support for developers of affordable housing over the years, particularly community development corporations like the nonprofit organization in Raleigh that we work for, DHIC, Inc. Local and regional banks, the philanthropic community, and intermediary support structures such as the North Carolina Community Development Initiative have helped create a strong pipeline of investment and political support for affordable housing.

But it is getting harder to develop affordable housing. Federal subsidies are shrinking, and competition is growing. The mortgage lending crisis has left many hardworking but lower-wage workers unable to repay their mortgages, resulting in a record number of foreclosures that will affect not just the families who are evicted but the lifeblood of rural and urban communities. As the economy has shrunk, so has support and empathy for people of lesser means.

Every community needs a diverse stock of housing for renters and homeowners to attract and retain a sustainable workforce along the entire wage continuum. Three kinds of affordable communities are particularly important if we also are to ensure the health and viability of families and individuals, young and old alike: supportive housing, housing for seniors, and affordable family apartments.

Supportive housing serves very low-income people with mental illness, a history of addiction, or some other disability that has prevented them from holding a job and staying connected to family and community support systems. These housing developments generally feature efficiency apartments and have live-in management and embedded social service providers who can help such individuals navigate the systems whose support they need to stay healthy. DHIC has built 2 such communities in Raleigh, partnering with Wake County Human Services to provide quality services in a safe and friendly environment. Residents are more economically and medically stable and less likely to experience another bout of homelessness than are individuals living in temporary shelters or other transitional environments.

There are never enough affordable apartments for

Lack of affordable housing can also contribute to poor mental health. Low-income families tend to move more frequently in their search for an affordable home, and this has detrimental health effects, particularly on children. Studies have shown that high mobility is associated with adverse health outcomes, including heightened stress levels, depression, and emotional and behavioral problems [10]. Studies have also shown that parents facing imminent eviction exhibit high levels of stress and that this has a negative influence on the mental health of their children [9]. Under such circumstances, parents find it hard to obtain continuous medical treatment and care for their children, and children with chronic diseases are particularly affected.

Overcrowding

One of the consequences of the lack of affordable housing is overcrowding within units. Some households cannot afford to rent or buy a home large enough to comfortably accommodate household members, or they may have to double up with other households to put a roof over their heads. The most common definition of an overcrowded housing unit is one with more than 1 person per room, although some research studies adopt a higher cutoff of 1.5 persons per room. Although the percentage of overcrowded housing units in North Carolina dropped from 3.4 to 2.1 percent between 2000 and 2010, as of 2010 there were still 75,373 overcrowded housing units in the state [3, 4].

Overcrowding may affect health in several ways. First, the limited amount of space per person may increase the transmission of airborne infections such as tuberculosis, bronchitis, and pneumonia. Second, overcrowding may constrain the types of activities that household members can comfortably undertake in the home or may cause stress among household members trying to engage in conflicting activities, such as watching television and studying. Chronic stress due to overcrowding may lead to more severe mental health problems.

The results of research on the relationship between overcrowding and health provide strong support for the notion that overcrowding has an independent effect on several dimensions of physical health. The evidence linking overcrowding to respiratory infections in children, including bronchitis and pneumonia, is quite strong [11]. Similarly, rates of tuberculosis have been found to be higher for those living in overcrowded units [12]. In addition, higher rates of meningitis have been found among children living in overcrowded housing units. And overcrowding has also been linked to mental health problems,

fixed-income seniors, particularly those who are mobility impaired, need ready access to public transportation, and are isolated from children or other support systems. The US Department of Housing and Urban Development and the US Department of Agriculture (through its Rural Development Housing Programs) are the largest supporters of subsidized apartment communities for seniors, which feature studio to 2-bedroom apartments, onsite management that can respond to problems and create a sociable environment, and amenities such as hair salons, libraries, and computer labs. DHIC has built 10 senior communities, where the average resident is a widowed female over the age of 70 with an income less than $20,000. DHIC partners with Resources for Seniors in Wake County to provide regular health screenings and other relevant programming to keep residents feeling healthier, safer, and less isolated.

Children's HealthWatch has found that young children experiencing housing insecurity because of frequent moves or overcrowded homes are 50% more likely to be in poor health and are 70% more likely to exhibit developmental delays [1]. Safe, stable, and affordable rental housing for families can be difficult to find in a place like the Research Triangle, where sustained high population growth has increased competition for apartments that are close to employers and amenities. Affordable apartments for families are also the most difficult type of affordable housing for developers to build, as the cost of land and infrastructure improvements can require more subsidy than the public sector is willing or able to provide. The Federal Low-Income Housing Tax Credit has attracted significant investment from the private sector, but competition is fierce. Some communities also feel threatened by the placement of affordable family apartments in their communities and actively oppose these development projects.

What makes affordable housing, and thus healthier communities, possible? Collaboration among community residents and stakeholders, including health care providers, employers, and educational institutions, to ensure that affordable housing is included in community visions and plans; cooperation between affordable housing developers, public and private investors, social service providers, and neighborhood residents to ensure successful, durable, sustainable development; and a commitment on the part of policymakers to pay attention to the evidence that affordable housing pays off—and to increase available subsidies for it. NCMJ

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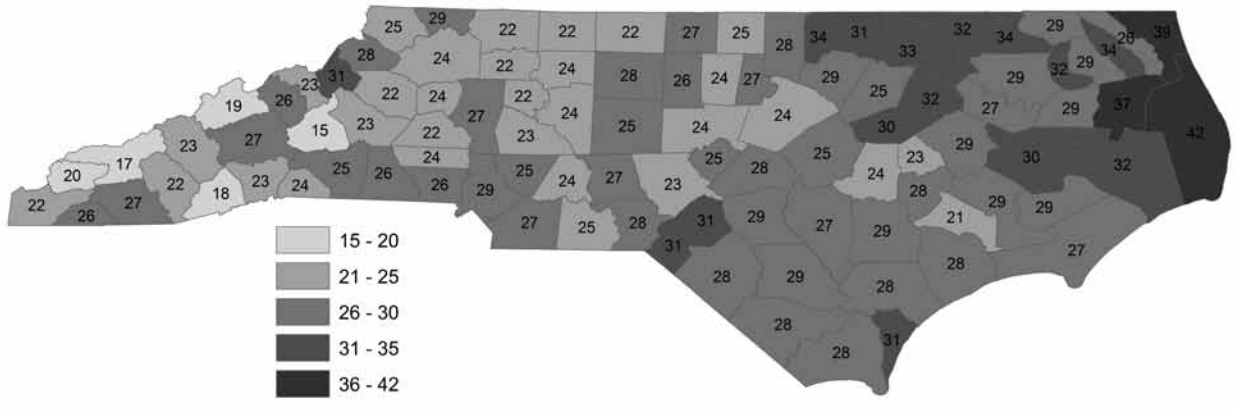
including anxiety and depression, particularly among adult women [13].

Housing Conditions

Although there is no official federal or state definition of substandard housing, the Department of Housing and Urban Development provides a number of guidelines for determining what constitutes a substandard house. Factors that may make housing substandard include lack of indoor plumbing facilities, lack of heating or inadequate heating, lack of electrical service, lack of adequate sewage disposal, frequent water system breakdowns, lack of kitchen facilities, struc-

FIGURE 1.
Percentage of North Carolina Homeowners Spending More than 30% of Their Income for Housing Costs, by County



Note: Housing costs are the sum of homeowner's mortgage payments, real estate taxes, insurances, utilities, and fuels. It also includes, where appropriate, condominium fees and mobile home costs. Source: US Census Bureau, 2006–2010 American Community Survey

Using Housing Code Enforcement to Improve Healthy Homes

Beth McKee-Huger, Lori Loosemore

Substandard housing results in more than $100 million in annual health care and related costs for North Carolina children [1]. Mold, cockroaches, and other pests often exacerbate asthma; combustion appliances that lack adequate ventilation can cause carbon monoxide poisoning; unsafe wiring can electrocute or cause fires; and deteriorating older paint exposes children to lead poisoning. These and other unsafe housing conditions are code violations, so code enforcement can be an effective preventive health strategy.

Greensboro Housing Coalition (GHC), a nonprofit advocate for safe and affordable housing, helps tenants, rental owners, and homeowners find ways to correct unhealthy housing conditions and helps members of the community work cooperatively to resolve complex problems.

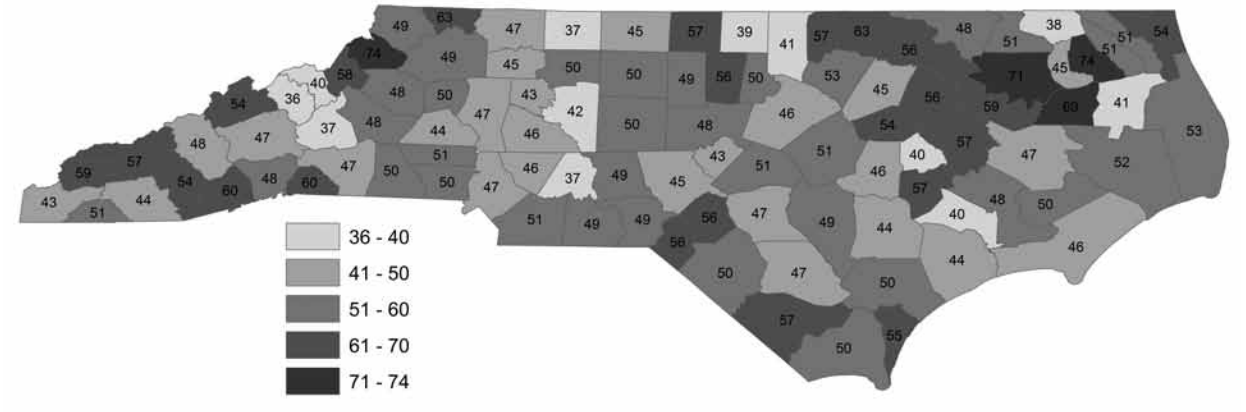
For example, 3 little girls and their mother repeatedly rushed to the hospital with respiratory distress. After writing many prescriptions, their physician inquired whether there were moldy conditions in their home. The mother said that she had asked the landlord many times to fix water leaks, without success. A Greensboro inspector cited the apartment for code violations and noted that the complex manager was slow to comply with repair orders. GHC helped the family contact an environmental consultant; the lab report the consultant requested showed high levels of *Aspergillus*, *Penicillium*, and *Chaetomium* spores. After GHC helped the family move to a safer environment, the health of the children improved.

Working with City of Greensboro inspectors to achieve better compliance with code enforcement orders, GHC urged the Greensboro City Council to enact a local ordinance in 2003 requiring that all rental housing, except those constructed in the past 5 years, to be inspected and certified as meeting minimum housing standards. According to a September 2010 presentation by a Greensboro code enforcement manager to the Rural Unit Certificate of Occupancy (RUCO) advisory committee, after the RUCO ordinance was enacted, the number of housing units with code violation orders dropped 77% in 8 years. Houses and apartments were inspected before conditions deteriorated to the point that occupants complained, promoting preventive maintenance, and rental owners usually complied with repair orders within the time allowed.

However, in 2011, the North Carolina General Assembly passed legislation limiting the authority of local governments to require periodic inspections [2]. The new law allows inspection when there is a reasonable cause to believe that unsafe conditions exist, including both complaints and a history of noncompliance. The law limits the authority of local governments to make inspections without "reasonable cause," so cities cannot inspect until the problem is already known. Now the City of Greensboro is meeting with GHC and other stakeholders to explore the most effective ways of improving housing stock within the constraints of this state legislation. Inspectors continue to respond to complaints, but doing so addresses housing conditions only after problems have been identified, and under those circumstances owners tend to be slower to comply. Other strategies allowed by the legislation include inspection of properties of owners with multiple code violations and inspection of all properties in geographic areas that are targeted because of concentrations of substandard housing.

Since the legislative change in 2011, the GHC Healthy Homes Specialist has experienced a higher volume of calls from tenants, many of whom are experiencing respiratory and other symptoms. When the Healthy Homes Specialist does a housing assessment, she often finds serious housing problems including: leaking water and sewage, holes allowing entry of rats and roaches, and lack of operable

FIGURE 2.
Percentage of North Carolina Renters Spending More than 30% of Their Income on Rent, by County



Source: US Census Bureau, 2006–2010 American Community Survey

smoke alarms. In many cases, the tenants have repeatedly requested repairs without success and want to move out. These conditions are a direct violation of North Carolina landlord-tenant law and minimum housing codes. Not only do such conditions jeopardize the health of tenants, they also decrease the value of the owner's investment and can subject the owner to litigation.

GHC is reaching out to owners to find mutually beneficial ways to protect tenant health and reduce vacancies, encouraging cooperation between tenants and landlords and informing owners of repair resources. For example, Guilford County Department of Public Health has a responsibility to investigate and order remediation of lead hazards when a child has a high blood lead level. GHC helps by urging the owner to apply for City of Greensboro grants for lead remediation. Also, GHC checks homes for indications of lead risks to prevent children from being poisoned by lead, and when appropriate, refers the owners to the City of Greensboro lead program. The City of Greensboro has several grants for lead hazard remediation and energy efficiency upgrades for homes occupied by low-income families, if the owner corrects code violations.

GHC educates tenants, owners of rental property, homeowners, and the community at large about the health and economic benefits of healthy homes. The 7 principles of healthy homes espoused by the National Healthy Homes Training Center and Network are to keep the home dry, clean, ventilated, pest-free, safe, contaminant-free, and maintained.

GHC encourages collaboration among community partners, including the City of Greensboro, the Guilford County Department of Public Health, Legal Aid of North Carolina, Housing Greensboro, North Carolina A&T State University, and the University of North Carolina at Greensboro. Through cooperation on policy recommendations to promote healthy homes, outreach to residents in at-risk housing, and community education, GHC helps the community resolve the complex issues of substandard housing. NCMJ

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tural problems (such as leaking roofs, cracks in walls, peeling paint, or holes in floors), and a number of common area problems, including inadequate lighting and loose or broken stairs or stair railings.

One of the datasets commonly used to measure the extent to which housing in the United States is substandard is the US Census Bureau's American Housing Survey (AHS). The AHS collects detailed data on the quality of housing on a nationally representative sample of housing units, but unfortunately, state level estimates are not available. The US Census, however, reports data on incomplete plumbing and incomplete kitchen facilities. According to the 2010 census, plumbing or kitchen facilities were lacking or incomplete in more than 39,000 housing units in North Carolina in 2010 [3, 4].

There is a substantial body of research that associates features of substandard housing with a wide range of negative health outcomes, including chronic illnesses, infectious diseases, injuries, and poor mental health [14]. Many of these health problems stem from lead paint, poor air quality, poor water quality, fire hazards, and injury hazards.

Abundant empirical evidence connects substandard housing conditions to health problems. The effects of mold, pest infestations, and other toxins on respiratory conditions are particularly well documented [15]. Ample evidence also exists that exposure to lead in older houses causes neurodevelopmental abnormalities. Damp, cold, and moldy houses have been associated with asthma, chronic respiratory illnesses, recurrent headaches, fever, nausea and vomiting, and sore throats [16]. Exposure to dust, allergens, and toxic chemicals found in old and dirty carpeting has been associated with allergic, respiratory, neurological, and hematological illnesses. Structural defects can lead to pest infestation, which can trigger asthma attacks. Poor ventilation resulting in high nitrogen dioxide levels has been linked to asthma symptoms [16].

Studies have also found that features of substandard housing—including lack of clean water, absence of hot water for washing, ineffective waste disposal, intrusion of disease vectors such as insects and rats, and inadequate food storage—contribute to the spread of infectious diseases such as tuberculosis and respiratory infections [16].

It is well established that certain features of substandard housing are associated with injuries, including burns and falls. Exposed heating sources, unprotected upper-story windows, low sill heights, slippery surfaces, breakable window glass, and poorly designed stairs can lead to injury and falls. In addition, outdated wiring and building materials found in many older houses are fire hazards [16].

Keys to Independence:
Supportive Housing

Dave Richard, Nicole Kiefer

Housing plays a key role in all of our lives. It impacts our health, education, employment, recreation, and social opportunities. For people with intellectual and/or developmental disabilities (I/DD), the creation of accessible community housing is critical. The Arc of North Carolina, which provides services and advocacy for people with I/DD, has been developing new models of housing for people with I/DD for more than 35 years. Over that period, the design of those housing models has evolved, based on principles of self-determination that support people with I/DD to become more involved members of their communities.

Housing for people with I/DD has shifted from large institutions to smaller group homes to more individualized models. Two of the largest barriers to independent living are cost and available support services. People with disabilities receiving Supplemental Security Income are among North Carolina's lowest-income citizens, and they are priced out of the traditional housing market. The choices that are affordable on their income are often unsafe and inaccessible. Therefore they often remain at home with family or are forced into more restrictive settings. In addition, for people with I/DD, affordable housing itself is not enough. Because their disability is lifelong, appropriate services must be consistently available to support them in living in their own homes.

In an effort to address these needs, The Arc of North Carolina has developed more than 240 supportive-housing projects for people with I/DD, while advocating for support services that meet individual needs. Serving more than 1,500 people, these residences are operated in partnership with local service providers and range from group homes with 5-6 residents, to small apartment buildings, duplexes, and condominiums. The Arc Rowan Apartments and High Point Condominiums are 2 examples of creative options that allow people with disabilities to choose the least restrictive settings possible and realize their housing dreams.

The Arc Rowan Apartments consist of 2 scattered-site quadruplexes for people with I/DD in Salisbury, North Carolina. Each newly constructed building looks like a single-family home and blends in with the neighborhood. One apartment is accessible for a tenant who uses a wheelchair and another is accessible for someone with a visual impairment. A unique feature is the central living space. Each apartment has both an exterior entrance and an entrance to the common area, which includes a laundry room and a furnished living room; residents also share a front porch and a backyard patio. One of the biggest fears of independent living for people with I/DD is social isolation, so this unique design offers not just the privacy of an apartment, but also space for socializing, networking with peers, and mutual support.

In addition to constructing new housing, The Arc of

Finally, substandard housing can negatively affect mental health. A study has shown that damp, moldy, and cold indoor conditions are associated with psychological disorders such as anxiety and depression. Other studies have found that substandard housing is linked with social isolation among children and with lower levels of self-esteem and life satisfaction among both homeowners and renters [17].

Conclusion

It is clear from this brief review that housing affordability, overcrowding, and substandard housing have important effects on both physical and mental health. So, how can public health and city planning professionals work together to address those problems before they make people sick? One overarching strategy would be to form local and statewide healthy housing advocacy coalitions that could bring public health professionals, planners, and other interested parties together to develop action strategies [13]. Based on assessments of local conditions, these coalitions could advocate for the adoption of a policy requiring health impact assessments for all proposed development. They might also advocate for programs that would assist residents in identifying and correcting home health hazards. In addition they might advocate for revisions to building and housing codes (to make them better reflect current knowledge of what constitutes healthful housing) and for better enforcement of those codes. Finally, housing and health coalitions could lobby at all levels of government for more funding for affordable housing programs so that fewer households would have to compromise their health to put a roof over their heads. NCMJ

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North Carolina has also purchased and renovated numerous condominiums and duplexes at scattered sites. In High Point, The Arc purchased 4 2-bedroom condominiums in established, safe developments to provide supportive housing for up to 8 people with I/DD. In order to facilitate integration and participation in community activities, the condominiums are located on a bus line and are close to employment, recreation, shopping, and services. The Arc renovated the condominiums to be energy efficient and made 1 of the units wheelchair accessible.

The Arc Rowan Apartments and High Point Condominiums do not have live-in staff, but tenants receive various services based on their individual needs from a provider of their choice. These services may include assistance with finding employment, budgeting and paying bills, planning menus, preparing food, shopping, maintaining a safe environment, and other activities of daily living. Although these services are not a requirement of tenancy, these supportive and skill-building services are essential for people with I/DD to be able to maintain themselves in independent housing.

Financing for these projects was provided by a combination of federal, state, and local resources. The Arc Rowan Apartments were funded in part by the US Department of Housing and Urban Development Section 811 Supportive Housing for Persons with Disabilities program, and both projects received funding from the Housing 400 Initiative of the Supportive Housing Development Program administered by the North Carolina Housing Finance Agency and the North Carolina Department of Health and Human Services. The City of High Point also contributed to the funding for High Point Condominiums. Ongoing operating subsidies are essential to making these apartments affordable for people with disabilities.

Having a home of one's own is an important value in our society, and the tenants of The Arc Rowan Apartments, High Point Condominiums, and similar projects are thriving in their new roles as tenants, neighbors, and community members. With these new roles have come not only newfound independence, but also increased self-esteem. As Terry, a young man who lives in 1 of the apartments, told us:

> I am able to be more independent now that I have my own place and I can do things for myself. I have learned how to use my stove and have opened up a bank account. I would not have been able to afford to move into another place because it would have been too expensive. NCMJ

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Communities Matter:
The Relationship Between Neighborhoods and Health

Michael F. Dulin, Hazel Tapp

Understanding the link between neighborhood conditions (both physical and social) and health outcomes is an essential step toward ameliorating health disparities in low-income and high-risk minority populations. This commentary discusses the evidence that the neighborhood is a key social determinant of health and describes tools that can be used to help overcome disparities in community health.

Progress in the efforts to reduce health disparities for vulnerable populations in the United States and North Carolina can be characterized as slow at best [1-3], despite extensive efforts and investments in research and medical care over the past 20 years. One reason for the difficulties in finding ways to ameliorate health disparities is that their underlying causes are intrinsically woven into the fabric of our society. Indeed, recent research indicates that the underlying causes of health disparities are multifactorial and are ingrained in not in genetics alone, but within multiple complex social determinants that include intrapersonal (family and social network), cultural, and environmental factors. Perhaps the most important of these social determinants for low-income and disadvantaged populations are the very neighborhoods in which they live [4].

The relationships between neighborhoods and health outcomes are complex, and they are related both to physical/environmental factors and to social dynamics. This link between health and the community has been implicated in a wide range of disparities, including disparities in birth weight, pain management, cancer outcomes, asthma prevalence, health care utilization, and even the quality of diabetes care [5-11]. Childhood obesity is an important medical condition that has been linked to neighborhood factors and is one of the most pressing health care concerns facing the US health care system today [12].

The Neighborhood Built Environment and Health Outcomes

Affordable housing for low-income populations can lack amenities that help to promote and maintain good health. These elements include access to parks, green spaces, and sidewalks that give children and adults the opportunity to freely exercise and utilize outdoor spaces. People lacking neighborhood access to these features must invest additional time, effort, and cost to travel to other locations to exercise, decreasing the likelihood that they will participate in this type of behavior. Unfortunately, when parks do exist within a low-income neighborhood, they are often in disrepair or are not accessed because of neighborhood safety concerns. Indeed, this finding was confirmed in a recent photovoice study performed by our research team in Charlotte, North Carolina [13]. The photovoice asks participants to answer questions about their community's health using photographs. In our study, local high school students noted that a particular park was unusable for children because a homeless person was often found sleeping inside a covered slide. They went on to note that crime in the area made residents unlikely to venture outside even during daylight hours.

Access to transportation is another issue facing disadvantaged populations who want to participate in health promoting behaviors. Many families share a single car and therefore have access only to facilities within their under-resourced neighborhoods when another family member is using the car for work. Walking or riding a bicycle within or outside their residential neighborhood can be life-threatening, because many cities lack connecting sidewalks or bike lanes. Pollution sources near or within neighborhoods are another threat to the health and well-being of community members. Low-income populations may lack the education to understand the risks posed, and even with a clear understanding of a potential hazard, they may lack the resources to make the needed policy changes to ensure the safety of their community. Finally, in low-income neighborhoods, healthy foods may be difficult to find, and unhealthy, low-cost foods are likely to be more plentiful.

Evidence now strongly supports the concept that all of the factors described above (lack of green space access, lack of transportation, lack of sidewalks and bike lanes, pollution exposure, and easy access to fast food) have created an obesogenic environment in the majority of US low-income neighborhoods, and that environment has been tied

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Mebane on the Move:
A Community-Based Initiative to Reduce Childhood Obesity

Annie Martinie, Rebecca J. Brouwer, Sara E. Benjamin Neelon

A growing body of evidence suggests that physical activity levels are affected by environmental factors. Residents of walkable neighborhoods who have access to recreation facilities are more physically active and less likely to be obese [1-5]. The availability of safe areas for outdoor activity, such as parks and other open spaces, is consistently associated with increased physical activity among children [2-7]. A handful of community-based health promotion initiatives aim to increase physical activity through enhancement of the built environment. Shape Up Somerville [8-9], for example, is a campaign to increase physical activity and improve healthy eating throughout the city of Somerville, Massachusetts. The Mebane on the Move initiative is a similar community-based campaign that is currently under way in North Carolina.

Mebane is a small, relatively rural community nestled between Research Triangle Park and the Triad. This former factory and farming town is now experiencing a rapid shift toward urbanization with the arrival of strip malls, big-box stores, fast-food restaurants, and a multimillion dollar outlet center. During this time of transition and vulnerability, Mebane's leaders have acknowledged the need for mindful planning for growth and development. In 2006, a group of concerned residents recognized an opportunity to help guide the future of their community and began to raise funds that were eventually used to launch the Mebane on the Move initiative in 2011. Mebane on the Move is a grassroots campaign to improve the health of residents through enhancement of the built environment and establishment of sustainable opportunities for active living. Using a socioecological model as its framework, the campaign has built on the burgeoning evidence that the built environment can affect physical activity in all age groups. The Mebane on the Move initiative includes business leaders, faith communities, schools, government officials, and local health professionals. The initiative has worked to leverage existing partnerships and to encourage new collaborations through community engagement, ongoing evaluation of intervention efforts, a vibrant social media campaign, and frequent feedback from citizens.

Mebane on the Move has engaged in a number of activities to improve the built environment, including the establishment of an urban walking trail throughout the town, elementary school running clubs, and free physical activity classes for community members. Initiative leaders have also worked with city officials to install new sidewalks and crosswalks, and to link existing sidewalks for the walking trail. They have also proposed improvements to the routes, including sidewalk repairs and additional lighting. The city installed 60 colorful engraved stone pavers in sidewalks to guide walkers and runners throughout town.

To establish the elementary school running clubs, Mebane on the Move partnered with the Mebane Running Club and the local public elementary schools. Participating students in kindergarten through fifth grade run after school, learn about the components of a healthy lifestyle, and earn prizes for increasing their mileage. The students complete the program by running their first 5-kilometer race as a team. Over the past 2 years, the program has served more than 500 students; 120 adult coaches have participated, providing an opportunity for many students to be physically active in a supportive and team-oriented environment.

Adult residents of Mebane have cited structured exercise classes as an important way for them to stay fit. However, these may be cost-prohibitive for some residents, so Mebane on the Move helped establish MebFit, a free group exercise program open to the community. To date, all of the

to the rapidly increasing prevalence of obesity in this country [14]. Taken together, these factors together can easily overwhelm interventions that focus on diet and exercise alone, and make it difficult for individuals to achieve the goals they set with their health care providers to maintain a healthy weight [14, 15]. Among the most visible aspects of the obesogenic environment within low-income neighborhoods are fast-food restaurants. These staples of almost every low-income neighborhood provide easy access to low-cost unhealthy foods. Greater proximity to a fast-food restaurant and lack of access to motor vehicles are both directly associated with increased fast-food consumption [16, 17]. The effects of living in a food desert (areas lacking stores that sell fresh fruits and vegetables) need more study; recent work has not found any correlation between access to healthy food sources and self-reported consumption of fruits and vegetables among children [18]. This suggests that other factors that have been shown to correlate with lack of access to healthy foods within low-income neighborhoods may play an even more important role than was initially thought.

Neighborhood Social Dynamics and Health Outcomes

Evidence is increasing that social influence plays a key role in driving health behaviors, particularly in populations with poor access to resources. For example, data from the Framingham study indicated that obesity can be spread through social networks, and subsequent studies have shown that social networks also affect behaviors such as tobacco abuse and that they positively influence mental health [19]. These same networks have been identified by our research team in Charlotte to be of key importance to Hispanic immigrants as they work to navigate the US health care system.

10-week aerobic dance, yoga, pilates, water aerobics, and circuit classes that have been offered have been filled to maximum capacity. The 80 current participants range in age from 20 to 72 years and encompass all levels of fitness.

Before launching the initiative, Mebane on the Move leaders engaged researchers from Duke University to study its effects. To evaluate this natural experiment and help assess the impact of the intervention, the researchers recruited a second town to serve as the comparison community, one with similar geographic and demographic characteristics. The comparison community is located approximately 100 miles from the intervention town, so it is close enough to allow for travel for data collection but far enough away to avoid contamination. The researchers conducted baseline assessments in both communities in the spring of 2011. The Mebane on the Move initiative was launched in the fall of 2011, and follow-up data collection was completed in early summer 2012. Results are forthcoming.

Mebane on the Move and similar grassroots campaigns have the potential to increase physical activity in all age groups through systematic changes to the built environment. In smaller towns, where social networks are strong and residents are invested in their communities, these types of initiatives can empower citizens to engage in healthier lifestyles. Promoting community-level health and well-being is a public health priority. Mebane on the Move is a promising initiative and a step toward achieving this important goal in North Carolina. NCMJ

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Neighborhood-level communities are central to the development of the underlying social networks that drive health behaviors. As new members of the community identify the neighborhood they will join, multiple factors influence their decision, including affordability, proximity to services, access to transportation, and the need to accommodate their immediate and extended families. Perhaps more subtle factors in this equation are the social networks that drive settlement itself. Community members are more likely to move into a neighborhood if they already have a friend or family member living in that community. This process creates some degree of homogeneity within a neighborhood in terms of socioeconomic status, race/ethnicity, age, and even preexisting health behaviors. This may lead to people with poor health behaviors moving into a community where these same behaviors are constantly reinforced. For example, a sedentary African American male who smokes would be more likely to befriend a colleague of similar age, race, and social behavior. This friend would then be a contact to assist in finding housing within the same neighborhood.

This process holds particularly true for obesity. Overweight adolescents have been found to be twice as likely as their counterparts to have overweight friends [20]. It would logically follow that overweight adults would also start to segregate themselves into neighborhoods and extended social networks that reinforce sedentary behaviors (eg, living in a neighborhood without sidewalks or access to parks) and poor eating habits (eg, living near a fast-food restaurant).

Overcoming Disparities Linked to Environmental and Social Factors in Neighborhoods

Potential best practices for improving health outcomes and reducing health disparities at the neighborhood level include the engagement and partnership of community

Accessing Nutritious Food in Low-Income Neighborhoods

Alice S. Ammerman

"Food deserts" are described in a 2009 Institute of Medicine report as "neighborhoods and communities that have limited access to affordable and nutritious foods" [1]. However, some have argued that, given the obesity epidemic, a more appropriate geographic term might be "food swamps," defined as "areas in which large relative amounts of energy-dense snack foods inundate healthy food options" [2]. Although results of recent studies have raised questions about whether simply living close to a food desert or a food swamp can by itself result in poor dietary intake, it is clear that one's neighborhood environment can have a profound impact on food intake and health [3].

Interest in locally grown food, initially found chiefly in higher income neighborhoods and at upscale farmer's markets, is increasing. As a result, a wide variety of things are being done to make healthier food more accessible and more affordable, and to teach people how to grow and prepare it. Benefits have accrued both to consumers and to the surrounding community in terms of better health and increased economic opportunities.

We are seeing the biggest resurgence in backyard gardening since World War II, when people were encouraged to become more self-sufficient in food production by planting "Victory Gardens." Cooperative Extension agents and community organizations are helping individuals to relearn the art and science of gardening—sometimes in pots or on rooftops, if yard space is limited. Urban gardening is booming, even in blighted areas like inner-city Detroit, where many vacant and overgrown lots have been transformed into productive urban farms and gardens. In addition to producing much-needed healthy food in neighborhoods with high rates of chronic disease, urban gardens have been shown to increase community collaboration and to build social capital.

Community gardens may be tended collectively or in assigned plots, and educational programs about composting and pest control are common. Most garden programs emphasize sustainable practices and limit the use of pesticides and fertilizers. Some gardens in more affluent communities include donation programs, inviting participants to "plant a row for the hungry." School gardens have also become increasingly popular, particularly for their educational value.

Another important mechanism for increasing food access in communities is through farmer's markets and variations on that theme. Because lack of access to transportation is often a limiting factor in low-income neighborhoods, bringing the food to the community can increase the likelihood of purchase and consumption. Although the higher cost of food in many markets located near affluent areas has been a barrier, the participation of low-income consumers has been facilitated by making it possible for recipients of the Supplemental Nutrition Assistance Program (formerly known as food stamps) to buy food using Electronic Benefits Transfer (EBT) [4]. Special vouchers for senior citizens and for participants in the WIC program for women, infants, and children have also made farmer's market food more accessible.

In addition, a number of creative distribution approaches are being tested to increase access. One program paired inner-city youth with rural farmers, with the youths serving as food vendors in their inner-city neighborhoods. The farmers and youth shared in the profits and had much greater reach than a stationary market. Minimobile markets also bring food directly to neighborhoods, just as fish vendors in Europe and ice cream trucks in the United States do.

members in community-based participatory research; working to improve access to primary care and preventive services through practice-based research networks; and using geographic information system (GIS) tools to better understand disparities at the neighborhood level.

Community-based participatory research has been identified as an ideal mechanism for improving community health, affecting social change, and ameliorating health disparities within disadvantaged communities. This framework can employ a wide range of methodologies, but key principles include fostering trusting relationships with community partners, building on strengths and resources within the community, promoting co-learning and capacity building among all partners, using equitable processes and procedures, using cyclic and iterative processes to develop partnerships and to build the research process, disseminating results to all partners, involving key stakeholders in all aspects of the research process from the outset, and ongoing partnership assessment, improvement, and celebration [21].

Practice-based research networks bring primary care providers together with community members and researchers to identify best practices for engaging communities in preventive health services and improving health outcomes. This is most likely to hold true when such networks utilize the community-based participatory research framework to better engage with the community and become more patient-centered and more community-centered.

GIS tools have the power to map variables within a community to demonstrate spatial relationships between health predictors and outcomes. In the past, mapping tools used to assess health have primarily focused on examining patterns of disease transmission. However, these tools can also be used effectively to evaluate patterns of health care access, to define community service areas, and to examine health disparities at the neighborhood level [22]. Additionally, using

Community Supported Agriculture (CSA) is an increasingly popular model. Consumers purchase a "share" in a farm at the beginning of the growing season and then receive a weekly box of seasonal fruits and vegetables, and sometimes meat, seafood, eggs, or cheese as well. Because this approach typically requires upfront payment, it has been less feasible for fixed-income families. However, in a model currently under development in the Triangle area, a large, for-profit CSA with more than 6,000 customers (The Produce Box) has paired with a nonprofit organization (Community Nutrition Partnership) to leverage the aggregation and distribution system of the CSA, with the help of donations from CSA customers, to deliver weekly, fresh, affordable food boxes to low-income people through churches, day-care centers, and YMCAs.

Farm-to-institution programs have diversified from the original Farm-to-School efforts as a way of increasing market opportunities for farmers while also improving access to nutritious foods for consumers and providing educational opportunities. School classes visit farms, and local chefs visit schools to demonstrate cooking techniques. Worksites may purchase local food for their cafeterias while underwriting CSA membership as an employee benefit. Other efforts link small farms with small stores to provide produce now available through the WIC program.

In order to make use of seasonal fresh produce, cooking skills are essential, but these are becoming a lost art. Although food programs on television are watched by many, they don't provide the basic skills needed to create a healthy meal from available affordable food. Therefore, many community-based organizations and agencies are sponsoring cooking classes, cooking demonstrations, and taste tests. Certified community kitchens and "value-added processing facilities" in many communities provide the equipment necessary for home canning, light prepping of vegetables for farm-to-institution programs, and opportunities for "food entrepreneurs" to create and market healthy food options for their communities. NCM

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geospatial models in combination with qualitative analysis can lead to the development, implementation, monitoring, and evaluation of community interventions that can positively influence a participant's social network.

These methods are currently being used in Charlotte by the Mecklenburg Area Partnership for Primary Care Research. The embedded research team (funded by the National Institutes of Health) has used focus groups, key informant interviews, and surveys with vulnerable community members and health care providers to identify the primary social determinants affecting neighborhood health [23]. Maps of these variables and maps of health outcomes such as obesity have been created and used to develop and target community-based interventions designed to improve community health. The research network and community partners also use these maps to examine associations between social determinants of health and clinical outcomes. Examples of such maps are provided in Figure 1.

We are optimistic that the interventions developed through community partnership and engagement will be effective in overcoming both the physical environment and social dynamics that create health disparities. For example, data collected on environmental factors will be provided to community members and policymakers with the aim of improving neighborhood conditions by building parks or adding sidewalks. The community-based participatory research process itself is designed to change social networks by introducing new members with different health behaviors and by promoting group discussions about ways to best improve one's health by directly altering unhealthy behaviors that were previously reinforced by both the physical environment and social contacts.

Conclusions

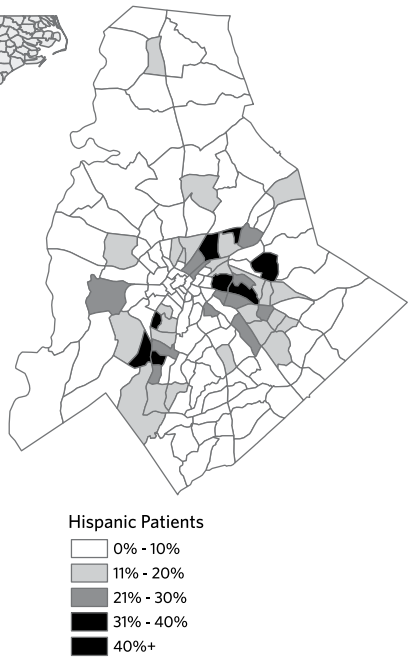
The future of health care depends on our ability to overcome health disparities and to change the underlying social

FIGURE 1.
Three Maps of Mecklenburg County, North Carolina, Showing Selected Neighborhood-Level Social Determinants of Health.

Map A. Percentage of residents participating in the Supplemental Nutrition Assistance Program in 2010, by zip code.

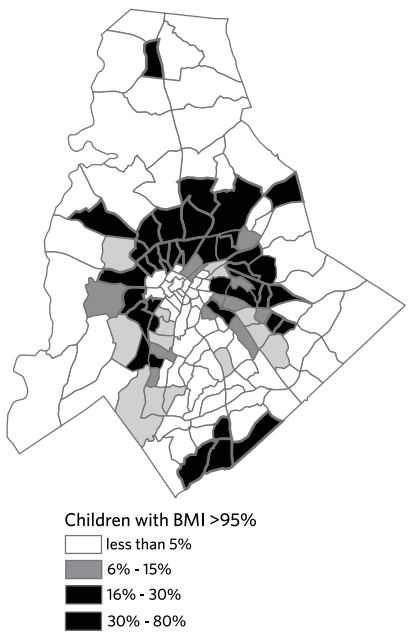
Source: Mecklenburg County Health Department data.

Map B. Percentage of residents who are Hispanic in 2010, by zip code.



Source: US Census 2010.

Map C. Percentage of residents 2-19 years of age with BMI at or above the 95th percentile, by zip code.



Source: Data from hospital electronic medical records.

determinants that sustain them. Neighborhood social determinants include both the physical environment and, perhaps more importantly, the social network. Methods that can help to overcome these social determinants include the use of community-based participatory research, practice-based research networks, and carefully targeted GIS models. NCMJ

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Faith Communities as Health Partners:
Examples from the Field

Annie Hardison-Moody, Willona M. Stallings

Faith communities have a critical role to play in improving the health and well-being of North Carolinians. Research indicates that faith communities are ideal venues for health promotion, because they are connected to hard-to-reach populations, large numbers of people attend services each week, and faith communities have existing resources that can be used to support these initiatives [1]. These resources include volunteers, available space and land, strong networks for social support, and leadership structures that can support healthy behaviors. Faith-based organizations thus have a unique opportunity to improve the health and well-being of the communities they serve. We describe 2 faith-based health promotion interventions in North Carolina.

The North Carolina Council of Churches—a statewide ecumenical organization representing 18 denominations, 6,200 congregations, and 1.5 million individuals—is working to improve the health of clergy and congregants through its faith-based health initiative, Partners in Health and Wholeness. The mission of the initiative is both to promote health as a practice of faith, illustrating the spiritual significance of leading healthy lifestyles, and to improve the health of clergy and congregants through increased physical activity, healthy eating, and prevention or cessation of tobacco use.

Since 2010, the Council has recognized more than 100 congregations across 36 different counties for their health-related efforts. These congregations, located in both rural and urban areas, are made up of more than 35,000 individuals of different socioeconomic levels, races, ethnicities, and genders. They are demonstrating their commitment to health as a practice of their faith by serving healthier church meals, adopting formal church policies related to healthy eating and physical activity, addressing health as a faith issue from the pulpit, maintaining tobacco-free buildings, planting community gardens, hosting youth events that encourage healthy lifestyles, providing healthy snacks and beverages to children and youth, and more.

The work of Partners in Health and Wholeness would not be possible without the endorsement of key denominational leaders and other clergy as well as the support of community health partners, such as local health departments and North Carolina Cooperative Extension, which provide free or low-cost resources to congregations. Using sustained funding from the Blue Cross and Blue Shield of North Carolina Foundation, and partnering with American Red Cross Health and Safety Services of North Carolina, and Blue Cross and Blue Shield of North Carolina, the Council of Churches will begin offering the following opportunities in late summer and early fall of 2012: mini-grants for congregations that have been certified by Partners in Health and Wholeness; a Faith and Health Leadership Council for clergy; and free training in cardiopulmonary resuscitation and the use of automated external defibrillators for selected congregations across the state.

Faithful Families Eating Smart and Moving More (Faithful Families) was developed in 2007, after a statewide stakeholder meeting initiated by the North Carolina Division of Public Health and North Carolina Cooperative Extension. Out of this meeting, 2 principles emerged: That faith-based health promotion work in North Carolina should focus on communities with limited resources, and that any program developed should be accessible and open to individuals belonging to any faith tradition. Working with an advisory committee made up of members of multiple faith traditions and people at various levels of leadership (community-based, state-level, etc), Faithful Families developed a 9-lesson curriculum, adapted in part from the North Carolina Expanded Food and Nutrition Education Program's successful Families Eating Smart and Moving More curriculum. It includes dialogue starters to help participants connect their health to their faith. Created for use with low-income families, the Faithful Families curriculum also includes a planning guide for creating and implementing new policies (eg, deciding to incorporate physical activity into all events or to serve water and fruits

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and vegetables at events) and making environmental changes (eg, planting community gardens, mapping out walking routes).

Since 2007, Faithful Families has been implemented in more than 45 faith communities across North Carolina, in predominantly low-income and minority communities [2, 3]. Self-reported data from 941 adults in participating faith communities shows that 70.5% of participants are African-American, 62.6% qualify as low-income under the federal poverty guidelines, and 71.6% are overweight or obese.

In addition to providing 9 weekly classes to more than 560 participants, Faithful Families has led communities of faith to make more than 170 policy and environmental changes. A majority of the faith communities that participate in the program have implemented multiple policy changes; the most common is a decision to serve water and healthy options like fruits and vegetables at all meetings and events. More than four out of five participants (83%) in the Faithful Families classes have reported a change in one or more nutrition behaviors [2].

Working with faith communities is an emerging and promising public health strategy. This type of multilevel, community-based approach has been effective in helping members of faith communities become advocates for policy and environmental changes that promote healthy eating and physical activity [4, 5]. Through programs like Partners in Health and Wholeness and Faithful Families Eating Smart and Moving More, faith communities are making North Carolina a better place to live, work, play, and pray. For more information, visit http://www.healthandwholeness.org and http://www.eatsmartmovemorenc.com/FaithfulFamilies/FaithfulFamilies.html. NCMJ

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Understanding and Addressing Health Disparities in North Carolina

Ronny A. Bell

Health disparities—differences in the provision and outcomes of health care in 2 distinct populations—are pervasive and long-standing in North Carolina. Although some strategies for closing these gaps have been effective, many disparities have resisted attempts to eliminate them. Future efforts should focus on policy implementation and the translation of research findings into effective interventions.

With the recent passage of the Affordable Care Act, there has been a focused effort to address many of the health disparities that exist in our country. Investments in research on disparities are being made by the National Institute on Minority Health and Health Disparities, which is now 1 of the 27 institutes within the National Institutes of Health (NIH). Policy initiatives are being implemented through the Office of Minority Health within the US Department of Health and Human Services and the Office of Health Equity within the Health Resources and Services Administration. Grassroots efforts are being organized through the National Partnership for Action to End Health Disparities.

What are health disparities? The NIH defines them as "the difference in the incidence, prevalence, mortality, and burden of disease and other adverse health conditions that exists among specific population groups in the United States" [1]. Similarly, the North Carolina Office of Minority Health and Health Disparities defines health disparities as "significant differences or inequalities in health that exist between whites and racial/ethnic minorities" [2].

Most of the focus over the past few decades has been on documenting the health differences—differences in mortality, morbidity, quality of life, health behaviors, access to health care, and the like—that exist among racial and ethnic minority groups. Numerous reports assessing these disparities have been published. As early as 1985, the Secretary of the US Department of Health and Human Services commissioned a task force to document the health of African American and other US minority populations [3]. The National Healthcare Disparities Report, published in 2003 by the Agency for Health Care Research and Quality (AHRQ), was the earliest national comprehensive effort to measure disparities in quality of and access to health care services across various populations [4]. The book *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, published by the Institute of Medicine at the behest of the US Congress, extended the work of documenting disparities in health care by offering policy recommendations to address these gaps [5].

North Carolina has a rich racial and ethnic diversity. In 2011, 22% of the population was black, 1.5% was American Indian or Alaska native, and 8.6% was of Hispanic or Latino origin. The state has one of the largest concentrations of American Indians in the United States, has recently had the fastest-growing Hispanic population in the nation [6-8, 10, 12]. Documenting health disparities in our state's racial and ethnic populations is therefore critical.

Fortunately, the North Carolina Office of Minority Health and the State Center for Health Statistics have been working to do just that. In 2010, these organizations released the second edition of the Racial and Ethnic Disparities Report Card [9], as well as Minority Health Fact Sheets for the 3 major racial/ethnic groups in the our state, African Americans, American Indians and Hispanics/Latinos [10-12]. Health disparities can be thought of in terms of both relative and absolute differences in rates relating to health conditions. The relative rate difference refers to the relative difference in the gap versus the total population difference. For instance, the death rate from HIV infection in African Americans from 2004-2008 was 16.5 per 100,000 population, compared with 1.2 per 100,000 in non-Hispanic whites, a relative rate difference of 13.8 per 100,000. Or said another way, African Americans are 13.8 times more likely to die from HIV than non-Hispanic whites. During that same time period, the death rate from diabetes in African Americans was 163.8 per 100,000, compared with 80.2 per 100,000 for non-Hispanic whites, an absolute difference of 83.6 per 100,000. In other words, for every 100,000 persons, about 84 more African Americans die of conditions related to diabetes than non-Hispanic whites do. Since HIV is a much less common disease, the absolute (total population) difference is not as

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Addressing Infant Mortality Disparity Rates in a Small Rural County

Fred H. Michael

"Two babies dying in a county this size is not that statistically significant unless it is your baby; then it is devastating," said Brunswick County Health Director Don Yousey in 1999. That year, in response to alarming statistics showing high rates of pregnancies among minority women, the Brunswick County Minority Infant Mortality Task Force was formed with a single goal in mind, to reduce the rate of minority infant mortality. It was a goal that some considered unattainable. In 1997, there were 2 infant deaths and 120 live births among minorities in Brunswick County, which translates into a minority infant mortality rate of 16.7 per 1,000 live births, compared with 8.0 per 1,000 live births for whites (who had 5 infant deaths and 628 live births that year) [1].

The task force was made up of members of the faith community, civic leaders, and medical providers, who all tried to help get the word out about existing services in the community. Jere McMillan, task force chair and North Carolina Public Health Association Public Health Social Worker of the Year in 2000, said that the first objective was to reach out to minority women, informing them about clinic services for prenatal care. "We knew all the services were in place to reduce infant mortality," said McMillan. "We just had to connect the services to the people who needed them."

In 2000, only 1 year after the task force was formed, the minority infant mortality rate was 0.0; there were no infant deaths and 149 live births among minorities [2]. Although in 2001 the rate jumped to 19 per 1,000 live births (there were 3 infant deaths and 158 live births that year) [3], in 2002 a rate of 0.0 was once again achieved; there were no deaths and 127 live births [4]. In comparison, the infant mortality rates for whites during the same years was 4.3 deaths per 1,000 live births (2000, 2001), and 5.8 deaths per live birth in 2002 [2-4]. "Lowering the rate to zero for 1 year may involve some luck, but twice in 3 years is a sign that something is indeed working," said Yousey in 2002.

Yousey has retired, but the task force continues to work on eliminating health disparities. David Stanley, current Brunswick County health director, says, "We support the task force and remain committed to closing the health disparities gap. A good start in life depends on providing proper care for mothers and young children."

Cyndi Simmons, director of nursing for Brunswick County, reaffirms the clinical aspects of the importance of prenatal care. "The foundations of adult health are laid before birth and in early childhood," she notes. "Public health has always focused on prenatal care and childhood immunizations."

The target population is women of childbearing age. Members of the task force have known that the success of the program requires that the whole community be empowered to change the underlying economic and social conditions that influence the health of individuals and their communities.

The task force was initially formed based on the results of the 1997 Community Health Assessment, which led the Brunswick County Board of Health to make reducing the minority infant mortality rate its No. 1 priority. A grant was received from the Kate B. Reynolds Charitable Trust to hire a minority outreach worker. A grant from the North Caro-

impactful as it is for diabetes. In the case of diabetes, which is much more common, the absolute difference can be used for population approaches to prevention. However, the relative difference is important because it helps us identify specific risk factors for disease. Both HIV infection and diabetes, in different ways, represent significant public health burdens and health disparities for African American and other minority populations.

There are some limitations to the data contained in these reports. For example, the documentation of race/ethnicity in medical records, on death certificates, and in other sources of data is notoriously fraught with error and omissions. For some health conditions, there are limited data available, and some population groups are not large enough to generate stable rate measures for less common health outcomes. For example, although there are 8 American Indian tribes in North Carolina, data are reported for American Indians as a whole, because most tribes are small. Finally, data on the Hispanic population in North Carolina may be difficult to interpret, particularly data for chronic diseases, because of the younger age distribution of that population in the state. Reporting on the Hispanic population also often does not take into consideration the diversity of this population in country of origin and length of time in the United States.

Despite these limitations, these reports are the most comprehensive sources of documentation on health disparities available to state policymakers, researchers, and health care providers. These reports not only demonstrate wide disparities in many health and health care indicators, they also unfortunately show that these disparities have been stubbornly persistent across long periods of time.

It is extremely important to continue to use data to document whether disparities continue to exist. According to the Institute of Medicine, increasing awareness of health disparities among health care providers, insurance companies, and policymakers is a key element in addressing health disparities [9]. Efforts on the part of providers, insurance companies, and policymakers to understand the reasons for these disparities are sorely needed, so that they can develop

lina Office of Minority Health was used to provide education and resources. In 2002, GlaxoSmithKline presented the task force with a monetary award in recognition of its outstanding achievements.

A plan was developed by the task force to make minorities aware of programs that can assist them during their pregnancies. The plan includes having maternity care coordinators involved in the care of minority women during pregnancy; in addition, minority expectant mothers are encouraged to seek prenatal care in the first 3 months of pregnancy and to use food supplements provided by the WIC program. Other strategies have included offering a parenting class, holding health fairs, and providing babysitting services for single moms so they can go to doctor's appointments or to the department of social services, attend support groups or community events, or address other needs. Participating agencies have adopted a policy of providing water and at least 1 healthy food choice at all events and meetings. Walking trails have been developed in minority neighborhoods to encourage physical activity.

To increase access to care, qualified minority staff members have been promoted, with a goal of attracting more minorities to the health department clinic. "We wanted to make minorities feel welcome coming here," said McMillan. "People tend to trust people they identify with." The lobby has been remodeled to make women feel more comfortable, and a new fleet of clinical vehicles has been purchased for home visits.

Since 1999, when the program went into effect, the overall minority infant mortality rate declined 32%, from 12.9 per 1,000 live births between 1995-1999 [5], to 8.8 for African-American, non-Hispanic and Hispanics between 2006-2010 [6].

As Stanley has observed, "This is an excellent example of what can happen when the whole community becomes engaged." NCMJ

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effective and sustainable interventions that reach the greatest number of people.

So, what to do? Recently, efforts have focused on understanding the social determinants of health. As the World Health Organization explains [13],

> The social determinants of health are the conditions in which people are born, grow, live, work and age, including the health system. These circumstances are shaped by the distribution of money, power and resources at global, national and local levels. The social determinants of health are mostly responsible for health inequities—the unfair and avoidable differences in health status seen within and between countries.

If we were to consider the social determinants that shape the life and health of communities, we might come to more fully understand the circumstances that have contributed to persistent health disparities. For example, consider the hypothetical case of a middle-aged African American man with high blood pressure. He might have this condition because he has an elevated stress level as a result of living in a dangerous neighborhood, or because he experiences discrimination from his employer or other people he interacts with on a regular basis. He may fail to keep follow-up appointments because he has difficulty taking time off from work or because he had an adverse experience with a provider on his last visit. He may have not have filled his prescription because he couldn't afford the medication and has no health insurance that would cover its cost. His diet may be unhealthy because there are no places to purchase healthy foods in his neighborhood. He may not be exercising because he is unable to afford a gym membership and there are no safe parks or recreation areas in his neighborhood.

Recent research has found strong associations between the social determinants of health and various health outcomes. For example, Auchincloss and colleagues [14] have demonstrated that the incidence of type 2 diabetes is significantly lower in neighborhoods with better resources for physical activity and healthy eating. Given the high costs associated with the

Lay Health Advisors Make Connections for Better Health

Alexis Moore, Patricia J. Peele, Florence M. Simán, Jo Anne L. Earp

In many communities across North Carolina, the use of lay health advisors (LHAs) has been an important method of promoting health for decades. North Carolina has been a hub for research on the effectiveness of LHA programs in improving health [1, 2] and for studies of what LHAs do and how they do it [3-5]. Findings from these research initiatives often are incorporated into newer LHA programs.

Lay health advisor is one of several terms used to describe community members who receive specialized training that prepares them to promote wellness through outreach and education; other titles include community health educators, peer health educators, and promotores de salud [6]. Training levels and topics vary by program purpose. In some places, LHAs are viewed primarily as the health system's volunteer ambassadors to a surrounding community, but in North Carolina many community-based LHA networks also work toward social change. LHAs are recruited on the basis of their local reputations for providing trustworthy, culturally relevant information and for managing confidential information with care and compassion. Working as volunteers or for modest stipends, they share information about disease risk and explain how to access an array of services. LHAs are known for interceding when cost, transportation, language, mistrust, fear, or the relatively simple problem of incomplete information has barred the way for a group of people to receive high-quality health care. LHA programs vary significantly in the scope of duties and span of control they delegate to LHAs, but all programs share a mission of bridging the gaps between community residents and health care providers or delivery systems.

Rural Health Group (RHG) provides primary care and dental care across the rural northeastern North Carolina counties of Halifax, Northampton, Vance, Edgecombe, and Warren. Since 2005, more than 60 women, most of them African American women, have graduated from RHG's annual 8-hour LHA training program. The LHAs coordinate with RHG's Case Management and Patient Navigator programs to guide women to mammography screening and, if need be, help them make successful transitions to diagnostic and treatment services.

RHG recruits people on the basis of personal recommendations. For example, a woman sought for recruitment and training may have solid ties to a community not yet reached or a reputation for effectively nurturing a wide circle of friends. Using targeted recruitment, RHG has developed an LHA program that spans several counties and penetrates senior citizen clubs, support groups, public housing, the large paper mill in Roanoke Rapids, and the local community college. Each year, a high school student is selected for LHA training and begins advising the families of fellow students and school faculty about breast cancer. Through regularly scheduled group meetings, LHAs participate in ongoing professional development, program evaluation, and information exchange with the clinical practice team.

Although many LHAs work in rural African American neighborhoods, the Líderes de Salud trained by the organization El Pueblo live and volunteer in Spanish-speaking communities in Chatham, Wake and other nearby eastern Piedmont counties. Líderes support others in managing asthma and diabetes, reducing obesity, immunizing their children, and seeking appropriate dental care and health care. Rural farm workers housed in remote enclaves could theoretically benefit from contact with coworkers trained as LHAs; however, El Pueblo's promotores program focuses on settled residents. Like the African American

treatment of diabetes and its many comorbidities, providing resources at the local level to enhance the built environment to promote healthy behaviors might prove to be cost-efficient and would have a broad impact. Providing opportunities to enhance the availability and cultural competency of health care providers, another recommendation of the Institute of Medicine and a key element of the Affordable Care Act, is also a critical piece in addressing health disparities.

Finally, effective interventions need to be adapted for and disseminated to those communities with the greatest disparities. The Diabetes Prevention Program study [15] confirmed that for nondiabetic overweight people at high risk, lifestyle interventions focused on weight loss through physical activity and healthy eating significantly reduce the incidence of type 2 diabetes. A recent systematic review [16] demonstrated that the Diabetes Prevention Program can be effectively put into practice at the community level using nonmedical personnel, and a subsequent report [17] showed that major health care cost-savings would result if such a strategy were implemented nationwide. A national program focused on bringing the Diabetes Prevention Program to communities has been launched by the Centers for Disease Control and Prevention [18].

The sad reality is that racial and ethnic minority groups in North Carolina generally do not experience optimal health. If we are to achieve health equity, defined as the attainment of the highest level of health for all people [19], we must be creative and have "all hands on deck." We also must be willing to provide the resources necessary to fully address these injustices. NCMJ

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programs that came before it, this Spanish-speaking LHA program relies on relationships that are based on trust and develop over time.

The 140 graduates of the Líderes training program are women and men, who are sometimes spouses. In addition to learning new health information, they gain practice in public speaking and learn how to write public service announcements and design flyers for Spanish-speaking audiences. Adult volunteers grapple with increasing complex barriers to health care access, particularly transportation. Under a recently enacted state law requiring a valid social security number or an unexpired visa to obtain a driver's license, undocumented residents have lost their ability to drive legally, register their cars, and buy automobile insurance. As a result of this policy change, some promotores, like the residents they are trying to help, find themselves increasingly isolated and limited in their ability to bridge the gaps between members of their community and the health care system.

LHA programs strive to find common ground between a community's health concerns and the mission of evidence-based health care. For example, a growing number of men are being trained as LHAs to help other men navigate conflicting information about screening for prostate cancer. As breast cancer survivorship statistics improve, LHAs are considering how to support adherence to treatment regimens for breast cancer. In addition to advising others one-on-one, some LHAs are now discussing how to introduce exercise breaks, healthy snacks, and stress reduction activities into their meetings and outreach events. Enduring LHA programs are founded on sound processes for recruiting and training new members and sustaining their efforts; many of these processes are research-tested. The programs also adapt to changing demographics, emerging evidence about the effects of policy and the environment on health, and new evidence-based recommendations for the prevention, early detection, and management of cancer and other chronic diseases. NCM

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On Public Obligation

Gene R. Nichol

Poverty has a potent and provable impact on health, education, opportunity, safety, dignity, and overall quality of life for Americans. This article argues that our obligations to ameliorate poverty are not only private, religious, and charitable, they are public and governmental as well.

The link between poverty and health is acute. Those fortunate enough to enjoy greater wealth and income receive, of course, superior medical care. But they also eat healthier foods, live in safer communities, attend better schools, face diminished dangers in the workplace, and attain higher levels of education. They are less apt to embrace risky behaviors such as smoking, excessive drinking and physical inactivity [1]. They are also, predictably, more apt to be white and, on innumerable fronts, privileged. When it comes to opportunity, condition, dignity, longevity, and quality of life, poverty matters [1].

The overarching impact of economic disparity has recently been illustrated in the related arena of education. The correlation between poverty and educational achievement in the United States has been well documented since the famed Coleman Report of 1966 [2, 3]. In fact, nothing about American education has been more repeatedly demonstrated than the yawning gap between the attainment of the rich and that of the poor. New findings by Sean F. Reardon of Stanford University trace our income achievement gap over the past 50 years and conclude that it now far exceeds the racial achievement gap [4].

International research magnifies the story. Data from the Programme for International Student Assessment show that among 15-year olds in the United States (and in the 13 countries outperforming us), students with lower economic status had much lower test scores than did their wealthier compatriots. None can credibly doubt that the lackluster comparative performance of American students on international tests is tied to our extraordinarily high rates of child poverty. Other advanced western democracies would not countenance a fifth of their children living in poverty [5]. In education, in health, in access to justice, in opportunity, in mobility, in life chances, we are plagued by our massive economic disparities.

In this brief essay I consider whether these economic privations ought to be deemed the concern of government. Are our obligations to those lodged at the bottom only private and charitable, or are they also public ones? Does the American promise include a shared and compelling commitment to the notion that we are all in this hopeful enterprise together? Perhaps more profoundly than many would have predicted, in the first quarter of the 21st century, the question is a live and immensely contested one.

For me, perhaps unsurprisingly, the answer is a resounding "yes."

The first reason for my conclusion is lodged in the old-fashioned belief that we might actually mean what we say. We "ordain[ed] and establish[ed]" our Constitution "to form a more perfect union, establish justice, . . . promote the general welfare, and secure the blessings of liberty" [6]. The 14th amendment guaranteed to every person "the equal protection of the laws". Lincoln at Gettysburg declared us to be a nation "conceived in liberty, and dedicated to the proposition that 'all men are created equal'" [7]. And we pledge allegiance endlessly to "liberty and justice for all" [8]. North Carolina's charter contains the additional foundational assurance that "all government of right originates from the people . . . and is . . . instituted solely for the good of the whole" [9].

I am the first to concede that these bold and inspiring commitments, state and federal, can be tough to square with the reality that the richest nation on earth, the richest nation in human history, embraces dramatically higher levels of poverty, particularly child poverty, than any of its first-world counterparts [5]. Still, like most, I reject the premise that these founding declarations are mere window dressing, platforms for hypocrisy. I subscribe to Chief Justice Warren's view of constitutional equity, espoused in Brown v. Board of Education: if we have fallen short of our boasts in the past, we're obliged to render them meaningful and effective now [10].

But if constitutional assertion doesn't persuade, in North Carolina we can also turn readily to history. A century ago, we had the highest illiteracy rate in the South and one of the highest in the country. We spent 21% of the national average, per pupil, on education—tying Alabama for last place. Comparative economic studies concluded that

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North Carolina was the least productive state in the nation. We placed near the bottom in per capita income. During World War II, we were stunned, and embarrassed, to learn that more candidates were declared physically unfit for military service in North Carolina than in any other state. As late as the 1960s, fully a third of North Carolina families lived in wrenching poverty. In 1970, we ranked 48th among the states in percentage of residents who had graduated from high school. Broadly speaking, in both competitive and humane terms, we found ourselves at the bottom of the South. And the South, as always, found itself at the bottom of the nation [11, 12].

Our plight is very different now. The derisive "Rip Van Winkle state" moniker has long since been left in the dust. In recent decades, we have been among the fastest-growing states in the nation. Poverty, though still massively troubling, has been reduced—in both absolute and relative terms. Changes in educational attainment, at the K-12 and higher education levels, have been among the most impressive in the country. Health care innovations in North Carolina have changed the lives of its citizens and have set the pace for other regions. The state can claim metropolitan, commercial, and intellectual centers that are the envy of much of the world [11, 12].

These massive and proud changes were not triggered by eliminating taxation, disinvesting in education, abandoning economic development, gutting the public sector, or ignoring the plight and the possibilities of the poorest North Carolinians. Rather, they resulted, often from wise and determined efforts to invest in a shared future for our children, our neighbors, our colleagues, and our successors. Although the road has sometimes been difficult, halting, and costly, its success has been undeniable. Now we frequently compete to lead the nation, not to trail it. North Carolina has thrived when it recognized, collectively, that our greatest traditional value is that we're all in this together.

And the claim that poverty cannot be alleviated by public intervention is an ancient and greedy canard. In 1959, before the advent of Medicare and the War on Poverty, 35% of those over 65 and 27% of children in the United States lived in poverty [13, 14]. By 1973, the child poverty rate had been cut almost in half, dropping to 14%. By 1977, the senior poverty rate had been slashed by almost 60%. And today, despite the buffeting of recession, given the sustaining force of Social Security and Medicare, poverty among those over 65 is 9%--while it has soared to historic levels for other Americans. As Terry Sanford put it, we did not lose the War on Poverty, we "abandoned the battlefield" [15]. The United States has markedly higher poverty and child poverty rates than any other advanced western industrialized democracy [16]. No one actually thinks that is because our version of free market capitalism is the most tightly constrained.

Third, and finally, in 2012, it is simply not accurate, or even feasible, to think of the conditions of citizen health as being the exclusive bailiwick of the private realm or the charitable sector. Our strands of involvement and obligation are, to understate, massively and inescapably intertwined.

To make the point, I like to recall a powerful speech John F. Kennedy gave at Madison Square Garden in May of 1962 [17]. A month earlier, in his State of the Union address, Kennedy had noted that "medical research has achieved new wonders, but these wonders are too often beyond the reach of too many people, owing to lack of income." Bold steps "to provide health care for the aged under Social Security . . . must be undertaken this year" [18].

Kennedy took his case for reform on the road. Speaking without a prepared text to more than 20,000 people in the Madison Square Garden [17], he reminded his audience that opposition to public support for health care was rooted in the same claims used to try to thwart the Social Security Act itself—that government assistance to poor people will "sap" their independence. The "fact of the matter," Kennedy chided, is "what saps someone's spirit is working eight hours a week at straight time" for inadequate wages [17]. What "we are now talking about doing [in health care] the countries of Europe did years ago." The "British, thirty years ago." We are "behind every [nation in] Europe in this crucial matter of medical care for our citizens."

Kennedy was outraged by reports that "doctors in hospitals in New Jersey said they wouldn't treat anyone who paid their hospital bills through social security." The "American people contributed half to two-thirds of the cost of those hospitals." We pay "fifty-five percent of all [medical] research dollars." And we spend huge sums to "help young men to become doctors."

Those who fret that government action "spoil the pioneer heritage," he argued, should "remember that the West was settled with [the help of] two great actions by the federal government." President "Lincoln's administration . . . [first] gave a homestead to any family that went west." Second, "in 1862 [it] set aside government property to build our land grant colleges. The young president concluded:

> This cooperation between an alert and progressive citizenry and a progressive Government is what has made this country great—and we shall continue as long as we have the opportunity to do so [17].

A nation that helps pay for the medical care of much of its citizenry, for the education of all of its students, that massively subsidizes housing for the wealthiest of its members, that taxes capital gains at lower rates than much ordinary income, that gives breathtaking levels of publicly-derived support to lavishly endowed private universities, and that bails out Wall Street barons, walks no comprehensible line of economic libertarianism. I am guessing it never will. What we could hope for, perhaps, is a government that invests in its people and its places in an effort to assure equal opportunity and dignity for all. NCMJ

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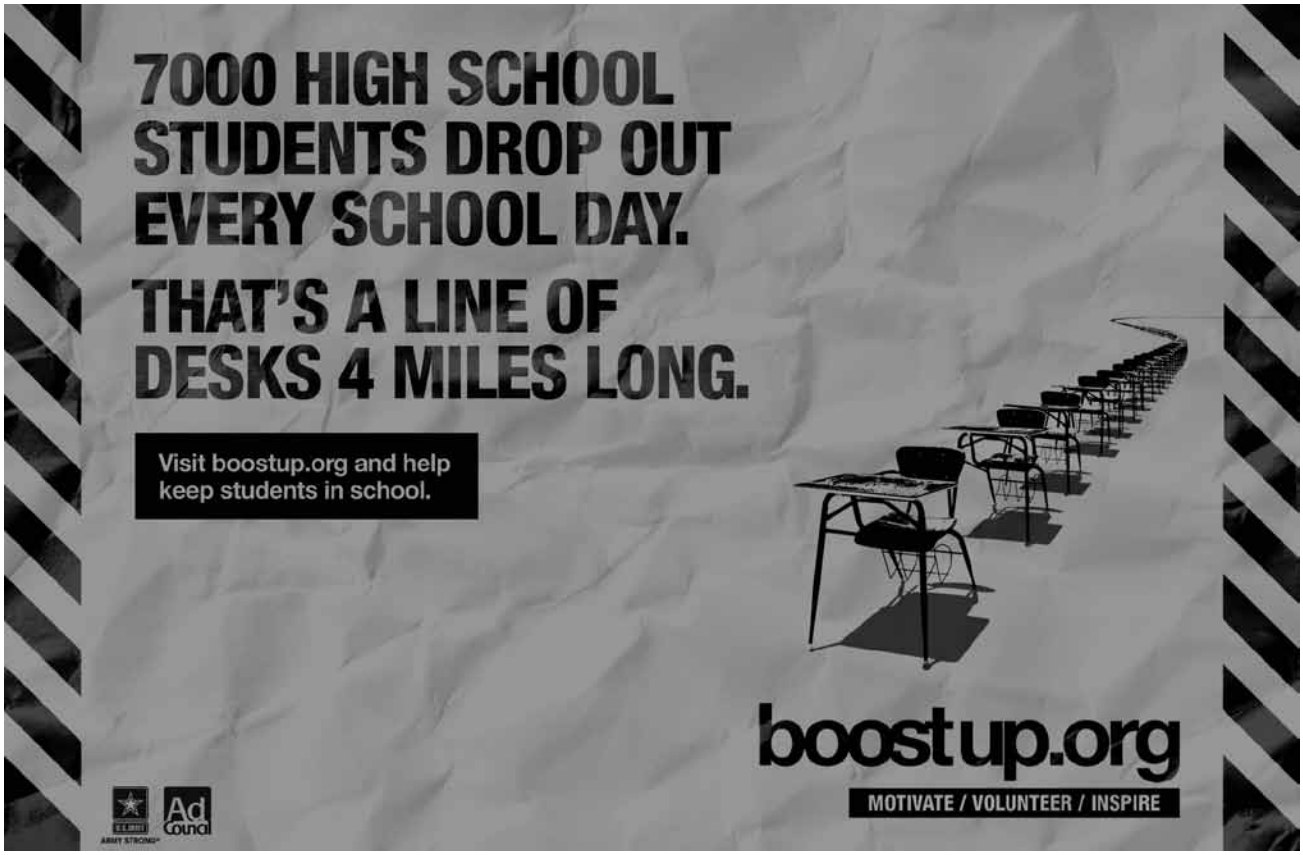

A Healthier Economy for North Carolina

John Hood

There is solid empirical evidence for a positive relationship between economic development and health outcomes. A successful strategy for promoting economic growth in North Carolina would include reforms of the state's education, infrastructure, tax, and regulatory policies.

The principle that "wealthier is healthier" has a long pedigree among scholars and policy analysts of all fields and persuasions. One of the most famous proponents of the idea was Aaron Wildavsky, a political scientist at the University of California at Berkeley and one of the most influential scholars of public administration in the 20th century. Speaking at an American Enterprise Institute conference in 1979, he argued that rising life expectancy and other indicators of improving health in the United States and elsewhere had more to do with economic growth than with rising medical expenditures. Given the lack of a consistent relationship between spending and outcomes in health care, Wildavsky said, "in the long run the lower classes and the middle classes undoubtedly will be healthier with more income than they would be with more medical care—dollar-for-dollar, one use against the other" [1].

Economist Lawrence H. Summers has also made a noteworthy contribution to the "wealthier is healthier" thesis. A former president of Harvard University, Treasury Secretary under President Bill Clinton, and director of the White House National Economic Council under President Barack Obama until November of 2010, Summers is now Charles W. Eliot University Professor at Harvard University's Kennedy School of Government. In 1996 he and Lant Pritchett coauthored an influential paper on the subject for the World Bank. It showed a clear link between rising incomes and declining infant mortality. The researchers found that the relationship was significant even after adjusting for other factors and that the causality arrow likely pointed from income gain to health improvement rather than in the opposite direction [2].

Although there may be broad agreement that socioeconomic factors such as income, poverty, and education level have a substantial effect on human health, the consensus breaks down when it comes to turning the "wealthier is healthier" thesis into public policy. Democrats and Republicans disagree about how best to boost income growth, alleviate poverty, and improve education. Scholars and activists from across the political spectrum bring different assumptions, and sometimes even different definitions, to the task of devising policy alternatives. After all, if the answers to these questions were obvious, much of our current political debate would be rendered superfluous—a welcome state of affairs, perhaps, but not one that is likely to transpire.

Having just completed a book about North Carolina's economic problems and prospects, I spent much of the past year reading nearly 100 studies on the relationship between public policy and economic performance, including income gains for households at all levels of the income distribution. I also examined many studies that probe the link between educational inputs and outcomes. I found it useful to organize the material in the form of 3 prevailing schools of thought about how state and local governments can best promote economic progress. I also found it convenient to give these competing theories the familiar political labels of *Left*, *Center*, and *Right* [3].

The Left believes that the recent recession and weak recovery are the result of inadequate consumer spending. In the short run, progressives favor taxes and transfer programs to redistribute income from the wealthy to the poor and unemployed, who are most likely to spend it and thus prop up aggregate demand. In the long run, the Left believes that chronic poverty and lackluster income growth can best be combated by government action to raise the minimum wage, strengthen unions, and provide universal health care, day care, and other services. With regard to education, many thinkers on the Left have come to believe that factors outside the classroom—the persistence of poverty and racism, for example—best explain performance gaps among racial and ethnic groups.

In contrast, the Center believes that our economic woes are primarily the result of inadequate investment in public capital such as schools, colleges, and infrastructure. Centrists point to overcrowded classrooms, congested roads, and ailing water and sewer systems as major impediments to business creation and growth, much as a body with a poor circulatory system has difficultly operating at

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peak efficiency. Centrists agree with progressives that government must take a lead role in economic policy, but they disagree with the progressives' emphasis on more income-transfer programs and heavier labor-market regulations. Centrists want to maximize government investment, not government spending per se. Most also believe that public schools can produce better educational outcomes if they receive more resources and put them to good use—in other words, it is not all about what goes on outside the classroom.

The Right agrees with the Center about the primacy of investment as a vehicle for economic development. But conservatives believe that our economic woes are primarily the result of inadequate investment in private capital, such as plants, equipment, technology, innovation, and new business enterprises. In North Carolina, the Right points to the state's relatively high marginal tax rates on savings and investment, an adverse regulatory climate, and other factors that reduce the projected rate of return on investment, thus chasing private capital elsewhere. They don't consider it an accident that North Carolina ranks poorly in both unemployment and entrepreneurial activity. I should hasten to say that, just as most centrists do not discount the importance of private capital, most conservatives do not discount the value of improving public capital such as infrastructure and educational institutions. But the Right does tend to doubt that higher government spending in these areas reliably produces returns high enough to offset the tax cost. So conservatives often focus on how to raise the productivity of taxpayer investment in education and infrastructure, not the amount of taxpayer investment.

In North Carolina, these 3 groups have pulled and tugged on leaders of both major political parties. Past governors and legislators have embraced the Center by approving major capital campaigns to build roads, schools, gas lines, and other infrastructure. They have nodded to the Left by expanding Medicaid and extending unemployment insurance benefits, while nodding to the Right by cutting taxes and reforming regulations. But the days of trying to mollify everyone are over. Both in Washington and in Raleigh, we have reached our fiscal limits. Faced with tight budgets and an increasingly competitive market, our leaders are going to have to make some tough decisions. They are going to have to choose the strategies with the greatest likelihood of creating jobs and economic opportunities, which will in turn lead to measurable improvements in health status.

My guess—and, I admit, my preference—is that policymakers will eschew the policies of the Left and opt for a blend of the policies of the Center and the Right. They have good reasons for choosing this option. The literature on economic growth is voluminous, and there are some conflicting findings. Still, the best-designed studies do offer some useful lessons to policymakers. In general, the available research is not very friendly to the Left's argument that government spending on transfer programs such as Medicaid or jobless benefits is a good way to stimulate growth in jobs or incomes. In most cases, researchers have found that such spending is inversely correlated with economic performance—and that the relationship cannot be explained simply as an artifact of people in weaker economies making greater claims on welfare programs [4].

The research is somewhat more favorable to the centrists' focus on government investment in education and infrastructure, and is more favorable still to the Right's focus on encouraging private investment by reducing the cost of doing business. Two factors really stand out. High marginal income tax rates are strongly associated with lower rates of economic growth [5]. And high average test scores in K-12 reading, math, and other core subjects are associated with higher rates of economic growth [6]. High-quality infrastructure, low energy prices, high private investment, and low labor costs are also significant. What doesn't show a consistent relationship with economic growth? Government spending on education and infrastructure. It's the quality of the outcomes that matters in both cases, not the level of inputs.

Raising North Carolina's academic performance offers a 2-for-1 deal when it comes to improving health. Not only would upgrading our human capital be good for income growth, but also education is independently correlated with good health outcomes. The higher the level of literacy and numeracy in a society, the more likely it is that patients will eat healthful foods, avoid risky behaviors, recognize health problems, seek appropriate care, and follow instructions. Better K-12 education also makes it more likely that colleges, universities, and training programs will produce high-quality medical professionals.

By national standards, North Carolina is relatively low in K-12 spending and relatively high in university spending. Interestingly—and contrary to popular belief—North Carolina ranks higher in K-12 outcomes than in higher-education outcomes. The state's K-12 students test just above the national average in math [7], about average in reading [8], and just below average in science [9]. Our high-school graduation rate is close to the national average as well. But in higher education, we actually lag nearly 2 percentage points behind the national average in degree attainment [10]. And according to a recent *Bloomberg BusinessWeek* study, North Carolina's public universities fare poorly in a ranking of how much they boost the average earnings potential of their students [11].

The international evidence does not support the spending-equals-learning thesis either. North Carolina spends more per student on education than almost every industrialized country in the world. Yet our students' test scores rank below the international average. The problem is particularly acute for black, Hispanic, and low-income youth, whose scores are far lower than those of whites, Asians, and students from middle- or high-income households [12].

To address the problems of unemployment, income stagnation, persistent poverty, and educational deficiency, I recommend the following strategies, which combine the

policy insights of the Center and Right: (1) Lighten North Carolina's tax and regulatory burdens to increase the profitability—and thus the likelihood—of investment in North Carolina businesses. The best social program really is a job, and entrepreneurs don't create jobs in places where they are unwelcome. We should adopt a flat-rate, pro-growth tax code and require all regulations to meet a cost-benefit test. (2) Reduce unwise government subsidies of immediate consumption to free up resources for valuable, job-creating investment in both public and private capital. Both Medicaid and unemployment insurance need immediate reforms to reduce their cost to taxpayers and their disincentive effects on employment. (3) Use consumer choice, competitive contracting, and other innovative mechanisms to increase the payoff from government spending on education and infrastructure. Invite private investment in physical and human capital, as well, through such policies as public-private partnerships for repairing and upgrading roads, and tax credits or scholarships that partially offset the cost of private education for students of modest means.

A strategy of improving the health of North Carolinians by raising their incomes and educational levels can't just be about good intentions or stated objectives. It should include policies that have proven themselves in other states or countries. Each of the policies I recommend has done just that. Let's proceed. NCMJ

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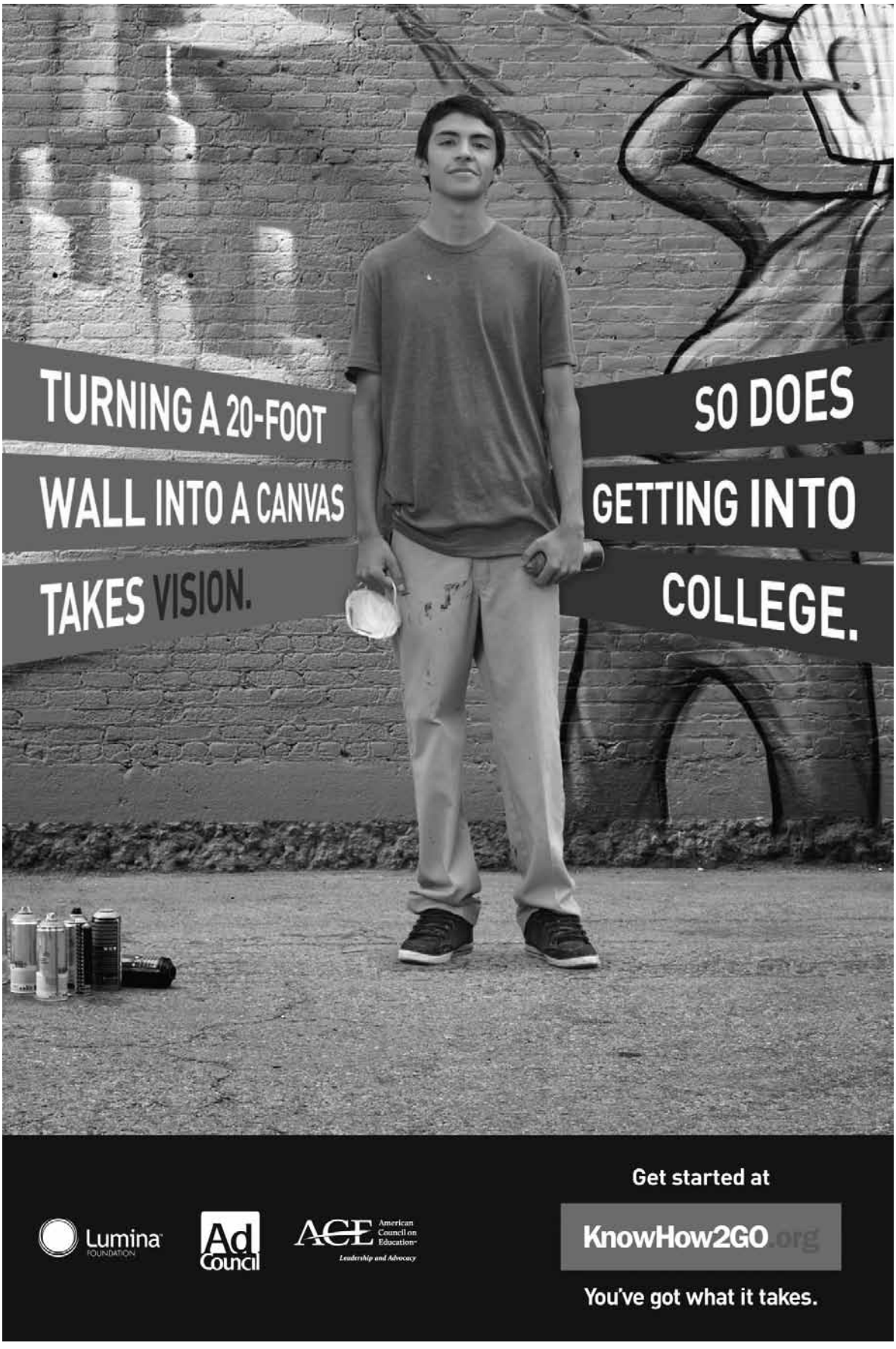
TURNING A 20-FOOT
WALL INTO A CANVAS
TAKES VISION.
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Running the Numbers

A Periodic Feature to Inform North Carolina Health Care Professionals About Current Topics in Health Statistics

Healthy North Carolina 2020: Social Determinants of Health Indicators

Socioeconomic factors such as income, education, and affordable housing are important predictors of the health status of a community. Individuals with higher income, more advanced education, and more stable housing tend to have better health status compared to persons with more limited income, education, and less secure housing [1]. People living in poverty or who have lower levels of education face greater barriers to health care, and tend to engage in more high-risk behaviors such as smoking [2]. Individuals who have difficulty paying their utilities and rent have less discretionary income for needs such as preventive health care, and tend to have more hospitalizations and emergency room visits than people living in more affordable housing [2]. Compounding the problem is that, although each of these factors is independently predictive of health status, they are also strongly correlated with each other. Therefore individuals living in poverty are more likely to have lower levels of education and to live in less affordable or substandard housing [3].

At the request of the Governor's Task Force for Healthy Carolinians, the North Carolina Institute of Medicine (NCIOM) coordinated the development of the Healthy North Carolina 2020 objectives, with the goal of improving the health status of North Carolina's citizens. The NCIOM, in collaboration with the Governor's Task Force and the North Carolina Division of Public Health, created a steering committee to lead the development of the Healthy North Carolina 2020 objectives. The steering committee included the state health director, the chair of the Governor's Healthy Carolinians Task Force, and numerous other public health experts and practitioners. The committee identified 13 focus areas for the Healthy North Carolina 2020 objectives, one of which included social determinants of health [4]. Three objectives were identified for the social determinants of health focus area: the percentage of individuals living in poverty; the 4-year high school graduation rate; and the percentage of people spending more than 30% of their income on rental housing. A 2020 target goal was set for each objective, which are respectively as follows: decrease the percentage of individuals living in poverty from 16.9% (2009) to 12.5%, increase the 4-year high school graduation rate from 71.8% (2008-2009 school year) to 94.6%, and decrease the percentage of people spending more than 30% of their income on rental housing from 41.8% (2009) to 36.1%.

Although each of these target objectives is set for the state overall, many of the strategies and interventions for achieving the target are local or community-centered efforts. Thus, it is important that each county track their own progress in reaching the 2020 targets. The figures below present the most current county-level data for the 3 social determinants of health objectives for 2020.

Figure 1 shows the percentage of the population living in poverty, by county. In 2010, 94 of the state's 100 counties were above the 2020 target of 12.5%. Many of the counties with the highest poverty rates (23.8% or higher) were located in the Sandhills region and in northeastern North Carolina. Figure 2 shows the high school graduation rate for the 2010-2011 school year. None of the counties met the 2020 target for this objective,

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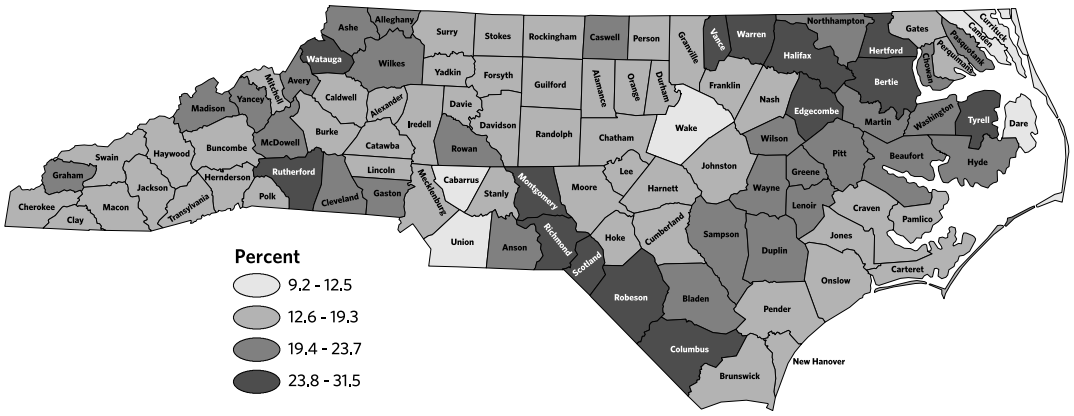
FIGURE 1.
North Carolina Percent of the Population Living in Poverty by County, 2010

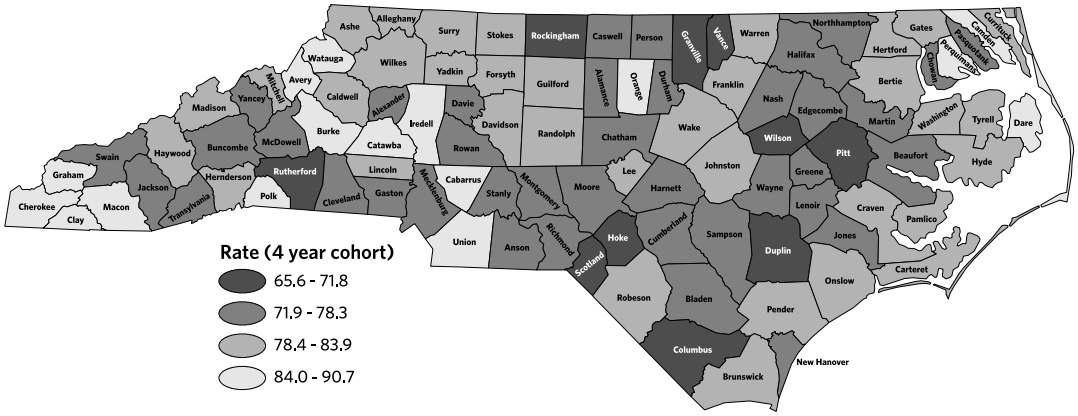


Source: US Census Bureau Small Area Income and Poverty Estimates (SAIPE)

and 10 counties had graduation rates of 71.8% or less. The percentage of the population spending more than 30% of their income in rental housing, by county, is shown in Figure 3. Nineteen counties met the 2020 target of 36.1% for the 5-year period of 2006-2010. Counties meeting that target were predominantly rural counties. Among the larger metropolitan counties the percentages were fairly high, typically above 42%.

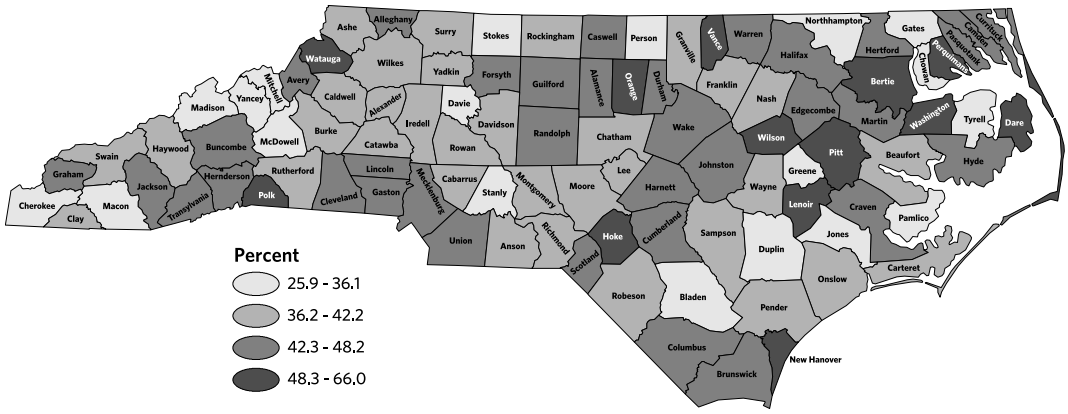
Meeting the 2020 target goals for social determinants of health will be a challenging endeavor, as these 3 objectives represent complex, multifaceted problems. Reducing the poverty rate is out of the direct control of public health, and requires improvements in the economic climate at both the national and state level, as well as a reduction in the state's unemployment rate which remains above that of the US overall [5]. Improving the high school graduation rate is a goal established by the North Carolina General Assembly, but achieving the 2020 target will require buy-in from parents and students, as well as more support for school districts to implement and maintain programs aimed at improving student performance and retention. Housing issues are also largely dependent on improving the state's economic and employment outlook, but

FIGURE 2.
North Carolina High School Graduation Rate by County, 2010-2011



Source: NC Department of Public Instruction

FIGURE 3.
North Carolina Percentage of Population Spending more than 30% of their Income on Rental Housing in the Last 12 Months by County, 2006-2010



Source: US Census Bureau American Community Survey, 5 year estimates.

community-level efforts such as establishing local rental-assistance programs can have an impact. As public health embraces a more holistic approach that incorporates social, economic, and environmental determinants of health into a life course perspective, the State Center for Health Statistics has begun to integrate a wider array of data into the scope of our public health surveillance mission. The State Center for Health Statistics will continue to track progress toward the Healthy North Carolina 2020 objectives at both the state and local level, to help ensure that stakeholders and policy makers have current and accurate information to assess the effectiveness of public health programs, interventions, and policies. NCMJ

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Philanthropy Profile

The Youth in Transition Community Initiative of Forsyth County

In 2009, a new community issue came to the attention of the Winston-Salem Foundation — the plight of young people who age out of foster care. As the Forsyth County Department of Social Services explained to the Foundation, the services provided for young people once they turn 18 are not adequate to meet their needs. There are provisions to provide supportive transitional programs and even Medicaid until they are 21. However, many of these young people feel they do not need or want ongoing child welfare services. Inevitably this means they may find themselves living alone without any support, trying to make it with few or no resources, and facing difficult life challenges without the guidance of a stable family or the networks that can support healthy development.

The Foundation understood that the community was losing the potential of these young people. Additionally, national studies show that young people transitioning from foster care without a support network are 20% more likely to become homeless, and also face higher rates of unemployment, criminal conviction, public assistance, and single parenthood [1, 2]. In fact, national statistics show only half are employed at age 24, 71% of the young women are pregnant by age 21, and fewer than 3% will earn a college degree by age 25 (as compared to 28% of all 25 year olds), and 1 in 4 will be involved in the criminal justice system within 2 years of leaving the foster care system [2, 3].

Those national statistics also reflected what Forsyth County was experiencing, but the Foundation felt the problems could be improved upon because there were resources available in the community. In addition, the number of young people was small enough to be manageable; between 2002-2008, there were only 149 young people who aged out of the system in Forsyth County.

The Winston-Salem Foundation agreed to serve as the convener and brought together a diverse group of community representatives including the Kate B. Reynolds Charitable Trust, the Forsyth County Department of Social Services, The Children's Home, Goodwill Industries of Northwest North Carolina, and individuals who had expertise in developing programs for young people or who had connections to local resources. The group also was committed to including youth previously in foster care as well as those currently in the system.

Working together, this community consortium began to identify the challenges facing young people transitioning from foster care, researching the resources that currently exist, and identifying the gaps that needed to be filled. The goal was to develop a comprehensive community plan designed to improve the chances of success for these young people ages 18-25. In 2010, the Youth in Transition Community Initiative of Forsyth County (YIT) was born, with technical support provided by the Jim Casey Youth Opportunities Initiative, a non-profit national organization that works locally in a number of sites across the US to create opportunities that will improve the lives of young people.

While YIT is a cooperative effort, the group believed there needed to be one lead agency and selected Goodwill Industries of Northwest North Carolina to fill that role, based on the organization's resources and experiences in implementing supportive youth programs in areas that parallel YIT's objectives such as mentoring, housing support, financial literacy, and job training. Goodwill also had a strong track record of developing partnerships with other resources in the community to provide these services.

Based on advice provided by the Jim Casey Youth Opportunities Initiative, YIT began an early focus on financial literacy since many of the young people had little or no knowledge of how to budget or manage money. The staff also supported the

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young people by working with them to overcome any barriers to participation they might have such as transportation to the sessions.

One of the key elements for the Initiative had to be the inclusion of young people in identifying needs and developing avenues to meet those needs. Leading Youth for Empowerment (LYFE), is the youth leadership board that allows the young people involved in YIT to have a voice and to develop their own network of supportive peers. One of their first tasks was to develop a list of priorities that needed to be addressed if they were to be successful in their development. Not surprisingly, the first priority was employment, followed closely by housing. These young people who were on their own needed an income and a stable place to live if they were to take advantage of the opportunities the community could provide them. While a job, a place to live, the ability to meet daily needs, and the ability to save money are certainly common priorities for most young people, the LYFE group did have a priority that was uniquely related to foster care, and that was being able to visit their younger siblings.

Organizations that have some of the necessary resources have been stepping up as partners with YIT to help meet all of these priorities. Forsyth Technical Community College is working to provide educational opportunities and mentoring, the local YMCA has agreed to hire YIT participants as counselors, and Goodwill's eLink program is providing job readiness training. The North Carolina Housing Foundation is partnering with YIT to identify temporary and long-term housing while the partnership created by Consumer Credit Counseling Services, the Forsyth County Department of Social Services, and Allegacy Federal Credit Union is working to provide financial literacy classes and to enroll participants in the Individual Development Account Program that allows participants to have their savings matched for education, housing, transportation, and other necessities.

While YIT has not yet completed all of the work necessary to support its goals, much progress has been made in the past 2 years. Importantly, 43 young people have some type of involvement in the Initiative. Of these, 12 of the young people completed financial literacy training, and 11 are currently enrolled. YIT staff has assisted 9 youth with housing, 10 with transportation needs, and 3 with obtaining a Social Security card. A practice model is nearly completed and, from that, the final research and evaluation tools will be developed. The evaluation component is not only important to funders, but also to strategic programmatic direction.

The framework that has been developed will allow YIT to expand its ability to determine gaps in services and to develop a more seamless relationship with the Department of Social Services that will ensure better support for the young people being served and lessen any possibility of expending resources on redundant efforts. Through the relationship with the Department, efforts will be made to reach a younger audience so that the youth transitioning from foster care 5 years from now will be much better prepared to live on their own.

With national program support from the Jim Casey Youth Opportunities Initiative (www.jimcaseyyouth.org) and local community organizations coming together with the young people they were trying to serve, The Duke Endowment provided a 2-year grant of $594,793 to support the Initiative and the Kate B. Reynolds Charitable Trust has provided a 3-year grant of $486,565 that will provide matching funds for the Individual Development Accounts as well as support financial literacy efforts. This funding has provided a foundation on which YIT can continue to build its programming and its reach in the community.

As those involved in the Initiative acknowledge and agree, this is not an issue that could be solved by the efforts of any one agency or organization. Bringing together a community collaborative to work hand-in-hand with the youth themselves will make a difference for the young people aging out of foster care and for the broader community. NCMJ

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Spotlight on the Safety Net

A Community Collaboration

Lucille W. Gorham Intergenerational Community Center (IGCC)

The Lucille W. Gorham Intergenerational Community Center (IGCC) in Greenville, North Carolina, was founded in 2007. Its goal is to identify and address the biopsychosocial health and wellness needs of the residents of west Greenville and Pitt County through innovative programs designed for people in all stages of life. The center's philosophy is that everyone has assets, and by promoting those assets it hopes to help strengthen another generation of families. The center's community development and sustainability plan strengthens individuals and families so that they can maintain their health and well-being.

The Intergenerational Community Center is a collaborative effort on the part of the west Greenville community, the City of Greenville, East Carolina University (ECU), Pitt Community College, and several community nonprofit agencies. The campus of the center, which consists of 6 buildings formerly occupied by St. Gabriel's Catholic Church, is owned by the City of Greenville and is leased to ECU, which is the site manager. The university is responsible for bringing in programs and services and nonprofits. Pitt Community College offers General Educational Development (GED) courses at the center during the days and evenings, and the college's new construction lab on the IGCC campus builds homes in the west Greenville community. IGCC partners use memoranda of understanding to operate the center and to drive its collaborative efforts.

In 2005, Lessi Bass, an associate professor of social work at ECU, took an interest in a community located between ECU's east and west campuses, which was struggling with a number of social, economic, and health needs. Bass worked closely with the City of Greenville, which was trying to revitalize the area. She was concerned about what disparities meant for residents and their families. She went door-to-door with Deborah Moody, who is now director of programs at IGCC, asking citizens about their needs. These 2 women made IGCC a reality. Bass died in January 2009. Her legacy is the center and the work it does in the community. Moody, who worked alongside her, is now the day-to-day person who keeps alive the connections that Bass made. One of us, K.A.L., an assistant professor of social work at ECU, recently joined the staff of the center as executive director.

In order to understand the needs of the community, in June 2011 the ECU Center for Health Disparities Research community and faculty partnership award funded the West Grenville Community Health Needs Assessment. It was the first time secondary data and survey data were used to examine health for residents of the west Greenville community. The results showed significant health disparities. Compared with Pitt County as a whole, the west Greenville area has extremely high mortality rates for HIV infection, lung cancer, nephritis, and diabetes. Through a random sample of homes in 2 census tracts near the center, the researchers gathered information on access to health care, health disparities, health behaviors, and health beliefs. They reported this information back to the community in a town hall meeting, and the IGCC used it to help determine the type of programming needed by the residents.

A variety of programs focused on strengthening the family have been established. A community garden built with funding from a Kellogg grant in 2007-2008 has provided health education, physical activity, nutrition, and an opportunity for young and old to work together. The garden is integrated into the children's applied math and science programs and also serves as a source of fresh produce for the community.

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Youth Excelling For Success (YES) is an after-school program (formerly funded by a 21st Century Community Learning Center grant from the North Carolina Department of Public Instruction) for youth in third through fifth grades. The program applies the North Carolina Standard Course of Study in nontraditional ways, teaching health, reading and math skills through cultural enrichment activities, chess, physical education, and community gardening. The program is free to families. The program receives community and Kate B. Reynolds Charitable Trust funding, and half of its staff members are people who live in the community. The chess teacher is a community member who has won state and national competitions. He works with students on math and critical-thinking skills. An in-class grocery store helps students learn to budget and to think about nutrition. A major component of the program is parent engagement. The staff holds large parent meetings with free health screenings to connect parents to resources; these meetings serve as a gateway connecting the center with the community and involving it in the lives of families.

Project FRESH (Food and Relationships for Equitable and Sustainable Health) is a pilot program in which children in the after-school program and their parents walk around the community and deliver locally produced food bundles and cards with healthy recipes on them to homebound seniors. These parent and student volunteers receive produce bundles as well.

The Summer Significance Academy is a 6-week program for students entering middle school. This program seeks to enhance study habits and math and science skills, and then tracks youngsters in their sixth-grade year, providing tutoring as necessary. Older community members serve as volunteers for this program.

IGCC Fit is a new health and wellness program funded by the Kate B. Reynolds Foundation. It focuses on serving youth, adults, and seniors by providing physical activities, nutrition assistance, education, and community support and engagement. The goals of the program are to improve access to affordable healthy food options, to increase opportunities for safe physical activities in the community, and to reduce health disparities, including disparities in the prevalence and treatment of obesity, hypertension, and diabetes.

The IGCC offers free health screenings in collaboration with Tom Irons and his staff from the James D. Bernstein Community Health Center. The IGCC is also involved in Doyle "Skip" Cummings's EMPOWER Study of African-American women with type 2 diabetes in Edgecombe, Pitt, and Bertie counties. IGCC is an enrollment and assessment site for the EMPOWER grant and provides free monthly diabetes screenings. EMPOWER is a randomized controlled trial funded by the Bristol Meyers Squibb Foundation to test the effects of implementing a small changes model with community health workers to maintain type 2 diabetes.

The Youth Apprenticeship Program (YAP) is a project for juvenile offenders and for youth ages 16 to 25 years who are at risk for law enforcement interaction. The program prepares these teens and young adults to complete the GED course or to return to high school by teaching them professional business practices (time management, dress, and attitude), vocational skills (welding, electronics, automotive repair, and the like) through apprenticeship placements with mentors at local participating businesses, and life skills (through classes on parenting, conflict/anger management, and financial literacy). Most of the program participants have completed the GED and some have gone on to college.

Seniors Sowing Seeds (SSS) is a program that connects senior women with young girls. The older women provide the younger women with child care advice, cooking and sewing lessons, and home management skills. In turn, the young women teach the older women about new technology, including cell phones, computers, e-mail, and digital cameras. Many of the older women also participate in a weekly quilting group.

The success of the programs and events offered by the IGCC is the result of its strong partnerships with the community and the participation of a variety of organizations. The staff and partners are committed to keeping the center and its programs going regardless of changes in funding sources. The IGCC will continue to use its community resources to strengthen the families of west Greenville. NCMJ

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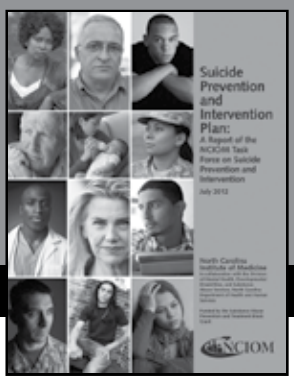

Issue Brief

Suicide Prevention and Intervention Plan

A Report of the NCIOM Task Force on Suicide Prevention and Intervention

July 2012

Suicide is a devastating problem that has major emotional consequences for the family and friends of people who die by suicide, and physical and psychological consequences for those who survive suicide attempts. Death by suicide is one of the top ten leading causes of death for people ages 5-64 in North Carolina. These deaths affect the entire state. Suicide deaths and suicide ideation cross gender, age, race, and other demographic lines. However youth and young adults, older adults, military service members and veterans, and people with mental health and substance use disorders are at increased risk for self-inflicted injury and death by suicide. Each year more than 1,000 North Carolinians die from self-inflicted injuries, more than 6,000 are hospitalized, and more than 8,000 are treated in emergency departments for self-inflicted injuries.[1] Suicide deaths in the state resulted in more years of potential life lost for individuals under age 65 than homicide, congenital abnormalities, cerebrovascular disease, human immunodeficiency virus (HIV), or diabetes mellitus.[2] What distinguishes suicide deaths from most other deaths is that suicide deaths are entirely preventable.

Many people who die by suicide have an underlying mental illness or substance use disorder. National data suggest that 90% of suicides are associated with some form of mental illness.[3] In North Carolina, 37% of the males and 67% of the females who died by suicide from 2004-2008 were in current treatment for a mental illness at the time of their death. Others had indications of mental health problems.[1] However we know that the North Carolina data are likely to underreport the connection between suicide deaths (or suicide attempts) and mental health or substance use disorders. The North Carolina Violent Death Reporting System relies on law enforcement interviews with survivors (those who knew the victim) to try to gather background information about suicide deaths. The people who provide the information may not know, realize the connection to, or feel comfortable revealing the underlying mental health or substance use status of the person who died.

Today, different governmental and private organizations and agencies in the state offer a patchwork quilt of suicide prevention and intervention services, but this quilt has many holes. Some services are targeted to specific populations, while others are more broadly available. People who are in the midst of a crisis do not always know where to turn to obtain the services that are available. Further, even when services are available, they are not always well coordinated. Treatment professionals do not always communicate suicide risk or ideation to other professionals and the system does not always ensure appropriate transitional care as people move from one provider to another. Some providers employ evidence-based practices—those services or treatments that have been shown to produce positive health outcomes—while others do not. Further, we lack a statewide plan—or vision—for how to effectively use existing state and local resources to ensure that we effectively target this critical public health issue. North Carolina needs a multifaceted suicide prevention and intervention plan that combines broad-based prevention activities, early intervention, crisis services, treatment, and recovery supports for people who have attempted suicide, and postvention for people touched by suicide.

The North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services (DMH/DD/SAS) works with other state and local agencies to provide prevention, crisis intervention, treatment, recovery support, and other services to people who are contemplating suicide or who have attempted suicide, and to their families. DMH/DD/SAS asked the North Carolina Institute of Medicine (NCIOM) to convene a task force to review the state's

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current suicide prevention and intervention system and identify strategies to enhance the system to better meet the needs of North Carolinians.

The NCIOM Suicide Prevention and Intervention Task Force included 24 members representing DMH/DD/SAS, the North Carolina National Guard, public health and other health professionals, behavioral health providers, outreach organizations, hospitals, survivors, and advocates. The Task Force met five times over six months to help DMH/DD/SAS develop its Suicide Prevention and Intervention Plan. This report focuses on the role that DMH/DD/SAS and the Division of Medical Assistance (DMA) can play at the state level in reducing suicide deaths and suicide risk. The report also focuses on the role of Local Management Entities/Managed Care Organizations (LME/MCOs) and contracting behavioral health providers in helping to identify people at risk of suicide, and to ensure they get into appropriate evidence-based crisis services or treatment.

This plan comes at a critical juncture as North Carolina transitions its publicly funded MH/DD/SA system from a loosely organized, fee-for-service system to a more tightly coordinated managed care system. DMA and DMH/DD/SAS are holding the new LME/MCO entities to higher standards and have enhanced performance requirements to include community engagement (i.e. engaging community partners), building an adequate network of qualified providers to meet the MH/DD/SA needs of people in their service area, and quality management responsibilities to ensure that high quality services are being delivered. These new standards can also be used to support the development of a more effective suicide prevention and intervention system at the local level.[4] While the plan focuses primarily on the role of LME/MCOs and contracting providers to prevent and reduce suicide risk, it also includes recommendations aimed at primary care medical homes within the Community Care of North Carolina (CCNC) networks. Primary care professionals are uniquely situated to help identify people who are contemplating suicide or otherwise at risk.

Ultimately, we know that effectively reducing the number of suicide attempts and deaths will require new and strengthened partnerships across agencies. **Thus, we need to create a statewide plan that includes all the state and community partners involved in suicide prevention, early intervention, crisis services, treatment, recovery supports for people with suicide ideation or who have attempted suicide, and postvention services for those touched by the suicide death of another person.** Comprehensive suicide prevention and intervention models that have been implemented elsewhere have been successful in reducing suicide deaths and suicide risk.[5-8]

This state suicide prevention and implementation plan cannot realistically be implemented immediately. **As a first step, the state and each LME/MCO should identify one or more staff members who will help coordinate the implementation of the state suicide prevention and intervention plan.**

To be effective, the state needs to invest more heavily in prevention—both in reducing risk factors that are known to increase the chance of suicide, and in strengthening the protective factors that can help reduce suicide risk. **Thus, the state should require all LME/MCOs to use a portion of their federal and state funding for suicide prevention and education in their communities.**

Individuals entering the medical system, including those who enter the mental health or substance abuse service systems, should be screened to determine their level of suicide risk. If identified as high risk, individuals should receive a more thorough suicide risk assessment that obtains information about their risk and protective factors, history of past attempts, current suicidal thoughts, and information about their suicide plans and capabilities. **The state should identify evidence-based screening tools and risk assessment instruments, and develop protocols for when the LME/MCOs and contracted providers should administer these tools.**

Individuals who are actively contemplating or who have attempted suicide need to be linked immediately to effective crisis services. The state and LME/MCOs should ensure that there are trained crisis providers available across the state. These providers should be trained in crisis de-escalation skills, identifying suicide risks and providing treatment to stabilize the immediate suicide risk. Individuals with mental health or substance use disorders who are discharged from institutions, hospitals, or crisis services

should receive care coordination services to connect them with community providers.

Once stabilized, individuals at high risk of suicide should receive high quality, evidence-based treatment for underlying conditions. Treatment, care coordination and information sharing among providers should be designed to target the populations most at risk for suicide, including individuals with major depressive, bipolar, schizophrenia, or borderline personality disorders, as well as those with other mental health or substance use disorders. **The state, LME/MCOs and contracted providers should also ensure that those who have attempted suicide or who have suicidal thoughts have treatment plans to support recovery and manage future crisis.**

In addition, the state and LME/MCOs should implement strategies to link family and friends touched by suicide into postvention services. Toolkits should be available in schools and communities and other approaches should be implemented to help those impacted by a suicide death deal with the tragedy and get appropriate help.

The Task Force recognizes that the state and local LME/MCOs could not implement the statewide suicide prevention and intervention plan all at once. **Therefore, the Task Force recommends that the North Carolina Department of Health and Human Services convene a broader workgroup to develop a timetable to implement the Task Force's statewide suicide prevention and intervention plan.**

Now is the time to act. We have lost the lives of too many North Carolinians by failing to invest in suicide prevention, early intervention, and a coordinated crisis response system, and by failing to provide evidence-based treatments, recovery supports, and postvention services. We have the building blocks for an effective suicide prevention and intervention system; what we have historically lacked is an organized focus on this issue. This plan provides DMH/DD/SAS the blueprint for a more effective suicide prevention and intervention system, targeting people with mental illness or substance use disorders. By implementing this plan, we can go a long way to reduce unnecessary deaths and hospitalizations and improve the well-being of many North Carolinians.

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Steering Committee members: Steering Committee members: Mark Besen, PhD; Debra C. Farrington, MSW, LCSW; Janice Petersen, PhD; Susan Robinson, MEd; Flo Stein, MPH.

A copy of the full report, including the complete recommendations, is available on the North Carolina Institute of Medicine website, http://www.nciom.org.

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Payers Share the Responsibility for Decreased Quality Among Care Transitions

James McGrath

To the Editor—The January/February 2012 issue of NCMJ, as well as 3 recent discussion articles in The New England Journal of Medicine, focused on issues related to care transition, particularly hospital readmission rates [1-3].

Left out in all of this discussion, and in other discussions regarding costs of our current medical care system is, in my mind, the culpability shared by payers of services. Payers have relentlessly cut reimbursement for primary care services over the past couple of decades while, at the same time, implementing and requiring procedural changes and staffing requirements in primary care offices which necessarily raise office overhead.

The net effect of these changes has been the near universal withdrawal of primary care physicians in both hospital and nursing home care. This withdrawal was occasioned not by lack of interest or skills, but simply because the continuation of such services is not cost effective.

The payers of services should not be allowed to escape their culpability in forcing changes in the practice of primary care which have made it more difficult for patients and their families to negotiate the system, have reduced care quality, and have increased costs. NCMJ

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North Carolina's Mental Health System:
We Are Devolving, Not Evolving

Assad Meymandi

To the Editor—I write to take exception to the title of your May/June 2012 issue, Are We on the Right Path? North Carolina's Evolving Mental Health System. The correct verb is *devolving*, not *evolving*. For nearly 50 years, I have been involved in various capacities with the North Carolina mental health system. At no time have the services to and for our patients been as chaotic, sparse, and erratic as they are today. Fifty years ago in North Carolina we had a system in place that was truly superb. At the Dorothea Dix Hospital, in the late 50's and early 60's, patients had predictable, excellent, and academically cutting edge treatment available to them with ready access. We have certainly *devolved* and not *evolved*. NCMJ

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Oral Health:
Just as Important as Ever

Allen J. Smart

To the Editor—Our experience at the Kate B. Reynolds Charitable Trust mirrors much of what was communicated in the March/April 2012 issue on oral health. From 1995-2005, the Trust funded 108 safety net oral health programs with over $16 million in grant dollars. Of these grants, 18 programs were specifically for mobile/portable units intended to better meet the needs of rural or otherwise place-bound clients.

The oral health issue reminds us that very little has changed since we were a major funder of dental treatment in the state. North Carolina still ranks 47th of 50 states in proportional numbers of dentists and the initiation of the ECU dental school will only help us make sure we don't slip further down the list. The lack of availability of dentists to serve low-income rural communities was, in fact, one of the major reasons that we moved away from being a funder of safety net dental services. No amount of grant money can seemingly entice a stable dental workforce to serve financially disadvantaged residents. The ECU model of training dentists in rural settings is a good example of some creative thinking around the issue.

Without a major infusion of dental workforce into the state anytime in the foreseeable future, we need to look at system changes that better respond to the overall oral health needs of low-income persons. One system change should include removing a prior exam by a dentist as a prerequisite before sealants can be placed. North Carolina is one of 20 states that require an exam—thus making school-based programs very difficult to administer. Sealants and fluoridated water are the 2 major low-cost public health measures for setting a baseline for good dental health. Another necessary change is better integration of oral health and primary care. North Carolina has made significant strides in the integration of primary care and behavioral health services. Oral health needs to be brought into this type of innovative thinking. Finally, there needs to be a better place for oral health emergencies than a hospital emergency room. No one believes that the current system of hospitals serving as the after-hours oral health treatment facility is good for the patient or the system.

Thanks to the NCMJ for highlighting this important issue. Too often oral health gets segregated as a health care service rather than an integral part of whole person health and wellness. NCMJ

Allen J. Smart director, Health Care Division, Kate B. Reynolds Charitable Trust, Winston-Salem, North Carolina.

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Interested candidates are asked to submit their CV and cover letter to Dr. James Breen (James.Breen@ConeHealth.com). Telephone inquiries may be directed to Ms. Darcy Hitz, Residency Coordinator (Darcy.Hitz@ConeHealth.com) at 336-832-7486.

North Carolina- Assistant Professor. The Internal Medicine Program of Cone Health, a tertiary care, community teaching hospital in Greensboro, NC, affiliated with the University of North Carolina at Chapel Hill, seeks an academic general internist to join full-time faculty. Role is that of clinician-teacher to residents and medical students in a general internal medicine oriented program. Special interest in health services or health education research helpful. Time and support provided for scholarly work and clinical research. The Cone Health System is an Equal Opportunity Employer. Please respond with CV and references to: Lawrence Klima, MD, Chief, Internal Medicine Program, Moses Cone Hospital, 1200 North Elm St., Greensboro, NC 27401-1020, gaye.galyon@conehealth.com

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