

Cancer in a 29-County Area in Eastern North Carolina: An Opportunity to Reduce Health Inequities

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Cancer mortality rates are higher in a 29-county area of Eastern North Carolina than in the state's other 71 counties combined; within this 29-county subregion, African Americans have higher cancer mortality rates than whites. Better integration of health promotion and structural changes that improve health care access and delivery are needed to reduce these disparities.

Cancer mortality rates are an indicator of population health and have been continually declining over the past 2 decades in the United States [1]. Despite tremendous progress, deaths from cancer still accounted for 23.3% of all deaths in the United States in 2010 [2], and it is projected that in North Carolina in 2014, a total of 57,298 people will be diagnosed with cancer, and 20,155 people will die from cancer [3]. Cancer deaths thus constitute approximately 22.5% of all deaths in the state, making it the leading cause of death [4]. Nationally, the lifetime probability of being diagnosed with an invasive cancer is higher for men than for women (44% versus 38%), and the risk of cancer varies with age [1]. Cancer incidence and mortality rates also vary by race/ethnicity and geographic region, both nationally and in North Carolina [5].

In this discussion of cancer in Eastern North Carolina, we will focus on a 29-county subregion that is home to approximately 1.5 million of North Carolina's nearly 10 million residents [6] (see Figure 1). On average, this region has higher unemployment rates and a greater proportion of minority individuals compared with the rest of the state, and residents of this region have lower incomes and lower educational attainment [7, 8]. Of the 40 counties in North Carolina that are most economically distressed, 19 are in this 29-county area [9]. Within the 29-county subregion, several coastal counties have a population that is more affluent than that of the interior coastal plain.

An analysis of mortality data obtained in August 2013 from the North Carolina Central Cancer Registry reveals that, for the years 2006 through 2010, cancer mortality rates for the cancers presented in Table 1 were higher in the 29-county region than in the state's other 71 counties. The highest mortality rates in both regions were for lung or bronchus cancer, invasive female breast cancer, prostate cancer,

and colorectal cancer. Black residents of the 29-county eastern subregion had higher mortality rates than did blacks in the rest of North Carolina, whites in the 29-county subregion, or whites in the rest of the state. The mortality rate from all cancers combined was 16% higher in the 29-county eastern subregion than in the rest of the state, and cervical cancer mortality was 53% higher in the eastern subregion than in the rest of the state. How can a state with such superb cancer research and treatment resources have such inequities in cancer outcomes?

Screening modalities for breast, colorectal, prostate, and cervical cancers allow for early detection of cancer, before symptoms begin. Table 2 provides results from the 2012 Behavioral Risk Factor Surveillance System (BRFSS) survey, which asked respondents about their use of mammography, colonoscopy, prostate-specific antigen (PSA) testing, and Papanicolaou (Pap) smear testing [10]. Respondents living in the 29-county eastern subregion reported similar use of colonoscopy, PSA testing, and Pap smears compared with respondents elsewhere in the state [10].

Behavioral factors that increase the risk of dying from cancer are more common in the 29-county eastern subregion than in the remaining 71 counties of North Carolina. Smoking remains a significant health issue in the eastern subregion, with 36.6% of adults smoking cigarettes daily, compared with 33.04% of adults in the rest of the state [10]. Data from the BRFSS surveys during the period 2005–2009 also showed that 31% of adults were obese in the eastern subregion, compared with 28% of adults in the rest of the state [11].

Geographic Disparities in Cancer Outcomes

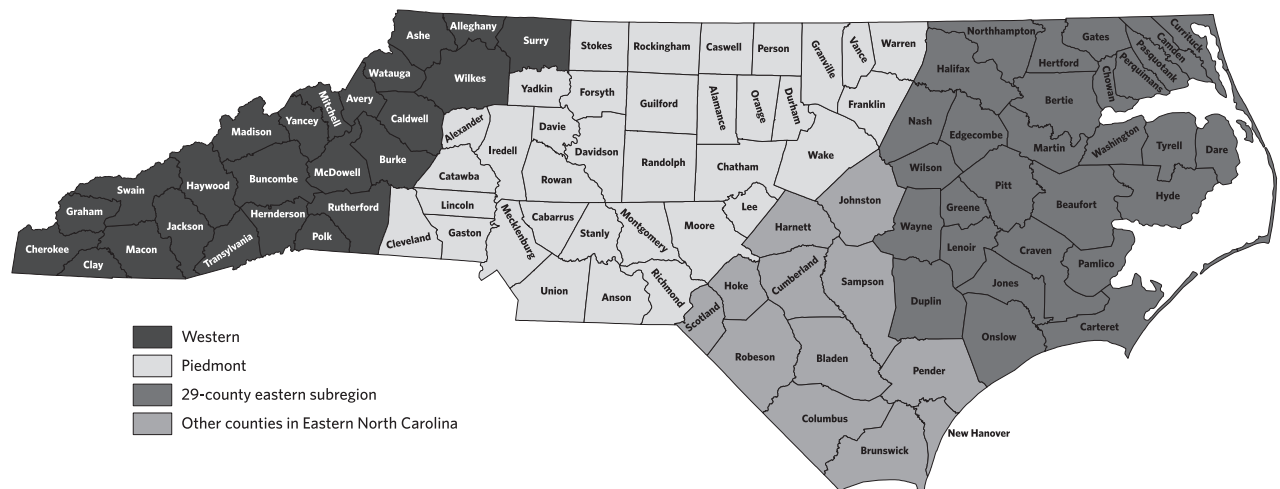
Although cancer screening behaviors are relatively similar across North Carolina, cancer mortality rates remain higher in the 29-county eastern subregion, probably as a result of a variety of lifestyle, economic, and social factors that are fundamentally driven by income, poverty, educational attainment, and other social determinants of health

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FIGURE 1.
North Carolina Counties and Regions



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[12]. These factors influence whether individuals seek diagnostic services, treatment, surveillance, and follow-up care.

Several factors influence a person's decision to seek medical care. The Patient Protection and Affordable Care Act of 2010 is expected to provide more Americans with health insurance coverage in the coming years, but broader availability of insurance coverage may not eliminate disparities. Other patient barriers to cancer care include inability to pay for diagnostic screening and treatment due to high copayments, lack of transportation, difficulty obtaining time off from work, fear, distrust, illiteracy, and not wanting to burden family members [13]. One recurring barrier for uninsured individuals is the difficulty of finding a health care provider who will provide low-cost diagnostic services when screening results are positive; this problem is particularly evident for diagnostic screening and treatment of breast and colorectal cancer.

In many parts of Eastern North Carolina, federal and free community clinics have arrangements with local gastroenterology and radiology groups that allow some patients to receive discounted diagnostic screening. Some local foundations also provide screening and treatment support, although it may be limited to residents of certain counties. Although some state programs provide screening, diagnosis, and treatment coverage—such as the North Carolina Breast and Cervical Cancer Control Program—such programs do not meet all of the demand in rural Eastern North Carolina. As a result of this unmet need, patients may eventually present to the emergency department of a local or tertiary care center for diagnosis and linkage into care, which is an expensive option.

Possible Solutions

Although medical professionals may not be able to influence social and economic factors, we certainly can do our

best to provide a medical home and coordination of care across the cancer continuum. First, structural and systems improvements in health care are needed. Lay health advisors have been successful in addressing health inequities among lower-income women in Eastern North Carolina, and this model could be expanded to additional federally funded community clinics and local health departments [14].

Patient navigation can also help to address health care disparities and barriers to care. In cancer care, patient navigation refers to individualized assistance offered to patients, families, and caregivers that helps them overcome health care system barriers and facilitates timely access to high-quality medical and psychosocial care; such assistance can be offered before a cancer diagnosis and throughout all phases of the cancer experience [15]. By 2015 cancer programs accredited by the American College of Surgeon's Commission on Cancer will be required to implement a patient navigation process [15]. Ideally, a lay health advisor and patient navigator (often a nurse) would provide seamless guidance for patients across the continuum of cancer care. Data will be forthcoming on quality of care, cancer recurrence, and survivorship among patients who receive such guidance.

In addition to structural and systems improvements, health information technology can help to improve coordination of care by integrating care across different systems (such as public health departments, private practices, or academic medical centers and their affiliated practices). Telemedicine and other technologies are also being used to diagnose and treat cancer patients closer to home. For example, expanded integration of cancer services within the local hospital network may reduce patients' transportation burden by eliminating the need to drive to Greenville (or further) for certain aspects of cancer care. Structural and system improvements may emerge by having a bet-

TABLE 1.
Cancer Mortality Rates for 29 Counties in Eastern North Carolina^a and for the Rest of the State (71 Counties), by Race, 2006–2010

Cancer type	Cancer mortality rate per 100,000 population in residents aged 20 years or older						Ratio of cancer mortality in eastern region ^a to the rest of the state		
	In eastern region ^a (29 counties)			In the rest of the state (71 counties)			Whites	Blacks	All races
Lung/bronchus	99.1	77.2	91.1	84.7	62.5	78.5	1.17	1.24	1.16
Breast ^b	37.9	51.1	41.8	35.4	38.1	35.1	1.07	1.34	1.19
Prostate	23.2	56.8	32.8	23.6	42.9	26.6	0.98	1.32	1.23
Colon/rectum	24.8	31.0	26.4	21.8	24.6	21.8	1.14	1.26	1.21
Pancreas	16.7	20.3	17.7	15.1	15.8	14.9	1.11	1.28	1.19
Melanoma	6.2	0.7	4.4	5.4	0.5	4.3	1.15	1.40	1.02
Cervix	3.7	6.3	4.6	2.6	4.6	3.0	1.42	1.37	1.53
All cancers	293.4	308.5	294.7	265.7	237.6	254.7	1.10	1.30	1.16

^aThese 29 counties are shown in Figure 1.

^bInvasive ductal carcinoma in women.

Source: Mortality rates for cancer sites by race and region were generated in August 2013 by a statistician at the North Carolina Central Cancer Registry using the mortality rates for 2006–2010.

ter understanding of the referral patterns across practice domains with respect to cancer care. We have an opportunity to focus on minority populations in rural areas, as this is where we can have the greatest impact on cancer mortality.

Behavioral changes are also needed to help reduce cancer disparities. Cancer prevention and control strategies hinge on effective application of knowledge about human behavior [16]. Because smoking prevalence is high in Eastern North

Carolina, smoking cessation and prevention are important public health initiatives—not just for cancer but also for many chronic diseases. North Carolina’s Tobacco Prevention and Control Branch offers many strategies for smoking cessation [17], and the branch provides information on smoking cessation resources around the state.

Obesity in rural Eastern North Carolina also remains a challenge due to a variety of cultural, geographic, social, and economic factors. In addition, emerging evidence suggests that interactions of health behaviors are related to cancer progression [16]. Recognizing that obesity has economic effects on our state, North Carolina leaders have promoted the Eat Smart, Move More initiative, which aims to increase the number of North Carolinians who are maintaining a healthy weight. This program focuses on promoting breast feeding, increasing physical activity in schools, building structural access to fruits and vegetables, and promoting work-site wellness [18]. Innovations in mobile technology to promote smoking cessation and exercise are also being tested.

Finally, there are many examples across the state of individuals and local community partnerships promoting healthy choices. For example, the faith-based community has been engaged in reducing the burden of diabetes and heart disease in Eastern North Carolina, and outreach for cancer prevention could be enhanced using these models.

Conclusion

It is predicted that by the year 2030 the number of new cases of cancer diagnosed each year in the United States will have increased by 45% (from 1.6 million to 2.3 million), largely as a result of aging; by 2022 the number of cancer survivors will have increased from 13.7 million to nearly 18 million [19]. Moving forward, multimodal strategic programs focusing on prevention must be integrated into

TABLE 2.
Number and Percentage of North Carolina Survey Respondents Who Reported That They Had Been Screened for Cancer, by Region

Type of screening	Region ^a	No.	% (95% CI)
Mammogram ^b	Entire state	4,116	75.16 (73.57–76.67)
	Eastern region	586	73.25 (69.19–76.95)
	Rest of state	3,530	75.49 (73.76–77.14)
Colonoscopy ^c	Entire state	5,057	70.44 (68.93–71.90)
	Eastern region	696	71.67 (68.01–75.06)
	Rest of state	4,361	70.24 (68.58–71.84)
PSA test ^d	Entire state	2,042	58.85 (56.57–61.09)
	Eastern region	268	63.20 (57.24–68.78)
	Rest of state	1,774	58.16 (55.69–60.59)
Pap smear ^e	Entire state	3,736	81.54 (79.97–83.01)
	Eastern region	529	82.12 (78.14–85.51)
	Rest of state	3,207	81.44 (79.72–83.05)

Note. CI, confidence interval; Pap, Papanicolaou; PSA, prostate-specific antigen.

^aThe eastern region is the 29-county area in Eastern North Carolina depicted in Figure 1.

^bIncludes women aged 40 years or older who answered yes to the question “Have you had a mammogram within the past 2 years?”

^cIncludes men and women aged 50 years or older who answered yes to the question “Have you ever had a colonoscopy?”

^dIncludes men aged 40 years or older who answered yes to the question “Have you ever had a prostate specific antigen (PSA) test?”

^eIncludes women aged 18 years or older who answered yes to the question “Have you had a Pap test in the past 3 years?”

Source: North Carolina Behavioral Risk Factors Surveillance System 2012 Survey [10].

health care practices. Just providing education regarding risks is ineffective for effecting behavioral change. As health care providers, we need to lead the population toward healthy lifestyle choices by encouraging smoking prevention and cessation; a diet that includes plenty of vegetables, fruits, and whole grains; healthy weight management; physical activity; use of sunscreen; and stress management. Health promotion should be the cornerstone of health care systems and community action, and it should aim to reduce cancer risks by fostering self-efficacy and positive health choices.

The unfortunate reality is that ethnic and racial minorities in Eastern North Carolina do not experience optimal health. Because the cancer burden is greatest in this part of the state, access to high-quality care centered on optimizing survivorship should be a primary goal of the health care system. This goal must be recognized as a priority both in statewide policy making and in public health and health care planning. *NCMJ*

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