Bridging the Urban-Rural Divide in Chronic Disease Through Community Engagement in Health Program Delivery

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The urban-rural divide in chronic disease contributes to persistent geographic disparities in life expectancy in North Carolina. Policies and programs in resource-constrained rural areas should be designed to increase health equity and reduce this continuing divide by including greater community engagement and decision-making for meaningful, sustainable change.

Introduction

We approach this paper from the perspective of a tale of two North Carolinas, which centers on an inequitable rural-urban infrastructure divide. The viability of the health care safety net in rural areas has been compromised. Hospital closures in North Carolina have left rural communities without adequate access to care. Financial distress, inequity, and high patient volume have escalated rural hospital closures [1], meaning rural residents have to travel longer distances to the nearest emergency room for clinical care [2]. Consequently, across the country emergency medical response times have doubled in rural areas compared to urban areas; a one-minute increase in response time leads to an 8%-17% increase in mortality [3]. Hence, delayed emergent response time is a major health determinant driving poorer health outcomes and lower survival rates among rural populations. Those living in rural areas are further threatened by the emergence of COVID-19 and its variants, leaving many communities unprepared to offset the ramifications of hospitalizations, "long COVID," and excessive mortality.

Rural communities are in dire need of a safety net infrastructure that responds to their public health needs. Public health departments in these areas are weakened by diminished funding and human capacity, as well as a heavier reliance on federal and state funding relative to their urban counterparts. This leads to a "double disparity" that is also known as the rural morbidity and mortality penalty [4–6]. As a result of problematic or unstable local funding, rural health departments are more likely to report fewer public health service delivery options, and are less able to take actions to mollify health disparities when compared to their urban counterparts [7]. This is particularly alarming given the burden of chronic diseases, such as obesity, opioid use disorder, diabetes, and heart disease among rural populations, and the risk of death from COVID-19 due to comorbidities. The burden of chronic diseases is ubiquitous across the state of North Carolina, and the physical environment plays a critical role in either reducing or exacerbating the impact in communities. While the physical environment is important for any community, it is particularly critical for rural communities, where resources are often more limited. For the purposes of this commentary, we discuss the physical environment in terms of the geographically rural landscape, and describe inequities in rural areas that exacerbate the "southern rural health penalty" [8, 9].

The disparities between urban and rural communities require varying approaches to close the gap, and community input and engagement must be a priority in developing more coordinated and collaborative approaches to sustainable solutions.

The Health Impact of Geographic Inequities

The urban-rural divide in life expectancy is well documented (Figure 1). With an estimated total of approximately 19% of the US population, rural residents have higher rates of heart disease, obesity is more than six times more prevalent in rural populations compared to urban populations, and rural residents are more likely to be diagnosed in the later stages of cancer compared to their urban counterparts [9]. Latent-stage chronic disease presentation in rural patients is attributed to preventable high-risk behaviors including lack of physical activity, smoking, substance use and misuse, sedentary lifestyles, and unhealthy dietary practices [9].

Inequities between urban and rural communities predispose rural areas to excess morbidity and mortality and further complicate access to health care. With nearly 65% of rural counties nationally having a designation as health

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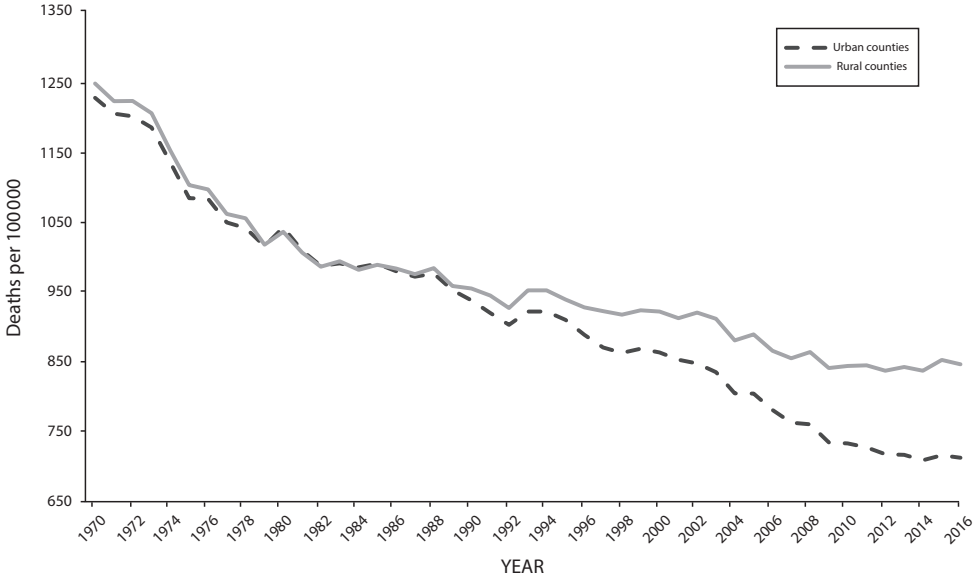
FIGURE 1.
Trends in Rural and Urban Age-Adjusted (All-Cause) Mortality for the United States

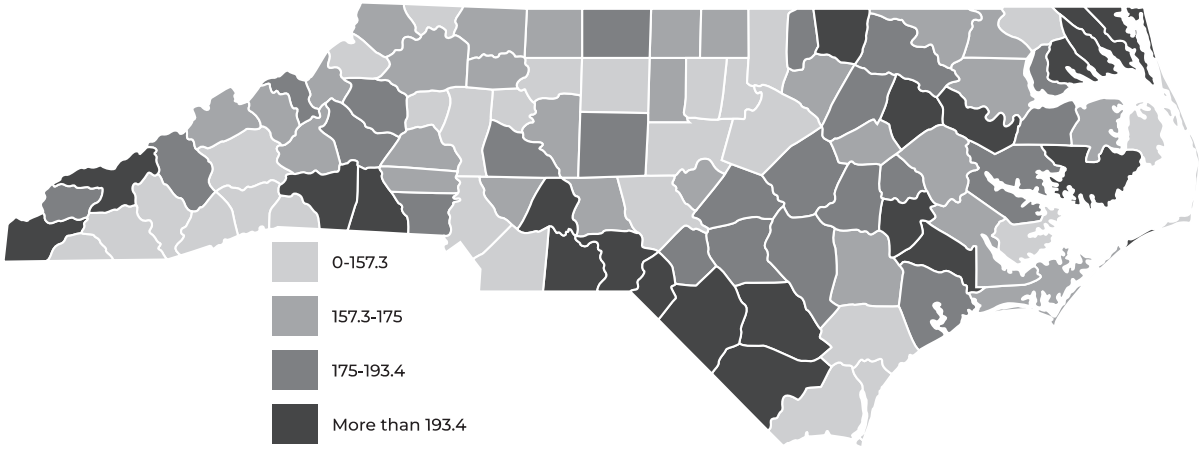


Source. US Centers for Disease Control and Prevention WONDER (Wide-ranging Online Data for Epidemiologic Research), 1970-2016 (Cosby et al., 2019)
Note. Results are from 47 annual ordinary least squares regression models of race, education, income, poverty, and rural residence regressed on age-adjusted all-cause mortality for the contiguous United States.

professional shortage areas, place matters in the context of health outcomes [10]. In North Carolina, provider supply outpaced the total population in the past 40 years, but rural communities experienced maldistribution in the physician workforce during this same time period [11]. How we live, work, play, and age is predetermined by geographic locale (Figures 2–3) [12]. Income insufficiency, poverty, inadequate transportation, food deserts, and a lack of weight-reduction public health programs heighten obesity, diabetes, and cardiovascular health-related disparities in rural communities [13, 14]. In this current economic environment, in addition to income insufficiency, homelessness and low-quality housing have increased substantially in rural areas, leading to a series of health-related complications.

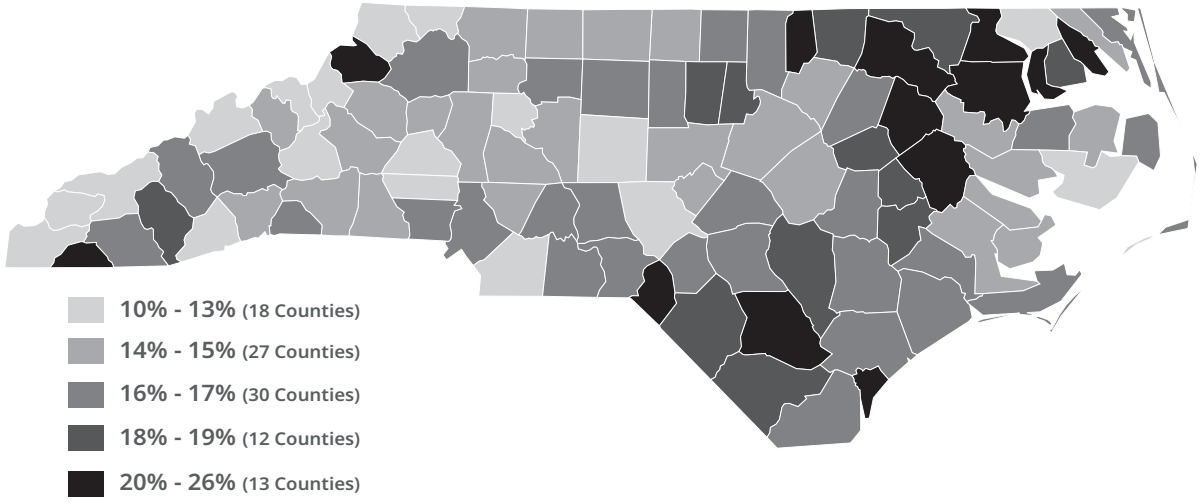
The "Healthy North Carolina 2030" process and report revealed the urban-rural divide in geographic proximity to medical institutions, distribution of general practitioners and specialists, and the impact these factors have on disease progression in cancers, cardiovascular disease, and hypertension [15]. Access to broadband was declared a human rights issue by the United Nations in 2016, and during the COVID-19 pandemic the digital divide placed rural populations at a grave disadvantage as people depended more heavily on technology for critical news alerts, human con-

FIGURE 2.
Age-Adjusted Rate of Heart Disease Deaths per 100,000 Population



Source. NC County Health Data, NC Institute of Medicine (NCIOM) (https://nciom.org/nc-health-data/map/?Health_Data_Email__health_map_email_)

FIGURE 3.
Percent of People with Severe Housing Problems in North Carolina Counties, 2018



Source. County Health Rankings & Roadmaps; https://www.countyhealthrankings.org/app/north-carolina/2019/measure/factors/136/data

nection, telehealth services, and the ability to work at home [16]. Information inequality is pervasive in rural areas [17].

Rural inequities worsen in the presence of racial and economic disparities. In Latino immigrant populations, particularly the seasonal migrant farmworker community, the deleterious aspects of the rural landscape can provoke mental health problems as a result of social isolation [18]; many reside in inadequate housing, which increases exposure to mold [19]. The rate of chronic diseases—including kidney disease, diabetes, and hypertension—is disproportionately higher in rural Black residents when compared to rural White residents, and the former are less likely to get screened for cholesterol or cervical cancer due to transportation barriers to health care institutions, the availability of non-traditional facilities for health care screenings, and inadequate health insurance, compared to Black residents of urban areas [10, 20, 21]. Higher unemployment rates disproportionately affect rural Black residents and further widen the health gap [22]. Overall, the rural landscape is more diverse than ever and such areas warrant increased attention to such issues as systemic racism, segregation, and historic distrust of health care institutions.

To date, the prevailing discourse attributes higher rates of COVID-19 mortality to racially segregated rural and urban counties with a greater percentage of Black residents with comorbid conditions, with death rates higher in counties with low education attainment [23]. The rural built environment and its health care safety-net resources are generally not as equipped with the infrastructure to withstand the health care challenges that COVID-19-infected patients present as those in urban areas.

Community-centered Change

Individuals throughout the state participate in interventions and programs designed to reduce the burden of chronic diseases. However, communities—particularly rural communities—serve other essential roles in promoting health that must be elevated in order to better address the structural and environmental factors that affect residents' health outcomes. Community organizations mobilize residents to participate in interventions, share resources, disseminate health information, and advocate for change [24]. They are trusted sources, deeply embedded in the fabric of their communities, and understand the landscape in ways that surpass outside experts seeking to assist in improving health. Systematically including them as equitable partners in implementing policies and programs designed to improve the physical environment and its impact on resident health may help lead to meaningful, pragmatic shifts toward improved quality and efficient delivery of health care and services in rural areas.

To help bridge the urban-rural divide in North Carolina, our call to action is to involve community in three ways. First, we should make a concerted effort to assess the community organizational landscape across the state. Understanding community assets is just as important as capturing the distribution of chronic disease. Mapping community organizations can help us understand where the community resources are in rural areas, and how to develop new strategies with local experts. Second, we should include community organizations and community experts in decision-making and design efforts for policy and system changes. While public health agencies have involved the community voice—whether in, for example, community health assessments, guidelines for community health workers, or the production of "Healthy North Carolina 2030"—more substantial efforts are necessary, with an extended effort in the rural regions across the state. Third, more programs and interventions should engage community organizations as partners in delivering services. As we have learned from COVID-19,

grassroots efforts and trustworthy partnerships are essential to increasing knowledge, dispelling misinformation, and increasing testing and vaccination. Lessons learned from the pandemic about systems change can serve as examples for future, in-depth collaborations. Examples include the Resilient American Communities COVID Initiative, a network in which local leaders and community members engage to enact change. Given the mounting concerns about the factors in the physical environment that compromise the health of rural populations in the era of COVID-19 and its highly infectious variants, community voice matters more than ever. Health systems should establish connections to local health agencies, where they already leverage their power in rural communities to set the narrative; communities themselves are the experts. NCMJ

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