

Is Health Determined by Genetic Code or Zip Code? Measuring the Health of Groups and Improving Population Health

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Maintaining the optimal health of all North Carolinians is integral to the overall well-being of the state. It is not enough to have policies, initiatives, and reforms created and led by experts in health and health care. To move towards a culture that appreciates and promotes optimal population health, we also need assistance from other arenas. Data continue to suggest that domains such as education, housing, and income may be just as important, if not more important, than determinants that are usually associated with health outcomes. Thus North Carolina's leaders, professionals, and policy makers need to adopt shared responsibility for our population's health by taking a health-in-all-policies stance. Research to expand our understanding of individual and group actions that contribute to health outcomes, collaboration of partners across diverse sectors to implement evidence-based initiatives, and creative thinking and planning for future workforce needs are a few important actions. Together, these efforts can help to shift our long-standing focus on "disease care" to an upstream approach that ultimately reduces health care burdens and improves population health.

During a recent North Carolina meeting of academic, clinical, and public health professionals, a participant asked an eye-opening question: "So what exactly *is* population health?" If a question like this is asked—rhetorically or not—among a group of experts who have dedicated their professional lives to promoting and advancing good health, how well do those in other fields understand the importance of population health? This issue of the NCMJ is dedicated to explaining what population health is and why it is important.

What Is Population Health?

The health of the population is important, and not just for its own sake. People want to live full and satisfying lives at work, at home, and at play. Businesses need workers to produce goods and services. North Carolina needs vital residents who are capable of contributing to the state's economic engine. Fulfillment of these needs requires a foundation of good health—not just good health for some people, but good health for the entire population.

The term *population health* is being used more frequently today, and it has a variety of meanings. Sometimes it means the measure of a total population's health outcomes; other times, it may mean the field of study that examines the factors that contribute to the health outcomes of a population. Sometimes it refers to the health of a subpopulation—for example, the group of people served by a hospital, a health center, or a medical practice. There is no precise, widely used definition of the term population health, which contributes to the general uncertainty about the meaning of the concept.

In 2003 Kindig and Stoddart proposed that population health be defined as, "the health outcomes of a group of individuals, including the distribution of such outcomes within the group," and they argued that, "the field of population health includes health outcomes, patterns of health determinants, and policies and interventions that link these two" [1]. This definition helps us see that it may be misleading to look only at health outcomes for the state as a whole. The urban/rural, rich/poor divides in North Carolina mean that health determinants vary throughout regions of the state, and understanding those patterns of health is necessary to understand and improve the health of North Carolinians. This issue of the NCMJ therefore uses a broad definition of population health that encompasses not only measurement of overall population health but also analysis of health disparities.

Why Does Population Health Matter?

Certainly, the health of North Carolina's population was on the front burner in the 2014 regular legislative session of the North Carolina General Assembly. Legislators rarely use the term population health, but the concept underlies their discussions of medical coverage, costs, and Medicaid reform. Only with improvement in the health of the state's

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population can we possibly begin to contain health care expenditures—the growth of which has shrunk the amount of money available for other vital projects and infrastructure needs, such as education, road repair, the development of power sources, and telecommunications. In 2009 the amount that North Carolinians spent on personal health care was 14.7% of the state's gross domestic product [2, 3].

Healthy North Carolina 2020 sets the state's goals for improving population health during the current decade. Consisting of 40 measurable health-related objectives in 14 focus areas, this plan provides a road map to guide population health efforts, and it specifies ways of measuring the impact of those efforts. A commentary in this issue by Edwards and colleagues [4] documents how the Center for Healthy North Carolina is helping the state move toward the Healthy North Carolina 2020 goals, and the Running the Numbers column by Howell [5] shows the progress that was made during the first 3 years of the decade on 25 of the Healthy North Carolina 2020 objectives.

Understanding population health is a crucial element of efforts to improve the health of North Carolinians while reducing unsustainable health sector costs. To accomplish this aim, we must transform our medical system—which is currently a “disease care” system—into a system that promotes health and prevents disease whenever possible, while treating disease and preventing complications when necessary. We must also push forward and persist in our examination of socioeconomic and environmental factors that affect the health of populations, especially those factors that prove amenable to change through careful crafting of policies and practices.

The Centers for Disease Control and Prevention (CDC) maintains a Web site and publication known as *The Community Guide* [6], which contains the collected findings of systematic reviews of community interventions that work to improve health and prevent disease. *The Community Guide* offers evidence-based guidance that can aid in designing and implementing policies and programs that contribute to improved population health. Another resource, which was created for primary care providers, is the *Guide to Clinical Preventive Services* [7] created by the US Preventive Services Task Force (USPSTF); this guide summarizes USPSTF recommendations regarding clinical services intended to prevent or reduce the risk of heart disease, cancer, infectious diseases, and other conditions and events.

Innovative health care policies and practices and an emphasis on prevention are necessary for the improvement of population health. The Patient Protection and Affordable Care Act (ACA) of 2010—however dense and complex it may be—has already begun to push us toward new models of health and health care. As we move forward, population health and prevention will come into sharper focus as health care providers, hospitals, other health care organizations, and community networks innovate and change practices in order to implement the ACA and meet its requirements

for reimbursement. Early adoption of initiatives such as the Institute for Healthcare Improvement's Triple Aim—which calls for us to improve the patient experience, improve the health of populations, and reduce the per-capita cost of care [8]—has led North Carolina hospitals, local health departments, and community care organizations to join in creative partnerships; such collaborations will hopefully yield permanent and positive changes in the culture of health care in North Carolina.

Although such changes are a good start, improving population health requires more than just reforming our “disease care” system; we cannot treat our way to better population health. We must also focus our attention on related areas—such as education, income, and housing—because these determinants are actually more influential than health care in their contribution to overall health. There is solid evidence linking the social and economic conditions in which people live to lifetime health for individuals, families, neighborhoods, towns, counties, states, and nations [9]. The belief that Zip code may be more important than genetic code in determining health is gaining ground, and the field of epigenetics may soon shed some light on the possibility that social determinants, such as adverse events in childhood or long-term stress, can lead to genomic variations that contribute to intergenerational health problems and disparities—thereby linking Zip code to genetic code.

Private sector entities may contribute to improvements in social determinants of health as they begin to understand that investing in pro-health policies can help to improve the health of their workers, strengthen their businesses, decrease their health care costs, and improve their bottom lines. Government leaders can also see the benefits of investing in population health and can gain a return on this investment in the form of an energized and more productive state economy. All of the state's leaders are able to significantly influence the policies, initiatives, rules, and statutes that help to shape the health of North Carolina's population. Is population health on their minds as they conceive, develop, and produce policies, products, and services for their customers and constituents? If not, it should be. There is good reason why the interrelated nonmedical influencers of health—the social determinants of health—are garnering an increasing amount of attention from academicians, researchers, health care practitioners, and policy makers. Growing evidence shows that these other contributors profoundly affect the health of individuals and of large groups. Indeed, health status and its consequences appear to be directly tied to geographical and socioeconomic boundaries. For this reason, considering health in all policies seems a reasonable step to take to improve population health. Commerce, transportation, education, and other sectors all have roles to play in the health of North Carolinians.

The complex and interrelated factors that contribute to improving the health of the state's overall population are influenced both by the health care delivery system and by

the public health system [10]. The clinical care system—which includes medical practitioners, clinics, and community hospitals—attends to the well-being of a defined population of individuals, often within a specific geographic area, by providing care that promotes, protects, and repairs health. In contrast, the governmental public health system, in addition to often being a clinical provider of last resort, attempts broad-based upstream solutions that promote health and prevent disease throughout North Carolina; such solutions involve evidence-based or evidence-informed policies and programs that are conducive to health and are implemented with a variety of partners. Current discussions of population health improvement and health care reform do not sufficiently emphasize the contributions that individuals can make to maintain or improve their own health, although this is certainly part of the solution. Many evidence-based educational efforts, policies, and programs are designed to encourage and promote personal responsibility, so that North Carolina residents have the knowledge, understanding, and opportunity to make healthy choices for themselves and their families.

Efforts to Improve Population Health in North Carolina

The clinical and public health systems are working together better than in the past to address health, which is a good first step in developing an overarching culture of health. This paradigm shift is being accelerated by the ACA, which instituted a requirement that nonprofit community hospitals participate in a community health needs assessment every 3 years and develop a plan to address the needs that are identified [11]. Often community health needs assessments are carried out in concert with local health departments, which must meet a similar requirement to be accredited by the state [12]. In a commentary in this issue, Reed and Fleming [13] explain how community health needs assessments can contribute to improving population health. Collaborations like the ones they describe almost certainly foreshadow new strategic possibilities for creating a culture of health; the power for positive change will be multiplied if the system that acts to improve the health of individuals and specific groups works synergistically with the system that labors to improve overall population health. Harris and Gates expand on this idea in their commentary, in which they present a case for integrated health improvement [14], and Newton provides a sidebar discussing the link between public health and transformation of primary care [15].

There is evidence that the right changes can help to create a culture of health. The CDC's list of the 10 greatest public health achievements of the first decade of the 21st century [16] includes accomplishments in population health improvement such as tobacco control interventions, which have saved thousands of lives by significantly reducing tobacco use. In North Carolina, remarkable cultural changes in tobacco use have occurred in the 50 years since publication of the first

Surgeon General's report on the harms of smoking [17]. In a commentary in this issue, Herndon and colleagues [18] outline the evolution of tobacco-related policies and smoke-free legislation in North Carolina and their positive effects on population health in the state.

Other population health initiatives have also proven effective. Throughout its history, the field of public health has sought effective, efficient, and safe ways to assist populations in reaching their optimum state of health. Community water fluoridation is one such example, as White and Gordon [19] discuss in their sidebar in this issue. In a similar vein, the commentary by Barros and colleagues [20] highlights the importance of testing private drinking water sources to ensure that this water is safe.

Cross-sector cooperation and collaboration between clinical care and public health to address the upstream factors related to chronic diseases, substance abuse, and mental health are also helping to improve population health. Examples of such cooperation and collaboration can be found in the sidebar by Gates and Harris, which describes Western North Carolina Healthy Impact [21]; in the commentary by Gardner, which discusses the obesity prevention movement Eat Smart, Move More North Carolina [22]; and in the sidebar by Gregory, which covers the implementation of a tobacco-free campus policy at the Walter B. Jones Alcohol and Drug Abuse Treatment Center in Greenville, North Carolina [23].

As we seek to improve population health, we must consider the well-being of all groups within a population. If the health of one segment of the population is measurably different than that of the rest of the group—either better or worse—then population health experts should ask why. It is well known that access to health care, differences in physical and socioeconomic environments, genetics, and personal behavioral choices contribute to the health status of individuals and groups. As we work to improve and hopefully eliminate health disparities and to achieve health equity for all members of the population, focusing on small subpopulations can achieve positive results. The sidebar by Fleischhacker and colleagues [24] describes 2 programs that are promoting healthy eating among the state's American Indian population: the American Indian Healthy Eating Project, which encouraged tribal leaders in 7 American Indian communities in North Carolina to implement positive changes in their communities, and the Healthy, Native North Carolinians program, which is also achieving positive changes in health behaviors. Finally, Plescia and Emmanuel describe in their commentary how evidence-based efforts are being used to address ethnic and racial health disparities in Mecklenburg County [25].

Throughout North Carolina, cultural changes in health and health care are in process. The road ahead is uncertain, and the outcomes are not assured. As we move forward, we need to continue to learn and to explore new evidence, new ways of thinking, and new behaviors that will improve the health of the population of North Carolina. NCMJ

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