but for the health care profession as well.

Disclosure forms provided by the authors are available at NEJM.org.

From the Williams Institute, University of California Los Angeles, Los Angeles (J.S.); and the National Center for Transgender Equality, Washington, DC (M.K.).

This article was published on December 19, 2018, at NEJM.org.

1. Green EL, Benner K, Pear R. 'Transgender' could be defined out of existence under Trump administration. New York Times. October 21, 2018 (https://www.nytimes.com/2018/10/21/us/politics/transgender-trump-administration-sex-definition.html).
2. Prescott v. Rady Children's Hospital-San Diego. Transgender Law Center (https://www.ebglaw.com/content/uploads/2017/10/Prescott-v.-Rady-Children_s-Hospital-San-Diego_-2017-U.S.-Dist.-LEXIS-160259.pdf).
3. James SE, Herman JL, Rankin S, Keisling M, Mottet L, Anafi M. The report of the 2015 U.S. transgender survey. National Center for Transgender Equality, December 2016 (https://www.transequality.org/sites/default/files/docs/USTS-Full-Report-FINAL.PDF).
4. Boulware LE, Cooper LA, Ratner LE, LaVeist TA, Powe NR. Race and trust in the health care system. Public Health Rep 2003; 118:358-65.

DOI: 10.1056/NEJMp1814406

Focusing on Population Health at Scale — Joining Policy and Technology to Improve Health

Aaron McKethan, Ph.D., Seth A. Berkowitz, M.D., M.P.H., and Mandy Cohen, M.D., M.P.H.

Progress in biomedical innovation and technology has resulted in unprecedented improvements in human health. But population health is influenced by more than medical technology or health care services. Socioeconomic, psychosocial, and behavioral factors — including access to basic needs such as food, housing, and transportation — are major contributors to health and cost outcomes.[1,2]

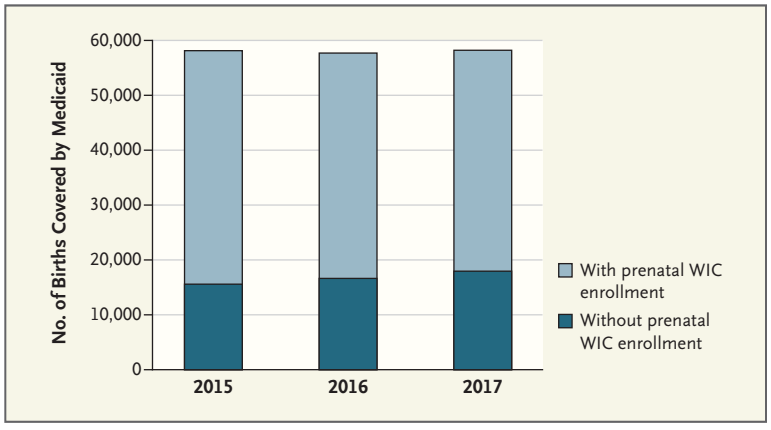
America's safety net of government and community-based programs includes the Supplemental Nutrition Assistance Program (SNAP), the Special Supplemental Nutrition Program for Women, Infants, and Children (WIC), the Housing Choice Voucher Program (Section 8), and many others. These programs — many of which are financed and administered by federal and state governments — have the potential to improve health and reduce unnecessary spending by addressing many of the nonmedical factors that influence health.

A growing body of research supports the value of investments outside health care for improving health and fiscal outcomes,[2] and many pilot programs[3] are investigating how to implement such an approach. On a population level, however, much work remains to be done.

A telling example comes from our own state of North Carolina. In 2017, North Carolina Medicaid covered prenatal and delivery services for 58,159 births — nearly half (48.4%) of the total births in the state. Yet 31% of these births were to mothers not enrolled in WIC (see graph), despite similar income eligibility criteria for WIC and Medicaid. Since WIC provides nutritional support from the prenatal period through 5 years of age and has been shown to improve participants' health, this mismatch risks undermining the benefits of the prenatal, labor and delivery, and pediatric care that Medicaid supports.[4]

Moving from establishing pilot programs to addressing these issues at scale presents major challenges. Information technology in both the government and health care sectors lags behind what is needed to support seamless integration of Medicaid and other services and programs. Even new payment models explicitly designed to link reimbursement to health outcomes may not effectively stimulate performance of tasks such as WIC enrollment. Perhaps most important, addressing all the factors that affect health will require new ways of thinking, collaboration, and accountability on the part of both health care and government leaders. We suggest three considerations for advancing broader, sustainable initiatives that improve health and use fiscal resources wisely.

First, human services programs that address unmet health-related needs could be integrated into a systematic population health approach. Such a strategy should not mean creating additional tasks for busy clinicians — primary care physicians should not manage SNAP enrollment, for example. Rather, there is a need for coordinated workflows that facilitate identification and enrollment of eligible patients. These arrangements can be accomplished only with direct collaboration among health care provider organiza-



Medicaid-Covered Births with and without Concurrent Prenatal WIC Enrollment, North Carolina.

WIC denotes the Special Supplemental Nutrition Program for Women, Infants, and Children. Medicaid-covered births include births for which both prenatal and delivery services were covered by Medicaid. Births covered by emergency Medicaid, which covers only delivery services, are excluded. Data are from the State Center for Health Statistics, North Carolina Department of Health and Human Services.

tions, payers, community organizations, and government agencies.

Innovations in health care finance will be needed to encourage a more comprehensive approach to population health. Under a recently approved Section 1115 demonstration waiver,[5] for example, North Carolina Medicaid will expect at least half of expenditures by managed care entities to fall under alternative payment arrangements linked to the total cost of care in order to encourage intervention into all drivers of a person's health and medical expenditures.

Methods other than payment reform can also facilitate integration of services. Screening for health-related social needs can help identify people who would benefit from enrollment in social services programs, and state governments can work to better equip the workforce to provide enrollment assistance. In North Carolina, the Office of Rural Health is working with community colleges to implement standardized core competency training for community health workers, which will include skills for helping people to navigate public programs and supports.

Second, it will be important to promote both policy and information-technology innovations that make program enrollment seamless. Our experience with WIC and Medicaid cross-enrollment motivated us to try to establish better approaches for data sharing and streamlined enrollment. We are also aiming to enlist the help of health plans, providers, community-based organizations, and government leaders to design systems that search across programs with similar eligibility requirements for people who aren't enrolled in programs that could improve their health. Some states have already made progress on this strategy, and the Affordable Care Act required standards and protocols for facilitating electronic enrollment in health and human services programs. But putting such approaches into practice has not been easy. For example, eligibility criteria for Medicaid and SNAP use different definitions of a household, which creates a substantial barrier to simultaneous enrollment.

It is difficult to know a priori whether policy changes (e.g., harmonizing official definitions used for various programs) or technological solutions (e.g., introducing standards and software that can aggregate the necessary data and apply various definitions to those data) will be more successful for addressing challenges related to coordination and integration of services. It is therefore necessary to pursue both approaches simultaneously. Beyond facilitating enrollment, technology could be used to help bridge the gap between identification of needs and receipt of services. In North Carolina, we are launching a statewide open-access, Web-based resource platform and call center that can serve as a referral hub to connect people with available community resources. Over time, our goal is to enable health plans, care managers, and other stakeholders to use this information as they assist beneficiaries.

Finally, we believe policymakers should explicitly consider the effects of human-services programs on health and total cost of care. This approach will require developing rigorous evidence regarding the combined effects of health care and human-services programs as well as evaluations of new ways to integrate such services.

As health care payments are increasingly tied to population-level outcomes, the sustainability and effectiveness of human services should be an increasingly important priority for health care

leaders. SNAP resulted from a political coalition of rural, conservative advocates for farmers and urban, liberal advocates for alleviating poverty; we envision a similar partnership between health care leaders taking on risk for population health and cost-related outcomes and human services leaders supporting the same populations. Increased bipartisan advocacy and support from health care leaders could help improve the political stability of human services programs and encourage innovations that enhance their effectiveness.

Smaller-scale programs have been testing grounds for determining how best to incorporate nonmedical factors into population health strategies. Yet scaling up this work will require much that is new: a new vision of responsibility for the health of populations that extends beyond delivery of traditional health services; new payment models to support technological and care delivery innovations; and new — and perhaps more interconnected — relationships among various government programs, payers, health care delivery organizations, and community organizations. Failure to make practical progress on these steps risks undercutting the value of our large and growing investments in health care services. But getting them right will enable a coordinated system that uses all available avenues to improve the health of populations.

Disclosure forms provided by the authors are available at NEJM.org.

From the North Carolina Department of Health and Human Services, Raleigh (A.M., M.C.), the Department of Population Health Sciences, Duke University School of Medicine and the Margolis Center for Health Policy, Duke University, Durham (A.M.), and the Division of General Medicine and Clinical Epidemiology, University of North Carolina School of Medicine, Chapel Hill (S.A.B.) — all in North Carolina.

1. Centers for Disease Control and Prevention. Social determinants of health: know what affects health (https://www.cdc.gov/socialdeterminants/).
2. Gottlieb LM, Wing H, Adler NE. A systematic review of interventions on patients' social and economic needs. Am J Prev Med 2017;53:719-29.
3. Alley DE, Asomugha CN, Conway PH, Sanghavi DM. Accountable health communities — addressing social needs through Medicare and Medicaid. N Engl J Med 2016;374:8-11.
4. USDA Food and Nutrition Service. Women, infants, and children (WIC): about WIC — how WIC helps (https://www.fns.usda.gov/wic/about-wic-how-wic-helps).
5. Verma S. CMS approves North Carolina's innovative Medicaid demonstration to help improve health outcomes. Bethesda, MD: Health Affairs, 2018 (https://www.healthaffairs.org/do/10.1377/hblog20181024.406020/full/).

DOI: 10.1056/NEJMp1809451

Evolving Board Certification — Glimpses of Success

Alex Macario, M.D., M.B.A., Ann E. Harman, Ph.D., Tamar Hosansky, Mary E. Post, M.B.A., C.A.E., Huaping Sun, Ph.D., and Graham T. McMahon, M.D., M.M.Sc.

Physicians are busier than ever: the complexity of patient care has increased, patient expectations have evolved, production pressure is substantial, administrative burden is high, time is limited, and yet everyone is somehow expected to balance personal and professional responsibilities. Although physicians in practice acknowledge the fast-paced evolution in medical knowledge and skills and are generally committed to their professional responsibility to continuously improve their abilities, errors in decision making are commonplace and physician performance is variable. We believe a key to overcoming these interconnected challenges is to create lifelong learning experiences that promote self-awareness and leverage principles of adult learning to provide the skills, competencies, and intellectual fulfillment that help physicians practice to the best of their abilities.[1-3]

Educators and certifying boards are working together to integrate education and assessment, applying a variety of techniques that are effective and efficient in engaging physicians, such as simulation, small-group problem solving, reflective exercises, and adaptive learning. One effort to create experiences to better meet physicians' needs in a changing practice environment is the redesigned Maintenance of Certification in Anesthesiology (MOCA) program from the American Board of Anesthesiology (ABA), known as MOCA 2.0. A collaboration with the Accreditation Council for Continuing Medical Education (ACCME) has enabled the ABA to link assessment with continuing medical education (CME) opportunities to support lifelong learning and skill maintenance.

The MOCA Minute, a longitudinal assessment program introduced in 2016, enables anesthesi-