



F. Javier Nieto,  
MD, MPH, PhD

## Chair's Address

# Advancing the science of understanding and improving the health of the population

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In this special issue of the *Wisconsin Medical Journal*, we celebrate 50 years of the Department of Population Health Sciences at the University of Wisconsin School of Medicine and Public Health (SMPH). This anniversary could not come at a more momentous time in the context of the transformation of the former UW Medical School into an integrated school of medicine and public health. In several past issues of the *Journal*, Robert Golden, MD, Dean of the SMPH, has described how fundamental and extensive this innovative transformation truly is for the school.<sup>1</sup>

This 50th anniversary also occurs alongside important and evolving worldwide shifts in public health and health care policy. Today, for example, the United States is confronting the challenge of a major overhaul of its health care system; obesity and type 2 diabetes are becoming global pandemics, occurring even in countries where people suffer from malnutrition; and as was all too clear this past spring, when almost no country proved immune to swine flu, emerging infections do not respect national boundaries. The international aspects of health and disease are becoming much more mainstream in the public discussion and decision-making.

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Doctor Nieto is Chair of the Department of Population Health Sciences, University of Wisconsin School of Medicine and Public Health.

As reflected in the accompanying overview article,<sup>2</sup> much has happened within the department and its parent institution in these past 5 decades. Founded in 1959 as the Department of Preventive Medicine, the department has evolved over the years to include significant academic programs in epidemiology, health services research, and health policy. This evolution culminated in 2001 with the department's name change to the Department of Population Health Sciences.

Some have asked, "What was the problem with the previous name?" Of course, there is nothing wrong with preventive medicine. Quite the contrary. We recognize that preventive medicine is a key—albeit often neglected—aspect of health care and a paramount goal for public health.

But the term did not accurately reflect the true scope of the faculty's research and educational activities. Preventive medicine usually refers to activities of health care professionals aimed at preventing diseases—or disease consequences—in individuals. Even if the department's research and educational activities often have a preventive flavor, our work is not restricted to prevention and certainly is not limited to clinical preventive approaches in individual patients.

Let's look at the example of the patient who arrives in an emergency

department with a heart attack. The medical model will put a cardiologist, a nurse intensivist, and other health care professionals in charge of that person's care to try to keep the patient alive and well. To improve the patient's chances of avoiding another heart attack, secondary prevention strategies such as lipid lowering therapy and an exercise program might be initiated. Ideally, however, primary prevention activities would have been implemented in order to keep that heart attack from occurring in the first place. That would be the job of preventive cardiologists, family physicians, and nurse practitioners advising individuals in their clinics to improve their diets and quit smoking to improve their cardiovascular fitness.

But research and experience show that the reach and effectiveness of these clinical approaches to prevention is sometimes limited. They do not cover the uninsured, the less educated, or the less motivated individuals in our society; and even those who receive this care might have a hard time following through with the recommended lifestyle changes. Quitting smoking might be nearly impossible for a nicotine-addicted individual who does not live or work in a smoke-free environment; a healthy diet might not be affordable for individuals of limited economic means or who live in areas with low-quality grocery stores; and increasing physical activity will be harder for

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residents of urban suburbs or those living in high-crime inner-city neighborhoods.

A broad understanding of the determinants of health demonstrates that biological factors (eg, genes) interact with individual circumstances (eg, educational level, behaviors) and upstream contextual conditions (eg, physical and social environments) in complex, multilayered causal networks.<sup>3-4</sup> Individuals live in social and physical environments that determine their exposures to noxious agents and condition their behaviors. This is true for practically every single health problem and is key to finding effective ways to prevent and treat them all.

This is where population approaches to prevention can complement and enhance individual-based approaches.<sup>5</sup> And this is where many other professionals outside the medical field could also contribute. Urban planners, for example, would try to alter the environment with an eye on health—eg, by designing a built-in environment that is conducive to physical activity (promoting mixed land use or adding bike trails). Sociologists and behavioral scientists would strive to identify environmental barriers to healthier behaviors and design community-based programs that promote health. Political scientists and economists would aim to ensure that people have access to health care, proper education, and employment, giving them access to health information and resources. Public health officers would work to guarantee that drinking-water supplies are safe and to promote smoke-free work environments.

In an explicit recognition of the need for an integrative approach to understanding health and its determinants, department leaders chose the name Population Health

Sciences. The sciences of population health attempt to identify the distribution of health and disease outcomes in the population and its subgroups, understand the determinants of this distribution, and find and optimize approaches to improving health and reducing health disparities. Population health sciences are fundamentally rooted in epidemiology, biostatistics, environmental health, behavioral sciences, health services research, public health, and health policy. These sciences encompass the etiologic studies of disease as well as the study of treatment efficacy, quality of health care (both preventive and curative), and ways to optimize resources.

The plural in the word sciences is no accident; it reflects the inherently multidisciplinary nature of the discipline. A full comprehension of the determinants of the health of individuals and populations requires not only the input of the traditional health professionals such as nurses, pharmacists, physicians, and veterinarians, but also that of economists, engineers, sociologists, political scientists, lawyers, urban planners, environmentalists, geneticists, and others.

Reflecting the breadth of population health sciences, our department consists of core faculty representing physiology, genetics, epidemiology, biostatistics, anthropology, environmental sciences, health services research, public health, health policy, economics, behavioral sciences, and sociology. Our reach across campus is extensive, and we envision the department as a portal for the SMPH to interact with the rest of the amazingly rich and diverse academic environment at the UW-Madison. In fact our graduate program, created in 1997, is run through the UW-Madison Graduate School

and has faculty from nearly 40 departments. Based on this model, we have developed our Master of Public Health program in the same spirit. Faculty members are drawn from the schools of law, pharmacy, nursing, sociology, and public affairs. The same interdisciplinary quality is true for the evolving UW Center for Global Health.

Health is an inherently broad construct and one could say that it is hard to find a department on the UW-Madison campus that does not relate somehow to population health sciences. This broadness is both the beauty and the challenge of the discipline. The concept might surprise newcomers to the discipline, even though it is rooted in deep historical traditions in medicine and public health. In the 1800s, the German pathologist Rudolf Virchow (considered by many the father of modern pathology) emphasized the importance of the broader determinants of health—including economics and education—and wrote:

Medicine is a social science, and politics is nothing else but medicine on a large scale. Medicine, as a social science, as the science of human beings, has the obligation to point out problems and to attempt their theoretical solution: the politician, the practical anthropologist, must find the means for their actual solution.<sup>6</sup>

Almost 50 years ago, John Rankin, MD, a pulmonary and occupational health physician and one of our early department leaders, had the foresight to promote the integration of biology, medicine, epidemiology, and health policy within the department's mission.<sup>2</sup> Today, the overarching goal of our interdisciplinary department is to understand, preserve, and improve

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the health of human populations and individuals. To accomplish this we:

1. Conduct research to understand health, diseases, and their determinants across the lifespan; test interventions to improve health; and develop methodological approaches for population health research.
2. Provide training, mentorship, and education on methods in epidemiology, health services research, social and behavioral health sciences, public health, and related disciplines to undergraduate, graduate, and professional students, post-doctoral fellows, and faculty.
3. Develop partnerships and collaborations with researchers, clinicians, communities, and institutions to improve

understanding of health and translate population health research findings into policy and practice.

We believe that our mission aligns with one of the longest and deepest UW-Madison traditions: The Wisconsin Idea. It is attributed to University of Wisconsin President Charles Van Hise, who in 1904 declared that “the boundaries of the university are the boundaries of the state.” Today, the university is rethinking this cherished idea, expanding the university’s reach from the borders of the state to all corners of the globe. And so as the department and the school expand their perspective of public health, the Badger State can become the laboratory for the world.

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## References

1. Golden RN. An integrated school of medicine and public health—what does it mean? *WMJ*. 2008;107(3):142-143.
2. D’Alessio D, Dempsey J, Inhorn S, Laessig R, Albanese M. The Evolution of the Department of Population Health Sciences. *WMJ*. 2009;108(5):224-230.
3. Evans RG B, ML, Marmor, TR. *Why are Some People Healthy and Others Not? The Determinants of Health of Populations*. New York: Aldine de Gruyter; 1994.
4. Kindig D, Stoddart G. What is population health? *Am J Public Health*. 2003;93(3):380-383.
5. Rose G. *The Strategy of Preventive Medicine*. Oxford: Oxford University Press; 1992.
6. Virchow R. Die Medizinische Reform. In: Sigerist HE, ed. *Medicine and Human Welfare*. New Haven, CT: Yale University Press; 1941.