Informing Future Population Health Interventions

To address the growing inequities in cancer and cardiovascular diseases, the NIH's Centers for Population Health and Health Disparities (CPHHD) Initiative promoted transdisciplinary research with the goal of directly improving health outcomes and quality of life among the underserved (http://cancercontrol.cancer.gov/populationhealthcenters/cphhd/). The focus of the Initiative was not only to understand the pathways that result in disparate health outcomes but also to develop comprehensive models of how various social, economic, cultural, environmental, biologic, behavioral, physiologic, and genetic factors affect individual health outcomes and their distribution in populations. Thus, projects within the centers in the CPHHD Initiative focused on implementing multilevel interventions (directed at more than two factors, including the individual level) that address the social determinants of health and the corresponding underlying structural factors. These transdisciplinary projects offer critical insights in conducting population-based interventions that have shown significant promise in improving health behavior, health policies, and health care delivery.

The emergence of precision medicine and the development of new tools and strategies for tailoring interventions to individual level biologic characteristics present opportunities and challenges for public health research and practice. Population health research, which traditionally has relied on demographic variables, self-report survey methods, and simple biomarkers, needs to embrace more aggressively the incorporation of molecular analyses for exposure assessment and early signs of disease. At the same time, biomedical scientists need to more fully appreciate the proportion of disease incidence and mortality variance at the population level that is accounted for by social determinants, including geography. As population health interventions utilize more multilevel approaches, the task of understanding effect pathways becomes more complex. Health disparities research provides an ideal context within which to understand these pathways and inform a compelling problem of huge public health significance. "Precision public health" (1), is an integrated approach that has recently been proposed as a means of utilizing advances in biomedical science in a way that will maximize its population-level impact. Some approaches, such as identifying and targeting high-risk groups, are already well-established strategies for efficiently applying limited resources to those who stand to benefit the most. What is new is the rapidly expanding infrastructure for population-level data collection, whether it be through enhanced surveillance, the use of administrative data, social media and self-monitoring, or commercial sources that have yet to be fully exploited by the academic research community. These remarkable opportunities are already being utilized by local governments, law enforcement, and the marketing industry. The challenge we face and need to meet is the skills gap among us and our students. Statistical modeling, data analytics, data integration, and data quality assurance are all domains that have been recognized by the private sector as essential for remaining competitive. Those of us concerned with health disparities now need to bring the full force and potential of these methods to bear on the complex interaction of wealth inequality and biologic vulnerabilities that undermine the potential of those living in poverty to overcome the immoral barriers to living full and healthy lives.

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See all articles in this *CEBP Focus* section, "Multilevel Approaches to Addressing Cancer Health Disparities."

Reference

1. Khoury MJ, Iademarco MF, Riley WT. Precision public health for the era of precision medicine. Am J Prev Med 2015 Nov 4. [Epub ahead of print].

Published online April 1, 2016.
doi: 10.1158/1055-9965.EPI-16-0141

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Cancer Epidemiol Biomarkers Prev 2016;25:583.