Population Health Metrics

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Population health and *population health metrics*

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The title and purpose of our journal, *Population Health* Metrics, bring questions and comments—"Population Health Metrics aims to advance the science of population health assessment and welcomes papers relating to concepts, methods, ethics, applications, and summary measures of population health." What is population health? How do we assess it? Why do we assess it? And more.

Those asked to define health inevitably cite the well-known definition from the 1948 Constitution for the World Health Organization (WHO): "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity." [1]*Population health*, however, is a more recent term being used over the last couple of decades. In 2003, Kindig and Stoddart described the introduction of the term and the evolution of the concept of public health, leading to a definition: "we propose that population health as a concept of health be defined as "the health outcomes of a group of individuals, including the distribution of such outcomes within the group." Other definitions have been offered (Table 1), and efforts have been made to distinguish population health and public health.

Population health can be conceptualized as the holistic assessment and enhancement of an entire community's or population's overall health outcomes and well-being, transcending the focus on individual sickness or specific risk factors that dominate health care. This approach emphasizes the collective health status of diverse demographic groups within a population, encompassing not only those currently experiencing illness but also individuals at varying levels of health, risks to health and vulnerability. Central to the concept of population health is recognizing the interconnected social, environmental, economic, and behavioral factors that influence health outcomes across populations. Thus, population health initiatives aim to address underlying determinants of health disparities and promote equitable access to resources and opportunities that support optimal health for all individuals, irrespective of their individual disease risks. Such initiatives are necessarily multidisciplinary.

Given the holistic nature of the health definition, population health assessment needs to be multidimensional and integrative. We have long had fundamental measures of population health, e.g., mortality rates, life expectancy, and disease incidence and prevalence. To capture morbidity, we now have Disability-Adjusted Life Years (DALYs) and Quality-Adjusted Life Years (QALYs). However, the need for population health assessment in the 21st century calls for more sensitive measures that capture heterogeneity and disparities within populations and provide insights for particularly susceptible and vulnerable subpopulations, e.g., the fetus and the elderly. Population health also needs to span the range of data systems globally, reaching from incomplete and manual vital registration systems to encompassing and automated national data systems. The former often involves dealing with non-standardized systems and missing data, while the latter may pose the analytical and computational challenges of "big data." Challenges abound in contending with the diversity of data systems for assessing population health across the resource spectrum: for example,

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Table 1 Definitions of Population Health

Organization	Definition	Source
Interdisciplinary Association for Population Health Science (IAPHS)	"Population health is the health of all people living in a given place, such as New York City, Kansas, or Bangladesh. It also refers to differences in health—for example, between the rich and poor. A population's health is the product of many causes, operating at many levels 'from cells to society.'"	https://iaphs.org/what-is-population-health/
Centers for Medicare & Medicaid Services (CMS)	"…health behaviors and outcomes of a broad group of individuals, including the distribution of such outcomes affected by the contextual factors within the group."	https://www.cms.gov/sites/default/files/2021-09/Population-Health-Measures.pdf
National Quality Forum Prevention and Population Health Standing Committee	"Population health focuses on disease and illness but also on prevention and health promotion for an identified group of people. The result of these activities should achieve positive health outcomes within the identified population. Population health activities also look to reduce health inequities and disparities across populations."	https://www.qualityforum.org/Publications/2023/01/Prevention_and_Population_Health_Final_Report_-_Spring_2022_Cycle.aspx#:~:text=Population%20health%20focuses%20on%20disease%20and%20illness,promotion%20for%20an%20identified%20group%20of%20people.
American Public Health Association (APHA)	"…the health outcomes of a group of individuals, including the distribution of such outcomes within the group"	https://www.apha.org/-/media/Files/PDF/topics/ACA/Tranformation/Integrating_Public_Health_into_SIM.pdf
Institute of Medicine (IOM)	It can be defined as what "we as a society do collectively to assure the conditions in which people can be healthy"	https://nap.nationalacademies.org/catalog/1091/the-future-of-public-health
New York State Department of Health	"Population health refers to the health status and health outcomes within a group of people rather than considering the health of one person at a time."	https://www.health.ny.gov/events/population_health_summit/docs/what_is_population_health.pdf
Centers for Disease Control and Prevention (CDC)	"CDC views population health as an interdisciplinary, customizable approach that allows health departments to connect practice to policy for change to happen locally. This approach utilizes non-traditional partnerships among different sectors of the community – public health, industry, academia, health care, local government entities, etc. – to achieve positive health outcomes. Population health 'brings significant health concerns into focus and addresses ways that resources can be allocated to overcome the problems that drive poor health conditions in the population…'"	https://archive.cdc.gov/www_cdc_gov/pophealthtraining/whatis.html#:~:text=It%20can%20be%20defined%20as%20what%20%E2%80%9Cwe,can%20be%20healthy%E2%80%9D%20(Institute%20of%20Medicine%2 C%201988).
Elmhurst University	Population health refers to the health outcomes of a defined group of people. More specifically, it includes how outcomes are distributed within the group.	https://www.elmhurst.edu/blog/what-is-population-health/

using verbal autopsies where healthcare access is limited at one extreme of resources and completing data linkages across multiple large databases at the other.

Measurement of disease burden has become intertwined with the concept of population health. Almost three decades ago, the methodology for estimating the disease burden was advanced by the WHO [2]. The concept of attribution of disease occurrence to risk factors was first advanced by Levin in a 1953 paper that described the calculation of population-attributable risk [3]. Citing the then-emerging literature on cigarette smoking and lung cancer, Levin proposed that if a risk factor caused a disease (his example being smoking and lung cancer), the proportion of disease caused by the factor is of interest. This principle underlies the massive undertaking of periodic disease burden estimation at the global, national, and subnational levels by the Institute for Health Metrics and Evaluation through its Global Burden of Disease project. The most recent estimates, just released, are for 2021 [4].

As to the "why" question, the answer is straightforward: We need a firm grasp of population health over

time to identify where interventions are required and describe the consequences of existing interventions. Accurate population health monitoring is critical to decision-making and allocating the often scarce and inadequate resources available for dealing with problems and advancing population health.

The genesis of *Population Health Metrics* arose from the imperative to enhance the understanding of population health, facilitating the development of targeted interventions. Our mission is to disseminate research papers employing well-established methodologies or introducing innovative approaches for population health assessment, showcasing their practical applications. We strive to harness methodological advancements alongside the burgeoning availability of extensive datasets and machine learning techniques while remaining mindful of data scarcity in certain global regions. Moreover, we acknowledge the potential for novel methodologies to exploit limited information effectively. We are interested in how these new approaches to assessing population health will figure in decision-making. We particularly welcome papers that employ novel methods to utilize limited data in low- and middle-income countries (LMICs) for understanding population health and maximizing the utility of available information while addressing data scarcity challenges.

Our scope extends to papers exploring how population health measurements can inform decision-making processes and ways to optimize their utility. We advocate for a multidisciplinary approach, drawing insights from diverse fields such as public health, epidemiology, social sciences, data sciences, and policy. Through collaborative efforts, *Population Health Metrics* endeavors to promote comprehensive strategies and interventions that contribute to enduring enhancements in population-level health outcomes and advancing health equity.

With these emphases, some classes of papers are unlikely to fit well with *Population Health Metrics.* We often receive national and subnational surveys that generally offer results of national interest without bringing methodological advances. Such surveys and epidemiological studies of risk factors are not of interest, nor are clinical studies. We will consider systematic reviews on topics within the scope of the journal. We receive many papers that provide descriptive data analyses from the Global Burden of Disease (GBD) project. Most of these papers do not fit with the journal's scope. We are, however, interested in papers that provide innovative uses of the GBD data, for example by linkages to other data resources to explore drivers of disease burden.

The concept of population health and the approaches to measuring it have evolved continually, taking the long-run view that evolution began centuries ago. We intend for *Population Health Metrics* to support that evolution, publishing papers that refine our assessment of population health.

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Declarations

Competing interests
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