

Assessing the Public's Health

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KEYWORDS

• Public health • Health care • Health systems

KEY POINTS

- The metrics of public health have evolved to accommodate the changing landscape of health care.
- Single measures imperfectly summarize the health of a population with each seeming to describing only a single aspect.
- Summary measures used by the Global Burden of Disease Study allow comparisons along many other lines for communicable and noncommunicable diseases and their burden.
- Community health has been assessed nationally and around the world in rural and urban communities with differing results and policy implications.
- One area of agreement is the importance of addressing population health needs at the community and neighborhood level, a finding that transcends the world megacities.

INTRODUCTION

The health reform debate continues to focus on finding a way to expand health insurance coverage for all Americans,¹ an access issue that is estimated to account for a minority of mortalities,² suggesting the contribution of other factors to adequate health. With up to 95% of health spending directed toward medical care and biomedical research,² and an increasing body of evidence that health behavior and environment are responsible for up to 70% of avoidable mortalities, there has been increasing awareness of the contribution of other nonmedical factors related to health promotion and mortality. The tide is turning toward a discourse among public health officials, researchers, and health care providers to address the varied social factors and the impact of economic inequality on health.³ This article describes approaches to the assessment of domestic and global public health. It is strategically placed in this issue

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to follow articles that describe individual diseases and precede descriptions of other national health care systems.

ASSESSING POPULATION HEALTH STATUS

The metrics of public health have evolved to accommodate the changing landscape of health care with no measure perfectly summing the health of a population and each way of estimating seeming to violate some tenet of epidemiology. Measures of risk are generally expressed using mortality rates (MRs) for estimating the frequency of the occurrence of death in a defined population over a specified interval, whether expressed as crude mortality for all causes in a population or a single cause. MRs can be studied in reference to infant and maternal deaths; adjusted for sex, age, race, and ethnicity; or by particular conditions or the proportion thereof to provide insight into public health responses to the leading causes of mortality and health disparities. The global focus on noncommunicable diseases has been driven by the faster rate of decline of communicable, maternal, neonatal, and nutritional causes in an aging world population. It comes as no surprise that global age-standardized MRs significantly increased between 1990 and 2013 for Alzheimer disease and other dementias by 3.2%, and Parkinson disease by 28.2%.⁴ According to the National Center for Health Statistics in 2013, the 10 leading causes of death, which accounted for 73.6% of all deaths in the United States (US), included heart disease, cancer, chronic lower respiratory diseases, unintentional injuries, stroke, Alzheimer disease, diabetes, influenza and pneumonia, kidney disease, and suicide. Stroke, the fourth leading cause in 2012, became the fifth leading cause in 2013.⁵

Premature mortality, originally proposed to address the inadequacy of MRs in measuring the burden of disease due to tuberculosis,⁶ proved to be a particularly useful way to describe other diseases. In choosing an arbitrary limit to life, the calculation of the difference between the age at death and an arbitrary designated limit measured in years of life lost (YLLs) due to premature mortality became a useful assessment of the impact of premature mortality in a given population. The YLLs rate, which represents years of potential life lost per 1000 populations below an arbitrary endpoint age such as 65 years, was found to be more desirable in comparing premature mortality in different populations because YLLs did not take into account differences in population sizes.⁷ Another measure of the burden of disease in a population, disability-adjusted life years (DALYs), captures in a single figure health losses associated with mortality and different nonfatal outcomes of diseases and injuries.⁸ DALYs were first described by Murray and Acharya,⁸ Murray and Lopez,⁹ and Murray and colleagues¹⁰ in the 1990s, with the World Health Organization (WHO) and the Harvard School of Public Health, for the first global burden of disease (GBD) study in 1990 and used in subsequent revisions to the present GBD 2013.

FROM MORTALITY TO DISABILITY MEASURES

Summary measures used by the GBD studies^{11,12} of DALYs, such as healthy adjusted life expectancy, are derived from YLL and years lived with disability (YLDs) to compare assessments of broad epidemiologic patterns across countries and time, and to quantify the component of variation in epidemiology related to sociodemographic development. Calculated by adding YLLs and YLDs, DALYs add disability to the measure of mortality and, based on the universal measure of time in life years, have provided a common currency for health care resource allocation and the effectiveness of interventions assessed relative to each other across a wide range of health problems. YLDs, equal to the sum of prevalence multiplied by the general public's assessment

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