



International Perspectives on Summary Measures of Population Health in an Aging World

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People are living longer not only in developed countries but in developing countries as well. It is often thought that an increase in life expectancy (LE) signifies the improvement in the health of a nation. However, previous studies show that this is not necessarily true. Longer LE may mean an expansion of the number of years spent in poor health. Quality of life, rather than just the length of life, has become an important issue for all countries today. How long can a person live in good health and without disability? How long can one remain independent and active? These are the questions now being addressed by researchers of health expectancy around the world. This special issue puts together 10 articles that were presented at the Réseau Esperance de Vie en Sante (REVES) 27th scientific meeting, Health Expectancy: Is It Possible to Measure Population Health in One Index? held in Singapore from June 2 to 4, 2015. The articles targeted how disability is measured, including new measures of population aging, and provided information across a variety of country settings, including, Singapore, the United States, Europe, Japan, and South America. Stratifying factors in disability were discussed in several

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articles; these factors included age, gender, education, economic status, and region. Finally, issues around monitoring and measurement of disability were highlighted in the U.S. and European contexts. This is the second volume based on a REVES meeting. The first such volume was published in 1998 (Vol. 10, Issue 2) based on articles presented at the REVES meeting in 1995 in Chicago.

The direction and quality of this special issue is encapsulated in the first article of the volume by Verbrugge. This article formed part of the REVES George Myers memorial lecture. In her article, Verbrugge discusses the top themes of international research on disability in the past three decades: disability dynamics, buffers and barriers for disability, disability trends, and disability among very old persons. Variations in how disability is measured, and their merits are also discussed. Measures of disability range from traditional measures, new longer and shorter measures, and composite measures such as disability-free LE. Verbrugge concludes by showing how scientific research on disability has genuine pragmatic utility for health care and policy. Another major contribution of the article is a comprehensive reading list of disability research in the past two decades.

New Measures of Population Health

New approaches to the conceptualization and measurement of age and aging are discussed in the article by Scherbov and Sanderson. Traditional measures of aging—chronological age—are supplemented with new ones that consider changing characteristics of people such as remaining LE, health, normal public pension age, and hand-grip strength. Results of the article show that past and future population aging looks less rapid using the characteristics approach, compared with traditional ones. Hence, supplementing chronological age with ages that take into account the changing characteristics of people allows aging to be analyzed more comprehensively.

Sanderson et al. empirically test and provide an example of the new methodology for using multiple characteristics proposed by Scherbov and Sanderson. Using the English Longitudinal Study of Ageing (ELSA), the study investigates three characteristics of each person aged 60 to 85 years old by level of education—hand-grip strength as a measure of upper body strength, “chair rise speed” as a measure of lower body strength, and whether the person survived from 2004 to 2012. The three are converted into a common metric called alpha-ages. The results of the article show that the average of the alpha-age differentials in the measures of upper body and lower body strength predicts educational differentials in subsequent survival better than using either physical measure separately.

The article by Loichinger and Weber introduces the concept of working LE (WLE) that can be considered as a measure of population health. Using the Sullivan method, the authors analyze past and present developments of WLE at age 50 by sex and education in Europe. WLE is also compared with LE and healthy LE (HLE). Results of the article show that WLE at age 50 has been increasing since the mid- to late 90s in most countries, particularly so among women. There are substantial differences in WLE by education. The correlation between WLE and LE is smaller than between WLE and HLE. In sum, the article provides insights on how the distribution of economically active and inactive years above age 50 is developing in Europe's aging societies.

Stratifying Factors

Disability in later life is the result of an accumulation of differential life experiences over the life course. Key factors influencing the onset and duration of disability include education level, ethnicity, and gender. Using the European Statistics on Income and Living conditions (EU-SILC) for 26 countries, the article by Cambois et al. examines the extent to which European variations in differentials in disability (activity limitation [AL]) by education level are associated with variations in poverty (economic hardship). The authors find that the rate of economic hardship and the extent of AL advantage/disadvantage vary substantially across Europe, though in general, large economic hardship goes along with increased disability differentials. Thus, actions to reduce poverty are needed in Europe to reduce the levels and differentials in disability.

The article by Downer et al. examines differences in self-reported health and functional characteristics of Mexican and Mexican American adults aged 80 years and above. Wave 1 (2001) and Wave 3 (2012) of the Mexican Health and Aging Study (MHAS) and Wave 4 (2000-2001) and Wave 6 (2010-2011) of the Hispanic Established Populations for Epidemiologic Studies (HEPESE) are used. The study presents new evidence that there are significant differences between very old Mexican and Mexican American adults for self-reported health conditions and activities of daily living (ADL) difficulties. These differences may reflect worse health for Mexican Americans, differences in health care access, reporting bias, and more selective survival to very old age in Mexico.

Cross-cultural comparisons suggest that educational differences in health and mortality are similar; however, differences in health systems and culture may result in different health profiles. Using the Nihon University Japanese Longitudinal Study of Aging and the Health and Retirement Study of the

United States, the article by Chiu et al. compares educational gradients of health and mortality between two long-lived populations: Japan and the United States. The results show that education gradients of physical health and mortality are similar for both Japan and American populations though older Japanese have overall better mortality and health profiles. Japan's superior health profile compared with that of the United States may be attributed to Japan's compulsory national health service system and living arrangements with adult children.

The final article in this section tackles the issue of gender and inactive LE (IALE) in an Asian context. Using data from a longitudinal survey of older Singaporeans, the article by Malhotra et al. assesses variation in gender gap (female-male) in IALE and active LE (ALE) by three definitions of inactivity: (a) health-related difficulty in ADLs, (b) health-related difficulty in ADLs/instrumental ADLs (IADLs), and (c) health-related difficulty in ADLs/IADLs *or* non-health-related non-performance of IADLs. Although LE, absolute and relative IALE, and absolute ALE at age 60 are higher for females, the gender gap varied considerably by the definition of inactivity. Thus, it is imperative that researchers and policy makers be mindful of the definition of inactivity on the gender gap in IALE and ALE and the extent of support for the presence of male-female health survival paradox.

Monitoring Population Health

Monitoring population health is highly dependent on the types of measures and methods used. The final set of articles provides examples of the different measurements used in the United States and Europe and the intricacies associated with the wording of specific measures. The article by Madans and Weeks proposes a hierarchical framework that can be used to summarize changes in population health. The first tier of measures is comprised of four measures of HLE: one indicator of participation in society, two measures of disability, and one measure based on respondent-assessed health. The expectancies can be measured at any age, and examples are provided in the article using U.S. data at ages 25 and 65. The second tier of measures disaggregates the healthy life expectancies into the components parts to provide more detail on changes over time. An optional third tier can be added that tracks the prevalence of key diseases. The framework proposed attempts to provide a conceptually consistent mechanism to evaluate whether programs and policies have been successful in achieving their broad policy goals.

A second article by Cambois et al. explores the possibility of changing the wording of the global activity limitation indicator (GALI) instrument as the complexity of the wording has been questioned by some European Member

States. The study analyzes differences in the prevalence of AL in three alternative variants of the GALI that aims to simplify the wording. The study finds that alternative GALI variants result in significantly different prevalences compared with the original question. However, the current variant is more inclusive than the alternative variants suggesting that the benefits of changing the GALI wording is limited.

In summary, the articles in this volume highlight the sensitivity of population health summary measures to definition and context. The definition of disability, as highlighted by Verbrugge, has major implications for health policy makers interested in improving population health. In addition, key stratifying variables, such as education level, ethnicity, and gender need to be taken into account when assessing a population's disability status. New ways of measuring population health need to be carefully developed to holistically capture a population's health and broaden our perspective. As the field moves forward, continued communication between scholars through publication and concerted engagement of academics with policy makers paves a solid foundation for improving population health.

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