HALE—Unification Theory for Clinical Medicine and Population Health

Authors: Steven M. Teutsch, Dave A. Chokshi, Nicholas W. Stine, and Jonathan E. Fielding

A common lament of the post–Affordable Care Act era is that clinical medicine and population health need to be more strongly integrated. Although there is optimism that new incentives will help achieve greater integration (Shortell, 2013), the separation is well entrenched, exceeding the administrative disjunction between an individually-focused clinical delivery system and a population health system that deals with groups. It derives from different perspectives, financing systems, and—in the United States—traditions and training.

Yet, in the end, they share the same goal: long, healthy lives for all. The two simply use different tools to achieve that end. Sometimes, public health, clinicians, and the health system measure progress similarly, such as with immunization rates or levels of hypertension control at the individual or population level. Nevertheless, in practice, the public health orientation toward geographic populations and the clinical focus on individuals engaged in care can be difficult to unite in shared accountability. There is no single overarching measure of health that either group uses to guide its overall priorities or day-to-day actions. Health-adjusted life expectancy (HALE), however, could bridge that gap (IOM, 2010). HALE is the union of life expectancy and quality of life and can be thought of as the number of quality-adjusted life years (QALYs) an individual can expect to live. HALE is an intuitive concept for a number that can be estimated for individuals as well as for the entire population (Chang, et al., 2013; Gold et al., 2002).

How can we use HALE in practice? Historically, large population datasets were required. However, risk modeling tools increasingly enable useful estimates of HALE at the clinical level based on demographic, clinical, and patient-reported data at the point of care (Stine, et al., 2013). One can compare that to the patient’s potential HALE if he or she were to take specific actions to manage health conditions or behaviors. The gap between a patient’s estimated and potential HALE represents an opportunity for improving health. Indeed, this opportunity can be quantified so that patients can discuss the potential clinical and behavioral interventions with their clinicians in the context of the HALE to be gained. For example, a patient with prediabetes and hypertension could evaluate the relative and absolute importance of smoking cessation, exercise and dietary programs, and adherence to antihypertensive therapy with her provider. Existing health risk assessments provide a foundation of experience with personalized risk communication of this sort (Edwards et al., 2013). Clinicians and patients can focus on impactful interventions they view as desirable and feasible in jointly creating an individualized health improvement plan.

A similar approach can be used at the population level, taking advantage of the fact that population HALE is simply the aggregate of individuals’ HALE. The broader health system, which includes health care institutions, government, employers, schools, housing and other

Author affiliations: Los Angeles County Department of Public Health (S.M.T.); U.S. Department of Veterans Affairs (D.A.C.); New York City Health & Hospitals Corporation and New York University School of Medicine (N.W.C.); and Los Angeles County Department of Public Health and University of California, Los Angeles, Schools of Medicine and Public Health (J.E.F.).

1The authors are participants in the activities of the IOM Roundtable on Population Health Improvement.
sectors, and community groups, could prioritize actions based on an understanding of the gap between the total population’s current and potential HALE. Thus, analogous to the patient described above, these stakeholders could prioritize tobacco control (e.g., increasing tobacco taxes or promoting quit lines to the highest-risk groups), interventions to stimulate greater physical activity (e.g., safer streets or forming walking groups), or interventions to enhance adult immunizations (e.g., reminders or incentives) with an understanding of the potential short- and long-term gains in HALE.

In many cases, the priorities for individuals and populations will be similar, since health-related behaviors are powerful determinants of longevity and well-being. But the greatest determinants of health in population terms may be quite different from those commonly addressed by clinicians. Social and environmental factors, including safe, affordable housing; high school graduation; early childhood development; employment; income; and access to healthy foods account for about half of the differences in health among populations.

Economic evaluations merging cost and productivity data with HALE estimates would help guide health investments to get the most “bang for society’s buck”—and may also lead health care systems and hospitals’ community benefit programs to look beyond their walls to affect the social determinants of health. Moreover, a simple, understandable measure such as HALE facilitates comparisons across geographic regions as well as among ethnic and socioeconomic groups. Such comparisons can motivate change by enhancing understanding of health disparities and the potential of interventions to mitigate them.

A research agenda to support consistent HALE measurement and implementation could undertake two linked aims. First, methodologic difficulties in computing HALE—particularly techniques for collecting and standardizing quality-of-life data—must be addressed. Existing patient-reported survey tools used to measure quality of life have generally been deployed in research settings or for community health assessments. Further refinement to improve internal consistency and usability would facilitate more general clinical use. Meanwhile, an acceptably robust life expectancy prediction model needs to be deployed. Second, almost as important as measurement is the framing of HALE results, particularly to individuals. Many intrinsically understand a complex concept like gross domestic product, although few could describe how it is calculated. Communicating HALE should strive for a similarly intuitive understanding—while drawing upon tenets of behavioral economics to maximally motivate change. For example, the concept of “loss aversion” suggests that presenting HALE data as “healthy life-years lost” could motivate greater behavior change than simply presenting an adjusted life expectancy or a summary health score. Ultimately, multiple approaches should be tested empirically to gather data on individuals’ responsiveness and downstream effects on health outcomes.

Policy reforms could help support a research and implementation strategy in three principal ways. First, the National Center for Health Statistics of the Centers for Disease Control and Prevention should facilitate standardization of quality-of-life measurement, as described above, and facilitate its incorporation into the Behavioral Risk Factor Surveillance System and other population health surveys. Second, the Department of Health and Human Services should undertake an effort to collapse the three current measures it uses to track “healthy life expectancy” in Healthy People 2020 into a single HALE measure that includes self-reported quality of life. Third, the U.S. Preventive Services Task Force and the Community Preventive Services Task Force should collaborate to endorse consensus methods for calculating interventions’ benefits in terms of HALE.
A shared goal of improving HALE creates a shared accountability for the health system to improve it. All parts of the health system have a role to fulfill, committing to specific tasks and interventions that will have the greatest impact on the HALE of individuals and populations. From solo practitioners to accountable care organizations to the federal government, aligning how we measure health can help align our efforts to deliver on the promise of long, healthy lives for all.


**REFERENCES**


3