

Distinguishing Health Expectancies and Health-Adjusted Life Expectancies from Quality-Adjusted Life Years

Several recent publications have emphasized the need to consider both length and quality of life in setting health goals for the nation.¹⁻³ However, in doing so, they have confused the concept of "expectation of life free of disability" with that of quality-adjusted life years.

Technically speaking, disability-free life expectancy is an example of a health expectancy, an estimate of the number of years a population can expect to live in a specified state of health (in this case, free of disability). The concept was first proposed nearly 30 years ago in an article in this journal.⁴ It is usually defined in terms of a dichotomy of health states (e.g., disabled, not disabled), one of which is implicitly given a weight of unity and the other zero. When health expectancies for a set of discrete health states are weighted, using a set of "quality of life" weights, their sum provides a health-adjusted life expectancy. Health expectancies and health-adjusted life expectancies are population health status indicators or indices; they are calculated by means of a particular methodology (a modified life table⁵ or multistate life table^{6,7} involving various assumptions); and they take values expressed in years of life.

Weinstein et al.⁸ popularized the concept of the quality-adjusted life year as the sum of products of value weights measuring health-related quality of life and quantities of life (measured in years). Quality-adjusted life years are clearly a unit of measurement for adding years of life in different health states. They have typically been used to measure and compare the benefits of medical interventions,⁹ although they can also be used as a unit of

measurement for the values taken by health-adjusted life expectancy indicators.

Health-adjusted life expectancies have been variously referred to as weighted life expectancy,^{10,11} value-adjusted life expectancy,¹² and well-life expectancy (quality-adjusted).¹³ The quality of well-being scale was developed to provide quality weights for the measurement of quality-adjusted life years¹³; its use to measure the output of programs in quality-adjusted life years is clearly distinguished from its use to calculate well-life expectancy using data on the expected duration of stay in each health state.¹⁴ Wilkins and Adams¹⁵ published the first examples of health-adjusted life expectancy in this journal, using illustrative weights. They and subsequent authors recognized the need for weighting health states to produce an index useful to health policy makers for establishing priorities and allocating resources. The terms *health expectancy* and *health-adjusted life expectancy* are being promoted as an international standard by the International Network on Health Expectancy, also known as REVES.^{16,17} Most American groups working on health expectancies (disability-free life expectancy, active life expectancy) are members of the Network.

We feel it is important to maintain the distinction between the concepts of quality-adjusted life year (a unit of measurement) and health expectancies and health-adjusted life expectancies (population health indicators). It is also important to clarify the distinction between health expectancies (in which no quality adjustment is performed apart from the implicit weighting of 0 and 1) and health-adjusted life expectancies. All three concepts were

confused in *Healthy People 2000*. Objective 17.1 is entitled "Increase of healthy life to at least 65 years (baseline: an estimated 62 years in 1980)"; the instructions for use specify that "[Y]ears of healthy life (also referred to as quality-adjusted life years) is a summary measure of health that combines mortality (quantity of life) and morbidity and disability (quality of life) into a single measure. For people aged 65 and older, active life expectancy, a related summary measure, also will be tracked."¹ The actual objective is clearly to achieve an increase of *disability-free life expectancy* at birth by 3 "healthy years" over 20 years of calendar time. There is no weighting of health states in the formulation of this objective and consequently no quality-adjusted life years are involved in measuring progress toward it.

The confusion in these concepts is probably long-standing, but it first appeared in print in a paper by Erickson et al.¹⁸ quoted by Stoto and Durch,² in which it is concluded, "For example, combining composite scores such as those from the [quality of well-being scale] with life expectancy to calculate an estimate of quality-adjusted life years allows for comparison across disease- and other problem-specific target populations." Similar confusion has recently crept into the United Kingdom, where Kind et al.¹⁹ wrote, "The [quality-adjusted life year] is the arithmetic product of life expectancy and an adjustment for the remaining life years gained." Quality-adjusted life years have been an important parallel development to health expectancies, both being attempts to add quality to quantity in measuring health. That confusion has arisen is understandable. Quality-adjusted life year methodology will be of great assistance in moving from the estimation of health expectancy to the estimation of health-adjusted life expectancy.

We believe it is important to distinguish clearly between the concepts of quality-adjusted life year (a unit of measurement of health outcomes in general),

health expectancies (a population health indicator involving no quality weighting of health states), and health-adjusted life expectancies (a population health indicator whose value may be expressed in quality-adjusted life years). The clarification of these concepts and terminology will assist communication within the national and international research community and enable us to more clearly promote the concepts to health policy makers and the general public. □

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