Compression of Morbidity and Mortality: New Perspectives[1]

Eric Stallard, ASA, MAAA, FCA [2]

Presented at the Living to 100 Symposium
Orlando, Fla.
January 8–10, 2014

[2] Research Professor and Associate Director of the Center for Population Health and Aging, Duke Population Research Institute and Social Science Research Institute, Duke University, Durham, NC 27708 USA

ABSTRACT

Compression of morbidity is a reduction over time in the total lifetime days of chronic disability, reflecting a balance between (1) morbidity incidence rates and (2) case-continuance rates—generated by case-fatality and case-recovery rates. Chronic disability includes limitations in activities of daily living and cognitive impairment, which can be covered by long-term care insurance.

Morbidity improvement can lead to a compression of morbidity if the reductions in age-specific prevalence rates are sufficiently large to overcome the increases in lifetime disability due to concurrent mortality improvements and progressively higher disability prevalence rates with increasing age.

Compression of mortality is a reduction over time in the variance of age at death. Such reductions are generally accompanied by increases in the mean age at death; otherwise, for the variances to decrease, the death rates above the mean age at death would need to increase, and this has rarely been the case.

Mortality improvement is a reduction over time in the age-specific death rates and a corresponding increase in the cumulative survival probabilities and age-specific residual life expectancies. Mortality improvement does not necessarily imply concurrent compression of mortality.

This paper reviews these concepts, describes how they are related, shows how they apply to changes in mortality over the past century and to changes in morbidity over the past 30 years, and discusses their implications for future changes in the United States.