

## Frailty Patterns in the US and Implications for Long-Term Care

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**Abstract :** Older persons are at greatest risk of becoming frail. As survival to the age of 80 and beyond continues to increase, the health and frailty of older Americans has garnered much recent attention among policy makers and healthcare administrators. This paper examines patterns in old-age frailty within a multistate actuarial model that characterizes the stochastic process of biological ageing. Using aggregate population-level U.S. mortality data, we implement a stochastic aging model to examine cohort trends and gender differences in frailty distributions for older Americans born 1865 - 1894. The stochastic ageing model, which draws from the fields of actuarial science and gerontology, is well-established in the literature. The implications for public health insurance programs are also discussed. Our results suggest that, on average, women tend to be frailer than men at older ages and reveal useful insights about the magnitude of the male-female differential at critical age points. Specifically, we note that the frailty statuses of males and females are actually quite comparable from ages 65 to 80. Beyond age 80, however, the frailty levels start to diverge considerably implying that women are moving quicker into worse states of health than men. Tracking average frailty by gender over 30 successive birth cohorts, we also find that frailty levels for both genders follow a distinct peak-and-trough pattern. For instance, frailty among 85-year old American survivors increased in years 1954-1963, decreased in years 1964-1971, and again started to increase in years 1972-1979. A number of factors may have accounted for these cohort differences including differences in cohort life histories, differences in disease prevalence, differences in lifestyle and behavior, differential access to medical advances, as well as changes in environmental risk factors over time. We conclude with a discussion on the implications of our findings on spending for long-term care programs within the broader health insurance system.

**Keywords :** actuarial modeling, cohort analysis, frail elderly, health

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