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Trajectories of changes in health status over fourteen years of older adults using a multi-state modeling.

Changes in health show complex dynamics but can be summarized using a multi-state transition modeling approach. Our objective was to investigate, in people aged 70 years and older, whether changes in frailty status and mortality risk depend on baseline health, using a stochastic model of frailty state transitions. We performed secondary analysis of data from the Yale Precipitating Events Project, a cohort study based in New Haven CT, of non-disabled people aged $70+$ years ($n = 754$), assembled in 1998 and reassessed every 18 months. Thirty-six dichotomized variables (deficits) were used to calculate each individual's health status, combined in a frailty index. Transitions in the number of deficits over each time interval were represented by the Poisson law, with the Poisson mean dependent on the deficit numbers at baseline. Logistic regression was used to estimate mortality parameters over 162 months of follow-up. The model predicts a variety of changes in health status. Over 14 years of follow-up, the slope of the Poisson mean remained unchanged (0.77 ± 0.04) while the intercept (characterizing the transitions of those who had zero deficits at baseline) increases to 8.5. At the same time, the probability of death accelerated. People with zero deficits have a 20% chance of dying during the first 90 months, then slightly accelerates. The FI increased significantly more slowly in longer lived individuals (life-span $90+$) compared to the individuals whose life span was bellow age 90. The model is valuable for estimating how changes in health can influence mortality in older adults.