



SOCIETY OF ACTUARIES

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Longitudinal Analysis of Mortality Risk Factors

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Individual risk factors such as education, marital status and health status are known to influence survival probabilities. Data at an individual level is required to assess the relative importance of these risk factors. This study investigates important drivers of retirement age mortality using the U.S. health and retirement study (HRS). Two distinct representations are used that preserve both the cross-sectional as well as the temporal nature of the data. The first is for continuous survival data analysis and the second is for discrete panel data analysis. Proportional hazard models are fit to the survival data and marginal models to the panel data. We show the relationship between the two approaches and how, in contrast to the proportional hazard models, the marginal models are able to explicitly incorporate external covariates. The analysis of the HRS data quantifies the significance of these risk factors and explores the extent to which external risk factors, such as GDP, unemployment and health expenditures, explain individual survival probabilities in contrast to individual risk factors.