



Frailty Modelling for Adult and Old Age Mortality: The Application of a Modified DeMoivre Hazard Function to Sex Differentials in Mortality

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Article:

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Abstract:

Unobserved differences in individual's susceptibility to death are an important aspect in the analysis of contemporary mortality patterns. However, observed mortality rates at adult ages, which are usually well-described by a Gompertz curve, are often perceived inconsistent with frailty models of mortality. We therefore propose a modified DeMoivre hazard function that is suitable for the application of frailty models to adult and old ages. The proposed hazard increases faster than exponential, and when combined with unobserved frailty it can capture a broad range of patterns encountered in the analysis of adult mortality. Our application to Bulgaria during 1992–93 suggests that the stronger selection process in the male population, caused by an overall higher level of mortality, may constitute a primary mechanism leading to the convergence of male and female mortality at higher ages. Hence, the convergence between male and female mortality is not necessarily caused by a differential process of aging across sexes, but is merely a consequence of the different levels of mortality at adult ages.

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