

# **The Relationship Between Cognitive Impairment and Mortality Rates Among Long-Term Care Insurance Applicants**

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## **Abstract**

In this paper, we examine the relationship between the earliest stages of dementia—mild cognitive impairment—and mortality. Using data from 896,756 applicants of long-term care insurance who applied for policies between 1996 and 2008, and linking this to the Social Security Master Death File, we focus on the classification results of two distinct cognitive screens that have been used by LTC carriers in the underwriting process. These screens were deployed either telephonically or through in-person evaluations. The first, the Delayed Word Recall (DWR), was employed throughout the 1990s, and the second, the Enhanced Mental Skills Test (EMST), entered widespread use from 2004 through the present. This latter test is the most sensitive in the market at detecting individuals with mild cognitive impairment.

Using the Cox Proportional Hazards Model as well as relative mortality ratio analysis, we show that the proportion of individuals classified as cognitively impaired have significantly higher relative mortality compared to those classified as cognitively intact. This is true for both cognitive screens. In fact, holding age and gender constant, an applicant classified as cognitively impaired has a death hazard between 1.52 and 1.69 times greater than someone who is cognitively intact. With respect to relative mortality ratios, across all age and gender groups, higher relative mortality ratios are found among individuals classified as cognitively impaired, and individuals identified by the EMST as cognitively impaired have higher relative mortality ratios than those identified by the DWR. The results presented here have implications for forecasting health services use among the older adult populations, budgeting and funding of programs designed to serve their needs, underwriting methods for older age life insurance policies and policy pricing.