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Long-Term Care Models and Dependence Probability Tables by Acuity Level: New Empirical Evidence from Switzerland

Michel Fuino, Joël Wagner*

Abstract

Due to the demographic changes and population aging occurring in many countries, the financing of long-term care (LTC) poses a systemic threat. The scarcity of knowledge about the probability of an elderly person needing help with activities of daily living has hindered the development of insurance solutions that complement existing social systems. In this paper, we consider two models: a frailty level model that studies the evolution of a dependent person through mild, moderate and severe dependency states to death and a type of care model that distinguishes between care received at home and care received in an institution. We develop and interpret the expressions for the state- and time-dependent transition probabilities in a semi-Markov framework. Then, we empirically assess these probabilities using a novel longitudinal dataset covering all LTC needs in Switzerland over a 20-year period. As a key result, we are the first to derive dependence probability tables by acuity level, gender and age for the Swiss population. We find that the transition probabilities differ significantly by gender, age and time spent in the frailty level and type of care states.

Key words long-term care · semi-Markov model · actuarial dependence tables

1 Introduction

One of the most dramatic challenges facing many high-income countries is population aging. Therefore, long-term care (LTC) delivered to elderly persons in need of assistance in activities of daily living (ADL, e.g., dressing, bathing, eating) is predicted to increase in the foreseeable future (United Nations, 2015). In many countries, over a 30-year horizon from the present, spending on formal LTC is expected to reach approximately 2% of GDP (Colombo et al., 2011; Rockinger and Wagner, 2016; Fuino and Wagner, 2018b) while the value of informal care delivered by relatives remains important (Pickard et al., 2000; Karlsson et al., 2006; Brown and Finkelstein, 2009; Zhou-Richter et al., 2010; Courbage et al., 2018). This stresses the relevance of proper financing and pricing of LTC. At present, countries employ various approaches

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