Integral equations for moments and loss distributions in multistate life and health insurance models

Marcus C. Christiansen, *University of Ulm*
(joint work with Franck Adekambi, University of Johannesburg)

Abstract

For the risk management in life and health insurance, a mathematical key quantity is the probability distribution of the random future liabilities of an insurance contract. We focus on unsystematic biometric risk, modeling the randomness of the future health status of individual policyholders by Semi-Markovian multistate models. We derive integral equations and partial differential equations for the moment generating function and higher order conditional moments of the future liabilities. From the moments we can then construct approximations for the loss distribution. Furthermore, we discuss how to represent the loss distribution directly via an integral equation.