

**LONGITUDINAL GRADE-OF-MEMBERSHIP/MIXED-MEMBERSHIP MODELS FOR THE NATIONAL
LONG TERM CARE SURVEY**

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The number and proportion of older Americans is rapidly increasing and this demographic shift will increase demands on the public health system while decreasing the American income and social security tax base. In the 1980s policymakers acknowledged a critical gap in national data regarding health and function changes at older ages; are increased life spans increasing the amount of chronic disability (which is expensive) or not? Therefore government officials initiated the National Long Term Care Survey to assess chronic disability status in a longitudinal sample of elderly Americans. The survey consists of six waves taken from 1982-2004 with a high response rate and low drop out rate between waves. We seek to discover and describe groups of individuals who exhibit similar behavior over time in order to answer these policy questions. Most existing analyses of this survey have used cross-sectional summaries to examine trends over time. Our approach involves models that capture how individuals move between groups over time or group characteristics change over time or both. We work from a general formulation of hierarchical Bayesian mixed-membership models in which we present several model specifications and variations. These include cross-sectional mixed-membership, longitudinal mixtures of disability trajectories, and longitudinal mixed-membership of disability trajectories.