

Methodological issues in municipal lifetable construction:  
How much prior knowledge of regional differentials in mortality stabilizes  
death rate estimates in a small area?

Keita SUGA

This paper empirically analyzes how methods for construction of a municipal lifetable alter regional differentials in life expectancy, using Japanese mortality data from around 2005. Official statistics for the municipal lifetable in Japan have been published by the Ministry of Health, Labor and Welfare since 2000. First, we demonstrate that regional patterns of life expectancy in the 2010 official lifetable differ significantly from those recorded in both 2000 and 2005. Then we examine whether this difference is a consequence of methodological revisions undertaken in the 2010 round. In particular, we construct five types of municipal life tables and compare their life expectancies with the official life expectancy. The five types are classified by two factors in their construction methods: (1) utilizing periods of death data (single years from 2004 to 2006, or the average over 2004 to 2006); and (2) land sizes of regions by which prior distributions for Bayes estimation of death rates are decided (the second medical [administration] area, or prefecture which is larger than the former). We find that the changes in construction methods affect the regional patterns in municipal life expectancies: there are more than 0.5-year differences by the construction methods among half of the municipalities, and the modification of the prior information in Bayes estimation results in the differences being more than 0.3 years among half of the municipalities and 1 year in ten percent of the municipalities even after fixing the period of death data.