

SUMMARY OF Ph.D. DISSERTATION

School	Student Identification Number	SURNAME, First name HANAYAMA, Nobutane
Title Environment effect models for analyzing (age, period)-tabulated data		
Abstract <p>In the field of cancer study, it has been accepted that crucial exposure to environmental risks might have occurred years before a malignant tumor become evident in human body. Besides, in the field of census study, it may be considered that people's sense of value are influenced by their experiences of social events. Further, environmental factors like advancing medical technology or recent nourished food conditions can influence the limit of longevity distribution. Considering these fact, it may be meaningful to see trends in influences of environmental factor on cancer deaths, people's sense of value or the limit of longevity in the statistical analysis of data.</p> <p>So, in this dissertation, for projecting trends in influences of environmental factors on human death or people's sense of value, three statistical models are proposed for analyzing (age, period)-tabulated data which are those observed for a long period as several decades and aggregated by age groups. Besides, the identifiability problem and the existence and consistency of MLEs for the parameters in the models are discussed. Further, from the results of fitting the proposed models to actual data obtained in Japan, U.S. and the Nordic countries, it is seen that the proposed models provide better fits to the data. Moreover, several significant findings obtained form the estimates of parameters in the models are given.</p> <p>In the study of (age, period)-tabulated data, the age-period-cohort (APC) model, which has age, period and cohort-effects as their parameters, has enjoyed considerable popularity. Because both the period and cohort-effects in APC model are associated with environmental factors for time intervals, it may be considered that the proposed models have something to do with APC model. The meanings of parameters in AE and STS models are, however, different from those in APC model, and besides the proposed models provide better fits to the used actual data than APC model in terms of AIC as for AE model and the deviance as for STS model.</p> <p>Following the introduction described in Section 1, basic theories in the analysis of (age, period)-tabulated data are described, and APC model and its problem on fitting it to actual data are introduced in Section 2. And we propose AE model for the analysis of breast cancer deaths or working population for females in Section 3, STS model for analyzing deaths of cancer of all sites in Section 4, and the oldest-old model for the analysis of the oldest-old deaths in Section 5.</p>		