

Bayesian spatial analysis of chronic diseases in Chinese elderly people using a STAR model*

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Abstract

Chronic diseases have become important factors affecting the health of Chinese elderly people. Because the prevalence of chronic disease varies among the provinces, it is necessary to understand the spatial effects on these diseases, as well as their relationships with potential risk factors. This study applies a structured additive regression model and the `R2BayesX` package to conduct a Bayesian analysis. The data were obtained from the 2000, 2006, and 2010 Chinese Urban and Rural Elderly Population Surveys. For chronic diseases, and two in particular (hypertension and heart disease), the study obtained the following conclusions: (1) the reported prevalence for elderly females is higher than that for elderly males, and the reported prevalence for urban elderly people is higher than that for rural elderly people; (2) the gap in the census register is much greater than the gap in gender; (3) the effect of marriage is negligible; (4) smoking and drinking effect the reported prevalence; (5) the nonlinear effects of continuous covariates for the elderly (age, years of education, number of sports activities and cultural activities) were all very small (less than 0.01), but considerable; and (6) the highest spatial effect usually appeared in two types of provinces: economically developed provinces, and economically backward provinces with complex terrain. Based on these findings, the government should further strengthen its investment in rural areas and economically backward provinces as a cost-effective intervention, and should educate the population on the harmful effects of smoking and drinking alcohol on health.

KEY WORDS: Bayesian analysis, Chronic disease, Markov chain Monte Carlo (MCMC), `R2BayesX`, Spatial effect, Structured additive regression (STAR) models.

JEL CLASSIFICATION: C11, C35, I1.

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