

**Abstract:** The estimation of income distributions plays an important role in the measurement of inequality and poverty over space. In this work, we focus on the simultaneous estimation and inference for area-wise income distributions with taking account of geographical relationships. Based on the likelihood functions of the multinomial distributions for grouped data, we propose hierarchical models by introducing spatial stochastic structures for area-wise parameters in parametric income distributions. We develop a Bayesian approach for estimation and inference for area-wise parameters under the hierarchical models. We demonstrate the proposed method using grouped income data of Japanese municipalities.