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Bayesian spatio-temporal random coefficient time series (BaST-RCTS) model of infectious disease. (English) [Zbl 1314.92173](#)
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Summary: This paper proposes a new method, using Bayesian approach, to analyze time series data of infectious diseases which have both temporal and spatial variational structures. Standard ways to model heteroscedastic time series are the ARCH-type models. However, from an empirical standpoint, there is a need to include spatial effect into time series analysis to make allowance for confounder and ecological biases. On the basis of random coefficient autoregressive model, our model takes account of spatial correlated/uncorrelated heterogeneity. To assure the applicability of our model, we set up hypothesis framework before analyzing. It was proved that our model could provide the first two conditional moments of ARCH-type models. The empirical study of bacillary dysentery data also illustrated that our model could make accurate and precise approximations.

MSC:

[92D30](#) Epidemiology
[62F15](#) Bayesian inference
[62M10](#) Time series, auto-correlation, regression, etc. in statistics (GARCH)

Keywords:

[ARCH-type model](#); [Bayesian analysis](#); [infectious disease](#); [spatial effect](#); [time series analysis](#)

Software:

[BayesDA](#); [FinTS](#); [MLwiN](#); [SAS](#)

Full Text: [DOI](#)

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