عنوان مقاله:

A Disease Outbreak Prediction Model Using Bayesian Inference: A Case of Influenza

نویسندگان:

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خلاصه مقاله:

Introduction: One major problem in analyzing epidemic data is the lack of data and high dependency among the available data, which is due to the fact that the epidemic process is not directly observable. Methods: One method for epidemic data analysis to estimate the desired epidemic parameters, such as disease transmission rate and recovery rate, is data intensification. In this method, unknown quantities are considered as additional parameters of the model and are extracted using other parameters. The Markov Chain Monte Carlo algorithm is extensively used in this field. Results: The current study presents a Bayesian statistical analysis of influenza outbreak data using Markov Chain Monte Carlo data intensification that is independent of probability approximation and provides a wider range of results than previous studies. A method for estimating the epidemic parameters has been presented in a way that the problem of uncertainty regarding the modeling of dynamic biological systems can be solved. The proposed method is then applied to fit an SIR-like flu transmission model to data from ۱۹ years leading up to the seventh week of the ۲۰۱۷ incidence of influenza. Conclusion: The proposed method showed an improvement in estimating the values of all the parameters considered in the study. The results of this study showed that the distributions are significant and the error ranges are real.

کلمات کلیدی:

Disease Outbreak, Metropolis-Hastings Algorithm, Influenza

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