



The University of Chicago
Department of Statistics
Master's Seminar

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Bayesian Time Series Approaches for Analyzing Epidemic Data

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ABSTRACT

The main objective of this paper is to present and compare several approaches for analyzing a single epidemic dataset. The paper consists of two parts. The first part demonstrates the Gibbs sampling approach for estimating four time series regression models for the epidemic time series data. In the second part, a time series version of the classic Susceptible-Infected-Recovered (SIR) model will be used to model the evolution of the epidemic. These methods are applied to an 18th century smallpox epidemic. Goodness of fit is discussed for all models, and models are compared in terms of their ability to predict the course of epidemic.