A Temporal Bayesian model with discrete response: An Application in Epidemiology

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Abstract

This work presents a Bayesian methodology for modeling discrete data considering a temporal structure of dependence. Descriptive temporal studies developed in order to estimate the incidence rate of Type 1 Diabetes Mellitus in Chile have motivated the proposal of an adequate model to explore and determine the existence of seasonality and trend, both implicit in the temporal behavior of the available information. A temporal Bayesian generalized linear model with autoregressive errors and lags in the observations is proposed. Environmental measures, such as pollution, are incorporated as covariates looking for an explanation for the growing incidence rate of Diabetes Mellitus in the Metropolitan Region of Chile, between 2000 and 2007.

Keywords: Time series, Generalized Linear Models, Bayesian Statistics, Type 1 Diabetes Mellitus.