Gastrointestinal disease simulation

The health component of the MEGADAPT model is implemented as two separate regression models that simulate the expected number of incidences of gastrointestinal diseases in the lowlands and in the highlands of Mexico City.

For the lowlands, a regression model of the form

(14)

was used to incorporate the full set of predictors and the spatial dependency observed in the data. is a vector of observations of the dependent variable, with one observation for every census block, is the number of flooding events in census block , and is a parameter that relates the number of flooding events to the risk of gastrointestinal diseases. is a vector of disturbance terms, where is assumed to be independently and identically distributed for all , with zero mean and variance of . This regression is spatial because it captures the spatial dependency observed in the incidence data (*Baeza et al., in review*). The model thus incorporates an additional regressor in the form of a spatially-lagged variable,(Anselin, 2001). This variable captures cross-section dependencies, in which a covariance structure exists in different locations derived from the geographic space (Anselin 1998, Anselin, 2001). The term is the unknown spatial lag coefficient, and *W* is the contiguity matrix. For this implementation of the MEGADAPT dynamics model we assumed that . This assumption is based on the observation that a new model will be required to calculate a temporal regression.