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Bayesian Modeling of Smoking Exposure During Pregnancy

Studies trying to assess effects of prenatal exposure to cigarettes frequently acquire both self-report and biologic assays of maternal smoking. Most common biological assays are those of cotinine, a metabolite of nicotine, from urine or serum. Both of those measures have their own sources of information and bias. Single bioassay measures alone cannot reflect the metabolic mechanism over time, while self-report may have serious recall, topographic, and metabolic biases. In this project we present a Bayesian statistical model for describing in utero smoking exposure based on the combined biological and self-report information. The model takes into account heterogeneity among women and metabolism during pregnancy. The model is applied to the data from East Boston Family Study.