

## DISCUSSION OF “SPATIAL ACCESSIBILITY OF PEDIATRIC PRIMARY HEALTHCARE: MEASUREMENT AND INFERENCE”

BY AMELIA M. HAVILAND

*Carnegie Mellon University*

This paper describes the infusion of many fresh statistical ideas into the area of spatial access to healthcare, and I hope that the procedures described are widely implemented. What is described is a large and an impressive applied research project incorporating space-varying coefficient models, simultaneous confidence bands and backfitting to address otherwise potentially unstable and computationally expensive estimation. In my opinion, there are three high-level areas of this work that would benefit from further development. I describe these next, followed by much briefer descriptions of some minor quibbles I have with the paper that the authors may want to consider.

The first area where further development could be valuable is in the “procedure developed to systematically evaluate multiple models.” I commend the authors in not narrowing down the space of possible models to a single “best” model and instead considering a family of acceptable models. I also appreciate that they state clear and reasonable criteria for deeming models to be acceptable. What I find less satisfying is that the procedure described to summarize the multiple models deemed to be acceptable is largely qualitative. Thus, the ability to make accurate probability statements about the relationships between the predictors and the outcome, over the family of acceptable models, is lost. The issues surrounding model selection and/or how to incorporate the information from a family of useful models into an inferential structure are highly relevant to any decision-making that could result from statistical modeling. This issue was highlighted in a recent National Research Council Report evaluating the existing research regarding deterrence and the death penalty in the U.S. [[National Research Council \(2012\)](#)]. The committee for that report, which I served upon, concluded that large model uncertainty swamped any claims of the presence or absence of statistical significance within any particular model. Bradley Efron’s work, “Estimation and Accuracy After Model Selection,” also presented at the 2014 Joint Statistical Meetings, may be useful to consider in this context [[Efron \(2013\)](#)].

In the particular setting of this spatial accessibility analysis, the model uncertainty issues are due to correlations among the predictors. This source of model uncertainty makes relationships of individual correlated predictors to outcomes of little value. A principal components or factor analysis may be helpful to better