

UTSA College of Business
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“Bayesian Measurement Error Models in Demographic Analysis”

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Abstract

The American Community Survey (ACS) summary file data provide rolling 5 year estimates of demographic and socioeconomic indicator data for small geographies throughout the United States. These estimates are commonly used as indicators for regression models to measure conditions in communities. The Margins of Error (MOE) in the ACS estimates for small geographic areas can often be very large, and without taking them into account, regression analyses using them can be mis-specified, leading to bias in regression coefficients and model standard errors. This paper directly compares measurement error model specifications to naive model specifications for a mortality outcome in Texas Census tracts using Bayesian model specializations. The results show that there is bias in the naive regression model. We urge users of the ACS summary file data to be aware of such bias as it can potentially impact interpretation of model results and hypothesis tests.