

In recent years, demand for reliable small area statistics has considerably increased, but the size of samples obtained in small areas is too often small to produce accurate predictors of quantities of interest. To overcome this difficulty, a common approach is to use auxiliary data from other areas or other sources, and produce estimators that combine them with direct data. A popular model for combining direct and indirect data sources is the Fay-Herriot model, which assumes that the auxiliary variables are observed accurately. However, these variables are often subject to measurement errors, and not taking this into account can lead to estimators that are even worse than those based exclusively on the direct data. In this paper, we consider structural measurement error models and a semi-parametric approach based on the Fay-Herriot model to produce reliable prediction intervals for small area characteristics of interest. Our theoretical study reveals the surprising fact that the properties of the prediction interval are not the same for all values of the noisy covariate. Indeed, the convergence rates are slower when the contaminated covariate takes the value zero than in other cases. Our procedure is illustrated with an application and simulation studies.