

**NONPARAMETRIC MODEL-BASED ESTIMATION**

by

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## ABSTRACT

A nonparametric model-based estimator of the population total is proposed. The sample data along with the auxiliary information are used in fitting a generalized additive model that is then used in reconstructing the unknown population. The estimates of the population parameters are computed from the predicted population values (for the unsampled part of the population) and the sample values. A simulation study designed to account for different association patterns between the target variable and the auxiliary variable, population size, and sample size was conducted to evaluate the proposed procedure. The method is robust to model form, population size, and sampling rate, and is generally superior to design-unbiased estimators.