ON DESIGN-BASED SMALL AREA ESTIMATION

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Abstract

Small area estimation methods are used in surveys, where sample sizes are too small to get reliable direct estimates of parameters in some population domains. We consider design-based linear combinations of direct and synthetic estimators of domain means and propose a two-step procedure to approach the optimal combination. We construct the mean square error estimator suitable for this and any other linear composition that estimates the optimal one. We consider also the case of small true domain proportions and propose a new design-based composite estimator to estimate them. We apply the constructed estimators to the data of the Lithuanian Labor Force Survey and the statistical survey of the Lithuanian census and compare them with empirical best linear unbiased predictors and some other composite estimators.

Keywords: composite estimator, synthetic estimator, mean square error, bias.