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Title. Robust small area estimation under semi-parametric models

Abstract. In small area estimation auxiliary information is used through linking models and the classical approach is to use linear models and to obtain the empirical best linear unbiased predictors (EBLUP) of small area means. However, the efficiency of the estimators depends on the correct specification of the linking models so the performance of the EBLUPs can be severely affected by the presence of representative outliers in the data or departures from the normal distribution assumption of the random effects. In recent years several robust techniques have been developed for unit-level linear mixed models. Nevertheless, the assumption of linearity can be restrictive in practice and extensions of the EBLUPs of small area means under semi-parametric models have been introduced. We discuss recent developments of robust methods which are adequate for these more general models and present robust empirical best linear unbiased predictors of the small area means which are shown to be more efficient than their EBLUPs under several types of contamination.