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Heavy tailed priors: an alternative to non-informative priors in the estimation of proportions on small areas

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We explore the Cauchy and a new heavy tailed (Fuquene, Perez and Pericchi (2011)) priors to estimate proportions on small areas. Hierarchical models and the Binomial likelihood in the exponential family form are used. We believe that the heavy tailed priors in survey sampling settings could be more effective than the choice of noninformative priors to eliminate antipathy towards methods that involve subjective elements or assumptions. To illustrate the robust Bayesian approach, we apply this methodology in a popular example: "the clement problem". Finally, we recommend to use the Cauchy prior in absence or presence of outliers within the small areas and the Fuquene et al. (2011) prior when the outlier is a particular small area.

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