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A comparison of design-based and model-based approaches using the results of Demographic and Health Survey data analysis

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In analyzing complex surveys, the complexity of the sample design should be considered and specialized statistical packages used for handling data from such surveys. This research examines the differences between design-based and model-based approaches to emphasize the importance of using the design-based approach in analyzing complex survey data. We used data from the Sri Lanka Demographic and Health Survey (SLDHS) 2006/2007 conducted by the Department of Census and Statistics. We examined the differences in design-based and model-based estimates. We used generalized linear models to obtain model-based estimates and their corresponding standard errors while Bootstrapping was used for design-based estimates. We used coefficients of variation (CV) to compare the differences of the estimators. We used design effects to evaluate the efficiency of the sample design. We found lower coefficients of variation for model-based estimates than for design-based estimates. This indicates underestimation of sampling errors in model-based estimates. We also found that the design effects are greater than one (01) which is generally valid for complex sample designs.

Keywords: Bootstrapping, design-based approach, Generalized Linear Models, model-based approach

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