



## Using R-indicators for Adaptive Follow-up in Longitudinal Studies

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The motivation for the growing focus on adaptive data collection is the efficient allocation of resources. From the perspective of response rates, directing efforts to the easy to convert or easy to contact units may increase the risk of a greater contrast between response and nonresponse resulting in more biased estimates. By ensuring a more representative sample at the source, we reduce the variation in final survey weights mainly caused by non-response adjustments and thus improve the efficiency of estimators. We use Representativity Indicators (R-indicators) to facilitate the monitoring and controlling of data collection. R-indicators measure the degree to which respondents and non-respondents differ from each other (the contrast) and go beyond response rates alone. R-indicators are based on the variation of response probabilities estimated through a response propensity model conditional on auxiliary information and paradata available to both respondents and non-respondents. R-indicators can be further decomposed into partial R-indicators which determine relevant population sub-groups that are contributing the most to the lack of representativity. The R-indicators identify which groups should receive more or less attention and differentiate data collection strategies. For the case of longitudinal studies, there is a wealth of information and paradata from previous waves for developing response propensity models and R-indicators to implement targeted follow-up strategies in subsequent waves. The longitudinal survey design is generally more complex and hence response propensity models and confidence intervals of R-indicators need to be adapted to deal with clustered and weighted survey data. An application for adaptive follow-up in the longitudinal UK Millennium Cohort Study is presented.

**Keywords:** response propensity model; auxiliary data; targeted data collection; nonresponse