Weighting in Survey Statistics

Instructor: Dr Anne Konrad, LIfBi

Date & Time: Monday, July 24 until Wednesday, July, 26, 09.00 a.m. to 01.00 p.m.

Place: LIfBi, Wilhelmsplatz 3, 96050 Bamberg; Room 01.13

Registration: To register, please send an email to weiterbildung@lifbi.de by July 03, 2023. Registration is mandatory. The number of participants is limited to 16.

Course Description:

Methods to analyse data taught in introductory statistics and econometric courses often rely on the assumption that the data are collected in a simple random sampling process. However, in practice rather complex sampling techniques are often used, such as stratification or clustering. In these cases, a weight has to be assigned to the sampled units to account for the sampling design. The course will cover methods to select random samples and weight the sampled units to infer from the single sample to the population. We will discuss the several steps in a weighting process including 1) obtaining the design weights to account for the random sample selection, 2) adjusting the design weights to compensate for nonresponse, and 3) adjusting the weights such that the sample estimates agree with known population totals. Moreover, we will discuss the use of weights in statistical models such as regressions and oppose it to the pure model-based approach where design variables and variables explaining the nonresponse pattern are included into the model. The focus of the course is on the intuition of the underlying theory and the statistical methods so that the participants can assess the appropriateness of the methods in their application by themselves. We will do exercises in R that apply the techniques learned in the lecture. Participants will get the most out of the class if they have prior experience with R.

Workshop content

- Basic concepts in survey statistics: motivation, selection process, estimation process and sampling designs
- Importance of weighting
- Calibration estimators: GREG estimators, post-stratification and raking
- Weighting process: construction of design weights, nonresponse adjustment and adjustment to external auxiliary information

- Longitudinal weighting
- The use of weights in regressions

About the Trainer

Anne Konrad is research associate at the Leibnitz Institute for Educational Trajectories. After studying economics and statistics, she completed her doctorate in sampling theory at the University of Trier. Her research focus on weighting sampling data, calibration methods, nonresponse adjustment and sampling theory.