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CENTRE INTERUNIVERSITAIRE QUÉBÉCOIS DE STATISTIQUES SOCIALES | QUEBEC INTER-UNIVERSITY CENTER FOR SOCIAL STATISTICS

THE USE OF BOOTSTRAP WEIGHTS FOR VARIANCE ESTIMATION

Location: McGill University, Peterson Hall Building, 3460 McTavish, Room 310.
Date: Friday, February 8, 2013 from 9am to 4pm.

This workshop will cover the bootstrap method used to estimate the variance of a parameter. The bootstrap is an inference technique based on successive resampling. The *survey* bootstrap exploits the existing sample to build synthetic samples, called replicates. These replicates are used to estimate the variance of a parameter. For example, this parameter can be a mean, a ratio or the coefficient of a variable in a regression model. Since the estimator is calculated from a sample randomly selected, it follows that the estimator can vary among the different samples that could be generated from the same population. This variation is expressed by the variance and the variance reflects the reliability of the estimator. Both the estimator and the margin of error are needed to generalize results to the population (inference).

Course Objectives:

- Gain the theoretical concepts of the *survey* bootstrap method and of the variance estimation of a parameter;
- Learn to use different software for estimating the variance using bootstrap weights.

Content:

- Illustration, by an example, of the concept of sampling variance.
- Definition and utility of the bootstrap ;
- Algorithm of the bootstrap;
- Applications of the use of the bootstrap weights with the software SAS, SUDAAN and STATA.

General Course Information:

Both parts, theoretical and practical, will be presented in the conference room (Peterson Hall Building, Room 310). Notes from the presentation, including the practical part (syntax + result), will be distributed. There will be no hands-on practice in this workshop.

Trainer:

Danielle Forest, MSc., Statistics Canada Analyst at QICSS.

Participants:

The course is open to graduate students and postdoctoral fellows as well as to professors and practising researchers. Priority will be given to students/researchers using datasets available at QICSS.

A maximum of 15 participants will be selected on the basis of the relevance of the course to their curriculum, research, or teaching.

Readings:

Lohr, S. 1999. Sampling: Desigh and Analysis. Duxbury Press, USA.

Pfeffermann, D. and Rao, C.R. (Eds.) (2010). Handbook of Statistics, Volume29, Sample Surveys: Inference and Analysis. Elsevier.

Phillips, Owen (2004). Using Bootstrap Weights with WesVar and SUDAAN. RDC Information and Technical Bulletin Vol. 1 no. 2, 6-15.

Research Triangle Institute (2001) SUDAAN User's Manual, Release 8.0. Institute, Research Triangle Park, NC: Research Triangle Institute.

SAS Institute Inc. 2008 *SAS/STAT 9.2 User's Guide*. Cary, NC: SAS Institute Inc.

StataCorp. 2009. Stata: Release 11. Statistical Software. College Station, TX: StataCorp L.P.

Information:

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