Course title:	**SC16 - Construction of weights and treatment of influential units in surveys**
Duration:	**2 days**
Date and time:	**13 & 14 July**
Venue:	**Faculté de Médecine et de Pharmacie de Marrakech** **Address: Sidi Abbad, Marrakech 40000**
Registration fee:	- **Developed Country: € 370** - **Host , Least Developed & Developing Country, or Student[(1)]: € 240** (1) For students, proof of enrolment will be required.

Instructor 1

David Haziza, Professor, Université de Montréal, Canada

David Haziza is an Associate Professor in the department of mathematics and statistics at Université de Montréal. His research interests include the treatment of nonresponse in surveys, estimation in the presence of influential units and resampling methods.

Instructor 2

Jean-François Beaumont, Chief Research, Statistics Canada, Canada

Jean-François Beaumont is chief research in the International Cooperation and Corporate Statistical Methods Division. His research interests include the treatment of nonresponse in surveys, estimation in the presence of influential units and resampling methods.

COURSE DESCRIPTION

The course consists of two parts: the construction of survey weights and the treatment of influential units in surveys

Part 1: Weighting is one of the central steps in surveys. The typical weighting process involves three major stages. At the first stage, each unit is assigned a base weight, which is defined as the inverse of its inclusion probability. The base weights are then modified to account for unit nonresponse. At the last stage, the weights adjusted for nonresponse are further modified to ensure consistency between survey estimates and known population totals. This part will provide an overview of the various stages involved in a typical weighting process used by national statistical agencies.

Part 2: When the distribution of variables in a survey is highly skewed, it is likely that the methodologist will face the problem of influential values. This problem is especially acute in business surveys because the distribution of most economic variables is highly skewed. Classical estimators exhibit (virtually) no bias, but they can be very unstable in the presence of influential values. Thus, it is desirable to develop estimation procedures whose mean square error is significantly smaller than that of classical estimators when there are influential values in the population but which do not suffer a serious loss of efficiency when there are none. We will attempt to answer the following questions:

- What is an influential value in the context of surveys?
- How measure the influence of a unit?

How reduce the impact of units that have a large influence at the estimation stage?

SYLLABUS

The course consists of 5 chapters:

- Basic weighting system (uni-phase, two-stage and two phase sampling, weight share method, properties of estimators)
- Weighting system adjusted for nonresponse (estimation of the response propensities, properties of estimators adjusted for nonresponse)
- Calibrated weighting system (calibration methods, properties of estimators, one step and two-step procedures)
- Internal and external consistency
- Treatment of influential units (Definition, measures of influence, methods for treating influential units including winzorisation, weight trimming and weight smoothing)

TARGET AUDIENCE

Survey statisticians working in statistical agencies, researchers and graduate students. This course is an intermediate level course.