TOUNKARA FODE, Université Laval  
Copula Model-based Approach and Empirical Bayes Techniques for Small Area Proportions

Survey data are used to obtain information regarding characteristics such as mean and proportion relating not only to a population, but also to areas. However, the sample size in some areas may be small, leading to direct estimators of poor quality. Indirect estimators based on auxiliary information and constructed from implicitly and explicitly models-based methods are recommended. On this point the methodology is very rich, however for the case of binary data the theory is limited. Here, we propose a copula-based approach of small area estimation for binary data. Empirical Bayes techniques are used to obtain explicit form for estimates of proportions. Using simulation study, we evaluated the performance of estimators. Finally, we present a numerical example.

NAIMA GOUZI, Statistique Canada  
Integrating Establishment Characteristics When Calibrating a Business Survey

In the context of business surveys, an enterprise can have several production entities, called establishments. Each establishment works in an area of activity in a geographic region. The purpose of a survey is to estimate the total of the variables of interest associated with specific areas of activity. Surveys use the same population of enterprises; an enterprise can therefore be in the scope of several surveys. First, a large sample of enterprises is selected for all surveys to correct auxiliary information, such as misclassification. Each survey then selects its own subsample; subsamples can overlap. We present the issues surrounding the use of auxiliary information on establishments to improve each survey estimates.

AMANDA HALLADAY, Statistics Canada  
Methodological Challenges with the 2015 Canadian Community Health Survey - Nutrition

The 2015 Canadian Community Health Survey (CCHS) - Nutrition presents several interesting methodological challenges. The aims of this survey are to gather information regarding dietary intake and consumption of dietary supplements, to estimate distributions for usual dietary intake, to obtain accurate height and weight measurements, to collect data on certain health conditions, and to evaluate changes from the 2004 Nutrition Survey. The purpose of this talk is to discuss the challenges that Statistics Canada faces, including: the number of second interviews required to get an accurate picture of the within-person variability and the optimal methods of sample allocation and estimation of dietary intake given budgetary constraints. We will address these issues and others as we discuss the complexities of nutritional data.

ERIC PELLETIER, Statistique Canada  
The Volatility and the Rarity of Scientific Research and Development in Canada – How to “Search” for It?

Due to its transition into the Integrated Business Statistics Program (IBSP), the Research and Development in Canadian Industry (RDCI) survey will undergo major methodological changes. The target population for the RDCI survey – Canadian enterprises performing or funding scientific research and development – is rare and volatile, which makes the challenges even more considerable. This presentation provides a general overview of the survey and discusses its inherent complexities, the improvements that will be introduced under IBSP, as well as the difficulties arising from identifying the target population.

MICHAEL ROTONDI, York University  
Towards the Estimation of Effect Measures in Studies Using Respondent-Driven Sampling
Respondent-Driven Sampling (RDS) is an increasingly common sampling technique to recruit hidden populations. Statistical methods for RDS are not straightforward due to the correlation between individual outcomes and subject weighting, thus analyses are typically limited to estimation of population proportions. This presentation discusses the Method Of Variance Estimates Recovery (MOVER) to construct confidence intervals (CIs) for effect measures such as the risk difference or relative risk in studies using RDS. To illustrate the approach, MOVER is used to examine differences in the prevalence of demographic characteristics between an RDS study and convenience study of injection drug users. MOVER is then applied to obtain CIs for the relative risk between education levels and HIV-seropositivity, respectively.

**KYLE VINCENT**, Bank of Canada

*Bayesian Item Response Analysis of Method-of-Payment Habits in Banking Surveys*

Customers have a wide variety of choices in selecting a method of payment in modern society due to advancements in technology. We investigate the method of payment habits of banking customers using item response models. We consider three binary item response models used in the literature within an empirical Bayesian framework. These models capture the heterogeneity and complexity of customer perception on methods of payment in different capacities, with different features. For this reason, model assessment methods need to be developed for better inferential purposes. We introduce an assessment criterion based on predictive simulations and illustrate the approach using graphical summary measures. The approach is further highlighted using empirical financial data.