This workshop provides a crash course on using statistical methods and software when conducting data analysis in survey research.

Though the workshop will not go into mathematical details and proofs, it will provide some reasoning and intuition behind the key formulas used in survey sampling. It will also look at various examples using the statistical software SAS (free to students, faculty and staff at the University of Waterloo). In addition to illustrating basic data analysis techniques, those examples aim to provide guidance on some of the pitfalls of analysing survey data. Part 3 is a practical hands-on opportunity for participants to conduct basic data analysis using SAS on their own laptop.

**Part 1:** (May 15th, 9:30 AM – 12:00 PM)
- Introduction (vocabulary, notation, and basic concepts)
- Sampling designs and selection probabilities
- Introduction to sampling weights

**Part 2:** (May 15th, 1:00 PM – 3:30 PM)
- Estimating a population total (i.e., Horvitz-Thompson estimator)
- Estimating a population mean (i.e., Hajek estimator)
- Estimating a population proportion
- Selection bias and other non-sampling errors

**Part 3:** (May 16th, 9:30 AM – 12:00 PM)
- Introduction to SAS University Edition, basic SAS commands and procedures
- Using the SURVEYFREQ and SURVEYMEANS procedures
- Basic data manipulations, better looking output (e.g., formats, titles, footnotes) and ODS

* In Part 3, participants will conduct basic data analysis using SAS University Edition (free to students, faculty and staff at the University of Waterloo). Hence, participants must bring their own laptop and install SAS University Edition. Installation instructions will be provided, but in person help will also be available from 3:30 to 4:30 pm on day 1.

**Part 4:** (May 16th, 1:00 PM – 3:30 PM)
- Variance estimator and confidence interval for the Horvitz-Thompson and Hájek estimators
- Rao-Scott Chi-Square test and introduction to analytical inference from survey data