

# Assessing Cumulative Effects of Medications Use: Flexible Methods and Real-World Applications

Course Syllabus

2024-2025

## ONLINE COURSE

### MODULE 5

Methodology

### DATE/TIME

Thursday, April 3rd, 2025

13:30 to 16:30 EDT

### LANGUAGE

English

### FREE REGISTRATION

[www.camccol.com](http://www.camccol.com)

## PRESENTED BY

*Dr. Michal Abrahamowicz*

Professor, McGill University

✉ [michal.abrahamowicz@mcgill.ca](mailto:michal.abrahamowicz@mcgill.ca)

*Dr. Marie-Eve Beauchamp*

Research Associate, RI-MUHC

✉ [marie-eve.beauchamp@rimuhc.ca](mailto:marie-eve.beauchamp@rimuhc.ca)

## DESCRIPTION

This, relatively advanced, course in applied biostatistics is designed for graduate trainees and researchers in (bio-)statistics, (pharmaco-)epidemiology, data science, as well as public health, who have good understanding of multivariable regression and some knowledge of applied survival analysis (especially of the Cox model).

The 1st part will focus on the non-technical conceptual introduction to relevant statistical modeling methods and real-life applications (mostly in pharmacoepidemiology), with an overview of different modeling approaches that may be considered to analyze associations between a time-varying drug exposure and time to a clinical endpoint (e.g., an adverse event or death). Then, the importance of considering potential (i) latency between exposure and change in risk and/or (ii) cumulative effects of past exposures will be discussed. Next, the Weighted Cumulative Exposure (WCE) methodology will be explained in a way accessible for participants without formal background in statistics or biostatistics.

The 2nd part will focus on practical issues related to the use of the R package WCE to analyze real-world pharmacoepidemiology data. The way data have to be prepared for WCE analyses and the steps necessary to carry out these analyses will be explained.

## LEARNING OBJECTIVES

- To understand the methodological challenges related to the time-varying aspects (within-subject & between-subjects variation in timing, dosage and duration of drug use) of drug exposure in real-world pharmacoepidemiology research, and its potential cumulative effects
- To get a “non-technical” conceptual overview of the rationale and general features of flexible statistical modeling of cumulative effects
- To illustrate the practical usefulness of the methods introduced in the previous learning objective, and the new insights offered by these methods, through 3 specific real-world examples, involving safety (adverse effects) or effectiveness of particular drugs
- To get practical instructions regarding the use of the software that implements the methods introduced and illustrated in previous learning objectives