



McGill

Department of
Epidemiology, Biostatistics
and Occupational Health

Biostatistics Seminars Winter 2020



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Doubly Robust Estimation of Optimal Dosing Strategies

Wednesday, January 22, 2020

3:30 pm – 4:30 pm – Purvis Hall, 1020 Pine Ave. West, Room 24

All are Welcome

Abstract: The idea of precision medicine and personalized adaptive treatment regimes has important implications in health care. The growing interest in this subject has led to the development of many statistical methods for the estimation of optimal treatment strategies on an individualized level. In this talk, I will discuss the application of precision medicine in the context of drug dose algorithms. While some work has been done regarding the estimation of optimal dosing strategies, the majority of existing methods are designed for binary treatment and robust, regression-based methods are lacking. This work helps to fill this gap by providing an intuitive, doubly robust regression-based estimation method appropriate for treatment measured on a continuous or categorical scale. In particular, an extension of the dynamic weighted ordinary least squares (dWOLS) regression approach will be presented. The proposed generalized framework can accommodate both continuous and categorical treatments. It will be shown that including weights satisfying a particular balancing condition in a linear regression model results in consistent estimation of the optimal individualized drug dose rule. The proposed approach is shown to perform well through various simulation studies and in an application to Warfarin dosing strategies. This is joint work with Dr. Erica Moodie.

Bio: **Juliana Schulz** is an assistant professor in the Department of Decision Sciences at HEC Montréal. She has a background in actuarial mathematics and statistics, with work experience in various sectors of the insurance industry. Juliana's research focuses on multivariate statistics, actuarial mathematics and biostatistics. She is particularly interested in dependence modelling and its applications in insurance and other fields. She is also interested in precision medicine and dynamic treatment regimes. <https://www.hec.ca/en/profs/juliana.schulz.html>