McGill | Department of Epidemiology, Biostatistics and Occupational Health

Biostatistics Seminars

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Global Measures for Capacity of Subgroup-Defining Variables to Yield Efficient Treatment Rules

Tuesday, January 15, 2019 - 3:30-4:30pm
Purvis Hall, 1020 Pine Ave. West, Room 24 - All are Welcome

Abstract:
Decision theory provides a consistent framework for efficient treatment selection. Nevertheless, a full application of decision theory requires context-specific valuations that might be impractical or even off-putting in many fast-paced areas such as Precision Medicine. As such, a potential way forward is to apply such principles to agreed-upon 'salient' clinical outcomes while letting more nuanced valuations to take place over their due course.
We are motivated by solutions to a similar problem in (bio)marker discovery: at early stages of marker development, the interest is, appropriately, on the global discriminatory capacity of the marker rather than its performance given a specific positivity rule. This is perhaps why AUC has remained such a popular metric for communicating marker performance.
The purpose of this work is to propose novel, global, 'AUC-type' metrics that quantify the capacity of subgroup-defining variables in finding individuals who benefit the most from treatments. The proposed metrics have intuitive interpretations and enable comparison of arbitrary sets of covariates on the same scale. They can be estimated with relative ease for a wide class of regression models and can accompany conventional metrics for subgroup analysis when reporting the results of clinical trials.

- This work is developed in collaboration with Paul Gustafson, The University of British Columbia, and Mohammad Mansournia, Tehran University of Medical Sciences.

Bio:
Mohsen is an epidemiologist who is interested in the application of decision theory in Precision Medicine. He runs the Respiratory Evaluation Sciences Program where he applies such methods in the context of chronic respiratory conditions. For his work he has received multiple awards including The Canadian Institutes of Health Research's New Investigator Award and Michael Smith Foundation for Health Research Scholar Award. A fuller bio is available at http://resp.core.ubc.ca/team/Mohsen_Sadatsafavi