

**Department of Epidemiology and Biostatistics
Biostatistics Seminar**

Thursday, September 11, 2014
12:00pm - 1:00pm -- WG73

**“Structural Equation Modeling for Analysis of Overlapping Symptoms in
Co-occurring Conditions”**

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Abstract: Structural Equation Modeling (SEM) is a very general approach to analyzing data in the presence of measurement error and complex causal relationships. In this seminar, we describe SEM, with special attention to exploratory factor analysis (EFA), confirmatory factor analysis (CFA) and multiple indicator multiple cause (MIMIC) modeling. The discussion is motivated by a problem of symptom overlap routinely faced by clinicians and researchers, in which symptoms or test results are common to two or more co-occurring conditions. As a result of such overlap, diagnoses, treatment decisions and inferences about the effectiveness of treatments for these conditions can be biased. This problem is further complicated by increasing reliance on patient-reported outcomes, which introduces systematic error based on an individual's interpretation of a test questionnaire. SEM provides flexibility in handling this type of confounding and disentangling the overlap. Scales and scoring approaches can be revised to be free of this overlap, leading to better care. We discuss an example of depression screening in Multiple Sclerosis patients in which depressive symptoms overlap with other symptoms, such as fatigue, cognitive impairment and functional impairment.