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Epidemiology, Biostatistics  
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Biostatistics Seminars  
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Comparison of Statistical Approaches Dealing with  
Immortal Time Bias in Drug Effectiveness Studies

Joint work with: Paul Gustafson, John Petkau, Helen Tremlett, and The BeAMS study group (UBC)

Tuesday, 19 January 2016  
3:30 pm – 4:30 pm  
Purvis Hall, 1020 Pine Ave. West, Room 24

ALL ARE WELCOME

**Abstract:**

In time-to-event analyses of observational studies of drug effectiveness, incorrect handling of the period between cohort entry and first treatment exposure during follow-up may result in immortal time bias. This bias can be eliminated by acknowledging a change in treatment exposure status with time-dependent analyses, such as fitting a time-dependent Cox model. The prescription time-distribution matching (PTDM) method has been proposed as a simpler approach for controlling immortal time bias. In addition, the performance of PTDM approach has been shown to be similar to the time-dependent Cox model in an epidemiologic application. Using simulation studies and theoretical quantification of bias, we compared the performance of PTDM approach with that of the time-dependent Cox model in the presence of immortal time. Both assessments revealed that the PTDM approach did not adequately address immortal time bias. Based on our simulation results, the sequential Cox approach, another recently proposed observational data analysis technique, was found to be more useful than the PTDM approach (Bias: -0.002, MSE: 0.025 versus PTDM Bias: -1.411 MSE: 2.011 in the main simulation). These approaches were applied to investigate the impact of beta-interferon treatment in delaying disability progression in the British Columbia Multiple Sclerosis cohort (1995 - 2008).

**Bio:**

[www.stat.ubc.ca/~e.karim](http://www.stat.ubc.ca/~e.karim)

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