McGill University
Department of Sociology
Sociology 622 – Event History Analysis
Fall 2017

Professor: Céline Le Bourdais
e-mail: celine.lebourdais@mcgill.ca
Office: Peterson Hall Room 314 Phone: 398-6840
Office Hours: Wednesday 10:00 – 11:30 and by appointment
Seminar / Lab: Leacock 212 Time: Wednesday, 14:35 – 17:25

Required text:

Other Material:
Online articles noted in Syllabus, lectures and exercises on myCourses.

General description and objectives:
This course is designed to introduce students to the practical application and interpretation of event history analysis (also known as survival analysis and hazard/risk analysis) in the social sciences. Event history analysis refers to a set of statistical methods used to analyze change from one state to another in longitudinal data that are able to explicitly model time dependence and the effects of independent variables on the timing and likelihood of the transition. Social life is replete with such transitions: examples on individual level include such things as marriage, births, divorce, entry into the labor market and entry into college.

The course will cover the basics of the method and data structure, and implementation using the software package STATA. Substantive topics will include parametric, semi-parametric and non-parametric models, as well as extensions to the analysis of multiple events and dealing with unobserved heterogeneity (frailty). Each topic will be explored through a combination of substantive examples, mathematical formulation, and practical application using STATA.

Students will become familiar with the logic of longitudinal analyses, and of event history analysis in particular. They will become comfortable with the evaluation and critique of empirical research employing event history analysis and will become competent in the application of standard and advanced methods of this type of analysis.

Evaluation:
Learning statistical analyses requires constant reading and practice. Consequently, first there will be both laboratory exercises and homework assignments. These are designed to give you
experience with the materials and methods covered in the readings and during the lecture and
discussion portions of the seminar. The second component of the evaluation will be in the form
of a proposal for a research project using Statistics Canada 2011 General Social Survey. The
third component will be the completion of the research project itself.

**Homework Assignments**: There will be four (4) homework assignments, which will be worth
15% a piece. Dates of distribution and collection are noted below in the tentative calendar of
dates.

**Project Proposal**: The project proposal will identify a research question and ancillary
hypotheses involving a theoretical/substantive problem that can be addressed through event
history analysis, and include a brief literature review (at least three journal articles that use event
history analysis concerning their topic, or one similar enough substantively or methodologically
to inform their research). The project proposal is due on **November 8** and is worth **10%**.

**Research Project**: The research project should take the form of a journal article and contains: 1) an introduction to the problem; 2) a brief literature review; 3) a statement of the aims of the
analysis; 4) a description of the data source to be used, and construction of data analysed
(generated variables, analytic sample selection); 5) a results section that will begin with simple
life table description and then proceed with event history analysis; and 6) a discussion/conclusion. Students should also note explicitly limitations of their analyses in this
section. The paper is due **December 8** and is worth **30%**.

**Disability and illness policies**: Individuals with university recognised disabilities will be afforded special considerations in the setting of examination times and venues and depending on the type of disability may be given extra time to complete the required work. Assignments and/or projects that are late due to illness will not be accepted without an authoritative third party excuse and explanation. Examinations will not be re-scheduled without the same considerations.

**Academic Integrity**: McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offences under the Code of Student Conduct and Disciplinary Procedures (see [www.mcgill.ca/integrity](http://www.mcgill.ca/integrity) for more information).

**Right to submit in English or French written work that is to be graded**: In accord with McGill University’s Charter of Students’ Rights, students in this course have the right to submit in English or in French any written work that is to be graded.
Course Outline & Schedule

<table>
<thead>
<tr>
<th>Week</th>
<th>Month</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>September</td>
<td>Introduction: Longitudinal Data and Analysis. Stata and Data Sets</td>
</tr>
<tr>
<td>2</td>
<td>September</td>
<td>Basic Concepts in Survival Analysis: Event, Timing, Spell, Censoring</td>
</tr>
<tr>
<td></td>
<td></td>
<td>and Truncation</td>
</tr>
<tr>
<td>3</td>
<td>September</td>
<td>Life Tables and Survivor Functions</td>
</tr>
<tr>
<td>4</td>
<td>September</td>
<td>Maximum Likelihood Estimation and Parametric Models</td>
</tr>
<tr>
<td>5</td>
<td>October</td>
<td>Parametric Models Continued: Changing Hazards with Time in Exponential Models; Piecewise Exponential Model</td>
</tr>
<tr>
<td>6</td>
<td>October</td>
<td>Discrete Time Models</td>
</tr>
<tr>
<td>7</td>
<td>October</td>
<td>Semi-parametric (Proportional Hazard) Models</td>
</tr>
<tr>
<td>8</td>
<td>October</td>
<td>Time Varying Covariates and Interactions: Exponential and PH Models</td>
</tr>
<tr>
<td>9</td>
<td>November</td>
<td>Non-Proportionality, Stratification and Interaction</td>
</tr>
<tr>
<td>10</td>
<td>November</td>
<td>Specification/Model Selection/Residual Analysis</td>
</tr>
<tr>
<td>11</td>
<td>November</td>
<td>Competing Risks</td>
</tr>
<tr>
<td>12</td>
<td>November</td>
<td>Frailty and Repeated Events</td>
</tr>
<tr>
<td>13</td>
<td>November</td>
<td>Special Topics/Review</td>
</tr>
</tbody>
</table>

Calendar of Exercises and Papers

<table>
<thead>
<tr>
<th></th>
<th>Distributed</th>
<th>Due</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exercise 1</td>
<td>September 20</td>
<td>September 27</td>
</tr>
<tr>
<td>Exercise 2</td>
<td>October 4</td>
<td>October 11</td>
</tr>
<tr>
<td>Exercise 3</td>
<td>October 11</td>
<td>October 18</td>
</tr>
<tr>
<td>Exercise 4</td>
<td>November 1</td>
<td>November 15</td>
</tr>
<tr>
<td>Project Proposal</td>
<td></td>
<td>November 8</td>
</tr>
<tr>
<td>Research Project</td>
<td></td>
<td>December 8</td>
</tr>
</tbody>
</table>
Schedule and Readings

1. **Introduction** (September 6)
   Longitudinal data and analysis. Presentation of class data sets.
   **Introduction to Stata**: Basic Commands, Help, UCLA guide to STATA

2. **Basic Concepts in Survival Analysis: Event, Timing, Spell, Censoring and Truncation** (September 13)
   Cleves et al., Chapters 2 & 4, Chapter 6 for lab

3. **Life Tables and Survivor Functions** (September 20)
   Cleves et al., Chapter 8
   Proulx, Christine. 2014. “The Provision of Unpaid Care over the Life Course – Changes across Cohorts and Genders”. Pp. 27-42 in *Juggling Spheres of Life: The Provision of Unpaid Care over the Life Course and Its Impact on Men’s and Women’s Employment Trajectories*. McGill University, Department of Sociology, Ph.D. thesis. (available on eScholarship@McGill)

4. **Maximum Likelihood Estimation and Parametric Models** (September 27)
   Cleves et al., Chapters 12-14

5. **Parametric Models Continued: Changing Hazards with Time in Exponential Models; Piecewise Exponential Model** (October 4)

6. **Discrete Time Models** (October 11)

7. **Semi-parametric (Proportional Hazard) Models** (October 18)
   Cleves et al., Chapters 9.1-9.2, 10.1-10.3
8. **Time Varying Covariates: Exponential and PH Models** (October 25)  
Cleves et al., Chapter 10.5  

9. **Non-Proportionality, Stratification and Interaction** (November 1)  
Cleves et al., 9.3, 10.4, 11.1  

10. **Specification/ Residual Analysis/ Weights** (November 8)  
Cleves et al., Chapter 11.2  
Other reading TBA

11. **Competing Risks** (November 15)  
Cleves et al., Chapter 17  

12. **Frailty and Repeated Events** (November 22) – Invited lecturer: Benoît Laplante (INRS)  
Cleves et al., Chapters 9.4, 15.1  

13. **Special Topics/Review** (November 29)