Biostatistics 9641U
Missing Data

May-June 2018

Time: Tuesday and Thursday 10:00-12:00
Location: K7

Lab Time:
Lab Location:
Instructor: Guangyong Zou

Office Hours: by appointment
E-mail: gy.zou@robartsinc.com
Phone Extension: 86298

Course Information

Unless you have either the requisites for this course or written special permission from the Graduate Chair to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Course Description

Study participants often do not provide all requested data, resulting in missing data. Most analytic procedures in statistical software quietly delete participants with missing values. Thus, missing data are a potential source of bias, and their handling in the statistical analysis can have an important impact on the likelihood and extent of bias. Inadequate handling of missing data may also result in invalid p-values and confidence intervals. This course introduces principled approaches to dealing with missing data arising from randomized controlled trials and observational studies. Students will have opportunity in analyzing studies with missing data using Stata and SAS.
Course Syllabus

Tentative

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>May 15</td>
<td>Introduction to missing data and methods for analysis</td>
</tr>
<tr>
<td></td>
<td>May 17</td>
<td>Direct maximum likelihood methods</td>
</tr>
<tr>
<td>2</td>
<td>May 22</td>
<td>Inverse probability weighting</td>
</tr>
<tr>
<td></td>
<td>May 24</td>
<td>Theory of multiple imputation</td>
</tr>
<tr>
<td>3</td>
<td>May 29</td>
<td>Multiple imputation using Stata and SAS</td>
</tr>
<tr>
<td></td>
<td>May 31</td>
<td>Analysis of clinical trials using multiple imputation</td>
</tr>
<tr>
<td>4</td>
<td>June 5</td>
<td>Pattern-mixture models for sensitivity analysis</td>
</tr>
<tr>
<td></td>
<td>June 7</td>
<td>Student presentations</td>
</tr>
<tr>
<td>5</td>
<td>June 12</td>
<td>Student presentations</td>
</tr>
<tr>
<td>6</td>
<td>June 21</td>
<td>Final Project Due</td>
</tr>
</tbody>
</table>

Prerequisite: Epidemiology 9553B and Biostatistics 9521B

Recommended Course Materials

Methods of Evaluation

- 10% - Attendance
- 30% - Presentation
- 60% - Final project (Due on Thursday June 21, 2018)

Note that to pass the course, students must obtain an overall mark of 75%.

Policy on Accommodation for Medical and Non-Medical Absences

For assignments worth 10% or more, refer to Western University’s Policy on Accommodation for Medical Illness: [https://studentservices.uwo.ca/secure/index.cfm](https://studentservices.uwo.ca/secure/index.cfm).

All non-medical absences must be approved in advance. In the case of an unexpected absence on compassionate grounds, documentation may be requested. If documentation is required by the instructor for either medical or non-medical academic accommodation, then such documentation must be submitted by the student directly to the appropriate Faculty Dean’s office and not to the instructor. It will be the Dean’s office that will determine if accommodation is warranted.

Statement on Academic Offences

Scholastic offences are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence: [http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf](http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf).

Support Services

As part of a successful student experience at Western, we encourage students to make their health and wellness a priority. Western provides several on campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students, as part of their registration, receive membership in Western’s Campus Recreation Centre. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page [http://www.music.uwo.ca/](http://www.music.uwo.ca/), and our own McIntosh Gallery [http://www.mcintoshgallery.ca/](http://www.mcintoshgallery.ca/). Information regarding health- and wellness-related services available to students may be found at [http://www.health.uwo.ca/](http://www.health.uwo.ca/).

Students seeking help regarding mental health concerns are advised to speak to someone they feel comfortable confiding in, such as their faculty supervisor, their program director (graduate or undergraduate chair), or other relevant administrators in their unit. Campus mental health resources may be found at [http://www.health.uwo.ca/mental_health/resources.html](http://www.health.uwo.ca/mental_health/resources.html).

To help you learn more about mental health, Western has developed an interactive mental health learning module, found here: [http://www.health.uwo.ca/mental_health/module.html](http://www.health.uwo.ca/mental_health/module.html).
This module is 30 minutes in length and provides participants with a basic understanding of mental health issues and of available campus and community resources. Topics include stress, anxiety, depression, suicide and eating disorders. After successful completion of the module, participants receive a certificate confirming their participation.

**Department & Faculty Offices**
The Epidemiology & Biostatistics main office is located in K201 in the Kresge Building on Main campus.

For undergraduate academic counselling assistance, students will need to speak with the Bachelor of Medical Sciences Office: [http://www.schulich.uwo.ca/bmsc/general-counselling](http://www.schulich.uwo.ca/bmsc/general-counselling).

**Technology Requirements**
You are responsible for all required course materials and announcements posted to the course’s OWL website. Please ensure after the first class that when you log in you are able to access the course site. A copy of the course outline will be available on both OWL and the departmental website.