

# Epi-on-the-Island

## Survival Analysis

4-8 July 2023

### Tentative Schedule (all times ADT, Atlantic Daylight Time)

(Instructors: ID= Ian Dohoo; HS= Henrik Stryhn, JS= Javier Sanchez)

Day	Time	Lecture	Laboratory (ID/HS/JS)	Pages (VER2)	Pages (MER)
Tues day	9:00 – 10:00	(ID) Introduction to the course, (ID) Introduction to survival data		468-473	502-507
	10:30 – 11:45 11:45 – 12:30	(ID/HS) Life tables, Kaplan-Meier (ID/JS) Introduction to Stata/R survival analysis software		473-480	507-514
	1:30 – 2:30		Life tables (#1a)		
	2:30 – 3:45 4:15 – 5:15	(HS) Hazard functions; Survival time distributions and models		480-485	514-518
	5:15 – 6:00	Assisting students with preparing their data sets			
Wed	9:00 – 10:30 11:00 – 12:30	(ID) Cox semi-parametric models		485-491	519-524
			Cox models (#2)		
	1:30 – 2:30 2:30 – 3:15	(ID) Time-dependent variables		491-494	524-527
			Time-dep. var. (#3)		
	3:45 – 4:30 4:30 – 5:30	(ID) Cox model diagnostics		492-503	527-536
			Diagnostics (#3)		
	5:30 - 6:00	Assisting students to get started on their analysis			
Thu	9:00 – 10:30 11:00 – 12:30	(HS) Parametric models		503-510	536-544
			Param. Models (#4)		
	1:30 – 2:30 2:30 – 3:30	(HS) Clustering and frailty models		510-518	545-552
			Frailty models (#5)		

Day	Time	Lecture	Laboratory (ID/HS/JS)	Pages (VER2)	Pages (MER)	
	4:00 – 5:00	(ID/HS/JS) Advanced topics: <ul style="list-style-type: none"> <li>flexible parametric distrib.</li> <li>multi-level frailty models</li> </ul>		NA	NA	
	5:00 – 6:00	Students free to work on own data				
Fri	9:00 – 10:30 11:00 – 12:30	(HS) Discrete time survival analysis	Discrete analysis (#6)	518-523	552-557	
	1:30 – 3:00 3:00 – 3:45	(ID/HS/JS) Advanced topics: <ul style="list-style-type: none"> <li>competing risk regression</li> <li>interval censored models</li> <li>joint models</li> </ul>	Advanced methods (#7)	NA	NA	
	4:15 – 5:00	Students free to work on own data				
	Evening	Course dinner				
Sat	9:00 – 10:30	Case studies / Further topics				
	11:00 – 12:30		Students work on their own data			
	1:30 – 3:00	Presentations by students				
	3:30 – 5:00	Presentations by students, Course wrap-up				

The above plan includes lunch breaks (scheduled for 12:30-13:30), and mid-morning and mid-afternoon coffee breaks (indicated as gaps in the schedule but times are approximate).

### ***Course Information***

#### **Hybrid format:**

In order to facilitate virtual participation, lectures and joint discussion sessions will be streamed on the Zoom video conferencing platform. Furthermore, all such sessions will be recorded and made available to participants. Material for lecture and lab sessions will be provided in advance of those sessions, for most parts at the beginning of the course. Additional discussion and support sessions for participants in other time zones may be set up outside the indicated hours above, depending on demand.

## **Text:**

The text for the course will be *Veterinary Epidemiologic Research* (2009), 2nd edition (<http://www.upei.ca/ver>), or alternatively *Methods in Epidemiologic Research* (2012, <http://www.upei.ca/mer>). Both textbooks are freely available in .pdf formats from the respective websites.

## **Software**

The primary software for the course will be Stata (version 17). Comprehensive supplementary material will be provided for R software, based on standard R libraries.

## ***Course Preparation***

In order to get the maximum value out of the survival analysis course, we encourage students to bring their own data with them to the course. There will be time during the course to work on your own data and we will endeavour to have lots of help available in the lab sessions to expedite this process. The following actions are recommended:

1. **Prepare a 1 page description of your data / problem** using the template attached (next page). These will be copied at the beginning of the course and distributed to all course participants.

2. **Prepare your data (if you are bringing some):** If you have data of your own which you would like to work on during the course, please bring a prepared dataset with you. Some suggestions for preparing the dataset are:

- (a) one variable giving the survival and censoring times, and another binary variable indicating whether the corresponding time is a time-to-event or a time-to-censoring
- (b) one record per observation at the lowest level of the hierarchy (e.g. if the dataset contained data from lactations within cows within herds, the dataset should have 1 record per lactation)
- (c) make sure that each observation is uniquely identified
- (d) identify the key variables of interest and create a dataset with just those variables in it (rather than bringing the whole dataset if it is very large)
- (e) if there are a lot of missing values, you might want to prepare a dataset that consists of those observations for which complete data are available
- (f) you can bring the data in any computer format you like, but we would suggest that some form of spreadsheet (e.g., Excel or Open Office Calc) would be the easiest to work with (larger files can be brought in any statistical package format – SAS, SPSS, Stata). If you bring the data in a spreadsheet, have the variable names in row 1 and the data immediately below (starting in row 2) - do not include anything else in the spreadsheet.

## Survival Analysis Project

Name:
Project Title:
Background: (provide a brief description of the background to your study)
Time to event: (describe clearly what constitutes an event and why observations were censored, and how the respective times were measured)
Hypothesis: (what is the most important hypothesis you want to investigate)
Expectations: (what are your expectations in terms of results ... based on literature or previous work)
Levels of organization: (if multiple hierarchical levels of organization exist, describe those)
Key Predictor(s): (identify a minimum of one and a maximum of four important predictors in your study and if applicable their level in the hierarchy, e.g. farm level variable, cow level variable)

Copies of these sheets will be distributed to all course participants