DPHS Summer Institute

Workshops In Quantitative Research Methodology

Department of Public Health Sciences
Medical University of South Carolina
Charleston, South Carolina
The 2018 Summer Institute in the Department of Public Health Sciences in the College of Medicine at the Medical University of South Carolina (MUSC) offers several workshops that introduce current quantitative methods used in key areas of public health, population health, and biomedical and clinical research, and offer hands on experience with implementing these methods. The targeted audience includes public health professionals, biostatisticians, epidemiologists, biomedical and clinical researchers as well as residents, post docs, fellows and graduate students.

**Schedule:**

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>May 24-25</td>
<td>Survival Analysis</td>
</tr>
<tr>
<td>May 24</td>
<td>Population Based Study Design and Analysis</td>
</tr>
<tr>
<td>May 28-29</td>
<td>Bayesian Biostatistics</td>
</tr>
<tr>
<td>May 29-30</td>
<td>Clinical Trials &amp; Design Simulation</td>
</tr>
<tr>
<td>May 31-June 1</td>
<td>Longitudinal &amp; Multilevel Data Analysis</td>
</tr>
</tbody>
</table>
Survival Analysis

This course provides an introduction to statistical methods for modeling time-to-event data. Topics covered will include estimation of median survival time and survival probability at a specific time, confidence interval estimation, non-parametric methods for comparing treatment groups, parametric models, and semi-parametric (Cox model) models. The course will also provide a brief introduction to competing risks, recurrent events, and time varying covariates. Extensive use of R for survival analysis is incorporated into the course. Methods presented in class will be accompanied by appropriate biomedical data examples to demonstrate the application of each approach. All example data sets and R code will be provided to participants and participants are encouraged to come with R loaded onto their computers.

Topics:
- Defining time to event data, censoring, and truncation
- Estimating survival probability
- Kaplan-Meier curves and log-rank tests
- Parametric survival models
- Cox proportional hazards models

Who Should Attend:
Clinical and basic science researchers interested in extending their understanding of how to model time to event outcomes.

Bethany Wolf is an Associate Professor of Biostatistics in DPHS. She is currently the Associate Director of the Methodologic Core for the CCCR for Improving Minority Health in Rheumatic Diseases and is a co-Investigator in the MUSC’s South Carolina Translational Research (SCTR) award Biostatistics Core. Her expertise is in biostatistics applications in data mining and data exploration for disease modeling and biomarker discovery and validation. Through her involvement with the CCCR and SCTR grants, she frequently interacts with basic scientist and clinical faculty across a multitude of disciplines at MUSC to design research studies, develop grant proposals, and analyze a variety of data. She has over 60 peer-reviewed publications in biomedical journals and has developed/taught graduate courses in survival analysis, multivariate analysis, and machine learning. She also serves as the vice-president of the South Carolina Chapter of the American Statistical Association.
Fundamentals of Epidemiology: Population-Based and Clinical Study Design and Analysis

This workshop includes three sessions. The first session reviews the rationale for specific study designs, their advantages and disadvantages for different research questions and populations under study, and practical methods and pitfalls in designing and conducting valid clinical and population-based studies. The second session focuses on modern causal thinking, reviewing theory and methods for assessing and controlling bias and assessing causality in randomized or observational studies. Sources of bias may include selection bias, confounding, information bias, differential attrition, and other sources. The second session will also focus on theory and methods for assessing differential effects or interactions between causal factors. The third session will review data analysis strategies and interpretation of results for different types of studies, including the basics of statistical approaches to analysis as well as an introduction to different types of multivariate modeling. Throughout the workshop students will be presented with concrete examples of appropriate methods, pitfalls to avoid, and fundamentals of causal thinking and interpretation of findings when designing, conducting, or evaluating clinical or population-based research studies.

Who Should Attend:
Clinicians and students having an interest in clinic-based and population-based study design and analysis, public health, and interpreting published literature.

Jeffrey E. Korte is Associate Professor of Epidemiology, and Graduate Training Director for Epidemiology in the Department of Public Health Sciences at MUSC. Dr. Korte has particular research interests in HIV, substance abuse, and women’s health, with over 15 years of experience conducting epidemiologic research and collaborating with clinical and population-based scientists. In addition, he has over 10 years of experience teaching epidemiologic research methods to PhD and masters students at MUSC. The contents of this workshop are informed both by his teaching experience and his research experience.
Bayesian Biostatistics II: 
Special Topics with OpenBugs and INLA

This two day course is designed for those with some previous experience of Bayesian statistical methods but who want to extend their experience into a variety of specialist areas of Biostatistical applications. The course provides coverage of the use of Bayesian software (WinBUGS/OpenBUGS and INLA) in the analysis of topic areas: Bayesian GLMMs, longitudinal analysis, Survival analysis, Meta analysis, Bioassay, Measurement Error, Imaging, and Disease mapping.

For this course a copy of the recent text by Lesaffre, E. and Lawson, A. B. (2012) Bayesian Biostatistics, Wiley, New York will be included in the course fee. Material included in the course is covered in the second half of the text and many examples are provided from those covered in the book.

Who Should Attend:
The course focusses on special applications found commonly in Biostatistics and is designed for those who already have some experience of applying Bayesian methods but want to extend their experience to a wider array of software (e.g. INLA) and a wider array of topics commonly found in Biostatistical collaborations.

Andrew B Lawson is a Professor in the Department of Public Health Sciences at the Medical University of South Carolina. He has wide ranging experience of the application of Bayesian modeling to Biostatistical applications. He is an elected fellow of the American Statistical Association and author of many Biostatistical journal papers and a range of books on Bayesian methods in disease mapping and more general Biostatistical application areas. He has run many courses on related topics over a number of years.
Clinical Trials and Design Simulation

This workshop provides two sessions per day (8-12pm and 1-5pm each day) on aspects of clinical trial development and implementation for randomized clinical trials, and hands-on experience with the latest developments. Attendees have the opportunity to bring their specific trial questions to the course for discussion and feedback.

**Day 1 Session I:** Study Designs (aligning designs with objectives)
**Day 1 Session II:** Bayesian Trial Designs
**Day 2 Session III:** Interim Analysis and Data and Safety Monitoring
**Day 2 Session IV:** Design Simulation

**Who Should Attend:**
Clinical researchers, biostatisticians and students having an interest in clinical trial design and methodology.

**Valerie Durkalski** is Professor of Biostatistics and Director of The Data Coordination Unit (DCU), a statistical and data management center housed in the Department. The DCU specializes in the design of clinical trials and analysis of their data and in establishing, implementing and maintaining data and project management systems for multicenter clinical trials. Dr. Durkalski collaborates on several large multicenter clinical trials in various therapeutic areas, serves on several Data and Safety Monitoring Boards (DSMBs) and NIH peer-review panels. She publishes and presents on various topics related to the design and conduct of clinical trials and teaches ‘Design & Conduct of Clinical Trials’ to graduate students and healthcare professionals.

**Caitlyn Ellerbe** is an Assistant Professor of Biostatistics and Senior Biostatistician with The Data Coordination Unit (DCU), a statistical and data management center housed in the Department of Public Health Sciences. The DCU specializes in the design of clinical trials and analysis of their data and in establishing, implementing and maintaining data and project management systems for multicenter clinical trials. Dr. Ellerbe collaborates on the design and implementation of several large multicenter clinical trials with a focus on rare diseases, stroke, and other neurological emergencies. She publishes and presents on various topics related to the design and conduct of clinical trials, with a special emphasis on the design and conduct of adaptive clinical trials.
Longitudinal and Multilevel Modeling

Frequently in medical research, data are collected longitudinally and/or in clusters. This workshop will focus on familiarizing the participants with the appropriate analyses for such data. Linear Mixed Models ANOVA (including random effects, fixed effects, nesting, repeated measures, missing data), Generalized Linear Mixed Models for analyzing categorical data and introduction to growth models will be presented. The workshop will be divided into three modules. Module I - multilevel data, Module II - longitudinal data, Module III—SAS software and hands-on experience in using SAS for topics covered in Modules I&II. Module II requires participants to have SAS installed on their laptops. The Modules I and II will be presented on Day 1 and the Module III will be presented on Day 2.

Who Should Attend: Clinical researchers, biostatisticians and students who have not been exposed to these topics.

Sharon Yeatts is an Associate Professor of Biostatistics in the Department. She collaborates with clinicians at MUSC and around the country in several health related topics, with a focus on neurological trials. She oversees design and biostatistical analyses of several multicenter longitudinal studies. She teaches regression and factorial analyses in the graduate program.

V. Ramakrishnan (Ramesh) is a Professor of Biostatistics in the Department. He has extensive experience in Multilevel and Longitudinal data methods. He has authored or coauthored methodological articles in several areas of biostatistics, including missing data, genetic epidemiology, longitudinal growth models, mixture normal models. He has developed and taught graduate courses on several topics including a course in longitudinal and multilevel data analyses.
Venue:
The courses will take place on the campus of the Medical University of South Carolina, Charleston, South Carolina.

Recommended Area Accommodations:

Charleston Marriott Hotel
Riverview
170 Lockwood Boulevard
Charleston, SC 29403
(843)723-3000/(800)968-3569
www.marriott.com/chsmc

Springhill Suites/Charleston
90 Ripley Point Drive
Charleston, SC 29407
(843) 266-8081
www.marriott.com/chssh

Comfort Inn
144 Bee Street
Charleston, SC 29401
(843)577-2224
www.marriott.com/chscy

The Courtyard by Marriott
35 Lockwood Drive
Charleston, SC 29401
(843) 722-7229
www.marriott.com/chscy

Inquire about an MUSC discount when making reservations. Additional information on Charleston and area hotel accommodations may be found at www.charlestoncvb.com. Download a campus map at www.musc.edu.
Registration Form:

Last Name: _____________________  First Name: ____________________

Institution: _______________________________________________

Mailing Address: _____________________________________

City: ____________________  State:____ Zip: __________

Phone: _______________ E-mail: __________________________________________

☐ MUSC Student  ☐ MUSC Employee  ☐ Other Student  ☐ Other Professional

Workshop Registration & Fees:

2-day workshops—$600
1-day workshops—$300

☐ Survival Analysis (May 24-25) (2 day)
☐ Population Based Study Design and Analysis (May 24) (1 day)
☐ Bayesian Biostatistics (May 28-29) (2 day)
☐ Clinical Trials & Design Simulation (May 29-30) (2 day)
☐ Longitudinal & Multilevel Data Analysis (May 31– June 1) (2 day)

Registration and payment can be made by phone, mail, or secure fax. Mail checks to the contact information on the top left corner of this page. Registration fees are payable in U.S. dollars only. Personal checks are acceptable if payable through a U.S. bank.

Payment Method:

☐ IIT (MUSC internal registrations only; send to watsonju@musc.edu)
☐ Check (make payable to MUSC, Dept. of Public Health Sciences)
☐ Credit Card (Visa, Mastercard, American Express only)

Total Amount to Be Charged: $____________

Credit Card Billing Address:

__________________________________________________________

City: ____________________  State:____ Zip: __________

Card #: _____________________________ Exp. Date: ___________

Name on Card: __________________________________________

Authorized Signature: _____________________________________
Parking

Parking will be available at President Street Garage for $5 per day. Please contact June Watson at 843-876-1578 or email at watsonju@musc.edu to register for parking. **All parking requests must be received by April 15th in order to park at the President Street Garage.** If parking is not requested by April 15th, you may park at the Jonathan Lucas Parking Garage for $.75 per half hour. Parking must be paid separately from the registration cost. Please contact June Watson with questions at 843-876-1578 or watsonju@musc.edu.

President Street Garage
91 President St
Charleston SC 29403

Jonathan Lucas Parking Garage
96 Jonathan Lucas St
Charleston, SC 29403