Announcing a virtual course sequence:

Using R for Bayesian Spatial and Spatio-Temporal Health Modeling
Parts I, II

June 1st- June 2nd 2021

COURSE CONTENT

These courses are designed to provide a comprehensive introduction to the area of Bayesian disease mapping using R in applications to Public Health and Epidemiology: Part I will run on June 1st , and Part II on June 2nd 2021.

Part I course consists of sessions dealing with:

AM

- Basic concepts of Bayesian methods and disease mapping
- Bayesian computation: MCMC and alternatives

PM

- R graphics for spatial health data
- Bayesian Hierarchical Models for disease mapping (BHMs):
  Simple models: Poisson-gamma; log-normal, convolution.
  Variants: Leroux, mixture, BYM2.
- Model goodness of fit
- Demonstration of risk estimation and using BRugs/OpenBUGS

Part II consists of sessions dealing with

AM

- Nimble
- CARBayes
- INLA

PM

- Space-time modelling with McMC (Nimble)
- Space-time modelling with INLA
- Clustering in space and space-time
- Infectious disease modelling and surveillance

This workshop sequence is designed for those who want to cover mapping methods, and the use of a variety of software and variants in application to small area health data.

The course will include theoretical input, but also practical elements and participants will be involved in hands-on in the use of R, BRugs(OpenBUGS), Nimble, CARBayes and INLA in disease mapping applications. Both human and veterinary examples will be covered in the course as well as simple space-time modelling. Examples will range over congenital anomaly birth data, a lung, larynx and oral cancer example, foot and mouth disease in the UK, and influenza and Covid-19 space-time modeling in South Carolina.

THE SPEAKER

Andrew B. Lawson (Department of Public Health Sciences, College of Medicine, Medical University of South Carolina) is a MUSC Distinguished Professor Emeritus and a World Health Organization (WHO) advisor on Disease Mapping and organized with the WHO an International workshop on this topic which has led to an edited volume "Disease Mapping and Risk Assessment for Public Health". He recently acted as chief editor of the CRC Handbook of Spatial Epidemiology (2016). He has published a number of books focused on disease mapping and spatial epidemiology. In particular, the 3rd edition of the book: Lawson, A. B. Bayesian Disease Mapping CRC Press, appeared in 2018. The recent addition:

Lawson, A. B. (2021) *Using R for Bayesian Spatial and Spatio-Temporal Health Modeling*. CRC Press.

will be a course text for the workshop. A copy of this book is included in the fee for the course.

WHO SHOULD ATTEND

The course is intended for epidemiologists and public health workers who need to analyse geographical disease incidence. In addition, the course sequence may be of interest to statisticians or geographers and planners who deal with spatial disease data. Some statistical/epidemiological background would be beneficial but not essential. Experience of basic R use is assumed.

WHY ATTEND

Participants will gain an in-depth understanding of the basic issues, methods and techniques used in the analysis of spatial health data using a Bayesian approach on R. They will gain insight into the detailed analysis of practical problems in risk estimation and cluster detection. The course is presented by an acknowledged expert in the field of disease mapping and spatial epidemiology.

COURSE FEE AND REQUIREMENTS

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Booking of the two-day course sequence is $800.

An early bird rate of $500 will apply before May 10th

Attendees are recommended to pre-load OpenBUGS (most recent version). Datasets will be provided. R software can be downloaded from the following websites: http://cran.wustl.edu OpenBUGS can be downloaded from http://www.openbugs.net/w/Downloads

A variety of R packages will be used in the workshop. The main R packages used will be BRugs, Nimble, CARBayes, and INLA. The graphics libraries maptools, sp, spdep, sf, tmap, and ggplot2 will also be used.

INLA can be downloaded with the R command:

```
install.packages("INLA",repos=c(getOption("repos"),INLA="https://inla.r-inla-download.org/R/stable"), dep=TRUE)
```

BRugs, Nimble, CARBayes, can all be installed from CRAN repositories in standard way.
Additional R packages will be needed, and notification of these will be sent to participants in the joining instructions.

VENUE

This virtual workshop will be hosted from the Medical University of South Carolina, Department of Public Health Sciences, 135 Cannon Street, Charleston, South Carolina. Access details will be sent to attendees prior to the workshop.

Registration queries can be made with Paula Talbot (talbotp@musc.edu).
Technical queries can be made to Andrew Lawson (lawsonab@musc.edu)

REGISTRATION INFORMATION

Medical University of South Carolina

Registration is not limited currently but a limit may be set later depending on demand.

Deadline for Registration is May 15th 2021

Conference Registration per person: Complete course sequence - $800 (early bird $500 until May 10th)

Name_____

Title_____

Company/Organization_____

Address_____

City_____State_____Zip_____

Phone (___)_____Fax (___)_____

E-mail_____

METHODS OF PAYMENT

Registration fees are payable in U.S. dollars only. Personal checks are acceptable if payable through a U.S. bank. (payable to MUSC, DPHS)

___ Enclosed is a check in the amount of $_____

___ Charge $ _____to my credit card.

___ American Express ___ Discover ___ MasterCard ___ Visa

Card# _____Exp. Date_____

Authorizing Signature_____

Card Holder Address_____

Refund Policy: Requests for refunds must be made in writing. There will be a $50 processing fee for cancellations before May 21st . Beginning May 21st , no refunds can be given.
We reserve the right to reschedule the course or courses should circumstances dictate, giving reasonable notice to participants.

REGISTRATION OPTIONS

• Mail registration form and fee to: Bayesian Disease Mapping courses Medical University of South Carolina Department of Public Health Sciences Attention: Paula Talbot 135 Cannon Street, Suite 303 MSC 835 Charleston, South Carolina 29425-8350 USA	• Email registration form and fee to: Paula Talbot: talbotp@musc.edu
• Phone registration to: Department of Public Health Sciences Paula Talbot (843) 876-1578	• Fax registration form to: Department of Public Health Sciences Attention: Paula Talbot (843) 792-6000