

PCW5



Advanced modelling techniques for time series analysis using R

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Duration: half day

Background and significance: Time series analysis has become a key tool for investigating short-term effects of environmental risk factors. In the last two decades, there has been an intense activity to develop more sophisticated study designs and statistical models for using time series data in this context. This workshop will offer an overview of recent methodological advancements, focusing on their application through the statistical software R. Participants will be provided with a theoretical introduction, as well as practical experience with a hands-on session using real-data examples. R scripts and specific functions will be provided to all participants.

The session will involve a mix of mini-lectures and mini-practical exercises on the various topics covered in the in workshop, including illustrative examples and real-data analyses. The session will cover:

- Introduction to time series analysis with R
- Study designs and statistical models for time series analysis: an overview of packages and functions in R
- Modelling non-linear and delayed effects: an introduction to distributed lag linear and non-linear models and the R package dlnm
- Pooling results in two-stage multi-location analyses: extended mixed-effects meta-analysis and meta-regression using the new R package mixmeta (replacing mvmeta)
- From aggregated to individual-level time series analysis: an introduction to the novel case time series design

This workshop is open to every environmental epidemiologist interested in the analysis of time series data. While no previous knowledge on time series analysis is expected, we assume that participants have basic experience on the use of R for epidemiological analysis and on the application of R regression functions, as these topics will not be covered in the session.

Interest for the workshop

The workshop will provide useful knowledge and analytical skills on an epidemiological design widely used in environmental epidemiology. The workshop will cover the main advancements in time-series analysis. At the end of the workshop, participants will be able to apply state-of-the-art methodologies for time series analysis using R and will gain skills to correctly interpret software outputs and conduct these analyses within their own research projects.

This workshop was offered last year as pre-conference course at the ISEE 2018 in Ottawa, and it had a great success in terms of number of attendees and very good feedback

Participants number: 30