Introduction to Spatial Analysis in R

Short course

Who are we?

- Course organiser
  - Oliver Brady (oliver.brady@lshtm.ac.uk)

- Course administration
  - Niall McCarthy (Niall.McCarthy@lshtm.ac.uk)

- Lecturers and Demonstrators
  - Ahyoung Lim
  - Emily Nightingale
  - Ruoran Li
  - Yang Liu
  - Amy Campbell

Who you are

Specialty:

- Academic health researchers
- Public health professionals
- Implementation and operational researchers

Previous experience:

- Some basic self-taught R
- Experience with other programming languages or software
- No previous coding experience but understanding of quantitative methods

Your goals:

- To learn how to process, visualise and analyse spatial data

Logistics

Timetable

- Sessions run 13:00-16:00 (London time) each day with regular breaks
- Each day:
    1. Complete exercises from previous day, ask questions, review answers
    2. New content
    3. Introduce exercises and help get you started

- New content = all together, exercises = break out rooms (~ 5 people)

- Two dedicated one-on-one sessions
    - Wednesday (Wk1) and Monday (Wk2)

Resources

- All course material (Slides, exercises, answers, data, etc) on the course website:

https://isair2025.netlify.app

- All sessions will be recorded
  - Recordings available the following day via Moodle:

https://ble.lshtm.ac.uk

What will you learn on this course?

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

Week 1	Foundations	Learning R, Spatial packages and basic of statistical models
Monday	Introduction to R I	Reading and manipulating data objects with the tidyverse
Tuesday	Introduction to R II	Practical applying tools from session 1
Wednesday	Introduction to Spatial in R I	Reading and manipulating spatial data objects such as shape files
Thursday	Introduction to Spatial in R II	Practical applying tools from session 3
Friday	Introduction to Modelling I	Statistical modelling with the Generalised Linear Model

The second week builds upon the first and presents more in depth spatial modelling.

Week 2	Spatial modelling	Discrete and continuous spatial models
Monday	Introduction to Modelling II	Extensions to GLMs for spatially structured data
Tuesday	Modelling with Discrete Space I	Models for areal data
Wednesday	Modelling with Discrete Space II	Models for areal data
Thursday	Modelling with Continuous Space I	Model-based geostatistics
Friday	Modelling with Continuous Space II	Model-based geostatistics

How will you learn on this course?

- Only so much we can teach you on a two-week course
- Goal: give you the confidence to support your own future learning
- We do this by:
  - Active demonstration of techniques (not just lectures)
  - Interactive format (with tutors, with classmates)
  - Process-focussed (not about getting code to work, but how you got it to work)
  - Tiered support (mix of large group, small group and independent work)

Feedback

Your feedback is important to us!

Please complete the feedback form on Moodle after the course — tell us what we did well and what we could improve.

And please don’t hesitate to ask questions during the course.

Online interaction

Benefits of learning together:

- Extra people to ask for help
- Group problem solving
- Meet new people in your field

To help this, please:

1. Please make sure your name on Zoom is your **first name + last name or last initial** to facilitate talking to each other
2. Please **raise your hand** to ask questions
3. When in breakout groups please keep **cameras on** when possible to encourage discussion
4. Regularly **share your screen** with your classmates and demonstrators. It's the fastest way to get he answers you need

Introduce yourselves to your classmates

- From each person:

1. Your **name** and where you **work**

2. What your **previous experience** with R and spatial analysis is

3. How you hope to **apply** the skills learnt on this course in the real world