2022 SISCER Module 2 Small Area Estimation
Course Outline

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Short Course Details

- Course will be taught remotely on Monday 11th July, 2022.

- Lectures will nominally last for 1 hour, followed by R practical sessions – timings will vary depending on, for example, the number of questions.

- Lectures will be recorded so that they may be reviewed later.

- Questions can be put on zoom, or please ask out loud!

- Course materials are here:

  http://faculty.washington.edu/jonno/SISCER-SAE.html

Big Picture

- SAE is often based on survey data with a complex design.

- Weighted estimates (that account for the design) would be ideal, but when sample sizes in the constituent areas are small, SAE models that use auxiliary data and smoothing via random effects are used.

- Two primary approaches to SAE modeling:

  - Area-Level: A random effects model with weighted estimate taken as response data. Known as Fay-Herriot models. Requires weighted estimate (with associated standard error) to be available.

  - Uni-Level: In sparse data situations, may be the only approach that is tenable – most hazardous, since most dependent on model assumptions.

Course Outline

- 8:30–9:30: Lecture 1 Part 1: Motivation; **Survey sampling**.
- 9.30-10:00: R Practical 1 Part 1: The `survey` package in R.
- 10:00–10.30: Break.
- 10:30–11.30: Lecture 1 Part 2: **Survey sampling**.
- 11:30–12:00: R Practical 1 Part 2: The `survey` package in R.
- 12.00–1:00: Lunch Break.
- 1:00–2:00: Lecture 2: **Area-level** mixed effects models with and without spatial smoothing.
- 2.00–2.30: R Practical 2: R implementation of area-level spatial mixed effects models via `sae` and `SUMMER` packages in R.
- 2.30–3.00: Break.
- 3:00–4:00: Lecture 3: **Unit-level** mixed effects models with and without spatial smoothing.
- 4:00–4:30: R Practical 3: R implementation of unit-level mixed effects models via `sae` and `SUMMER` packages in R.

Zoom Links

Link 1 8:30:

https://washington.zoom.us/j/96371838884

Link 2 10:30:

https://washington.zoom.us/j/96528451819

Link 3 1:00:

https://washington.zoom.us/j/93515914031

Link 4 3:00:

https://washington.zoom.us/j/95242093365