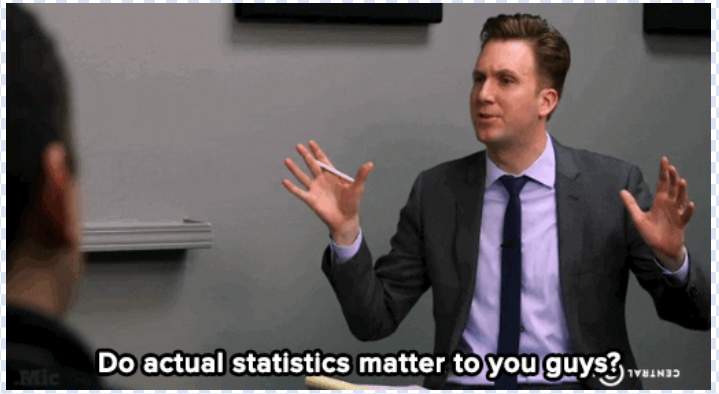
Biostat 200

Review & Short Topics



Short Topic 3: Fixed Effects vs. Random Effects

- Our regression & logistic models have been fixed effect models
  - the levels of each factor were fixed in advance of the experiment
  - we were interested in differences in response among those specific levels.

- A random effects model considers factors for which the factor levels are meant to be representative of a general population of possible levels.

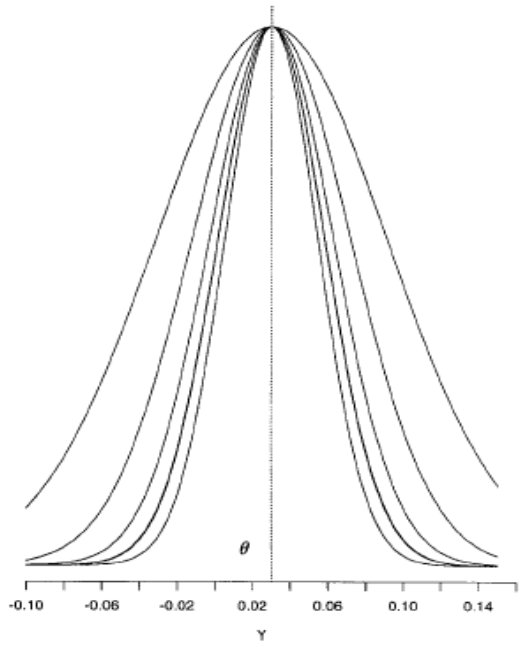
- *Will be covered in depth in the next Biostats class so this will give you an overview*

Fixed Effects vs. Random Effects: where do we use it?

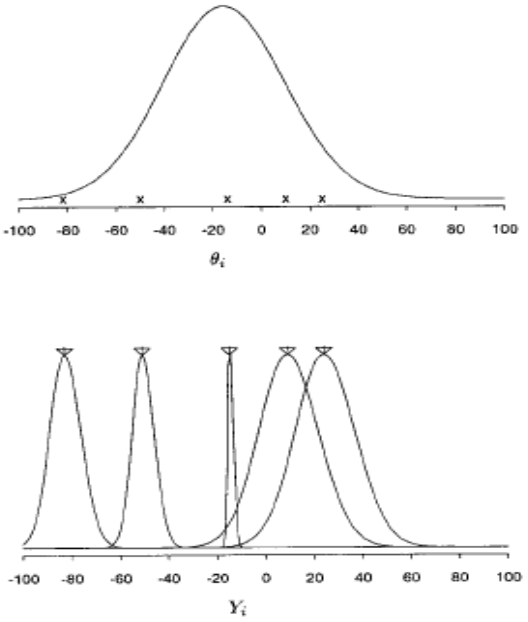
- Panel Data – individuals are observed at several points in time and also often grouped by location/diagnosis/etc
- Cross-sectional time series data where sampling may be by group but different individuals at each time point
- We have variables that are changing over time and others that are fixed
- *In each case we have variability within and between groups and individuals (both random error and error due to individual differences)*

Fixed Effects vs. Random Effects: Why is it important?

Fixed-effects model



Random-effects model



Fixed Effects vs. Random Effects: Definitions

- Effects are fixed if they are interesting in themselves or random if there is interest in the underlying population.

- Fixed effects are constant across individuals, and random effects vary.
  - in a growth study, a model with random intercepts and fixed slope corresponds to parallel lines for different individuals

- *It is also possible to have mixed effects models where you have both fixed and random effects.*

Fixed Effects vs. Random Effects: Operationalizing

- Observations where you have uneven sampling across time
  - Not all patients attend all visits
- Groups of observations with uneven numbers per group
  - Sampling households with zip codes but unequal numbers of households per zip
- Multiple levels of variables: hierarchical models where you are interested in estimating the variability within and between levels
- *Many ways to estimate with Stata: xtlogit (binary outcomes) & mixed (continuous outcomes)*

The four things to do and remember:

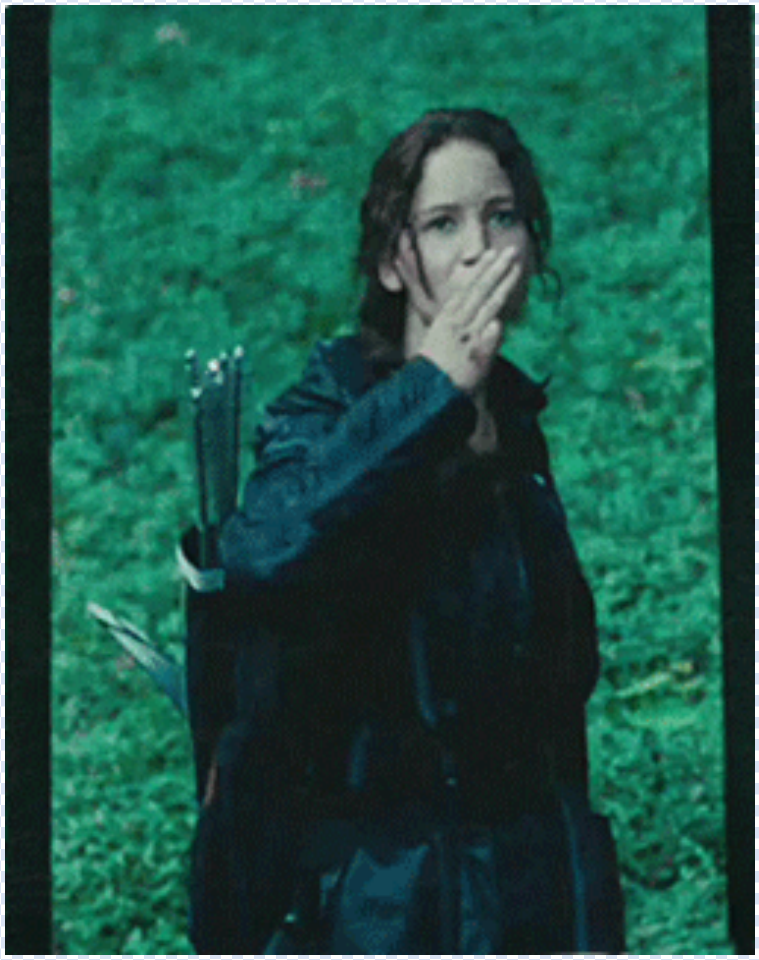
- Download the slides/examples/do files etc for your future research – some of the techniques may come in handy and you can repurpose them.

- You can always find me for a short recap or question – I'm probably going to be around UCSF for awhile so even if you have a committee for your certificate or degree or your next clinical trial – feel free to contact me.

- My email is: Isabel.allen@ucsf.edu and I'm on the 2nd floor (well maybe not right now)

- If this course is part of your TICR Master's degree and you now wish you were a biostatistician, you can request to be my TA next fall.

Please introduce yourselves if we meet in person



Remember: You are survivors of Biostatistics 200 taught online for the first time ever!!