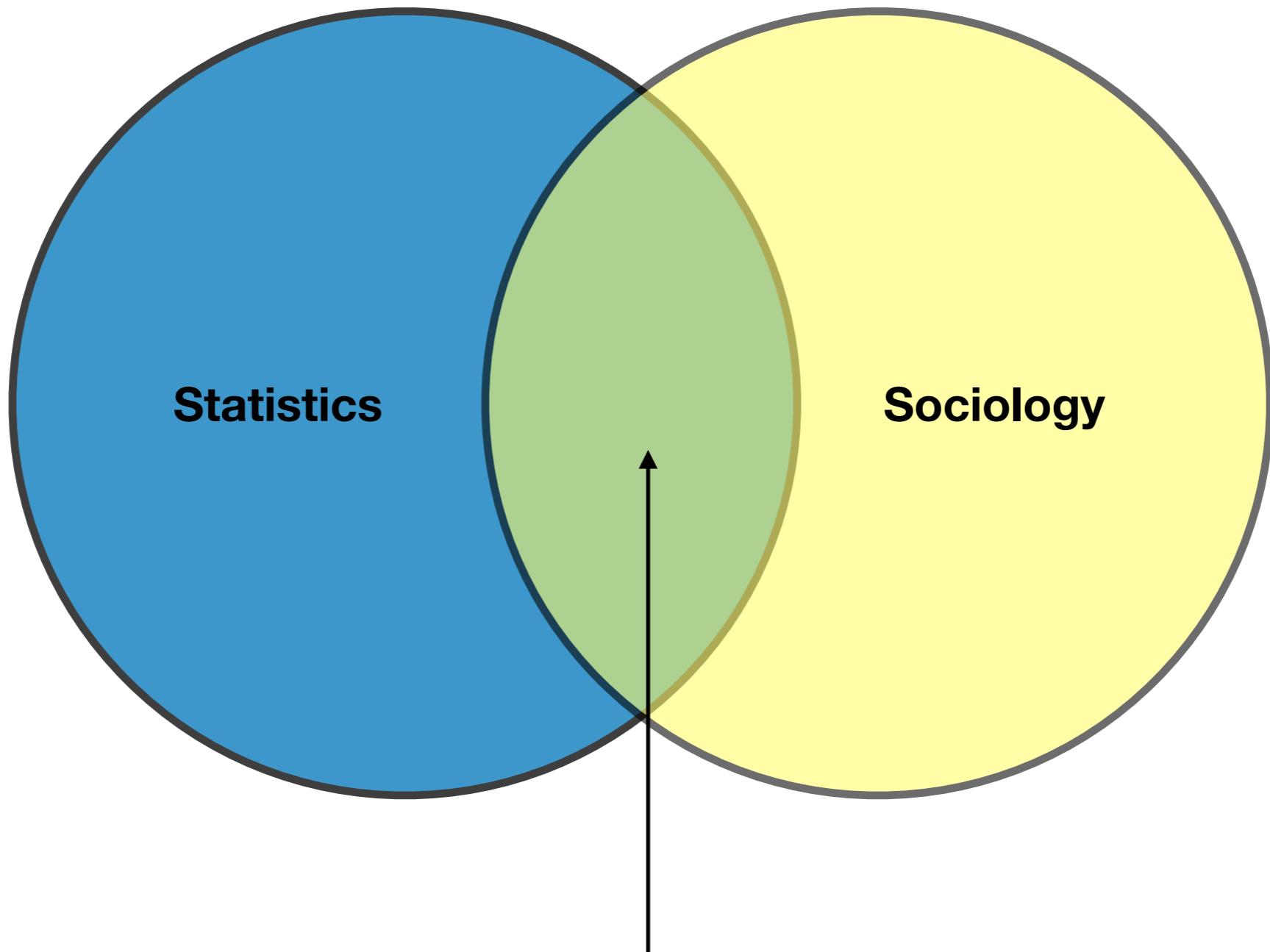


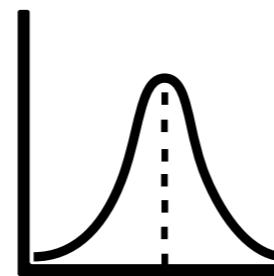
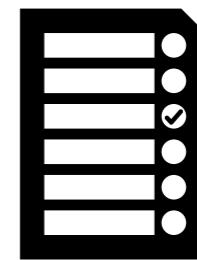
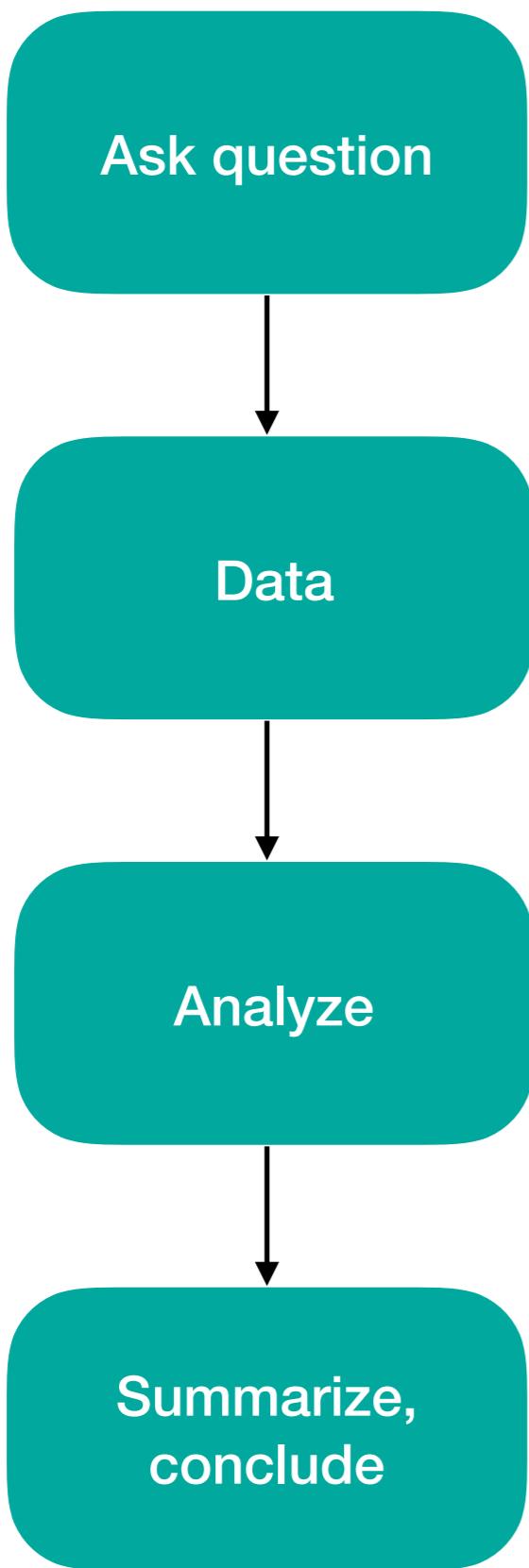
# **Statistics and the social sciences**

Monica Alexander  
Statistical Sciences and Sociology



**Quantitative social science**

# Research flow

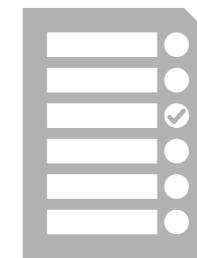
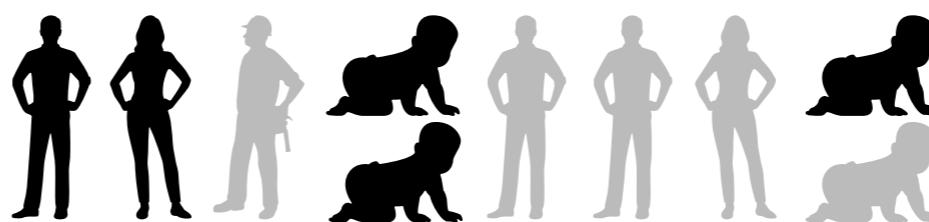


# In reality....

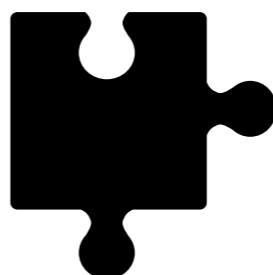
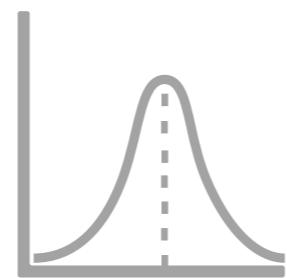
Ask question



Data



Analyze



Summarize,  
conclude



# Answering questions in social science

- Data are usually imperfect (missing values, biased, observational (causation hard))
- Data are often the poorest quality for those who are most in need
- Need to develop statistical methods to overcome data issues and get best estimates based on what we have

# **Example**

**How many people migrated out of  
Puerto Rico after Hurricane Maria?**

# 9 months after Hurricane Maria, thousands of Puerto Ricans still don't have power

The grid is in worse shape than it was before Hurricane Maria.

By Umair Irfan | Updated Jun 20, 2018, 8:03am EDT

The New York Times



*Nearly a Year After Hurricane Maria, Puerto Rico Revises Death Toll to 2,975*



# Out-migration from Puerto Rico

Thousands of people moved out of Puerto Rico around the time of the hurricane and afterwards

- Where did they move to?
- Who were they? (age, sex, education)
- Important for both Puerto Rico and receiving locations

# The data are limited

- No official statistics on monthly moves by US state
- No information on types of people who moved
- Official data that do exist are very delayed (no info on 2017 released yet)

Need to find other data sources to help solve this problem...



- Online population with lots of demographic and geographic information
- Unlike traditional surveys, data are updated in almost real time
- How do we get the data? Use Facebook Adverts Manager to get estimates of sizes of populations

## Audience

Define who you want to see your ads. [Learn more.](#)

Create New

Use a Saved Audience ▾

Custom Audiences ⓘ

Add Custom Audiences or Lookalike Audiences

Exclude | Create New ▾

Locations ⓘ

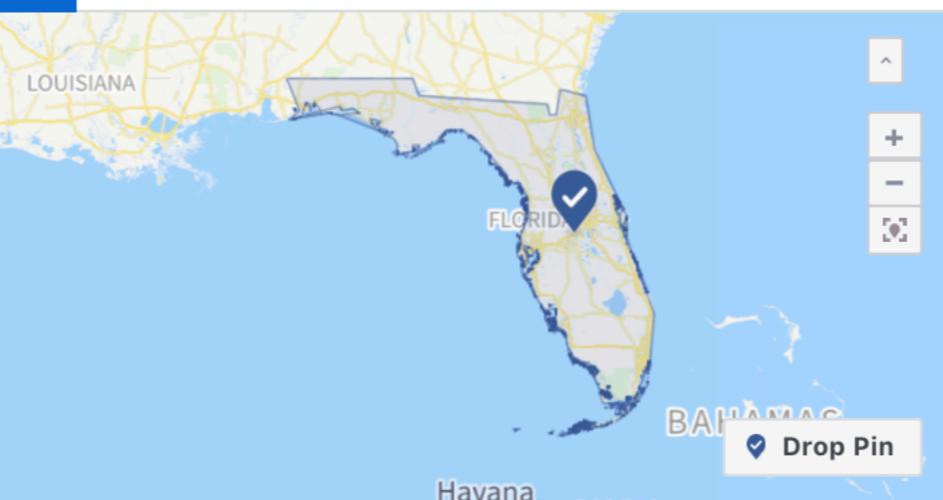
Everyone in this location ▾

United States

📍 Florida

📍 Include ▾ Type to add more locations

*i* Your audience location has been changed from United States to Florida. [Undo Change](#)



Add Locations in Bulk

Age ⓘ

15 ▾ - 24 ▾

Gender ⓘ

All Men **Women**

Languages ⓘ

Enter a language...

Detailed Targeting ⓘ

INCLUDE people who match at least ONE of the following ⓘ

Behaviors > Expats

Expats (Puerto Rico)



### Create Multiple Ad Sets in One Step

Add variables for locations, detailed targeting, age ranges and Custom Audiences to quickly create multiple ad sets at one time.

[Create Multiple Ad Sets](#)

### Audience Size



Your audience selection is fairly broad.

Potential Reach: 37,000 people ⓘ

### Estimated Daily Results

#### Reach

2,600 - 7,500



#### Post Engagement

37 - 220



The accuracy of estimates is based on factors like past campaign data, the budget you entered and market data. Numbers are provided to give you an idea of performance for your budget, but are only estimates and don't guarantee results.

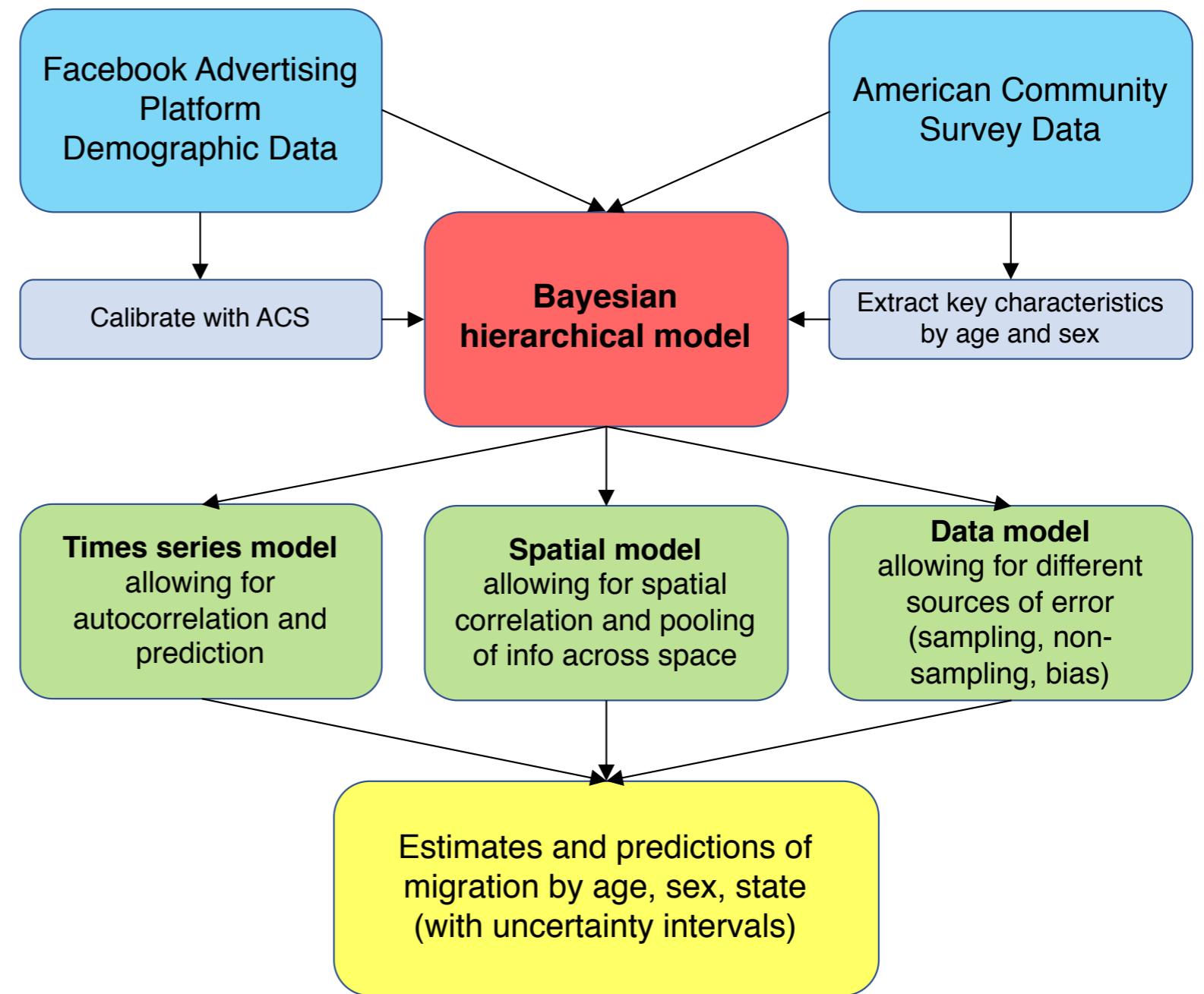
[Were these estimates helpful?](#)

# Collecting Facebook data

- Ongoing collection through API since January 2017
- Collect every 2-3 months
- Compare migrant stocks before and after Hurricane to get estimate of change

# Issues to overcome

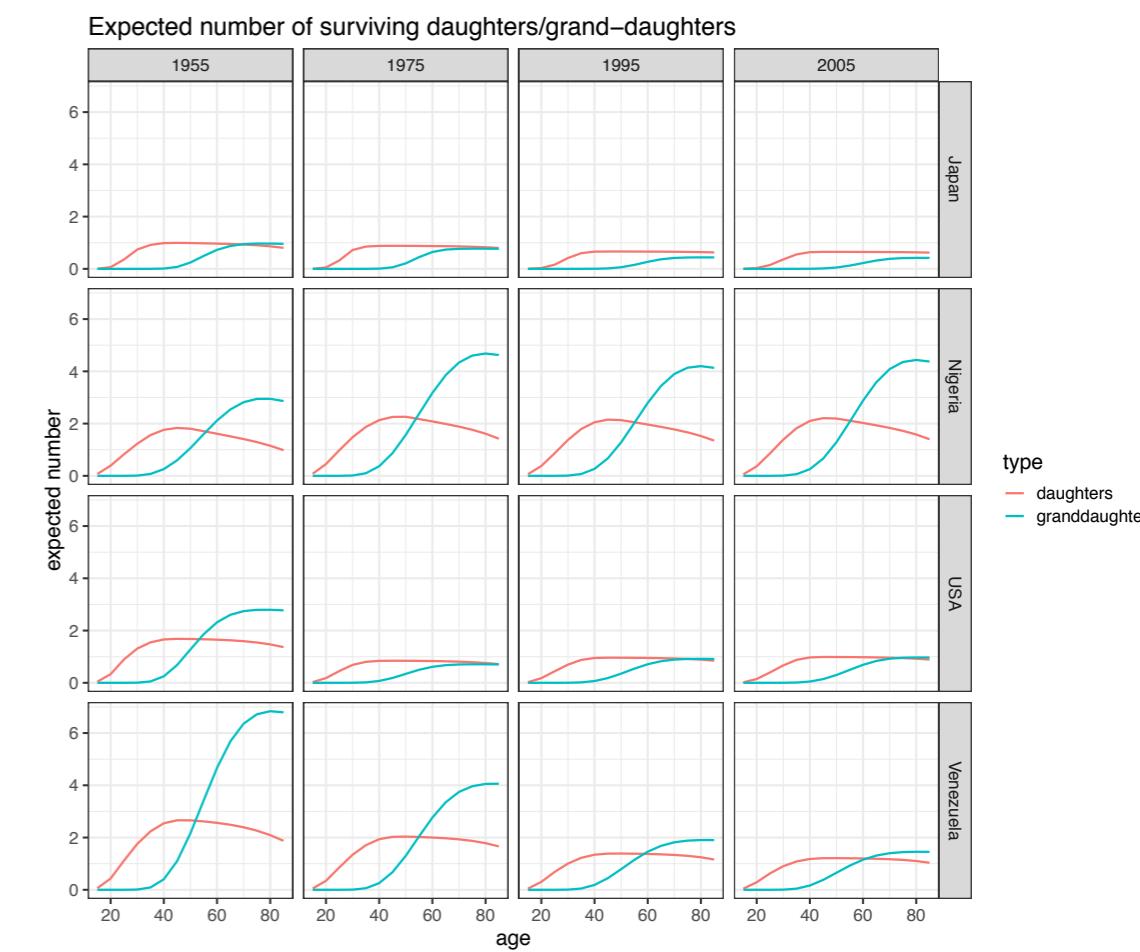
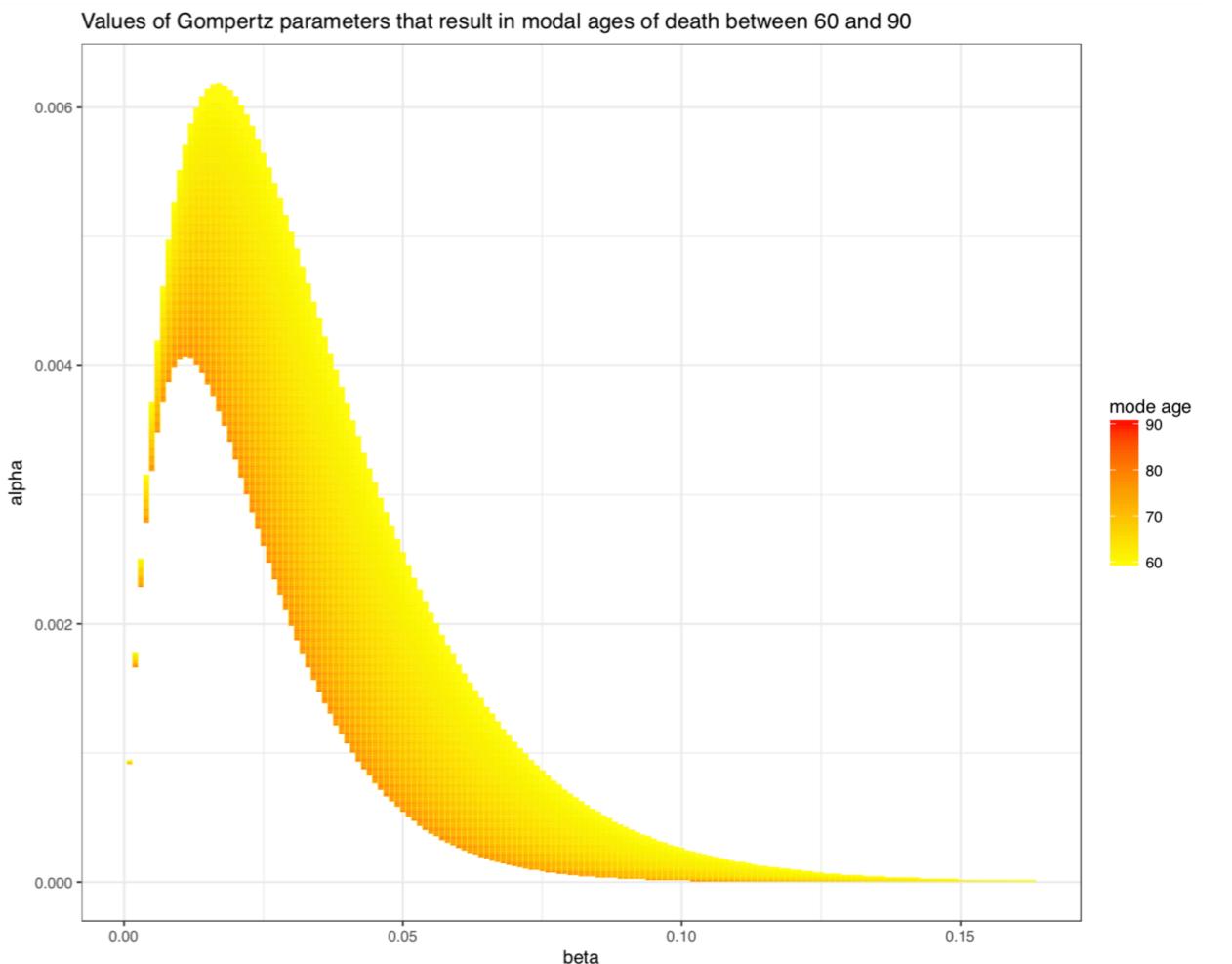
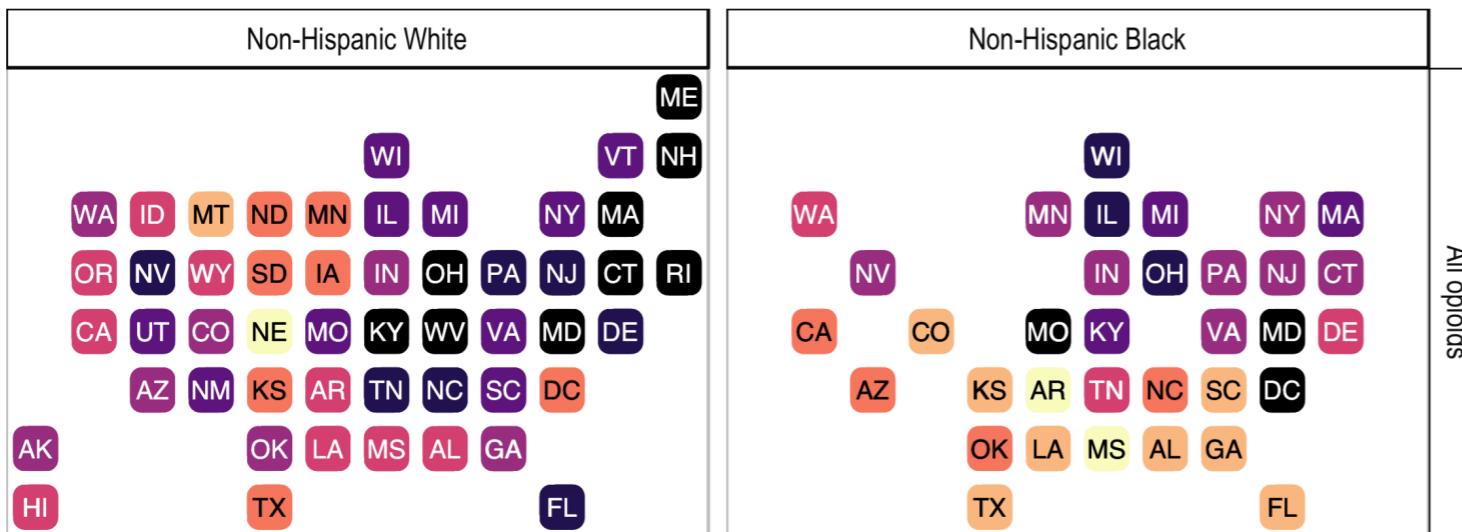
- Not everyone uses Facebook!
- Data are not representative
- Need to build statistical model to adjust for biases



# Demographic Methods

Winter semester 2019

- Life tables
- Models for fertility, mortality, migration
- Survival analysis
- Bayesian hierarchical models



# Thanks!

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Room 6010