Broadly interested in social determinants of health and how structural exposure to social risk develops across people’s lives

“Life-course epidemiology”

* Accumulating risk
* Critical periods

“The study of correlated life course processes”

* What does this mean conceptually?
  + Huge empirical literature and critical theory around the dynamics of how disparities between groups develop as people age. Lots of social determinants: income, education, neighborhood, environmental stressors, etc.
    - Complicated DAGs
  + We *know* these things are all correlated – your health at 30 is correlated with your income now and your income at 18, but also with your current neighborhood characteristics. But your current neighborhood characteristics are correlated with your current income *and* with your past income.
  + Your past income directly affects your current income, but also your current neighborhood, which both affect your health. This is obscured by estimating the average direct effect of everything.
  + Make some flowcharts that get increasingly complex
* What does this end up meaning empirically?
  + GLMs with lagged variables

Discuss how people try to parameterize massive DAGs effectively in one GLM

* Latent growth curves, latent random effect structure in clustered or longitudinal settings
  + End up with confusing marginal effects of lagged/contemporaneous predictors, interpret p-values
  + Latent growth curve modeling = random effects on slope/intercept of time by person to compare random effects between people
  + Older method is structural equation modeling, which relies on assumptions of linearity and no interactions
  + Multilevel modeling with fixed/random effects
* Demographers tend to use simulation methods, like multi-state life tables
  + Treats all transition probabilities as independent processes across the life-course
* Problems
  + Still end up with the average direct effect of predictors
  + Still don’t account for time-varying confounding

Parametric g-formula

* I have no idea why this is what it’s called
* Comes from more classic clinical epidemiology focused on *direct and indirect* effects in dynamic treatment regimes

Steps to g-computation

1. Make explicit DAGs (conceptual, critical theory)
2. Estimate series of models for each outcome defined by DAG (i.e. GLMs)
3. Draw from joint probability distribution (1000 times), bootstrap data at Time 1 (1000 times), simulate through each period to recover “natural course”

* Natural course should approximate empirical data
  + Estimate of causal interrelationships (theorized in DAG) based on empirical data
* Estimate other courses by altering bootstrap data to estimate direct and indirect effects

Fragile Families study

* Longitudinal cohort study in U.S. cities of around 5000 children (three-quarters to single-parents) – six waves available
* Working on a grant with Courtney and Irma related to the biomarkers
  + Restricted use data on neighborhood, school characteristics, health records
* Application to racial disparities research – how do structural disparities develop over time? What are the direct and indirect pathways?
  + Education, occupation, income, welfare status, permanent wealth, perceived social status, exposure to violence, criminal justice contacts, health behaviors
  + Outcomes for parents: incarceration, depression/anxiety
  + Outcomes for children: cognitive tests, stressors, biomarkers