NOPREN Monthly Call –April 13, 2015

1. **Presentation by Sanjay Basu, MD, PhD: "New research methods for the evaluation of policy change: Old Problems, New Solutions"**

Sanjay Basu, MD, PhD, is an Assistant Professor of Medicine at Stanford University. He is a primary care physician and epidemiologist focused on the application of statistics and mathematical models to evaluate chronic disease policies. Dr. Basu received his undergraduate degree in computation and systems at MIT, his master's degree in medical anthropology at Oxford, and his MD and PhD in epidemiology at Yale University. He completed his medical training through the internal medicine primary care program at the University of California San Francisco based on the San Francisco General Hospital, then joined Stanford's Prevention Research Center in September 2012.

- His presentation will focus on 3 new methods of policy evaluation to address common problems
- How to do a fair, unbiased policy assessment when we can't do an RCT.
- Overview of methods:
1) **Near-far matching**: If you have individual-level data, but an imperfect control group.
   - A program we want to evaluate but we don't have a perfect control group. Ex: An entire program shifts from 1 policy to another
2) **Synthetic control analysis**: If you have population-level data, but an imperfect control group
   - city or county undergoes a policy change
3) **Distributional decomposition**: If you have either type of data, and want to estimate disparities:

Near-Far Matching:
- Ex: Studying school-meal program in India
- Report said rural children in meal program have severe probability of being stunted compared to other children in program
- This might be confounded conclusion (rural children are in meal program because they are stunted already)
- Typical epi solution: *propensity score matching* (matching on observed characteristics) (SLIDE 4)
- Problem: assumption is that all relevant variables are in your data set
- Typical solution*: Instrumental variable analysis* (SLIDE 5)
- Problem: hard to find, often weak. Doesn't perfectly randomize a person into being in the program or not. Ex: some states require fingerprinting prior to SNAP.
- *Near-Far Matching*: combines benefits of propensity score matching and instrumental variable analysis to control for both observed and unobserved confounders (SLIDE 6)
- **For a worked example, see: Lorch et al, *Pediatrics*, 2012**
- Match people to be similar as possible on observed characteristics
- 2nd matching step: different from each other in terms of their instruments (ex: schools) increases statistical power of your instrument variable
- Ex: reanalysis of school program in India and stunting in children
- Near far matching found program was protective against stunting
- Sample sizes: same sample size calculation as for any other instrumental analysis

Synthetic control analysis:
- Typical solution: *Difference in differences analysis* (SLIDE 9)
- When comparing outcomes of populations in different states, cities, counties, etc.
- Researcher picks a control state or city and assumes that time trends and population characteristics are the same or similar enough between cities
- Ex: nutrition group in India (used a control village)
- *Synthetic control analysis:* (SLIDE 10)
  - Similar to propensity score matching
  - You can control for time varying and time invariant confounders
  - Weighting control populations through statistical procedures

- o This method creates a combination of all control cities to create a population similar to NYC
- o Ex: studying NYC's implementation of a nutritional policy that occurred a few years ago. You have a plot of nutritional outcome area (SSB consumption over time). You have data before and after policy change in NYC. Did this have a pre vs. post impact? Also, was it significantly different from anything else causing the change?
- o Collect data on similar cities (Chicago, LA, Houston) but none are perfect comparisons to NYC.
- o Synthetic control analysis combines some sections of the population from Chicago, LA, Houston and weights populations to be as equal as possible to the groups in NYC. Creates a synthetic NYC from other cities.
- o You can now compare NYC to other synthetic control population.

Distributional Decomposition:
- Method used for estimating disparities
- Fact: usually community level interventions are more beneficial to one population than another
- Typical solution: *Decomposition* – used since 80s. How much more does one group benefit than the other? How much might my program reduce the disparity?
- Problem: can't be applied to continuous outcome measures
- How much does my program affect disparities between two groups in my data set? Piece apart which subset of target population is being benefitted
- Ex: National salt reduction initiative: distributional decomposition identified the program was making a large impact but at the extreme end, typically where the largest disparities are seen in hypertension rates between white and African-Americans
- Can analyze subsets of population really well
- STATA: free package downloadable online: download distdecomp package from sdr.stanford.edu
- Sample sizes: same power analysis as standard regression

- QUESTION: are there specific examples of nutrition and or policy where these methods are not being done but there is great opportunity?
    - o Have not really seen these being done in nutrition yet
    - o Near far matching is being seen in economic literature
    - o Synthetic control: has been used in tobacco control work and the school meal program in LA
    - o Distributional decomposition: has been used in some educational research but have not seen anything yet in nutrition research

2. Funded Site Presentations
Melissa Laska, University of Minnesota, School of Public Health and Medicine:
    - o "Impact of a Local Staple Food Ordinance on Healthy Food Access"
- Minneapolis staple food ordinance: requires licensed food stores to stock certain types and quantities of staple foods that are in line with dietary guidelines
- Passed by city council in 2008; updated ordinance in 2014
- Wanted to address food access and crime prevention in underserved areas of the city
- 1st policy of its kind to address issues such as crime through food licensing
- Concerned that food stores in low socioeconomic areas were not stocking food that people wanted and serving as hot spots for criminal activity
- 2014-2015: passed an update to ordinance
- Now includes even more healthful criteria like whole grain products, minimum quantities around what needs to be stocked, low-fat dairy, fresh produce, mirrors WIC requirements
- City built in a 12-month grace period for implementation but became effective on 4/1/15
- Evaluation: pre baseline assessments of store audits, operator interviews, customer intercept surveys
- Baseline assessment fall winter 2014: audits, interviews, intercepts, home assessments
- Fall 2015: post-policy evaluation
- Goals:

- - Aim 1: Disparities in changes to healthy food availability in in small- to mid-sized stores located in low versus high SES neighborhoods.
  - Aim 2: Disparities in changes in perceptions of healthy food demand in low versus high SES neighborhoods of the city.
  - Aim 3: Disparities in pricing of healthy items in small food stores, compared with pricing in local supermarkets.
- Baseline sample of 140 (non-supermarkets, small to midsized food stores, non WIC stores)
- Excluding specialty food stores
- Control sample drawn from St. Paul food stores
- Collected in-store audit data using NEMS adapted tool
- Structured interviews with store owners/managers
- Progress: completed baseline data
- Focusing on data entry and processing, gathering ongoing feedback from advisory committee
- Ideas for collaboration: Healthy Retail WG

Joel Gittelsohn, Center for Adolescent Health, Global Obesity Prevention Center, Johns Hopkins Bloomberg School of Public Health:
- - "An Agent-Based Model of a Low Income Urban Population and Food System to Inform Obesity Policies"
- Project goals for first 2 years:
  - Conduct mixed-methods formative research to further develop the Baltimore Low Income Food Environment (BLIFE) model
  - Agent-based model of low income African American children and adults in the low income Baltimore food environment
  - Collaborate with policy makers, city agencies and other key stakeholders
  - Use the model to help shape policy to improve the food environment in Baltimore and reduce diet-related chronic disease risk
- Joel has R01-level project that is intervention trial to improve food environment in Baltimore, emphasizes systems science to address obesity epidemic
- Developed an early version simulation model to understand what is going on with obesity epidemic in Baltimore
- 1st model was BLIFE and now they are expanding on earlier work
- Strategies for improvement: conduct mixed methods formative research to expand BLIFE and get additional data on food behaviors and new aspects of the food environment, and on policymaker needs and priorities.
- Iteratively revise existing model with collected data. Priority additions: school, recreation center and home food and PA environment scores
- Adult diet and morbidity
- 2nd goal: do this in collaboration with BMORE city officials to make it useful model to shape food policy and reduce chronic disease
- Baltimore has 20-30% food deserts and below poverty level
- Child daily schedule: slide looks at afterschool food foraging model (simulating where kids would go after school to get food, corner stores, carry out restaurants – what could happen if we changed this)?
- Video: visualization of BLIFE model shows portion of Baltimore mapped out – shows kids moving from home to food sources
- Levers allow changing variables – what would happen if we changed the foods sold in corner stores?
- Outcomes presented at individual-child level
- Able to get some type of visualization of impact of changes, alone or together
- Where are we now? Goal is to collect additional data on food behaviors and food environment and to identify policy maker needs and incorporate into new model
- Current new version of BLIFE model: using Python
- Tool used by policy makers and planners to see the effect of interventions
- Model is showing how to add coordinates about sites in the community and depict actual locations of 300 kids and their families.

- Applications of revised model: use model to test impact, assist policy makers with decision-making, make a transferable model to other urban settings, offer systems science training to NOPREN members
- Baltimore has asked them to provide input into rezoning plan for city which included staple food ordinance and they can provide evidence of impact of new policies
- Progress: received IRB approval, convened work groups to develop and collect data around new components in model, initiated surveys with children and adults to generate new data incorporated into model
- In process of developing transferable model to be used in other settings
- Publications:
  - Gittelsohn J, Mui Y, Adam A, Lin S, Kharmats A, Igusa T, Lee BY, "Incorporating systems science principles into the development of obesity prevention interventions: Principles, benefits and challenges," Current Obesity Reports, Special Issue on "Preventing Obesity" (in press).
  - Mui Y, Lee BY, Adam A, Kharmats AY, Budd N, Nau C, Gittelsohn J, "The role of supplier networks in healthy food access for corner storeowners in low-income neighborhoods," Journal of Epidemiology & Community Health, (under review).
- Collaborations: training with other NOPREN members to introduce transferable model, ready this fall

3. Working Group Updates
- Water
  - Not having a call this month, having a subgroup meeting on 17 to discuss water fact sheet
  - May 27th call
- Rural Food Access
  - Next meeting is April 21st
  - Paper accepted in PCD
- Policy Impact
  - Conducted presentation on APPAM – was well received at conference, takeaway was how different each group is, public health, scientists, what's working and what is not, hope to continue the conversation
  - Presenting to NCCOR on Wed on NOPREN work
- Food Policy Councils
  - Our next call is Tuesday April 28, discussing annual food policy directory update that Johns Hopkins puts out every year
- Healthy Hospitals
- School Wellness Policy
  - Have call April 14 with Alliance for Healthier Generation presenting on school wellness policies
  - 1st call to kick off monthly calls!
- ECE-
  - year 3 of WGs doing some planning for the future
  - Subgroups are doing great, having monthly calls and getting lots of work done
  - Last 3 days to give comments on CACFP ruling
- New Working Groups:
  - Hunger Safety Net: Co-leads are Hilary and Steve Cook- 1st meeting on 4/27 @ 9am
  - Healthy Retail:

- Our next meeting is scheduled for Monday, May 11 (noon EST/11 CST/9 PST). Please mark your calendars!