Developing an index of exposure to obesity-related community interventions and policies

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Presenter Disclosures

Michael Prelip

(1) The following personal financial relationships with commercial interests relevant to this presentation existed during the past 12 months:

“No relationships to disclose”

Collaborators

UC Berkeley

First 5 LA

UC LA

LACDPH

Kaiser Permanente

PHFE-WIC

Background

- 1990s: Increasing focus on obesity throughout country
- Increased interest in the role of environmental factors on food and physical activity behaviors (major determinants of obesity) – 1990s
- Beginning of a series of place-based initiatives (e.g. HEAC, HEAL)
Background: LA County

- Obesity-related policies and community interventions (2002-2012) – examples:
  National:
  - New WIC food package mandate (2009)
  State/Regional/Local:
  - HEAC (TCE); Community Benefits Program (KP)
  - School wellness programs (California Project LEAN)
  - School food policies (state, local)
  - First 5 LA’s programs to promote breastfeeding and healthy eating among preschool-aged children
  - CDC’s Community Transformation Grants

Study Aims

1. Identify obesity-related interventions and policies in LA County since 2003
2. Develop and validate community-level “intervention dose index”
3. Estimate obesity trends in preschool-aged WIC participants
4. Evaluate relationships between preschool-aged obesity trends and community-level intervention dose
   - Use multilevel modeling, causal inference methods
5. Apply systems science approach (agent-based modeling) to explore dynamic interactions, feedback mechanisms, and efficacy of policies

Emergence of Systems Science

- Public health issues are often complex, with multiple factors that interact with each other
- Systems science helps address complex issues by considering all of these interactions

Systems science approach...

Explore the dynamic interactions among a set of agents

Predict obesity patterns under different intervention conditions
**Data Sources (2002-2012)**

- Child Obesity Rates
  - Data Mining Project (PHFE WIC)
- LA County Community Interventions & Policies
  - Workgroup 1: Constructs & Domains
  - Workgroup 2: Review variables
  - Index of community intervention dose
- LA County Neighborships
  - U.S. Census
  - Food store environment (Dun & Bradstreet)
  - Local planning department
  - Local police department

**How do we find the intervention dose?**

- Much of what has been described in terms of dose is related to interventions more generally focused on individuals
- Dose delivered and dose received
- Exposure (dose delivered in clinical trials)
- Reach (dose delivered in community trials)
- Exposure = dose in communication world

**Goal: Develop community level intervention dose/intervention dose index**

- **Population dose** is the estimated community level change in the desired outcome expected to result from a given community change strategy: Reach \* Strength
  - Reach = Penetration = # exposed/# in population
  - Strength = effect size

**Strength of Tobacco Control Index (SoTC)**

- Created to measure program effects of the American Stop Smoking Intervention Study (ASSIST)
- Serve as overall measure of tobacco control intensity at state level
- Comprised of three constructs (resources, capacity, and efforts) each comprised of multiple domains
SoTC Development

1. **Identified potential index components** related to tobacco programming through literature review
2. **Expert panel** convened to determine components
3. **Identified 27 domains** related to Resources, Capacity and Efforts
4. **Rated each domain** (Parsimony, Scientific Support, Feasibility)
5. Examine variables, develop instruments, collect data
   - Work divided between two Workgroups

Results: Per capita adult cigarette consumption levels were correlated with both the SoTC Index and its capacity construct

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**Workgroup 1’s Tasks**

- **Identify potential key domains and constructs** related to obesity and preschool children through literature review
- **Convene expert panel** (Workgroup 1) to further determine key domains and constructs
- **Consult further experts** to further verify domains through key informant interviews
- **Analyze data from interviews** to determine suggested domains for Workgroup 2
  - (In Tobacco control index they selected final domains based on parsimony, scientific support, and feasibility)

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**Quick Snapshot of Progress**

- Ongoing meetings since December (both in-person and telephonic)
- Ongoing discussions about domains and concepts
- Draft conceptual model developed
- Draft key informant interview guide developed
- Key informant interview guide pretested
- Key informant interview guide finalized
- Key informants identified
- IRB Approval for key informant interviews
- Recruit key informants
- Conduct key informant interviews to verify conceptual model
- Analyze data from KI interviews
- Workgroup 1 developed a “final” list of domains and constructs for workgroup 2
**Key Informant Interview Guide**

1. **Screening Questions**
   - What experience do you have working on issues related to obesity, diet, nutrition, physical activity, or child well-being in general?
   - Which populations and communities have you worked with in Los Angeles County?

2. **Questions about how the five domains have been classified.**
   - What do you think about these broad classifications?

3. **Specific questions on the constructs**
   - Are they appropriate and relevant?
   - Are there other constructs you would include?
   - How important are these constructs in order of their relevance to childhood obesity? Which construct is the most important and which is the least important?
   - Where or from whom do you suggest we can get information or data about these constructs?

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**Next Steps: Workgroup 2**

- **Workgroup 2**
  - Review work of Workgroup 1
  - Develop data collection instruments and interview guide
    - Develop criteria for rating measures
      - Domains (Key indicators)
      - Constructs (broad range of interventions)
      - Measures (to quantify dose)
Thank you

• Questions?
• For more about our system science approach come see our poster presentation
• Tuesday, November 18, 2014: 2:30 PM - 3:30 PM
  • Applying a Novel Systems Science Approach to Understand Child Obesity Trends in Los Angeles County, 2002-2011
  May-Choo Wang, DrPH, RD, et al.
• #310112