

Prepared for the "Study Designs and Analytic Strategies for Environmental and Policy Research on Obesity, Physical Activity and Diet" Meeting, April 8, 2008, Washington DC.

Promising study designs for environmental/policy research and evaluation



**Prevention
Research Center**

at Saint Louis University

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*Study Designs and Analytic Strategies for
Environmental and Policy Research on Obesity,
Physical Activity, and Diet*

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Overview

1. Briefly describe the backdrop for this type of research
2. Identify promising methods and issues
3. Recommend actions

The backdrop

“Laws are like sausages.
You should never watch them
being made.”

Honoré Mirabeau, 1918

ENORMOUS potential

Yet, the amount of well done policy research/evaluation in 'real world' settings is small compared with the reach and potential

Environmental and policy interventions

- Aimed at changing the physical and sociopolitical environments
 - Provide opportunities, support, and cues to help people develop healthier behaviors
- May directly affect behaviors or may alter social norms
 - Influence of the price of foods on consumption
 - Many physically active people in public spaces
- Often more permanent than many public health programs focused on individual-level behavioral change
 - Important complement to individual-level programs
- For policy intervention
 - Much of the power held by states
 - Local efforts in many areas related to the built environment

Remember differences: *Evaluation versus research*

Evaluation

- Controlled by stakeholders
- Flexible design
- Ongoing
- Used to improve programs

Research

- Controlled by investigator
- Tightly controlled design
- Specific timeframe
- Use to further knowledge

When does evaluation become a form of research?

Promising methods & issues

Research on measurement

Measure twice, cut once

--A wise carpenter

- A longer history in measuring dependent variables
- The built environment
 - Perceived environment
 - Telephone or self-administered questionnaires
 - Observed environment
 - aka, “unobtrusive”
 - Collected via environmental audits
 - GIS-derived and/or layered measures
 - Readily available, archival
 - Only feasible method for large geographic coverage
 - Allows graphical presentation of data
- Policy measures the least developed
- Nearly all environmental and policy exposures are 1st generation

Research design issues

- Randomized designs are strongest
 - Reduces selection bias/confounding
 - Helps to understand if something works
 - Does not add much to why or how something works or doesn't work
- Study designs in the existing literature
 - Largely cross-sectional for built environment research
 - For example, Community Guide findings on urban form
 - Selection issues
- Work needs to be highly trans-disciplinary
 - Advances by initiatives such as ALR, HER

Working across numerous disciplines



"I need an interpreter. Send in someone who speaks jargon."

Research design issues

- Chronic diseases develop over years and decades
 - Maintaining an RCT may be impossible
- Need to expand the use of non-randomized designs
 - Quasi-experiments
 - Time-series
 - Repeated cross-sections
 - Multilevel designs

Research design issues

- How the literature is populated
 - UK NHS evidence hierarchy
 1. Experimental
 2. Quasi-experimental
 3. Controlled observational (e.g., cohort)
 4. Observational (no control)
 5. Expert opinion
 - Recent JAMA article examined
 - Meta-analyses, randomized controlled trials, cohort studies, case-control studies, case reports, nonsystematic reviews, decision analysis or cost-effectiveness analysis

Research on methods issues

- Increasing focus on external validity
 - Lesser attention on factors like intervention content, costs, staff needs, sustainability
- Need to better address a range of contextual issues
 - Defining context
 - Individual, organization, socio-cultural, political
 - May be especially important for less studied, high-risk groups

Other approaches

- Evaluability assessments
 - A “pre-evaluation”
 - Systematic process used to determine the feasibility of a program evaluation
 - Factors such as innovativeness, potential impact, reach, feasibility, generalizability, capacity of staff/organization
- Policy surveillance
 - Expansion from usual behavioral or disease surveillance
- Cost and cost-effectiveness evaluation

Recommendations

1. Improve the measurement of exposures and contextual issues

- Deciding on policy relevant variables
- Finding & defining evidence-based policy
- Defining the “active ingredients” of an EP intervention
 - Much more commonly seen for clinical disciplines (e.g., psychiatry)
- Identifying essential contextual factors
 - Multilevel designs may be useful in assessing context
 - Qualitative methods may triangulate with quantitative designs

2. Match the question with the design

- For many (most) policy questions, exposure cannot be randomly assigned
 - Tobacco and alcohol research may provide lessons
- Clarify the unit of analysis
 - Describe what makes sense based on the EP
 - Does available sample match with power calculation
- Consider evidence typology instead of hierarchy
- Look for designs that are iterative, circular not linear

Also see: Mercer SL, Devinney BJ, Fine LJ, Green LW, Dougherty D. Study designs for effectiveness and translation research identifying trade-offs. *Am J Prev Med.* 2007 Aug;33(2):139-154

2. Match the question with the design

- Match design with research question(s)
 - For example, decision rules on when Q-E designs are warranted
 - Too few communities for comparable controls
 - Contamination
 - Randomization pre-determines exposure; Q-E allow more community discretion
 - May be unethical or impractical to deny intervention to controls
 - Main threat is in selection and resulting need to deal with confounding (unmeasured confounders)

2. Match the question with the design

- A clear need for
 - Hypothesis testing
 - Hypothesis generation
- Make better use of “natural experiments” with more flexible designs
- Build CEA in designs
- Ecological frameworks may be useful

3. Propose designs that are strong in *both* internal and external validity

- Essential for dissemination of effective practices
 - Dissemination & implementation research
- Multicenter studies
- Frameworks such as RE-AIM may be useful
- In medicine, being reflected in “practical clinical trials”

4. Better address design issues for populations with health disparities

- Populations with health disparities
 - Low frequency
- Context often poorly understood
- Aggregating data
- Participatory methods may be useful
 - Realize the trade-offs

5. Develop more practice-driven evidence

- Defining the issues of importance to study
- Involving stakeholders in the process
 - Research networks like the PAPRN
- Some clues for what works in body of literature on CBPR, evaluability assessments
- Linkage of surveillance systems with research questions
 - Building policy surveillance
 - Promising efforts such as
 - CDC state physical activity data
 - NCI state cancer legislative database

Research-based practice *or* practice-based research

Research
(Evidence)

Practice



Thank you!!

