

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

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***Promising study designs for environmental and policy research and evaluation***

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The backdrop: critical gaps in knowledge or practice

There has been growing attention on how environmental and policy (EP) interventions can affect obesity and other chronic diseases. Such interventions are aimed at changing the physical and socio-political environments. Environmental and policy approaches are designed to provide opportunities, support, and cues to help people develop healthier behaviors. These approaches serve as an important complement to individual-level programs. For example, EP changes can benefit all people exposed to the environment rather than focusing on changing the behavior of one person at a time. Alterations in the physical or policy environment may directly affect behaviors (e.g., the price of tobacco influencing consumption) or they may alter social norms (e.g., smoking in public places). Importantly, EP approaches are oftentimes more permanent than many public health programs focused on individual-level behavior change.

Public policy, in the form of laws, guidelines, and regulations, has a profound effect on our daily lives and health status. Public health research provides a foundation of scientific evidence on which to build public policy. For example, in a smoke-free worksite, the clean indoor air is largely due to epidemiologic studies of secondhand smoke and lung cancer in nonsmokers.

Despite the enormous potential of EP approaches, several key gaps remain in our understanding of these interventions. Rich opportunities for EP research may take a number of forms including: 1) identifying relevant policies (surveillance); 2) understanding the determinants of establishing policy; 3) exploring the process of developing and establishing policy; and 4) assessing the outcomes of policy implementation. In these studies, the policy can be either the independent or dependent variable.

Gaps include issues related to study design and study execution. In mainstream epidemiology, the most rigorous design for hypothesis testing is the randomized controlled trial. However, a randomized design is seldom useful in EP research because the scientist cannot randomly assign exposure (e.g., the policy). Therefore, quasi-experimental designs (e.g., ecologic studies, time-series designs) are likely to be more useful for many policy-relevant issues. Policy research can still be sophisticated in the absence of randomized designs (e.g., the multilevel nature of policy—federal, state, local—leads to multilevel modeling strategies). There also has been a lack of focus on external validity of studies of childhood obesity. This implies more attention to factors such as intervention content, costs, staff needs, and sustainability. In addition, we need to better address a range of contextual issues such as Individual, organization, socio-cultural, and political variables. These factors may be especially important for less studied, high-risk groups.

Recommendations for most promising methods and research actions

Five recommendations are proposed:

*1. Improve the measurement of exposures and contextual issues*

To do so, we need to identify policy relevant variables, find and define evidence-based policy, define the “active ingredients” of an EP intervention, and identify essential contextual factors.

*2. Match the question with the design*

To do so, we need to clarify the unit of analysis, consider the use of an evidence typology instead of an evidence hierarchy, seek out designs that are iterative and circular (not linear), better match the design with research question(s), make better use of “natural experiments” with more flexible designs, and fund both hypothesis generating and hypothesis testing studies.

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

These issues are essential for dissemination of effective practices. To address external validation, we need to conduct more multicenter studies, apply frameworks such as RE-AIM, and learn from medicine, where “practical clinical trials” are being touted.

*4. Better address design issues for populations with health disparities*

To do so, we need to better understand context, seek out ways to aggregate data, and employ participatory methods.

*5. Develop more practice-driven evidence*

To do so, we need to better define the issues of importance to study, involve stakeholders in the process, develop cross-site research networks, seek clues in emerging areas such as participatory methods and evaluability assessments, and better link surveillance systems with research questions.

Key references

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