

A Framework for Physical Activity Policy Research

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Background: Although policy approaches are traditionally an important element of public health efforts to address major health problems, public health policy around physical activity remains poorly defined and developed. *Methods:* After extensive literature searches and reviews of policy frameworks developed for other public health issues such as tobacco control and injury prevention, the Centers for Disease Control and Prevention hosted a series of workshops and discussions on physical activity policy. *Results:* A simple model describing relationships among policy, the environment, behavior, and health was developed, a framework for organizing and conceptualizing policy interventions was described, and priorities for public health efforts to promote physical activity were proposed. *Conclusions:* An expanded focus on physical activity policy interventions is warranted, and such efforts can complement physical activity promotion efforts at other levels. The addition of researchers with expertise in the policy sciences will enhance the work of existing multidisciplinary teams.

Key Words: policy sciences, physical inactivity, public health

Policy and environmental interventions have long been an important part of the public health approach to health promotion and disease prevention.^{1,2} John Snow's proverbial removal of the Broad Street pump handle could be considered an illustration of both. His decision to remove the pump handle was an executive policy decision; its removal an effective environmental intervention. Fueled by a number of factors such as the Surgeon General's Report on Physical Activity and Health (SGR), and recent findings of the Guide to Community Preventive Services (Community Guide), environmental interventions have received a growing amount of attention by public health practitioners and the physical activity research community.^{3,4} Both the SGR and the Community Guide confirm that the factors contributing to low levels of physical activity are myriad and that multiple strategies, implemented at multiple levels and with the help of multiple disciplines, are needed to address the problem. The socio-ecological model has served as a useful organizing schema

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for much of this environmental research.⁵⁻⁸ As this model and others suggest, all links in the casual chain should be explored and policies are important factors in this causal chain. In traditional public health parlance, policies can be conceived as farther “upstream” than environmental interventions, generally one step earlier in the causal chain. While the research and practice base for environmental interventions to promote physical activity is robust and growing, public health policy around physical activity remains poorly defined and developed.⁹⁻¹¹ This paper describes efforts by members of the Physical Activity and Health Branch (PAHB) at CDC to create an organizing framework for physical activity policy research and to stimulate work in the area.

The primary focus of the present paper is on policies that influence aspects of the built environment that are then assumed to exert some influence on behavior and subsequently health. It is also recognized that policies control and influence behaviors at many levels, with some policies having an immediate or direct effect while others have an indirect effect, mediated through a number of other factors. For instance, changes in national transportation funding to favor public transit may eventually result in more utilitarian physical activity such as walking from the bus stop to work, and current lending policies may encourage people to buy new homes in the suburbs rather than rehabilitating older homes in “walking friendly” urban settings. Changes in local policies, such as a school system’s decision to require physical education or to open school grounds to the public, may have more immediate and direct effects on physical activity.

Methods and Results

This paper is not a consensus statement on physical activity policies; rather it describes a physical activity policy research framework and agenda for applied policy research developed through a series of workshops, collaborative discussions, review of the literature, and review of other policy research frameworks.¹²⁻¹⁶ Methods and results are presented together because this was an interactive and iterative process. Included in the workshops and discussions were experts and stakeholders in a variety of disciplines that shared a mutual interest in how environmental conditions and the policies that create them serve to promote or discourage physical activity or for whom the positive aspects of activity enhancing environments would also contribute to their objectives. Participants included experts from urban planning, architecture, transportation, parks, recreation and public lands, health care, public health and physical activity, as well as key partners such as representatives from the Robert Wood Johnson Foundation and the National Institutes of Health.

Three workshops were conducted. The first focused on transportation, planning, and community design, and the second on economics, schools, insurance, safety, and social capital. In order to develop an initial research agenda and to help prioritize the many important policy studies proposed by workshop participants, criteria for ranking policy studies were developed during the third workshop.

Unfortunately “policy,” like art, is generally understood but difficult to define, and attempts at definition often revealed the various parties to be conceiving of quite different concepts. Therefore, a general conceptual description of policy research and a working definition of policy was developed.

A Definition and Conceptualization of Policy and Policy Research

Policy provides an organizing structure and guidance for collective and individual behavior. It may be defined as legislative or regulatory action taken by federal, state, city, or local governments, government agencies, or nongovernmental organizations such as schools or corporations. Policy includes formal and informal rules and design standards that may be explicit or implicit.

Policy may be conceptualized at three levels reflecting social and political commitment:

1. Formal written codes, regulations, or decisions bearing legal authority. Legislation and zoning are examples of this type of policy.
2. Written standards that guide choices. It is possible that these standards may be unwritten, however, their implementation is usually accompanied by a written statement, explanation, or decision. Guidelines suggesting acreage requirements for selecting new school construction sites are an example of written standards that guide but do not mandate policy. Also falling under this level would be professional practice, i.e., the standard practices of professions like planning and engineering that are entrenched but usually unchallenged and can have a significant impact on policy.
3. Unwritten social norms that influence behavior such as the highway patrol's unwritten tradition of allowing speeds up to 15 miles per hour above the posted limit, a manager's tacit acceptance of employees taking additional time at lunch for exercise, or social disapproval of women in some cultures taking part in physical activity in public. This third category was considered to be part of culture rather than explicit policy and not a primary focus of initial physical activity policy research.

Because of the relative infancy of physical activity policy research we also decided to define the types of studies believed to be most relevant to public health. Such studies are ones that focus on identifying relevant policies, the determinants of establishing policy; the process of developing and implementing policy, and the outcomes of policies once they are implemented.

In policy research, either the dependent *or* independent variable will be a policy or policies. It is important to study how policies come to be formed, what determines if they are applied or enforced, as well as their effects once they are in place. Applying this criterion can assist in focusing attention specifically on the determinants and outcomes of policy and on the process of implementing policy.

Figure 1 depicts an implicit causal sequence from the determinants of policy (A), policy's direct effects on physical activity (C[^]), and its effect on physical activity through its effects on the environment (C). C[^] also recognizes that policy can influence physical activity directly and indirectly through multiple mechanisms. For instance, policies can affect incentives for physical activity such as lower insurance premiums for active people. The link between health and physical activity (D-E) has long been established³ and the links between environment and physical activity (C-D) are established and growing.^{17,18} In this schema we broadly interpret "environment" to include the social, cultural, physical (built and natural),

and communications environments. Policy research and intervention strategies for physical activity have only become relevant for public health practice with the clear establishment of a strong science base linking physical activity to specific health outcomes and demonstrating efficacy of community interventions to promote physical activity. Therefore, our emphasis has moved from the relationships at the bottom of Figure 1 to those at the top. Physical activity policy research is related to but distinct from research activities that have a primary focus on identifying environmental, social, or individual correlates of participation in physical activity or the evaluation of interventions where physical activity or disease endpoints are the outcomes (Levels C-E).

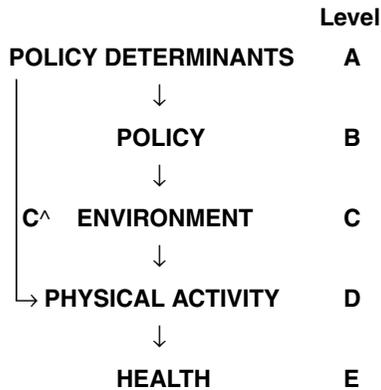


Figure 1—Presumptive model of how policy moves from formulation to implementation and thereby influencing physical activity directly or through the environment.

Figure 1 was developed to further our understanding of the determinants, processes, and impacts of new or existing policy on physical activity. It is built upon existing research on physical activity determinants, correlates, and interventions and syntheses of research such as that reviewed in the Guide to Community Preventive Services for Physical Activity (levels C and D).^{4, 17, 18} Policy research is also guided by the practical experience of community leaders and public health practitioners. Physical activity policy research is meant to provide information that can help shape public policy and should focus on the issues that are most likely to influence *population levels* of physical activity.

A conceptual framework was developed to better visualize, categorize, and understand our research and programmatic efforts in physical activity policy. After a review of the literature, discussion with policy researchers in other fields, and review of other policy frameworks, a policy framework with three axes was developed. As illustrated in Figure 2, the important components or aspects of policy are found on the vertical axis and the settings in which policy apply are defined by the sector and levels axes.

As noted above, in order to develop an initial research agenda and to help prioritize the many important policy studies proposed by workshop participants, criteria for ranking policy studies were developed during the third workshop. Criteria for ranking policies are shown in Table 1.

Physical Activity Policy Framework

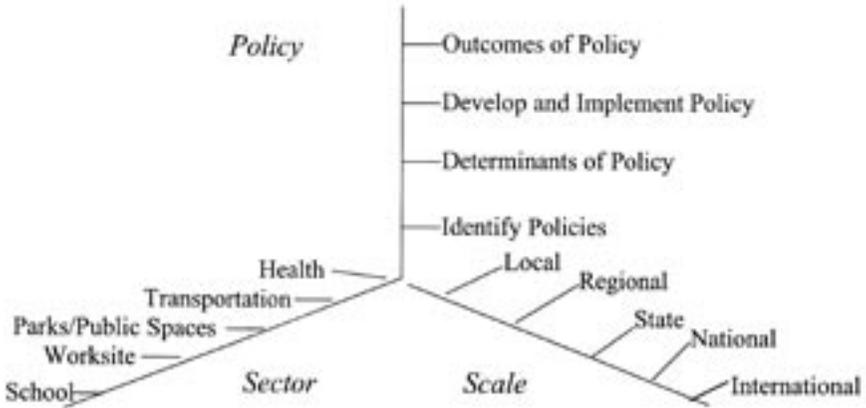


Figure 2—A conceptual framework for public policy relevant to physical activity

Table 1 Criteria for Ranking Physical Activity Policy Topics

- Demonstrated efficacy of intervention(s) associated with a policy
- Simple to understand
- Reasonable/face validity
- Non-physical activity outcomes already known
- Benefits outweigh the costs
- Reach a large population
- Population impact
- Low levels of public opposition or high levels of support

These criteria were used to narrow the enormous range of potential policy topics related to physical activity to broad high priority areas for physical activity policy research. The committee then ranked the categories. Listed below are the top ten categories along with illustrative policy research questions.

Workplace: Do policies that allow time off for physical activity or subsidized or free access to facilities or programs result in a more active workforce? Do parking subsidies discourage walking to work or transit use?

Economics: Do health insurance policies that provide rebates or incentives to seniors result in more active seniors? Do transit fare discounts result in a net increase in physical activity?

School: Does the “No Child Left Behind” legislation result in changes in the quality of, or the number of, students that participate in physical education classes?

Recreation, Parks, and Trails: Do recreation authority decisions on park locations result in equitable access across the community? Do shared use trails result in a net increase in users and a net increase in energy expenditure compared to single use trails? How do investments in park infrastructure and maintenance influence levels of use?

Land Use and Community Design: Do zoning ordinances that require sidewalks or mixed use result in a net increase in physical activity? Did federal legislation such as the Transportation Equity Act (T-21) result in more pedestrian and cycling infrastructure and in increased physical activity?

Crime and Safety: Do public safety programs such as “Crime Prevention Through Environmental Design” (CPTED) result in increased or decreased utilitarian or leisure time physical activity in the target area?

Active Commute to School: How do rules regulating where schools are located affect levels of walking to school and physical activity before, during, and after school? Does “Safe Routes to School” legislation lead to increased numbers of walk to school programs?

Public Spaces: How do regulations on public use influence physical activity (e.g., sidewalk vendors, prohibition of skateboards, allowing street side cafes, presence of amenities such as benches, and public art)? How do liability issues influence public access to school grounds and recreational facilities?

Active Commute to Work: How do transportation infrastructure investments influence commute mode choice? Do transit policies allowing bicycles on buses and trains result in net increases in ridership? Can policies on parking be manipulated to increase walking and cycling to work?

Neighborhood Walkability: Do traffic calming policies result in more pedestrians? Do zoning requirements for sidewalks result in more walking? How do state or regional long range development plans influence local walkability?

While these examples generally relate to determining the effects of physical activity related policies, it is important to note that much work also remains in identifying which policies have an influence on physical activity and in better understanding how policies are made and implemented.^{12-14, 19} Because this list was still far too broad and each area could absorb the resources available to our workgroup, additional consideration was given to areas and types of research appropriate for our internal priorities and those more appropriate for external or collaborative work. From these discussions, two high priority topics for internal CDC collaborative research were identified. The first priority is to develop better tools to assess the effects of policies and to guide policy development, and prioritize policy choices such as health impact assessment, cost effectiveness studies, and establishing policy surveillance systems and methods for rating their effectiveness. The second priority is to determine the effects of policies relating to school siting and physical activity in and around schools and cataloging and synthesizing model policies and relating them to evidence-based effective intervention strategies such as those recommended by the Community Guide. Recommended environmental

and policy approaches in the Community Guide include: creation and or enhanced access for physical activity; community-scale and street-scale urban design and land use policies and practices.

Collaborative Physical Activity Policy Research

In collaboration with various partners, PAHB has begun initial physical activity policy research and brief descriptions are provided here. In Utah, land use ordinances, laws, and regulations that promote walkability and physical activity were inventoried for all towns. Results of the survey have been used by the Utah Department of Health to focus their efforts to promote physical activity through community design and a follow-up survey is tracking changes in the prevalence of such policies. From Figure 2, this project could be listed under the Community sector, at the state and local levels, and crossing several research types. A practical example of efforts to understand how policy is developed and implemented is our collaboration with the Regional Plan Association of New York. As part of their Active Communities Program we jointly developed language and rationale for community design that promotes walking, bicycling, and other forms of physical activity for inclusion in the state of New Jersey's long range development plan.²⁰ While this plan is officially "advisory" it has the indirect effect of policy—an element in the approval of regional and local development plans is their compatibility with the state long range plan. Examples of ongoing policy research that could be classified in Figure 2 as policy outcomes are two health impact assessments (HIA). One is exploring the health impacts of proposed improvements in transportation and pedestrian amenities along an urban highway that has high volumes of traffic and pedestrians, along with a large number of retail establishments.²¹ The second HIA is exploring the potential health impacts of "kids walk to school"-type programs. The goal is to advance the methodology of HIA to the point that they become useful tools for guiding policy development. Similar efforts are focused on improving the methodology of cost effectiveness studies with an emphasis on a comparison of interventions recommended by the Community Guide.

Examples of PAHB's efforts to expand the base of physical activity policy research include collaboration with the World Health Organization to develop a framework for physical activity policy.²² This framework is intended as a practical organizing scheme to help public health and related physical activity researchers to develop national physical activity policy agendas. This comprehensive physical activity policy framework is a four-step process developed in conjunction with the WHO Global Strategy for Diet, Physical Activity and Health. Steps include: making the case for physical activity as an important public health issue; defining the country-specific situations with respect to physical activity, non-communicable diseases, determinants and barriers and target populations; identifying effective strategies and interventions and the settings where they may be applied; implementing interventions using a systematic approach characterized by elements drawn from successful programs from around the world; and incorporating an appropriate level and type of evaluation into each step. Formal, country level "consultations" on developing national physical activity policy agendas are being cosponsored by CDC and WHO.²³ To date, consultations have been conducted in Russia and Chile. These international efforts serve as policy laboratories, often providing the opportunity

for a much wider range and degree of physical activity related policy analysis. For instance, we are collaborating on an evaluation of the effects on physical activity of extensive policy and infrastructure change in Bogotá, Columbia. Finally, at the national level, to stimulate additional physical activity policy research the Physical Activity Policy Research Network (PAPRN) was formed. Initial funding was given to five academic research centers currently involved in physical activity research. PAPRN's first policy research efforts are to document and determine the effects of policies that affect physical activity of students and community members in and around schools, and subsequent funds have been secured to develop policy case studies of walking trails in five communities,

Conclusion

CDC and public health practitioners have long had an interest in how policy influences a variety of factors associated with health. Zoning regulations were first promulgated to segregate noxious industrial pollution from residential neighborhoods.²⁴ Included in the core functions of public health are responsibilities to “develop policies and plans, enforce laws and regulations, communicate with and inform the public and evaluate effectiveness efforts.”²¹ As described earlier, the activities that fall under the policy spectrum range from laws and regulations to formal and informal rules and social norms. The foundation for regulatory strategies to promote and protect health for infectious and noxious agents is well established, with accepted public health responsibilities. With the growing burden of chronic disease, CDC is now exploring how regulatory and policy actions of others serve to promote or discourage chronic diseases and their associated risk factors. A policy framework is important for a variety of reasons, among which is its organizing and heuristic effects. Much like the periodic table, a policy framework allows policies to be organized along related dimensions. Gaps in the framework can be identified and new policies that can be fit into the framework may receive “reflected” legitimacy by association with related policies that have proven effective or popular.

Addressing the many factors that continue to contribute to national and international levels of physical activity will require joint efforts to develop, implement, and maintain effective “upstream” policy interventions. CDC’s emerging policy research agenda will continue to coordinate and collaborate with important partners such as the National Institutes of Health, the Robert Wood Johnson Foundation-sponsored Active Living Research program, and the World Health Organization to increase the amount and quality of physical activity policy research. Just as effective public health interventions require multiple partners across multiple sectors, physical activity policy research needs an expanded base of researchers. While those with a stake in physical activity are natural partners in this work, so are those for whom the positive benefits of increased physical activity add to the decision balance toward their objectives. (e.g., urban planners, and those promoting mass transit, parks, and open space). PAHB’s initial efforts in policy research have focused on applied policy research relying on existing behavioral sciences models such as the socio-ecological model.⁵⁻⁷ Researchers with expertise in the policy sciences have a variety of schema for organizing and researching the process of policy making and evaluating policy outcomes. These heuristics, frameworks, models, and theories

should be further explored, and experts in policy studies are invited to join the active living and public health research communities.^{15, 16}

A popular model of policy development developed by Richmond and Kotelchuck describes three interrelated factors that are thought to influence the development, implementation, and outcomes of policy: the knowledge base (research/evidence), social strategy (effective interventions/solutions) and political will.²⁵ Recent studies from Europe suggest that research evidence can be an effective facilitator of policy implementation when political will is low.²⁵ When political will is high, evidence or effective interventions are less important to policy outcomes. The growing body of empirical evidence and its synthesis through efforts such as the Community Guide bolster the knowledge base and suggest effective social strategies/interventions. It is our goal to identify and understand effective policy solutions and provide this evidence and these strategies to those responsible for fostering political will.

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