Creating a Robust Public Health Infrastructure for Physical Activity Promotion


Abstract: The essential role of physical activity both as an independent protective factor against numerous common chronic diseases and as a means to maintain a healthy weight is gaining increasing scientific recognition. Although the science of physical activity promotion is advancing rapidly, the practice of promoting physical activity at a population level is in its infancy. The virtual absence of a public health practice infrastructure for the promotion of physical activity at the local level presents a critical challenge to control policy for chronic disease, and particularly obesity. To translate the increasing evidence of the value of physical activity into practice will require systemic, multilevel, and multisectoral intervention approaches that build individual capability and organizational capacity for behavior change, create new social norms, and promote policy and environmental changes that support higher levels of energy expenditure across the population. This paper highlights societal changes contributing to inactivity; describes the evolution and current status of population-based public health physical activity promotion efforts in research and practice settings; suggests strategies for engaging decision makers, stakeholders, and the general public in building the necessary infrastructure to effectively promote physical activity; and identifies specific recommendations to spur the creation of a robust public health infrastructure for physical activity.

Introduction

Physical inactivity is an important contributor to the risk profiles for many chronic diseases and is an independent primary risk factor for cardiovascular disease, similar to smoking and hyperlipidemia in importance. Insufficient physical activity also contributes to the risk of obesity, type 2 diabetes, osteoporosis, breast and colon cancer, and other chronic conditions. In fact, many studies implicate reduction in energy expenditure through increasing occupational sedentariness and growing reliance on labor-saving devices, motorized transportation, and sedentary entertainment, as key drivers of the chronic disease epidemic during the past several decades. Leisure-time physical activity levels, on the other hand, have remained fairly constant during this period.

The costs of the chronic disease epidemic are soaring, in dollars, health, and premature deaths. Physical inactivity has become so commonplace that the costs imposed on society by people with sedentary lifestyles may be greater than those imposed by smokers and heavy drinkers, and are similar to and likely independent of those imposed by overweight and obesity. Regular activity, even in late middle age, is linked to substantially decreased healthcare costs, and may ameliorate the adverse health consequences of less severe levels of obesity.

The Opportunity and Challenge of Physical Activity Promotion

The cornerstone of health promotion, embodied in successful tobacco control policy efforts led by public health, is making the healthy choices the easy choices and the unhealthy choices increasingly difficult. Consistent with its roots and Institute of Medicine (IOM)–defined role of ensuring the conditions necessary for good health, public health is positioned to take the lead in instigating the structural changes necessary to restore adequate population levels of physical activity. Urban blight, white flight, inexpensive suburban housing, and public policy favoring motorized over nonmotorized vehicle use are key drivers of physical inactivity and must be addressed if the opportunity to promote physical activity is to be realized.
transport and private transportation over mass transit, have created hazardous and unappealing residential areas. Walking to school and playing outdoors are no longer the childhood norm. Several conditions have, in fact, been met that generally precipitate government intervention to change personal behavior: evidence of a commercial “market failure,” such as lack of rationality (exploitative advertising to children), and externalities, described as production or consumption/utilization of sedentary entertainment and transportation imposes external costs on society, whereas internal costs borne by the producers/consumers are proportionately less than the benefits they gain; and inequities in distribution of public goods and services, such as fewer recreational facilities and poorer sidewalk and park maintenance in medically underserved communities. Ethnic disparities in sedentariness and chronic disease linked to these adverse environmental conditions provide another compelling impetus for public health leadership in this arena.

The preventive and therapeutic benefits of physical activity are well established. Physical fitness is an independent protective factor against all-cause and cardiovascular disease mortality, and the metabolic syndrome. Recent evidence suggests that physical activity may also protect mental and physical agility, improve sleep quality, elevate mood, improve affect and energy, enhance sexual enjoyment, serve as a relative appetite suppressant, and decrease preference for highly sweetened beverages. Physical activity is important in weight loss, especially for long-term maintenance, and in the prevention of weight gain. In addition, physical activity contributes substantively to cardiac and musculoskeletal injury rehabilitation and to long-term breast cancer and depression treatment.

Thus, increasing physical activity is essential to advancing the public’s health. There is considerable opportunity for even small increases in average energy expenditure to have a large positive population impact.

While the role of individual choice in, and personal/familial responsibility for health-constructive behavior change is undisputed, individual motivation and volition to be physically active are increasingly difficult to sustain in a society characterized by a proliferation of step- and labor-saving devices, along with fragmented public transportation and aggressive and pervasive commercial marketing of seductive sedentary entertainment and transportation. Decreasing levels of fitness, accompanied by increasing rates of obesity, are associated with greater perceived exertion at modest exercise intensities, further deterring energy expenditure. In addition, conserving energy is likely evolutionarily programmed, in that the high energy expenditure levels necessary to escape predators and find food tilted energy imbalance toward starvation for most of human history.

Inadequacy of Current Policy Efforts to Promote Physical Activity

Current U.S. tobacco control policy has been facilitated by hundreds of epidemiologic and corroborative laboratory studies over more than four decades that have made a clear connection between smoking and many cancers, heart diseases, and other health problems. Unlike nutrition or physical activity, which are necessary parts of daily life, tobacco is a nonessential, addictive substance. Furthermore, most smokers were habituated when they were minors and, in theory, legally barred from purchasing or using tobacco. In addition, smoking affected nonusers by subjecting them to secondhand smoke. The harm and discomfort to nonsmokers caused by this involuntary exposure was strategically leveraged in enlisting public support and outrage.

These conditions have not been met to the same degree for poor nutrition and sedentary lifestyle, although the ultimate societal impact may be comparable to the now well-documented toll of tobacco use. Attacks on tobacco, a product with no social value, garner a very different public response than do attacks on the multiple industries that have arisen to address societal needs (e.g., the movement of women into the workforce), produce goods and services used daily by most of the population, and may readily modify their offerings to assist in achieving social goals. Unlike tobacco, there are no consensus biomarkers that accurately capture physical activity participation. In addition, policy solutions are not as politically or logistically straightforward. Intervening to actively engage the majority in a protective behavior in a democratic and individualistic society is considerably more complex than intervening to passively prohibit a health-compromising behavior in a minority.

Thus, policy and environmental physical activity promotion strategies, while a burgeoning area of interest to policymakers, are still in an early phase of development. Individual-level intervention alone, such as one-to-one or group nutrition counseling or exercise instruction, has been the target of most chronic disease control efforts to date, and its limitations are increasingly apparent. Changing environments by influencing organizational practice and legislation has yet to permeate health policy in a way that is likely to engage the majority of Americans in regular physical activity.

Physical activity promotion policies, to date, have focused nearly exclusively on specifying school physical education (PE) requirements. As a primary approach, this is of questionable value because PE requirements already exist in 48 states and the District of Columbia. However, they are rarely enforced or sufficiently funded because of competition for students’ time, funding, and other priorities.
which results from government priorities on academic achievement. For example, in 1997 only 29% of adolescents participated in daily PE.

Promising Avenues for Population-Based Physical Activity Promotion

Evidence is mounting that built environmental attributes influence physical activity and weight status. Numerous studies have demonstrated that adults walk/cycle more for transportation, and weigh less, in “walkable” communities, characterized by mixed land use, connected streets, and higher density, than in sprawling suburbs. Adults and youth who live near aesthetically appealing recreational facilities engage in more physical activity. An evaluation of programs to increase “pedestrian friendliness” (e.g., sidewalk construction, traffic calming) supported their positive influence on children’s active commuting.

“Active living” initiatives are under exploration by federal, state, and local governments. Motivations include interest in reducing traffic congestion, preserving open space, enhancing quality of life, and, sometimes, improving air quality and promoting physical activity. Initiatives include developing parks, urban redevelopment, and planning new development to promote pedestrian and bicycling activity, and “smart growth” (e.g., “green space” and Brownfield development, density-promoting land use). The most developed of the initiatives, Safe Routes to Schools, included $1 billion in the 2005 federal highway bill for distribution to states to facilitate bicycle and pedestrian commuting.

However, the field of public health is missing opportunities to champion and accelerate such efforts in the multiple sectors that influence physical activity at the population level. Physical activity may be effectively fostered through community-scale urban design and government land use regulations, policies, and practices, including zoning, building codes, and fiscal incentives. The pace of development is rapid, often with little opposition to walkable community construction and rising demand for and receptivity to such residential areas on the parts of urban planners and consumers. School siting presents another development opportunity that may be more feasible in underserved communities than most “smart growth.” These “windows of opportunity” for coordination between public health and urban planning are fleeting. Once communities are built, reconfiguring them is expensive.

Considerations for Advocacy of Physical Activity Promotion Policy

A number of policy analysts have proposed that lessons from the public health campaign against the tobacco industry inform antiobesity efforts. One approach frames the battle against obesity primarily as public health versus the food industry. The new focus on physical activity promotion by food-industry public relations efforts has created a competitive backlash by public health nutrition advocacy groups. Many assert that these efforts are intended to deflect attention from the industry’s role in the obesity epidemic’s genesis and deter policy solutions involving increased regulation or taxation. These groups argue that healthy eating is more important than physical activity in stemming obesity, undermining (perhaps inadvertently) the importance of physical activity. Bombarding the food industry as the cause of the obesity epidemic, however, deflects attention from physical activity—restricting and sedentary behavior-promoting consequences of other industries, such as the highway, oil, tire, and automobile manufacturers/retailers; television/film industries; video game manufacturers/distributors; and spectator sports franchises. Also, aligning physical activity promotion too closely with obesity control advocacy may be a liability, risking under-appreciation of its full spectrum of benefits and the ineffectiveness of weight loss as a motivator of physical activity engagement in many sociodemographic groups.

Organizing advocacy to promote physical activity is quite complex, however. Advocacy for substance control organizes those with similar interests (health, safety) around preventing the use of a single product. On the other hand, convergent and even competing agendas are sometimes directed at policies to create opportunities for physical activity. A “zero sum gain” attitude explains some of the inertia: concessions to walkable community design increase development costs, investment in fitness staff/equipment channels funds away from behavioral interventions, investment in PE at school may be seen as a diversion of resources from academic missions, and personal expenditures of time and money in health club memberships or lunchtime exercise (necessary to translate workplace incentives into activity) compete with health/beauty treatments and other self-care services, with more immediate gratification for the latter. Consequently, efforts to focus diverse interests on a unifying agenda to advance population physical activity have been difficult and slow to evolve. Because large-scale expansion of locations to engage in physical activity such as bike paths/lanes, parks, and playgrounds will require substantial public funding, broad-based policy advocacy efforts are critical to establishing a sustainable base of support.

Building advocacy for public investment in physical activity will likely require multiple leverage points using such tools as social marketing. Opportunism might help as well with the greatest current challenge: to leverage public opinion in support of community versus individual solutions to address childhood obesity. This would parallel the successful effort against second-hand smoke. Another promising strategy advanced by
advocates is targeting educators, parent groups, and policymakers to highlight the growing evidence that physical education can improve academic performance.\textsuperscript{116} An advocacy tool used in successfully driving passage of aggressive school nutrition policy in California is aggregating student fitness data by assembly district to engage legislators.\textsuperscript{116}

As organizational leadership is critical in driving change—one decision by an “early adopter” may influence the environments of thousands—advocates may also target employers, documenting the healthcare and productivity savings from investments in workplace physical activity integration.\textsuperscript{25,117} Leaders at the forefront of change in this arena often have a personal stake in health promotion, including the Los Angeles school superintendent helping to pass a districtwide soda ban in 2002, after being diagnosed with type 2 diabetes,\textsuperscript{118} President Clinton’s partnering with the American Heart Association after his myocardial infarction to engage the beverage industry in voluntarily withdrawing sodas from schools,\textsuperscript{119} and the Arkansas governor’s weight loss after being diagnosed with diabetes, and the Arkansas House Speaker’s myocardial infarction, which, combined, precipitated legislation to create healthy school environments.\textsuperscript{120,121} Last, exposing inequities in distribution of public recreation “goods” may galvanize grassroots advocacy in low-income communities, as has supermarket and fast food franchise maldistribution.\textsuperscript{122–126}

Existing Infrastructure for Physical Activity Promotion

The public health practice infrastructure needed to translate, support, and disseminate research findings, and to design, organize and deliver services related to physical activity, especially at the local level, is undeveloped and untested. Characteristics of this rudimentary infrastructure are described below.

Existing Infrastructure Within Public Health Practice

Public health priorities at the state and local level are driven by a variety of factors, including categorical funding from the Centers for Disease Control and Prevention (CDC) or regulatory requirements for health protection. Physical activity promotion did not explicitly appear among the core functions of public health until the introduction of the Health Security Act of 1993, as one of a number of health risks about which to educate the public.\textsuperscript{127} Federal attention to physical activity promotion through organized public health at the national level was primarily channeled through the President’s Council on Physical Fitness and the 1995 Surgeon General’s Physical Activity and Health recommendation,\textsuperscript{128} which couched physical activity as an issue of individual responsibility. The establishment of a physical activity unit at the CDC in 1996 marked an elevation in priority, helping both to legitimize parallel structural foci at state and local health departments and to broaden the debate to include aspects of the physical and social environments.

As demand has grown, physical activity promotion has often been relegated by default to nutrition, tobacco control, or health education staff in public health departments and community organizations, with few additional resources and highly variable levels of interest or training. These staff sometimes view physical activity promotion as competition for scarce resources. In addition, the cultures surrounding nutrition and physical activity promotion are very different, with values that sometimes conflict.

Physical activity promotion programs funded by the CDC, at varying stages of development, exist in at least 28 state health departments.\textsuperscript{129} The California Department of Health Services, for example, has five dedicated positions (two filled, none state-funded) to assist in addressing the physical activity needs of the state’s 35 million residents (Susan Foerster, California Department of Health Services, personal communication, April 3, 2006). Very few dedicated positions exist in local health departments. No professional standards have been developed for recruitment or training purposes for these positions. For example, in a 1999 local public health agency infrastructure survey, respondents did not identify an occupational classification for exercise scientists or physical activity promotion specialists. In comparison, means of three to five full-time equivalents (FTEs) were reported for related positions in nutrition, occupational safety and health, policy analysis, and health education.

Existing Infrastructure Within Public Health Education

In schools of public health and public health master’s degree programs in medical schools or university health sciences departments, few public health physical activity promotion course offerings exist and almost none are mandatory. Those in existence are generally electives taught by the small number of faculty with related research interests. Of the 35 accredited schools of public health, only two identify exercise science as a program area or department, compared with 13 identifying nutrition as a program area.

Evolution of Physical Activity Promotion Field

Physical activity promotion research is dominated by scientists trained in fields related to, but outside of public health, with different traditional missions and foci, such as exercise physiology and kinesiology (optimizing athletic performance), physical therapy (reha-
bilitation of injured patients), psychology (understanding and changing individual behavior), physical education (increasing sports knowledge and skills), and sports medicine (treatment of injured athletes or elderly patients). Scientists who are runners have often preferentially studied and established the benefits of aerobic activity at the expense of attention to resistance training or flexibility enhancement. Physicians have tended to “medicalize” physical activity promotion with disease risk admonitions and noninteractive/prescriptive exercise counseling. Public health recommendations developed by this set of professionals predate more contemporary knowledge of the psychosocial correlates and determinants of physical activity. Thus, they assume many characteristics, such as motivation for physical activity, that do not generalize well to the entire population. For example, the 1975 “vigorous exercise” recommendation from the American College of Sports Medicine was over-generalized to become a public health message, and little population-level change resulted.8

However, change is evident as public health professionals become more engaged in physical activity research and practice. The 1995 “moderate physical activity” recommendations were designed to be more relevant to public health.139 New collaborators have brought additional perspectives—urban planners, transportation professionals, recreation and leisure researchers, and a variety of behavioral scientists have created the broader concept of “active living” that promotes physical activity for multiple purposes.131,132

Recently, the National Society of Physical Activity Practitioners in Public Health was formed to further coalescence around effective population physical activity promotion. It is still noteworthy, though, that two mid-2006 reviews of new challenges in strengthening the public health workforce133 and transforming governmental public health134 did not mention physical activity promotion at all.

Knowledge About Physical Activity Promotion Is Advancing Rapidly

The science of population-based physical activity promotion is early in its development, but advancing rapidly.60,135,136 A systematic review of community interventions to increase physical activity137 recommended six: two informational approaches (community-wide campaigns and point-of-decision prompts to encourage use of stairs), three behavioral and social approaches (school-based physical education, social support interventions in community settings, and individually adapted health behavior change programs), and one environmental/policy approach (creation of or enhanced access to places for physical activity, combined with informative outreach). However, the evidence base for population approaches from the public health literature is limited by the predominantly individual-level interventions and affluent white participants of most funded research published to date. Emerging areas of research in physical activity promotion include the following:

- Identifying physical and built environmental attributes associated with active and sedentary behavior and designing and evaluating changes which might increase activity.131,138–141
- Identifying physical activity facilitators and barriers within the school environment and intervening,142–145 primarily through PE and other structurally integrated physical activity participation.146–149
- Changing the workplace to incorporate and support physical activity,150–155 particularly to influence the professional and personal behaviors of health professionals.154–156
- Integrating physical activity into the structure of a broader range of community-based organizations.18,157–159
- Examining media influences on physical activity and policy implications of these findings.73,160,161
- Identifying barriers to and facilitators of physical activity promotion within the healthcare environment, and designing appropriate interventions.162–165
- Implementing and evaluating state and local community-level policy and environmental change initiatives to increase physical activity levels population-wide, including cultivating “active living” leadership in the public sector.15,131,136,166–170
- Crafting, shaping and evaluating the influence of expert recommendations, reports, and guidelines, such as infusing the concepts of energy balance, energy expenditure, and fitness promotion into the nutrition dialogue in the U.S. Department of Agriculture (USDA) Dietary Guidelines.171 Developing the IOM’s childhood obesity report,2 and commissioning the IOM’s scientific review of the diffusion of obesity control approaches.120

Creating A Robust Infrastructure for Physical Activity Promotion

A public health infrastructure sufficiently robust to anchor and sustain effective physical activity promotion intervention must be developed. Public health resources are typically constrained, with further constriction evident in recent cuts in the federal block grants that have been used to support physical activity programs. Thus, reallocation of existing resources, as well as identification of new funding streams, will be necessary. We believe that the following recommendations will lead to the development of a lasting and meaningful public health infrastructure for physical activity.

Educational Recommendations

1. Federal and private funders should support the design and implementation of educational curric-
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<th>Alcohol</th>
<th>Nutrition</th>
<th>Physical activity</th>
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<td>Individual solutions</td>
<td>Cessation programs</td>
<td>Educate drivers and encourage defensive driving</td>
<td>Educate gun users School-based education Alternative youth programs</td>
<td>Educate drinkers and future drinkers Designated-driver programs</td>
<td>Public education School-based programs</td>
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<td>Environmental solutions</td>
<td>Excise taxes Smoking bans Enforce access laws Marketing restrictions/regulation Liability Federal funding agency mandates for smoke-free workplaces</td>
<td>Redesign cars Redesign roads Liability</td>
<td>Reduce access to guns Restrict types of guns that can be manufactured Liability “Smart” personalized guns (bio-recognition of owner)</td>
<td>Reduce access to alcohol, especially to minors Restrict marketing Excise taxes Liability</td>
<td>Nutrition labeling Zoning restrictions Marketing restrictions Excise taxes on junk food (“external costs”) Restricted vending in schools Portion control Access to healthy food in all communities Liability Federal funding agency mandates for healthy/fit workplaces</td>
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PA, physical activity.
1. Federal and state public health agencies should develop policy change in the long term. The CDC-funded “Physical Activity and Public Health” course offered annually for recruitment, training, and continuing education may serve as a model. The development of undergraduate and graduate courses related to physical activity should also be undertaken for dissemination to and promotion within the wide variety of fields relevant to physical activity policy and systems, such as communications, organizational development and management, education, public policy, law, youth development, exercise science, urban planning, architecture, and public administration. Finally, these funding agencies should create scholarships and other financial support mechanisms for targeted recruitment of students and professionals from sociodemographic groups experiencing low prevalence of physical activity and high prevalence of sedentary behavior, such as from ethnic minority, low-income, Southern regional, and rural backgrounds.

2. Public health accrediting bodies and professional organizations should develop professional standards and certification requirements for physical activity promotion specialists, including core competencies in health promotion, exercise science, policy analysis, organizational change management, injury prevention, and urban design.

Organizational and Workforce Recommendations

1. Federal and state public health agencies should institutionalize physical activity promotion within local health departments, preferably as a separate program area from nutrition. Dissemination and evaluation of policy and environmental “push” strategies integrating “hard-to-avoid” physical activity experiences in high-exposure settings (worksites, schools, day care centers) should be prioritized, such as elevator restrictions with enhanced stair access, near-parking restrictions, incorporation of exercise breaks into organizational routine on non-discretionary time, and hosting walking meetings. Both internal and external leverage should be used in this effort, paralleling funding agency-mandated smoke-free workplaces (Table 1). The resulting improvements, albeit modest, in aerobic conditioning, movement skills, self-efficacy, enjoyment, and mood/energy at the individual level, and in employee retention, medical costs, and productivity at the organizational level, may assist in generating demand and resources for active living goods and services in the near term, and political will for aggressive policy change in the long term.

2. Schools of public health should develop and market physical activity promotion certification programs for video game designers, urban planners, educators, human resources managers and other outside professionals, modeling public health fellowship programs for journalists.

Community Recommendations

1. State and local health departments should cultivate “boisterous” grassroots leadership in advocacy, engaging tobacco and alcohol control, neighborhood safety and improvement, and immigrants’/civil rights organizations, to lobby for student fitness monitoring through evaluation and reporting requirements comparable to math and reading, among other initiatives.

2. Federal food and nutrition agencies should provide resources for physical activity promotion, such as USDA funding of local policy development and program implementation through the Women, Infants, and Children (WIC), food stamps, and school nutrition programs, consistent with their current obesity control mission.

Conclusion

Physical activity promotion constitutes a critical role for public health practice, given the increasing prevalence of inactivity and sedentary behavior, the substantial protection against obesity and chronic disease conferred by regular physical activity, the major contribution of sedentariness and obesity to health disparities, and the increasing understanding of the central role that physical activity plays in overall health and quality of life. The public health infrastructure for physical activity promotion, while undeveloped and untested, is not unlike the public health infrastructure for other major health concerns before they were recognized as such. Given the evidence, the time is right to move forward with putting the infrastructure into place. To not do so is to place future generations at grave risk.

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