Community-Based Physical Activity Programs for Adults Age 50 and Older

Anita L. Stewart

The term "community-based" can refer to many types of physical activity interventions. The bulk of physical activity research in older adults focuses on changing individual behavior, sometimes in community settings. Addressing the nation's goal of increasing the proportion of physically active older adults requires more programs to improve contextual factors that support individual behavior and calls for introducing into community settings successful individual-level programs based on solid research. The social ecology model provides an ideal multilevel framework for community-wide efforts. In conjunction with programs to increase the types and levels of physical activity of older adults, changes can be directed at social, cultural, environmental, institutional, and policy contexts for individual behavior change. Guidelines and evaluation methods, including cost analysis of developing, implementing, and sustaining programs, are needed. Recommendations are made to advance community-based strategies for promoting physical activity among adults age 50 and older.

The term "community-based" has been used to refer to various types of health promotion and physical activity interventions to increase the physical activity levels of older adults in the population. "Community" can refer to any group characterized by a sense of common identify, and may or may not correspond to geographical boundaries (Israel, Schulz, Parker, & Becker, 1998). Four main types of community-based programs are discussed in this paper:

- Programs to change individual behavior taking place in community settings;
- Programs to change contextual (e.g., community-level) factors that affect individual behavior;
- Projects to diffuse or establish successful programs into new community settings;
- Programs that integrate efforts to change individual behavior and improve context.

Most physical activity promotion programs that have been published in the scientific literature focus on changing individual behavior, which is true for health

The author is with the Institute for Health & Aging, UC San Francisco, 3333 California St., Suite 340, San Francisco, CA 94118.
promotion programs in general (Stokols, 1992). Theories underlying individual-level programs tend to focus on behavior change, e.g., learning theories, the health belief model, social-cognitive theory, the theory of reasoned action, the theory of planned behavior, and the transtheoretical model of change (Glanz & Rimer, 1995).

Individual physical activity behavior, however, occurs in a broad context and is strongly affected by a number of contextual factors (Green & Kreuter, 1991; King et al., 1995; McLeroy, Bibeau, Steckler, & Glanz, 1988; Stokols, 1996; Wandersman et al., 1996; Winett, King, & Altman, 1989). These include social (influences of family, friends), cultural (norms, values), physical environments (information, physical activity resources, safe sidewalks and neighborhoods), organizational/institutional (health professionals encouraging physical activity), economic (local economy), and societal/political (policies and laws that encourage physical activity). Community-based programs can be designed to change these higher-level factors to support individual behavior change. Theoretical models of this contextual perspective include social ecology, systems theory, communication theory, diffusion of innovation theory, and social marketing (U.S. Department of Health and Human Services, 1996).

The third type of community-based program refers to efforts to "disseminate" individual-level programs that have been found effective through research, i.e., establish these programs in real-world settings. This typically involves adapting the original research-based program to fit within the constraints and practicalities of the target community, for example, to accommodate cultural, financial, staffing, and other elements in the new community setting that differ from the original setting.

Finally, community-based programs can refer to efforts to increase physical activity through a blend or integration of individual- and community-level efforts. For example, an individual-level program could be provided in the community while at the same time working to improve higher-level contextual factors such as physical and social environments.

Researchers in health promotion and public health have long advocated applying multilevel models to promote positive health behaviors (Green & Kreuter, 1991; Green, Richard, & Potvin, 1996; McLeroy et al., 1988; Moos, 1979; Stokols, 1996; Wandersman et al., 1996; Winett et al., 1989) including higher physical activity levels (Dunn, Andersen, & Jakicic, 1996; King, 1994; King et al., 1995; U.S. Dept. Health and Human Services, 1996). The social ecology model is probably the most appropriate multilevel theory for guiding efforts to change physical activity at population levels (Bronfenbrenner, 1979; Green et al., 1996; McLeroy et al., 1988; Sallis, Bauman, & Pratt, 1998; Stokols, 1992, 1996). Social ecology is a broad overarching theoretical framework that integrates multiple disciplines and theories (Sorensen, Emmons, Hunt, & Johnston, 1998; Stokols, 1992). It includes perspectives of sociology, psychology, public health, medicine, anthropology, and epidemiology.

The social ecology model emphasizes the dynamics of person-environment interactions (mutual influence), rather than a one-way effect of environment on individuals (Stokols, 1992). It seeks to understand interrelationships among personal and environmental factors, focusing on environmental causes of behavior and the identification of environmental interventions that can facilitate individual behavior (McLeroy et al., 1988; Stokols, 1996).
Within a social ecology model, community-based programs are not distinct from those offered in health care settings, home-based settings, or worksites. For example, efforts to improve the context can include encouraging physicians and other health professionals to recommend exercise to older adults or refer them to community-based programs. Home-based programs can include efforts to help seniors find options for activities in their neighborhood that do not require being part of a group or class, such as a good walking route. Similarly, worksite programs can refer employees to community settings and facilities. All types of programs can benefit from efforts to enhance support from family and friends by imparting knowledge about the value of physical activity for older adults.

As current initiatives (e.g., National Institute on Aging, Robert Wood Johnson Foundation, Centers for Disease Control) encourage efforts to increase the physical activity levels of the nation’s older adults, the time may finally be ripe to take advantage of these multilevel theories and take action on the many recommendations for their use in a systematic manner (Institute for the Future, 1998; U.S. Dept. Health and Human Services, 1996).

Changing Individual Behavior in Community Settings

Of programs focusing on individual behavior change, two basic types have been tested using experimental designs. The key difference is whether physical activity is the dependent or independent variable.

The first type, which comprises the majority of published interventions, aims primarily to understand how physical activity can improve fitness, function, and health. In this type, physical activity is the independent variable that is examined in terms of health or fitness outcomes. These studies typically aim to identify the types, intensities, formats, and frequencies of physical activity that are needed to produce meaningful improvements in health or fitness. Most programs of this type are designed to be appropriate for persons with particular chronic conditions, or are restricted to fairly healthy seniors, thus requiring numerous eligibility criteria. The optimal design is to randomize eligible individuals to one or more physical activity protocols or prescriptions, or to a control group. Study procedures then attempt to obtain adherence to the prescribed protocol.

Sometimes cognitive and behavioral strategies are used to facilitate adherence, and some programs provide instruction and feedback. The interventions are usually highly structured and participants are carefully monitored to assure and measure adherence. A secondary aim of most of these studies is to increase the physical activity levels of participants in the long run, thus many assess continued adherence to the physical activity regimen once the trial has ended.

A second type of individual level program aims primarily to increase physical activity through lifestyle changes, that is, encouraging those enrolled to increase participation in a variety of physical activities they choose. The overall purpose of lifestyle programs is to help participants make regular physical activity and/or exercise a routine part of their lives. These programs have also been evaluated scientifically through randomized trials, but in this case physical activity is the dependent variable. Lifestyle physical activity is defined by Dunn and colleagues (Dunn, Andersen, & Jakicic, 1998) as “the daily accumulation of at least 30 minutes
of self-selected activities which includes all leisure, occupational, or household activities that are at least moderate to vigorous in their intensity, and could be planned or unplanned activities that are a part of daily life” (p. 399).

Other types of lifestyle programs focus less on the accumulation issue and simply emphasize choice. Participants in such programs choose, with guidance, the activity or set of activities they would like to do and set their own goals for gradually increasing activity. This choice enables individual preferences to be taken into account, which vary among older adults (Mills, Stewart, Sepsis, & King, 1997; Wilcox, King, Brasstown, & Ahn, 1999), as well as readiness to change (Marcus, Rakowski, & Rossi, 1992).

To date there are very few published lifestyle programs. Dunn and colleagues (Dunn, Andersen, & Jakicic, 1998) reviewed several lifestyle interventions but only one included older adults. The most recent one for older adults is the Community Healthy Activities Model Program for Seniors (CHAMPS), a program designed to increase lifetime physical activity levels of seniors. The program encouraged participants to develop a personal physical activity regimen that took into account their health, preferences, ability, and other factors. They could join existing exercise and recreational classes in the community (e.g., strength training, dancing, endurance activities) or develop an exercise regimen to do on their own or with friends. The program was successful in increasing physical activity over a 1-year period (Stewart et al., in press).

An earlier version of CHAMPS that primarily encouraged increased participation in classes already available in the community was also successful (Stewart et al., 1997). In Project Active, Dunn and colleagues (Dunn et al., 1999) compared a lifestyle program to a structured prescription-based program and found that both increased physical activity over a 6-month period. Their program included adults ages 35 to 60. A lifestyle program implemented in the Netherlands for older adults also appears to be achieving success (Stevens, Bult, de Greef, Lemmink, & Rispens, 1999).

A comprehensive review of both types of individual-level interventions targeting older adults is provided by King and colleagues (King, Rejeski, & Buchner, 1998). In their review, 29 studies qualified for review. Of these, 25 were conducted in community settings and did not focus on a particular chronic condition; 23 used prescribed protocols or required attendance at specific classes, and the other 2 were lifestyle programs. Of the studies of prescribed protocols, about one-fourth incorporated behavioral or cognitive strategies of behavior change. Most studies achieved improvements on at least some of the outcome measures.

INDIVIDUAL-LEVEL PROGRAMS: RESEARCH NEEDED

Very little is known about the long-term maintenance of changes in physical activity or about factors that enhance this maintenance (King et al., 1998). Further, the validity of maintenance findings is often jeopardized by dropout bias in which individuals who complete follow-up questionnaires are healthier, more active, or were more successful in the program than the original sample (King et al., 1998). Two lifestyle physical activity programs found 2-year levels that were still significantly different from baseline, although there was a decline in activity from the trial
endpoint to about half of the baseline levels of physical activity (Dunn, Andersen, & Jakicic 1998; Stewart, Mills, & Verboncoeur, 1999). However, as expected, the follow-up sample in one study was somewhat biased (Stewart et al., 1999); no information on bias was presented in the other study. It may be that programs should provide ongoing “booster” interventions as needed, for example an ongoing support program in the community that people could return to.

The types, intensities, and frequencies of physical activity that are associated with specific health and fitness benefits for various ethnic groups and for those with specific chronic illnesses are not clearly known. Such information would help in making recommendations to older adults with specific fitness or functional concerns and chronic illnesses. A project to obtain this information is under way by Thomas Prohaska and his colleagues at the University of Illinois at Chicago. They are systematically evaluating evidence-based data on the benefits of exercise in older adults to determine the type, frequency, and intensity of physical activity required to maintain or improve function, strength, stability, and psychological well-being among various subgroups of older persons (e.g., persons with specific chronic conditions, racial/ethnic groups). They are also examining the characteristics of successful exercise programs for older adults (e.g., incentives, theoretical models). Both epidemiologic and intervention research is being reviewed. Evidence will be ranked and clinical guidelines developed.

There is some information about factors that facilitate increased physical activity in older adults, i.e., factors predicting changes in activity, but this is based on only a few studies. More is known about determinants of physical activity in adults of all ages (King, 1997; King et al., 1992; King et al., 1998; U.S. Dept. Health and Human Services, 1996). Many of these known determinants are based on studies of correlates of naturally occurring levels of physical activity rather than of changes in physical activity.

Of the studies on determinants of change in older adults, mutable factors that are associated with positive changes include having a positive attitude toward exercise (Burton, Shapiro, & German, 1999), feeling less stressed (King, Kiernan, Oman, et al., 1997), having a physician recommend exercise (Mills, King, & Stewart, 1998), believing in the health benefits of physical activity (Burton et al., 1999), higher levels of self-efficacy for being physically active (Garcia & King, 1991), and higher levels of social support for exercise (Oka, King, & Young, 1995). Other factors associated with positive change are lower baseline levels of physical activity (Mills et al., 1998), better health or fitness (Burton et al., 1999; King, Kiernan, Oman, et al., 1997; Mills et al., 1998), younger age (Burton et al., 1999), and a preference for a group-based physical activity format when the program being offered is group-based (Mills, Stewart, et al., 1997). Future studies need to determine the consistency of such predictors across various types of interventions and populations.

**EFFECTIVENESS OF PROGRAMS FOR POPULATION SEGMENTS**

Only a few studies have examined systematically the differential effects of programs for subgroups such as racial/ethnic minorities, the oldest-old, rural populations, and women (King et al., 1998). In the context of the two types of individual-level programs, we need to identify population subgroups for which programs to
increase activity are differentially effective as well as subgroups for which programs to achieve fitness and health outcomes have different effects.

With respect to a program's differential effects on physical activity changes, the CHAMPS program was as effective in increasing physical activity levels for women, the older age group, and those who were sedentary at baseline as for their counterparts (Stewart et al., in press). Overweight persons especially benefited from the program. In Project Active, men were more likely to increase their physical activity at the 6-month assessment (Dunn, Garcia, et al., 1998); however, this was not found to be the case at the 24-month follow-up (Dunn et al., 1999).

Regarding differential effects of physical activity interventions on particular fitness or health outcomes, a common observation is that programs may improve a particular symptom or function only for those with problems in that area. Thus, programs aimed at improving sleep quality may be effective only for persons with sleep problems (King, Oman, Brassington, Bliwise, & Haskell, 1997), programs to alleviate depression will only be effective for those with depression or depressive symptoms (Blumenthal et al., 1999), and programs for improving physical function, strength, or endurance may be effective only for persons who are limited in these areas. If participants are fairly normal in these domains, efforts to improve them may be less effective.

### Changing Contextual Factors That Affect Individual Behavior

Even fewer programs target specific higher-level factors, particularly in a systematic manner (King, 1994). Sallis et al. (1998) review seven evaluations of policy and environmental interventions, although none focused on older adults. The best known programs have targeted entire communities, with the community as the unit of analysis in relation to comparison communities (Farquhar et al., 1990; Luepker et al., 1994). Given the array of higher-level factors that could be targeted, we need to determine the extent to which various multilevel elements influence behavior in the older adult population, or in different population segments, so as to target elements likely to be more effective (Fortmann et al., 1995). Changes have been suggested at the following levels:

#### Physical Environment

- Increase the number and breadth of physical activity classes and facilities for older adults (Steeples, Rager, Morse, Ervin, & Cortes, 1990; Travis, Duncan, & McAuley, 1996; U.S. Dept. Health and Human Services, 1996), particularly in neighborhoods with the least number.
- Improve physical environments to facilitate more walking and bicycling (U.S. Dept. Health and Human Services, 1996).
- Improve transportation options, especially in communities where this is a problem (U.S. Dept. Health and Human Services).
- Improve safety of neighborhoods where fear of crime is an issue (Clark, 1999; Kaplan, 2000).

#### Social and Cultural Environment

- Provide community events promoting physical activity for seniors.
• Enhance public education to change norms, values, and beliefs about the value of physical activity for persons 50 and over.
• Establish walking groups and buddy systems to provide support from others.

Organizations / Institutions

• Encourage physicians and other providers to assess physical activity levels and recommend increased physical activity to their older patients (Burton et al., 1999; Damush, Stewart, Mills, King, & Ritter, 1999; Mills, Verbano, et al., 1997).
• Provide physicians and other health care providers with appropriate materials to help them assess and counsel patients over 50 about exercise.
• Develop collaborations among businesses to create walking maps or sponsor benches along walking routes.

Media / Communication

• Provide informational materials on physical activity in languages and formats designed to reach all older adult population segments (e.g., low reading levels, culturally appropriate). A free English language booklet on physical activity for older adults is available from the National Institute on Aging (1998).
• Identify optimal channels for communicating this information to lower income and minority segments of the community.
• Provide information on exercise resources in the community that are appropriate for adults age 50 and older (Stewart et al., 1997; U.S. Dept. Health and Human Services, 1996).
• Design specific informational cues for public places, e.g., using the stairs (Anderson, Franckowiak, Snyder, Bartlett, & Fontaine, 1998; Brownell, Stunkard, & Albaum, 1980).

Policy

• Advocate for policies to reimburse physicians and nurses for physical activity assessment and counseling of older adults (Kaplan, 2000).
• Advocate for policies that make primary prevention a higher priority in the U.S. (Kaplan, 2000).
• Establish a system for reduced fees or a fund through community grants to help lower income seniors pay for classes and facilities.
• Identify and redress liability issues for community organizations that offer physical activity programs (e.g., churches, senior centers) (U.S. Dept. Health and Human Services).

An example of an innovative program targeting community-level factors in underserved communities is On the Move! (Cassady, Jang, Tanjasiri, & Morrison, 1999). The California Department of Health Services funded nine communities serving ethnically diverse adults to promote physical activity in their communities. The projects were required to develop community coalitions to fit the cultural, social, economic, and geographical characteristics of each community. A special issue of the Journal of Health Education (1999: 30) summarizes the project. Most programs were successful in terms of about half of the levels of evaluation, several at the policy level.
DEVELOPING COMMUNITY COALITIONS

One of the best ways to target community-level factors is through coalitions (local, state, national) among various community sectors (McLeroy et al., 1988). Benefits of working through a coalition to create community change include developing broad community support for the problems being addressed (Wandersman et al., 1996), helping to increase awareness of the issues, and creating momentum for community-wide changes (King, 1994). Such coalitions exemplify the social ecological perspective that emphasizes coordinating individuals and groups acting at different levels (Stokols, 1992). By building on the strengths and resources of a community, coalitions can mobilize more resources than any one entity could do (Israel et al., 1998). Coalitions can comprise a few or many agencies and leaders. They may also involve groups that are not part of a particular community such as state health departments or academic institutions (Israel et al., 1998). Capitalizing on existing coalitions may expedite the process. Various coalitions have included the following types of representatives and key leaders:

- Business community
- Neighborhood associations
- Senior services
- Health care providers
- Volunteer agencies
- Senior housing
- Universities
- Concerned citizens
- Politicians
- Grass roots community groups
- Transportation services
- Government
- Adult education
- Fitness centers
- Libraries
- Social Service agencies
- Religious community
- Parks & Recreation departments
- Professional organizations
- Insurance companies
- Nonprofit organizations
- Media/public information

Including members of the target population in any coalition is considered an essential component of ecological strategies (McLeroy et al., 1988). There are numerous national-level coalitions (National Coalition for Promoting Physical Activities, 2001; Sallis et al., 1998) pertaining to physical activity, and some successful state-level coalitions, for example the California Cardiovascular Disease Prevention Coalition (CVD Prevention Coalition). The latter comprises 32 organizations dedicated to promoting healthy lifestyles.

Local coalitions (e.g., county, city) are more able to address the complex issues involved in changing community-level factors (Wandersman et al., 1996). However, state or national coalitions can support local coalitions, providing resources and technical assistance. Some examples of community-based coalitions include the “Sisters Together” program to promote a healthy community and healthy lifestyles for people of color (Harvard School of Public Health), and a coalition in California that was part of the On The Move! program (Williams & Olano, 1998). Although these coalitions pertain to people of all ages, they provide useful models. A group of researchers, community senior centers, and frail seniors (the target population) developed a program together to increase physical activity (Hickey et al., 1996). It was successful during the initial research phase and continued on its own for at least 3 years.
UNDERSTANDING COMMUNITY ORGANIZATION AND CHANGE

Reviewing their experiences on the Stanford Five-City project, Fortmann and colleagues note that the forces that drive community change are not well understood. Exercise specialists thus need to learn how communities change, and how interventions can be designed to facilitate these changes (Fortmann et al., 1995; Paronen & Oja, 1998), perhaps by bringing together social scientists and community organizers. To work within communities, given their complex political and geographical structures, will require learning how to get to know a community and how to identify who represents the community and can best reflect the views of community members (Eyler et al., 1999; Fortmann et al., 1995; Israel et al., 1998; Minkler & Wallerstein, 1990; Sorensen et al., 1998). It is important to represent all relevant sectors from the beginning (Bracht, 1990). There may be turf issues and existing conflicts between some community-based organizations, which can interfere with coalition building.

Fortmann and colleagues also note that a great deal of time and thought must be devoted to establishing a relationship with a community (Fortmann et al., 1995). This is particularly true when working in minority or underserved communities where there may be less trust of institutions (Braithwaite, Murphy, Lythcott, & Blumenthal, 1989). It takes about a year to get to know a community and plan how a program might work in a community (Israel et al., 1998). Working in community settings thus requires a sustained commitment. A guide to physical activity programming in community settings is available from the U.S. Department of Health and Human Services (1999).

Reasons why there are not more efforts to facilitate community-level changes may include the following: (a) physical activity research on older adults is a relatively new area of study, hence the emphasis has been on individual behavior change; (b) ecological approaches are difficult to implement because of their complexity (Green et al., 1996); (c) funding streams for scientific research primarily emphasize individuals as the unit of analysis (Israel et al., 1998); (d) when funding is provided for community-level work, it seldom includes the time needed to build collaborative trusting relationships; and (e) academic promotion policies pay more attention to scientific publications and give little or no credit for applying programs in communities.

Establishing Successful Research-Based Programs in Community Settings

Disseminating programs found to be effective in scientific studies to community settings to make them available to the general senior population is a third approach. This approach differs from those described above in that researchers familiar with the original program collaborate with staff in community settings to adapt the program to fit within the economic and staffing resources of that setting. Settings for such programs can include community centers, senior centers, housing facilities, churches, fitness centers, and community colleges.

Attempts to transfer programs shown to be effective in one setting to a new setting have been referred to as the diffusion of innovation (Rogers, 1983; Steckler,
Goodman, McLeroy, Davis, & Koch, 1992) and as “translational research” (Prohaska, Peters, & Warren, 2000). Disseminating information on successful programs through publications and presentations is often considered the final product of a program; however, such information is seldom sufficient for programs to be applied in community settings.

Diffusing programs into new settings raises numerous issues and concerns that must be addressed in order to assure success at these efforts. These include, but are not limited to, the following:

- Maintaining the integrity of the original program shown to be successful while adapting the program to the culture and limited resources of sites;
- Limited staffing at sites, and competing priorities and time demands for those staffers (Israel et al., 1998);
- Impracticality of site staff fully assuming roles of original trained program staff;
- Time needed to build trusting relationships between researchers and community members (Israel et al., 1998);
- Issues of medical screening and liability in settings that are not normally concerned with this;
- Adequately training volunteers and staff in complex skills to help conduct the program within time constraints;
- Collaborating in bilingual settings when researchers themselves are not bilingual requires extra time in translating;
- Undertaking this effort with few guidelines for doing so (see Health Promotion in Diverse Cultural Communities, by Gonzalez, Gonzalez, Freeman, & Howard-Pitney, 1991);
- Motivating underactive seniors to join programs, not just those who are already active.

Integrating Efforts to Change Behavior and Improve Context

Perhaps the most constructive approach is to develop environmentally based strategies in conjunction with behavioral change and lifestyle modification programs (Simons-Morton, Simons-Morton, Parcel, & Bunker, 1988; Sorensen et al., 1998; Stokols, 1996; U.S. Dept. Health and Human Services, 1999). Blended models may be especially useful for vulnerable communities in which environmental change is crucial to eliciting individual behavior change. For example, a community that has no physical activity resources for people to take advantage of will find it extremely difficult to get individuals to increase their activity.

An example of such an integration occurred recently in a low-income San Francisco community in which an individual-level program, CHAMPS, was being adapted and implemented to increase the physical activity levels of seniors (Stewart et al., 2001). Because this community had no available classes or facilities where participants could go to exercise, the agency implementing the program and some of the senior volunteers for the program asked that the local community college establish a new exercise class for seniors that would be appropriate for persons beginning a new exercise regimen. The college was very responsive and a class has been implemented. This has proved to be quite popular and is now a resource for
seniors in the community (San Francisco Bay View, 2001). The agency has also obtained permission to use a gymnasium designated for youth programs as a site for a class for seniors during school hours when the gym is free.

**Targeting Segments of the 50+ Adult Population**

Because of the increased policy focus on disparities in health between minority and low SES groups and their counterparts (Pamuk, Makuc, Heck, Reuben, & Lochner, 1998), efforts to target these groups may be particularly important. Health behavior changes have been advocated as a promising approach to reducing these disparities. Further, there is some consensus that minority, low-income older adults are an at-risk group that warrants special targeting (Clark, 1999; King et al., 1998). Few physical activity programs specifically target older minority persons (Prohaska et al., 1999), although some include older persons (Lewis et al., 1993). A guide to developing programs such as these in minority communities is available (Gonzalez et al., 1991).

Rural communities and the very sedentary are also considered to be important target groups (King et al., 1998). The rationale for targeting the sedentary is that they have the most to gain in health benefits from even small increases in activity (Buchner & deLateur, 1991; Haskell, Montoye, & Orenstein, 1985; Paffenbarger et al., 1993). Other subgroups that some investigators have suggested targeting include the frail elderly, the oldest-old (85 years and older), those with chronic illness and disability, the socially isolated, and depressed older adults (King et al., 1998). The FICSIT trials, for example, were developed specifically for frail older adults (Ory et al., 1993).

In situations where interventions are relatively new, there is some disagreement as to whether to target population subgroups that are most at risk for poor health or, instead, to develop programs that would reach a broader population. The crucial argument in favor of such targeting is that at-risk groups tend to be the least active and hence can gain the most in terms of improved outcomes. Thus, investments in programs could yield great improvements in health and fitness. On the other hand, developing new community-based programs to reach specific populations is a very difficult task, thus it may be more effective to begin with general populations until the programs have been shown to be successful. Success can generate more interest and funding, and at that time the programs can add efforts to reach vulnerable at-risk subgroups.

**Evaluation**

Evaluating the effects of ecological community-level changes “presents formidable challenges and puzzles yet to be solved” (Green et al., 1996, p. 274). Because of their complexity, ecological approaches do not lend themselves to scientific designs (Green et al., 1996; Sallis et al., 1998). Evaluating programs being diffused into community settings is also problematic. Scientific evaluation requires tight control of interventions in order to attribute changes to the intervention. However, programs implemented in community settings require flexibility and accommodation to real situations; control is not possible and can even be counterproductive.
Program and process evaluation methods (Fitz-Gibbon & Morris, 1987; King, Morris, & Fitz-Gibbon, 1987) are more appropriate, and Green and colleagues (Green et al., 1996) note that systems theory methods may also be useful. These methods focus on describing the processes, problems, challenges, and solutions in developing and implementing community-based programs. Such evaluations elicit the perspectives of all involved, e.g., coalition members, program participants, and site staff.

There is a substantial literature on program and process evaluation for developing new community-based programs in general. The Centers for Disease Control publishes a practical guide for using program evaluation techniques in assessing community-based programs. It is intended for those who are not expert program evaluators; as such, it attempts to simplify the language and concepts of program evaluation (Centers for Disease Control and Prevention, 1999). To evaluate the establishment of an existing individual-level program into a community setting (not a new program), Prohaska notes there are few guidelines for doing so (Prohaska et al., 2000).

Steckler and colleagues (Steckler et al., 1992) proposed some measures that are appropriate for evaluating diffusions (disseminations) of existing programs. Some of these process evaluation approaches can include: (a) The number of people who show interest and then join and stay will be indicative of “success” in terms of “voting with their feet.” (b) Descriptions of the characteristics of individuals who join and stay with the program can be compared to the service area demographics, to determine whether interventions are reaching the target population. (c) Behavior levels at enrollment and changes at various points throughout the program can help determine whether change has indeed occurred (although without a control group, no attribution can be made to the intervention). It will also be important to know the extent to which the program is sustained in the community after the developmental grant is over.

The literature is scant with respect to evaluating physical activity programs specifically, although Myers (1999) provides guidelines for evaluating community-based exercise programs. Subjective evaluations by participants may be useful. For example, those going through a program can be asked to evaluate how helpful various aspects of the program were to them, and to provide suggestions for improvement (Gillis, Grossman, McLellan, King, & Stewart, 2000; Grossman & Stewart, 1999; Sepsis et al., 1995).

To document processes of community-level change, longitudinal evaluations are needed, as real change may be slow and not readily apparent in the early stages of an intervention (Stokols, 1996). Indeed, community-level interventions may not be shown to be effective for several years, given the time it takes to mobilize a community and implement changes (Mittelmark, Hunt, Heath, & Schmid, 1993).

A major barrier to adequately evaluating complex projects such as those described above is insufficient time and funding. The question of who should conduct the evaluation is also an issue. One advantage of academic/community coalitions is that researchers could conduct the evaluations. However, this would be optimized if all involved agree on the goals and outcomes to be evaluated at the beginning of a project.
Assessing Costs

Assessing the costs of developing, implementing, or sustaining any of these types of programs or community level changes is considered part of process and program evaluation. Such costs can be examined from various perspectives. The program costs can include: (a) the costs to community agencies and/or health care providers for establishing an individual-level program; (b) the direct and indirect costs to communities for making community-level changes; and (c) the costs of researchers’ time to facilitate and evaluate such efforts. Little is known about these types of costs, and there are no guidelines as to what types of costs should be included. Even more crucial than the costs of establishing a new program in a community are the costs of sustaining it, as many programs are established through grant funding. Ideas are needed as to how programs can be paid for if they are to continue as ongoing programs. Some programs can be sustained through a fee-based system, but this is unlikely to work for low-income segments of a community.

A second perspective is to identify the costs to society of physical inactivity, similar to studies of the costs of smoking (Chenoweth, 2000). Stearns and colleagues (Stearns et al., 2000) found lower costs over a 12-month period in a sample of Medicare beneficiaries who reported walking, swimming, and playing sports, but not for those doing physical exercise. Other recent research also suggests that costs of health care are lower for physically active persons (Pronk, Goodman, O’Connor, & Martinson, 1999).

For interventions, cost-effectiveness studies to determine whether the program is worth its cost will be particularly useful (Centers for Disease Control and Prevention, 1999). Most cost-effectiveness studies examine the cost per unit of “health improvement.” However, health improvements are a distal outcome of most community-based programs to increase physical activity, as it is important to first show that the program was effective in increasing activity. Nonetheless, Kaplan (2000) and Brown and Garber (1998) describe a cost/utility analysis of exercise based on computer simulation by Hatziandreou and colleagues (Hatziandreou, Koplan, Weinstein, Caspersen, & Warner, 1988); this analysis is based on the inferred health benefit of the exercise.

Because the proximal outcome of physical activity promotion programs for seniors is increased physical activity, methods are needed to design cost-effectiveness analyses where effectiveness is examined in terms of units of increased physical activity, i.e., program costs for a particular unit of increased activity. Inferences could then be made about the ultimate benefits of that increased activity. There is very little information on program costs in relation to increased physical activity (Stevens, Hillsdon, Thorogood, & McArdle, 1998).

Another approach is to examine reductions in health care costs of becoming more physically active (Buchner et al., 1997); however, it is likely that any savings in health care costs would occur in years subsequent to most trials. To the extent that we find a program can save the provider money over and above its costs, health care providers may be more willing to implement such a program as part of their health education. Dunn and colleagues found that the lifestyle intervention for Project Active was significantly more cost-effective than the structured exercise group; the total costs for the lifestyle group were from one-fourth to one-third of those of the structured exercise group (Dunn et al., 1999). This study was of adults ages 35–60.
Recommendations

With respect to increasing the physical activity levels of our adult population age 50 and over through community-based programs, efforts at virtually all levels described above are needed. Some key recommendations are provided below.

**Individual-Level Programs**

1. Strengthen the evidence base regarding the effectiveness of interventions aiming to increase the physical activity levels of populations (primary outcome is physical activity change). More randomized trials of lifestyle interventions for older adults are needed, as these appear to be promising and only a few have been tested.

2. Continue to address gaps in research on individual-level programs for older adults. King and colleagues, in their review of programs for older adults, suggest several directions for future research in this area (King et al., 1998). For example, more programs are needed that encourage a balanced physical activity regimen including endurance, strength, flexibility, and balance training.

3. Develop better methods for monitoring maintenance levels of any increased activity resulting from a community-based program. These methods could be developed in conjunction with efforts to identify mutable determinants of maintenance (and interventions to address them). Because it is impractical to conduct clinical trials beyond about one year, other methods are needed to track people over time (Kaplan, 2000).

**Community-Level Interventions**

1. Create mechanisms for multiple funding sources for community-level projects, as these are time consuming, lengthy, and expensive. No one agency can be expected to fund an entire program (Israel et al., 1998; Mittelmark et al., 1993).

2. Identify potential incentives for communities that take on multilevel efforts (e.g., improved community-level health indicators, lower long-term costs of senior services, the prestige of working with researchers).

3. Recommendations for advancing policy and environmental interventions to promote physical activity are provided by Sallis and colleagues (Sallis et al., 1998).

**Disseminating Existing Programs**

1. Develop guidelines on processes and strategies for disseminating physical activity programs found to be successful in experimental studies into real-world community settings.

2. Create sources of technical assistance for communities attempting to implement successful community-based programs. Because it is impractical for the original researchers to collaborate extensively, there should be ways to enable a variety of skilled professionals to offer technical assistance for a range of physical activity programs for older adults.

3. Identify mechanisms by which researchers receive academic credit for
conducting dissemination projects. Currently these types of projects are not valued in promotion criteria, since they do not qualify as research projects.

**Targeting Special Population Segments**

1. Develop more program models that are effective for underserved segments of the population. Such models may need to utilize blended approaches to address typically adverse physical environments.
2. Replicate programs that have been successful in underserved, low-income, minority segments of the population by establishing them in other geographic areas.
3. Conduct more qualitative (formative) studies of underserved populations to identify special needs that could be addressed in programs to increase physical activity.
4. Develop programs for other population segments that might differ substantially from the mainstream, for example rural communities. The priority groups can be identified through consensus processes.

**Evaluation and Costs**

1. Develop and disseminate more process and program evaluation methods that pertain specifically to various types of community-based physical activity programs for older adults.
2. Develop guidelines for assessing costs of developing, implementing, and sustaining programs (new programs or the diffusion of existing successful programs).
3. Identify cost-effectiveness analysis methods that consider increased physical activity as the unit of change.
4. Identify methods for analyzing interventions to increase physical activity based on ecological models (Green et al., 1996).

**Summary**

There have been many scientific studies on how various physical activity protocols affect health and fitness outcomes for adults age 50 and older, studies that have examined a range of types, intensities, and frequencies of activity in relation to health outcomes. More research of physical activity protocols is still needed, but to increase physical activity in our older adult population, more community-level interventions of all types are also needed. Potentially effective strategies are to improve community-level contextual factors that support individual behavior, and to disseminate successful physical activity promotion programs into new community settings. Although some individual-level physical activity programs have been implemented in community settings and other programs have targeted community-level factors, very few have addressed the special needs of older adults. Even fewer have addressed the needs of at-risk population segments. Evaluation issues need to be resolved, as traditional scientific methods must be supplemented by program evaluation approaches. The costs of developing, implementing, and sustaining programs should be addressed in as many studies as possible, with cost-effectiveness in mind, so as to facilitate planning by community leaders.
References


