

Church-Based Health Promotion Interventions: Evidence and Lessons Learned

Marci Kramish Campbell,¹
Marlyn Allicock Hudson,² Ken Resnicow,³
Natasha Blakeney,⁴ Amy Paxton,⁵
and Monica Baskin⁶

¹UNC Lineberger Comprehensive Cancer Center and the Department of Nutrition, School of Public Health, University of North Carolina, Chapel Hill, North Carolina 27599-7461; email: MarciCampbell@unc.edu

²Department of Health Behavior and Health Education, School of Public Health, University of North Carolina, Chapel Hill, North Carolina 27599; email: allicock@email.unc.edu

³Comprehensive Cancer Center and School of Public Health, University of Michigan, Ann Arbor, Michigan 48109-2029; email: kresnic@umich.edu

⁴Comprehensive Cancer Center and School of Public Health, University of Michigan, Ann Arbor, Michigan 48109; email: natashab@med.umich.edu

⁵Department of Nutrition, School of Public Health, University of North Carolina, Chapel Hill, North Carolina 27599-7461; email: apaxton@email.unc.edu

⁶Department of Health Behavior, School of Public Health, University of Alabama at Birmingham, Birmingham, Alabama 35294-0022; email: mbaskin@uab.edu

Annu. Rev. Public Health 2007.28:213–34

The *Annual Review of Public Health* is online at <http://publhealth.annualreviews.org>

This article's doi:
10.1146/annurev.publhealth.28.021406.144016

Copyright © 2007 by Annual Reviews.
All rights reserved

0163-7525/07/0421-0213\$20.00

First published online as a Review in
Advance on December 7, 2006

Key Words

faith-based interventions, health disparities, religious organizations

Abstract

Church-based health promotion (CBHP) interventions can reach broad populations and have great potential for reducing health disparities. From a socioecological perspective, churches and other religious organizations can influence members' behaviors at multiple levels of change. Formative research is essential to determine appropriate strategies and messages for diverse groups and denominations. A collaborative partnership approach utilizing principles of community-based participatory research, and involving churches in program design and delivery, is essential for recruitment, participation, and sustainability. For African Americans, health interventions that incorporate spiritual and cultural contextualization have been effective. Evidence indicates that CBHP programs have produced significant impacts on a variety of health behaviors. Key elements of CBHP are described with illustrations from the authors' research projects.

WHY CONDUCT HEALTH PROMOTION IN CHURCHES AND RELIGIOUS ORGANIZATIONS?

Churches and other faith organizations are increasingly popular settings in which to conduct health promotion programs and research studies. Most Americans attend a church or other organized religious institution, making this setting a prime venue for reaching and recruiting potential participants for public health programs. According to the 2001 American Religious Identification Survey, a random digit dial survey of more than 50,000 Americans, 85% of American adults identify with a religion (33). Of total respondents, approximately 80% self-identified as Christian and 5% as other religions including Judaism, Islam, nondenominational, Hindu, Buddhist, or other. Even among atheists/agnostics, 20% reported that they or a family member belonged to a religious affiliation and/or attended a church, synagogue, or mosque on occasion. African Americans, women, and older adults were more likely to identify themselves as religious compared with other population segments. The historical Bible belt also continues to thrive, as evidenced by states such as North and South Carolina where less than 10% of adults report no religious affiliation. In addition, the phenomenon of “mega-churches,” defined as churches with 2000 or more attendees, is increasing nationally, with approximately 1200 mega-churches listed by the Faith Communities Today Project in 2005 (55).

Religious affiliation and church attendance improve physical and psychological health across multiple religions and populations in various parts of the world (32, 44). Various explanations for this relationship exist, including the positive effect of social networks and social support provided by fellow members, and the role of prayer, beliefs, and religious practices in psychological well-being (22). In addition, many religions including Judaism, Islam, Mormonism, and others proscribe consump-

tion of foods and substances such as pork, alcohol, and tobacco, and following these doctrines may be associated with health benefits. Vegetarianism is practiced by certain religions, such as Seventh-Day Adventists, and this may lead to lower saturated fat intake and greater consumption of fiber, fruits, and vegetables compared with other populations. Adventists in particular have been the subject of a number of dietary studies demonstrating key nutrition-health relationships including the health benefit of maintaining a lean body weight throughout life and the role of certain dietary practices, such as high nut consumption, in preventing coronary artery disease (59).

Typically, churches have resources to conduct health promotion, such as buildings with kitchens and meeting rooms. In addition, churches may provide access to groups that are already convening regularly for weekly services and ongoing activities such as Sunday school and Bible study. Many religious organizations include health as part of their mission or ministry and often institute health committees and participate in community outreach activities such as soup kitchens. Churches also provide an attractive venue to recruit and retain participants, given that they tend to be stable institutions with members who attend frequently over many years. Other institutions, such as workplaces, have become less stable in recent years owing to economic changes and globalization that make it more difficult to recruit and track participants over time. Finding alternative venues, such as churches, has therefore become more critical among health researchers seeking to conduct community-based intervention research in organizational settings.

By providing government funding for activities such as substance abuse counseling, recent legislation has increased access to resources for churches and other faith-based organizations to deliver health programs (1). This shift reflects the recognition that churches and faith organizations may

be well positioned to provide such services more efficiently and effectively than can some federally administered programs and agencies. However, concerns about separation of church and state have emerged on both sides: Does eligibility for such programs mandate adoption of the religious beliefs of the delivering organization? On the other hand, do faith organizations have to open their doors to governmental oversight and audit? These challenges and issues face public health researchers engaged in research and practice with churches and other religious groups.

Churches and faith organizations have become essential partners in the effort to reduce health disparities (20). Non-traditional channels are often employed to deliver health-based interventions to populations that are sometimes considered hard to reach or who view traditional health care channels with distrust. In particular, numerous programs have focused on Black churches as a venue to reduce disparities that exist between African Americans and other racial/ethnic groups (8). As an institution, the Black church has a long and rich history as the center of spiritual, social, and political life for many African Americans. Historically, the mission of the Black church in America has extended well beyond the traditional functions of worship and spiritual growth. Many Black churches also contribute to the social, economic, and political welfare of their congregants, as well as the community at large (36). As early as the 1920s, Black churches were involved in outreach programs to address the health needs of community members through the provision of free health clinics (39). Pastors provide congregational leadership not only for spiritual matters but also for social action and community outreach (54). The church is often among the most visible, respected, and credible agencies in the community, and as such, the legitimacy of public health agencies that partner with Black churches may be considerably enhanced. Similarly, African Americans' distrust of public health and medical agencies and practitioners may be reduced (37).

Church-based health promotion (CBHP) programs also have potential to reduce disparities among other ethnic groups, and church-based programs have been conducted among rural whites and low-income Latinas (7, 57, 60). The role of religion in these communities/populations may be as strong as in the African American community. However, the communities may differ widely in terms of a variety of factors, such as the demographics and health concerns of the populations, where health fits into the interests and priorities of the congregation and its leadership, and the types of programs and messages that are deemed appropriate and feasible. Consequently, it cannot be assumed that programs that have worked in one ethnic group or religious organization will play out equally well in another context. Thus, careful formative research and partnering is essential in designing and structuring programs, and health agencies should avoid a "one size fits all" perspective on CBHP.

THEORIES AND CONCEPTUAL MODELS RELEVANT TO CHURCH-BASED HEALTH PROMOTION

Socio-Ecological Model

CBHP can be broadly conceptualized based on a socio-ecological model (40). This model considers the complex nature of the church community and provides a framework for intervening at multiple levels of influence on health behaviors and practices. These levels may include individuals, interpersonal/social interactions, organizational policies and resources, community and geographic resources, structures and systems, and policy factors influential to public health (53). Health promotion programs that address the multilevel nature of health problems are more complex to conceptualize and implement but are more likely to result in lasting behavior change. These factors and their potential role in CBHP are summarized in **Table 1**.

Table 1 Overview of socio-ecological model and CBHP (adapted from Ref. 24)

Level of change	Theoretical approaches and targets	Examples of CBHP strategies
Intrapersonal	Individual characteristics that influence health behavior such as knowledge, attitudes, beliefs, affect, and past experiences	Tailored communications Motivational interviewing
Interpersonal/social network	Interpersonal and group influences including formal and informal social networks and social support from family, friends, and church members to support healthy behaviors	Family programs Lay health advisors Support groups Witnessing/group testimonials
Organizational	Policies, facilities, and organizational structures, e.g., standing committees such as health ministry, which may help promote/maintain recommended behaviors within the church	Pastor leadership Church-sponsored education/events Bulletin inserts Policy changes, e.g., foods served Committees
Environment/policy	Neighborhood, community, or governmental resources, institutions, policies, advocacy, media activities, or other activities that improve the supportiveness and availability of healthy options for church members	Farmer's markets Produce discounts, gleaning Victory gardens Walking trails Community coalitions Increasing access to health care and low-cost screening/follow-up

From a socio-ecological perspective, CBHP may be studied in the context of multilevel interventions, for example, where it is hypothesized that an individual-level intervention will be less effective than one supported and enhanced by interventions at more macro levels of change, such as at the social network or organization levels. This approach is distinct from another type of study, which may examine which intervention approaches are most effective within a given level, e.g., in *Eat for Life*, where the aim was to test the relative impact of motivational interviewing plus self-help materials compared with self-help alone (both individual-level interventions) (50).

For example, the WATCH (Wellness for African Americans Through Churches) Project was a church-based research study aimed at improving nutrition, physical activity, and colorectal cancer (CRC) screening among rural African Americans (11). The aim was to measure the relative effectiveness of two different theory-based strategies: (a) an individualized intervention consisting of tailored print newsletters and targeted videotapes (TPV), and (b) a lay health advisor (LHA) social support/social network-level intervention. Using a socio-ecological

model, we hypothesized that combining the strategies into a multicomponent intervention would be more effective than performing each intervention separately. Results did not support this hypothesis, however. For all the primary outcomes, the TPV intervention outperformed LHA or the combined approach. One possible reason for this finding was that only 10% of people in the LHA-only and combined churches reported having talked with a LHA. However, individuals who had spoken about health with a LHA were far more likely to have obtained a fecal occult blood test for CRC screening compared with those who had not spoken with a LHA (48% versus 26%, $p < .01$). Thus, the evaluation revealed that the LHA intervention was potentially powerful but had inadequate reach in this study. Further research is needed to understand how best to strengthen interventions to capitalize on the potential benefits of intervening at multiple levels of change.

Faith-Based or Faith-Placed? Does It Matter?

Several recent reviews have tried to categorize CBHP programs according to models that place importance on church involvement

(versus researcher-driven programming) and the presence or absence of spiritual/religious contextualization and/or holistic perspective on health (mind-body-spirit connection). The concept of faith-based versus faith-placed health promotion attempts to capture the difference between programs that are “emic,” i.e., emanating from existing committees or groups such as health ministries within the church, versus “etic,” or coming from outside. A third category, “collaborative,” describes programs conducted in partnership between churches and outside groups (17). DeHaven and colleagues (17) reviewed the scientific literature on CBHP from 1990 to 2000 and reported that approximately 25% of programs were faith-based versus 35% collaborative and 40% faith-placed, i.e., developed by health professionals outside the congregation. They further found that faith-based programs were less likely to report outcome data. The review found significant health improvements from all three models of CBHP, especially from the faith-placed programs that were more likely to use study designs able to test efficacy. They recommended the formation of more collaborative partnerships particularly to evaluate and disseminate findings and encouraged more emphasis on effectiveness (real-world) rather than efficacy evaluations.

Lasater and colleagues (36) proposed a different framework for evaluating religious-based cardiovascular disease prevention trials, i.e., by the extent to which cardiovascular disease-related health programs incorporated spiritual and religious context and church participation into programs and messages. In Lasater’s schema, programs were classified as Level I if they used the church only as a venue to recruit participants, e.g., churches were used to recruit participants who then may be randomized to receiving either an intervention or a control condition. Level II included programs in which the intervention delivery occurs on-site at the church, for example, offering group classes or sessions after Sunday service. Level III is defined as including congregation members in

the program delivery, e.g., by training lay health educators/advisors who then adapt and implement researcher-derived protocols. Finally, Level IV included spiritual program elements integrating messages and scriptures linking religion and health. The authors further discuss the benefits of partnerships with religious organizations and the need to encourage more Level III and IV programs. They argue that these approaches can better capitalize on the strengths of faith organizations, as opposed to other venues such as workplaces, and that working in partnership with pastors and church leaders can assure cultural and spiritual appropriateness in program design and implementation (36).

Cultural and Spiritual Sensitivity

These various models and frameworks attempt to describe the need for cultural and spiritual sensitivity in CBHP as it relates to the beliefs and mission of the church organization and membership. One overarching dimension of this sensitivity is an understanding and an appreciation of the importance of religion and how health is perceived from a holistic perspective. Holt and colleagues have recently described this “religion-health connection” on the basis of qualitative interviews with 33 African American church members (31). Dominant themes that emerged included the impact of mental health on physical health, the scriptural passage describing the body as a temple of God and the need to keep it holy by refraining from unhealthy behaviors, and sickness as a message from God to change one’s behavior. In addition, themes included the importance of the church family as support and the need to “walk the walk” not only by attending church but by living out its tenets and values in everyday life.

Another way of considering the concept of cultural and spiritual sensitivity has been proposed by Resnicow and colleagues (47). They argue that cultural sensitivity can be conceptualized in terms of two primary dimensions: surface structure and deep structure.

Surface structure involves matching intervention materials and messages to observable social and behavioral characteristics of a target population. For audiovisual materials, surface structure may involve using people, places, language, music, foods, brand names, locations, and clothing that are familiar to and preferred by the target audience. Surface structure also includes identifying the sources, channels (e.g., media, word of mouth), and settings (e.g., churches, schools) that are most appropriate for the delivery of messages and programs (34). Such contextualization entails understanding behavioral characteristics such as products that are commonly used (e.g., mentioning typically eaten foods such as collard greens), behavior patterns (e.g., suggesting healthier ways to modify cooking practices such as frying chicken), and the environmental and social contexts in which behaviors occur (e.g., suggesting menu items for church suppers). In this sense, surface structure is analogous to face validity in psychological measures: a necessary but insufficient prerequisite for construct validity. Like face validity, surface structure is achieved generally through formative research with the target population (47).

The second dimension of intervention sensitivity, deep structure, reflects how cultural, social, psychological, environmental, and historical factors and values may influence health behaviors differently across racial/ethnic populations. This dimension requires understanding how members of the target population perceive the cause, course, and treatment of illnesses, as well as perceptions regarding the determinants of specific health behaviors. Deep structure involves appreciation for how religion, family, society, economics, and the government influence the target behavior, both in perception and in fact. For example, the "body-temple connection" noted above is often cited by African American church members as a rationale for engaging in healthy behaviors. In general, core cultural values for African Americans include communalism, religion/spiritualism, expressiveness,

respect for verbal communication skills, connection to ancestors and history, unity, cooperation, commitment to family (including extended family), and intuition and experience versus empiricism (2, 14, 27, 43). Among African Americans, perceived discrimination by the health system, including lack of preventive care and inadequate treatment, may be seen as a reason for health disparities. Understanding these perceptions and values can be key to creating meaningful programs and messages. Whereas surface structure generally increases the receptivity, comprehension, and acceptance of messages (52), deep structure conveys salience. Surface structure establishes feasibility, whereas deep structure determines program impact.

Using these concepts of surface/deep structure, incorporation of core cultural and spiritual values may contribute to successful intervention at any level of the socioecological model even when the intervention is entirely faith-placed, i.e., initiated by researchers. However, the collaborative/partnership model is probably most likely to achieve a balance between cultural/spiritual/church appropriateness and the ability to design a program with measurable outcomes. Such partnerships offer churches an opportunity to serve the needs of the community and fulfill their mission of healing and service while providing public health agencies and researchers with an effective means for reaching the community and conducting quality publishable research (3).

As stated earlier, much of the foregoing discussion about surface/deep structure has evolved from work with African American communities. When conducting CBHP with other racial/ethnic groups and other types of religious organizations, these concepts may play out differently or indeed may not be as important. For example, Winnett and colleagues (60) found significant effects on diet and physical activity from a completely secular, individually focused, Internet-based health program implemented in predominantly white churches in Virginia. This

suggests that for this population, there was little need to integrate a cultural/spiritual approach into a health-promotion intervention in order to achieve success. Clearly, more comparative research is needed to understand differences in structures and belief systems to design and conduct CBHP effectively in different types of churches and religious groups.

Community-Based Participatory Research

Principles of CBPR are highly applicable and relevant to church-based health promotion and can help researchers and practitioners avoid various pitfalls in program design and evaluation. According to Minkler & Wallerstein (42), CBPR is defined as “a collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings. CBPR begins with a research topic of importance to the community, with the aim of combining knowledge and action for social change to improve community [health]” (42). From this perspective, the research process should involve church members from the outset to identify and frame the research issues and health problems that should be studied, design the study measures and methods, participate in and/or lead implementation, and participate in evaluating and interpreting the findings. One typical way to achieve a more participatory approach is to convene a community advisory board consisting of church leaders and members, community agency representatives, and other key participants such as local health providers. A CBPR approach, along with careful formative research, should lead to identification of issues related to cultural values and to spiritual sensitivity, as well as to the type of intervention and level of church involvement that would be most appropriate for a given population and health issue. In addition, using CBPR can increase empowerment and community ownership of the health program and thus lead to greater par-

ticipation and long-term sustainability. CBPR methods ensure a “do with” rather than “do to” approach to research that is vital for building trust and community empowerment (63).

Efficacy/Effectiveness of CBHP

What evidence is given for effectiveness of CBHP? Many published papers describe health programs involving churches and other religious organizations. The majority, however, are program descriptions or did not utilize study designs that allowed for rigorous outcome evaluation. To evaluate the evidence, a literature review was conducted using PubMed as the major database. Index terms, such as church, health promotion/interventions, faith organizations, and religious organizations, were used to conduct the search. We also utilized two prior review papers focused on health programs in faith-based organizations, one published in 2004 by DeHaven et al. (17) and one in 1998 by Chatters et al. (13), to identify relevant articles. From an initial list of ~60 CBHP papers published in 1990 or later, we identified those articles that reported an experimental or quasi-experimental study design (i.e., had an appropriate comparison group) and that reported outcome data and statistics. We excluded purely descriptive reports of interventions, as well as small pilot studies and one-group pretest-posttest studies with no appropriate comparison group. Some studies were difficult to evaluate. For example, Kumanyika et al. (35) compared the effect of a church-based weight-loss program among church members on or off hypertension medication, but they did not include a true comparison group. The resultant 13 studies included in **Table 2** may not represent an exhaustive review but are meant to demonstrate the characteristics and evaluative findings of most CBHP studies currently in the literature.

The included studies focused almost exclusively on African Americans and were

Table 2 Characteristics and outcomes of CBHP interventions

Sample	Theory	Design	Outcomes	Intervention	Results
-N = 292-African Americans-21 churches in east Baltimore area (56)	-Stages of change model	-Randomization at church level-1-year follow-up	-Self-reported quitting-Salivary cotinine and exhaled carbon monoxide levels	Intensive, culturally specific, smoking cessation intervention:-Pastoral sermons and testimonies-Trained volunteer counselors-Support, audiotapes, and booklets or minimal self-help intervention	-Intervention group was nearly twice as likely to quit smoking compared with minimal intervention group. -OR = 1.68; P = 0.04
-N = 410 women-African Americans-11 churches in Lower Mississippi Delta region of eastern Arkansas-Witness Project (21)	-Theoretical base in health education, learning styles, and ethnographic fieldwork	-Quasi-experiment-6-month follow-up	-Breast self-examination and mammography-Self-report	-Witness Project: talks in churches given by teams of local African American breast cancer survivors or Control	-Intervention group increased BSE from 69.8% to 82% (P < 0.0005); no change in control group. -Intervention group increased mammography screening from 52.4% to 64.4% (P < 0.005); no change in control group.
-N = 2519-African Americans-50 rural churches in 10 eastern North Carolina counties-Black Churches United for Better Health (10)	-Stages of change model-Social cognitive theory-Social support models	-Randomization at county level-2-year follow-up	-F&V consumption, by food frequency questionnaire (FFQ), food record validation-Self-report	-Individualized tailored bulletins-Lay health advisors-Church-led educational activities-Community coalitions and events-Pastor support-Food events, gardening or Control	-Intervention group consumed 0.85 servings of F&V more than control group at 2-year follow-up (P < 0.001). -Effect size for F&V = 0.30
-N = 39-obese women-African Americans-3 urban churches-PATHWAYS (41)	None specified	-Randomization at individual level-14-week follow-up	-Weight loss (lb)-Waist circumference	-Weight-loss program-Administered in churches by trained lay facilitators or Control	-Intervention group lost average of 10.0 lb; control group gained 1.9 lb (P < 0.05). -Intervention group waist circumference decreased 2.5 inches; control group's remained the same (P < 0.05).

-N = 587-African Americans-12 rural churches in 5 eastern North Carolina counties-WATCH project (11)	-Social cognitive theory-Stages of change model-Health belief model-Social support models	-Randomization at church level-2 × 2 Factorial design-1-year follow-up	-F&V consumption, by FFQ-Recreational physical activity, by validated checklist-Colon cancer screening (participants 50 and older)-Self-report	TPV intervention or LHA intervention or Combined TPV and LHA or Control	TPV intervention improved-F&V consumption by 0.6 servings (p < 0.05)-Recreational physical activity by 2.5 MET hours/week-CRC testing by 15% (p = .08)-F&V effect size for TPV vs. Control = 0.25-PA effect size for TPV vs. Control = 0.32 LHA and combined groups produced no significant effects vs. control.
-N = 861-African Americans-14 churches in Atlanta-Eat for Life trial (50)	-Motivational interviewing (MI) principles	-Randomization at church level-3 treatment groups-1-year follow-up	-F&V intake, by FFQ	Culturally tailored self-help materials or Culturally tailored self-help materials and 3 MI counseling calls or Standard nutrition materials	Greater F&V intake in motivational interviewing group than comparison and self-help groups-increase of 1.1 F&V servings/day-effect size: MI vs. Control = 0.58-effect size: MI vs. Self-Help = 0.51
-N = 906-African Americans-16 churches in Atlanta-Healthy Body Healthy Spirit Trial (49)	-Surface/deep structure cultural sensitivity-MI principles	-Randomization at church level-3 treatment groups-1-year follow-up	-F&V intake, by FFQ-Physical activity, by self-administered recall	Standard (std.) nutrition and physical activity (PA) materials or Culturally targeted self-help nutrition and PA materials or Culturally targeted self-help nutrition, PA materials, and four telephone counseling calls	Increase in F&V consumption-Std. materials: 0.17 servings-Culturally targeted: 0.44 servings-Self-help plus calls: 1.13 servings-F&V effect size for MI vs. Control = 0.30-F&V effect size for MI vs. Self-Help = 0.20
-N = 854-African Americans-15 churches in California, the southeast (GA, NC, SC), and mid-Atlantic (DE, VA)-Body and Soul (48)	-Ecological model-MI principles	-Randomized at church level-6-month follow-up	-F&V intake, by FFQ (2 and 17 items)-Self-report	-Church-wide nutrition activities-Self-help materials-Motivational interviewing by volunteer advisors or Control	Intervention group increased F&V intake compared with the control participants (p < .05)-0.7 servings increase for 2-item measure-1.4 serving increase for 17-item measure-Effect size for F&V 2-item measure: 0.39-Effect size for F&V 36-item questionnaire: 0.18

(Continued)

Table 2 (Continued)

Sample	Theory	Design	Outcomes	Intervention	Results
-N = 123—Overweight adolescent females—African Americans—10 churches in Atlanta area—Go Girls (51)	None specified	—Randomization at church level—6-month and 1-year follow-up	—BMI—Waist and hip circumference, % body fat, serum insulin, glucose, lipids, cardiovascular fitness (secondary outcomes)	High intensity: 20–26 sessions including 30 min of activity, preparation and tasting of healthy foods, and 6 counseling calls or Moderate intensity: 6 sessions including 30 min of activity and preparation and tasting of healthy foods	At 6 months:—No overall treatment effect—Girls who had high attendance in the high-intensity intervention group had a lower BMI than did girls who had low attendance in the high-intensity intervention group—0.5 BMI units ($p = 0.01$)
-N = 529—women aged 40+—African Americans—16 urban churches in Baltimore—Project Joy (61)	None specified	—Randomization at church level—1-year follow-up	—Body weight—Waist circumference—Systolic blood pressure—Dietary energy—Dietary total fat—Sodium intake	Spiritually based, behavior modification program or Self-help behavior modification program	Intervention group improved:—Weight loss, -1.1 lbs—Waist circumference, -0.66"—Systolic blood pressure, -1.6 mm Hg—Dietary energy, -117 kcal—Dietary total fat, -8g—Sodium intake, -145 mg. No change in self-help group
-N = 196—African American women—11 churches in the Baltimore city and county (62)	—Social cognitive theory—Social support	—Randomization at church level—6-month follow-up	—Physical activity assessed by PAR and YPAS measures—Self-report	Aerobic exercise or Health N Stretch	No difference between intervention groups. Both groups decreased physical inactivity (26% and 18% decline)
-N = 192—African Americans—6 churches in southwest United States (58)	None specified	—Quasi-experiment—6-month follow-up	—Cholesterol levels	Education (6-week nutrition education classes) group or Usual care, comparison group	—mean of 23.4 mg/dl decrease in cholesterol for education group (75% return rate)—mean of 38.7 mg/dl decrease in cholesterol for comparison group (36% return rate)
-N = 813—Latino, African American, and white churches—30 churches in Los Angeles area (19)	—Health belief model	—Randomization at church level—1-year follow-up	—Annual mammography screening adherence status—Self-report	Telephone counseling or Control	Telephone counseling maintained 7.5% more baseline adherent participants than control ($p < 0.05$)

conducted in a variety of geographic areas. All but one study (Go Girls) (51) focused on adults and sample sizes ranging from 39 to 2519. Theoretical frameworks, when specified, were based primarily on social cognitive theory, the stages-of-change transtheoretical model, and social support concepts (5, 30, 46). Most interventions utilized church member volunteers as lay advisors/facilitators/peer educators to deliver intervention activities (10, 21, 56, 61). In addition, they generally provided self-help materials that were culturally targeted and/or individually tailored (10, 11, 48, 49, 50, 56), and some included telephone counseling (19, 48, 49, 50, 51). Behaviors varied and included dietary change (10, 11, 48, 49, 50, 51, 58), physical activity (11, 49, 51, 62), weight loss (41, 51, 61), cancer screening (breast or colon) (11, 19, 21), smoking (56), and cholesterol reduction (58). The studies taken together demonstrate evidence of the potential of CBHP to be effective in achieving health behavior changes. Standardized effect sizes were calculated for five studies for which sufficient data were available and ranged from 0.18 to 0.58 for fruit and vegetable consumption (across five studies) and from 0.30 to 0.32 for physical activity (two studies). These effect sizes are considered to be in the small to moderate range (15).

As to weaknesses, a number of studies did not specify any theoretical framework, and self-report measures were used in some studies to evaluate change (although validation substudies were performed in some of these). Long-term sustainability generally was not assessed or reported in these efficacy/effectiveness trials. Currently, there is a gap in the literature for studies in groups other than African Americans, although studies are currently underway among low-income whites in Appalachia (I. Tessaro, unpublished data) and in Latino churches in California (4). The field would also greatly benefit from more studies conducted in other types of religious organizations and denominations and more rigorous evaluation of these programs.

Essential Elements of Design and Evaluation of CBHP

Many researchers have described essential elements of CBHP (3, 16, 45). Using the table above, one can see that a variety of intervention strategies and techniques have been effective at changing health behaviors among church members, and only a few studies have been designed to test rigorously one strategy versus, or in combination with, another (e.g., 11, 49). However, certain overarching themes and core elements are necessary for creating the conditions in which effective CBHP can be conducted. On the basis of our experience, and the frameworks previously described, we agree that several essential elements of the CBHP process are critical to success (3). These include the following five principles, discussed in more detail below:

- careful attention to partnership development and building trust;
- an everything-on-the-table approach to involving churches in recruitment of participants;
- efforts to understand the cultural/social context through extensive formative research and involvement of key informants/advisors;
- an intervention strategy that incorporates the sociocultural environment and can be delivered at least in part by the community; and
- ongoing plans for ensuring program sustainability (leaving something behind).

Attention to Partnership Development and Building Trust

Recruitment of participants into research is particularly challenging when working with African American or other racial/ethnic minority groups that traditionally have not been well served by health programs or research. An initial and vitally important step in recruiting participants is the establishment of trust

and credibility within the community. If the program is endorsed by an important institution such as the church, some level of credibility may be afforded to the program. Making contact with pastors and church leaders, ideally during the planning or grant-writing stage, and using CBPR principles can help to create a sense of partnership and “doing with” that can go a long way toward defusing the potential impression of researchers “doing to” the community. Sitting down at the table at the outset can enable a two-way dialogue aimed at discussing topics such as community concerns about health and research, other competing issues/priorities, potential program benefits to the church, and alternative ways to conceptualize the program and evaluation to suit the needs of the members better.

Beyond that, the act of showing up is critical: at church services, at scheduled meetings to discuss the project, and at other community events if invited. Informational sessions can be very helpful to provide an opportunity for the church leaders and members to learn about and discuss the benefits and costs of the project, to discuss the research design and possible random assignment consequences, and to identify what the community wants out of the project. For example, in WATCH we found that virtually all churches wanted us to conduct a health fair and kick-off event. Although we had not planned for or budgeted funds to do this, we went ahead and organized these events collaboratively with all the churches (intervention and control) in order to build a sense of trust and community benefit from participation.

Another factor in building trust is the use of culturally competent staff. Program leaders should hire and train individuals who will promote sensitivity to the cultural, ethnic, and religious values of the target population. Such training can challenge individuals to rethink assumptions about the target communities and to recognize community strengths and assets rather than focus on deficits (6).

Approach to Recruitment of Churches and Participants

Potential churches can be identified through several means, including mailing letters to local clergy, conducting presentations at local ministerial organization meetings, and networking (6). The yellow pages of local telephone books are useful for finding churches, followed by discussions with key community informants to identify potentially eligible churches on the list (e.g., predominantly African American and of a size eligible for the given study). Local funeral home directors are particularly knowledgeable informants who typically know the locations and key membership characteristics of all local churches. A windshield tour with the local funeral director can be invaluable, especially in rural areas.

Once potential churches have been identified, the next step is to contact a member of the church who represents, or can act as a liaison to, church leadership (18). If the pastor/minister is not available, the director/coordinator of the health or outreach ministry, a deacon board member, or the church secretary may be a good contact. Leadership structures differ on the basis of denomination and church size. The health professional making the initial contact may wish to ask some initial screening questions to determine potential eligibility and interest, and also to identify the person or group who will ultimately decide on church participation. It is generally useful to follow up with a mailed packet that provides a brief synopsis of the proposed study protocol and to schedule an in-person visit to meet with key members to explain the study and answer questions.

When a church that meets eligibility requirements has agreed to participate in the program, a letter of agreement between the health organization and the church should be signed. This document describes the key roles and responsibilities of both parties, such as the details and length of the intervention, what will and will not be provided, expectations for number of participants, data collection,

confidentiality, personnel roles, and any payments or incentives. The agreement should also acknowledge the voluntary nature of the partnership and provide for the dissolution of the agreement if expectations are not met or other circumstances arise. The pastor is often asked to designate a church liaison/coordinator who is familiar with key church personnel, procedures, and church membership. In addition, at this stage it is helpful to form a community advisory board of local public health professionals and church and community leaders to review program content and procedures (28).

Financial incentives in the form of donations to the church can be helpful in recruitment and retention and acknowledge the researchers' awareness that use of church space, utilities, resources, and member time represents a cost to churches (18). Incentives are usually limited by grant budgets and do not compensate the church fully for all potential costs; however, this act of sharing resources helps build a sense of trust and goodwill between the church and the researchers. Funds may be given to the church for discretionary use and/or earmarked to defray the costs of program implementation. Incentives can be staggered, e.g., by providing \$300 to churches when baseline surveys are completed and another \$300 at the end of the study. It may be helpful to offer a per-person incentive (e.g., \$5) on the basis of the number of participants who enroll in the study and complete the questionnaires. The incentive amount(s), as well as church and individual requirements for receiving payment, should be explicitly described at the outset and adhered to throughout the study (6). Participant incentives can take the form of cash, gift cards/certificates, and/or program paraphernalia such as T-shirts and water bottles. Cash incentives may be more useful and appropriate for evaluation-oriented activities, such as providing survey or focus-group information and/or blood samples as opposed to participating in interventions. In addition, food should be provided during activities such

as focus groups and trainings. The serving of food both acknowledges the importance of providing amenities to participants and is a way to model healthy eating choices. Church members often contribute to this effort, and it can serve as an integral part of the intervention.

Formative Research to Understand the Social and Environmental Context

Formative research and discussions with community members and key informants are critical in the early phases of designing CBHP programs owing to aforementioned concerns about cultural and spiritual sensitivity and appropriateness of the interventions. The knowledge gained from these qualitative studies can enable researchers to design appropriate and effective messages and strategies and to improve on these elements with each successive project.

In the Black Churches United for Better Health (BCUBH) 5 A Day community study, for example, six focus groups were conducted during year one to identify attitudes, beliefs, and behaviors related to health, cancer, and eating five daily servings of fruits and vegetables (F&V), and barriers and motivators related to improving F&V consumption (9, 10, 29). Focus groups were conducted separately by gender and were led by a trained moderator. Focus-group discussions revealed that the word "cancer" was associated with deterioration, pain, suffering, and death. Most people felt that medical treatment could help, but that ultimately whether you lived or died from cancer was in God's hands. As one man stated, "...cancer's one thing, if it gets too far on you, no matter how strong your mind is, you're going to leave here. Unless the Lord works a miracle." People expressed the belief that cancer cannot be prevented, but they believed that one could take precautions to help avoid cancer. These precautions included eating healthy foods, exercising properly, and seeking medical care. They also felt that

F&V: fruits and vegetables

spiritual health, prayer, and being close to God can help people avoid illness. Skepticism was expressed regarding scientific research and expert health advice reported in the media. People cited the Bible as a trusted source of health and nutrition information and cited the pastor as the most effective person to deliver health messages to the congregation (9).

People said that F&V were healthy and were foods they liked. When asked to describe someone who eats 5-a-day, participants often used positive words such as healthy, good skin and teeth, good digestion, and committed to religious faith. However, there were some negatives: must not have any children (because with children there would be no time to eat 5-a-day) and needs more protein (because eating 5-a-day could imply not eating enough meat). Participants said they had a wealth of expertise among church members to implement health programs, and they did not want outsiders coming to tell them what not to eat.

An Intervention that Incorporates the Sociocultural Environment and Is Delivered by the Community

The insights from the formative research described above were vital to understanding the sociocultural environment and shared beliefs of church members. These findings were instrumental in shaping the BCUBH intervention program and have proved invaluable in subsequent programs such as WATCH and Body & Soul. They showed that focusing too heavily on cancer would likely provoke negative reactions or fears that might reduce participation in the project. Positive messages about eating F&V were stressed, not only for cancer and chronic disease prevention, but also for general wellness and weight management. Modifying meat-based and other traditionally favored recipes to meet recommended guidelines and using food events at the church were strategies derived from the focus groups to incorporate F&V into the social and cultural environment. Also, the formative findings indicated that people might

be more responsive to messages that include spiritual and Biblical references rather than biomedical/expert recommendations. If possible, the pastor should deliver health messages. In these projects, pastors agreed to support projects with sermons from the pulpit and to participate in project events when possible. In some projects, pastors have provided scripture-related health messages and prayers for their congregations that were incorporated into personalized computer-tailored bulletins sent to all church members.

Finally, because church members made it clear that they wanted to use and enhance their existing resources rather than have outside “experts” deliver the interventions, a “train the trainer” model was used in BCUBH, WATCH, and Body & Soul by working with church coordinators, health ministries, and lay health advisors. These trained church members provided educational sessions and social support and were charged with spreading the word about the project throughout the congregation.

Ensuring Program Sustainability: Leaving Something Behind

“Are you going to kick us to the curb when the study ends?” This powerful comment by a male focus group member from the formative research for BCUBH spoke eloquently to the important issue of leaving something behind. The perception that researchers will get their data and then disappear is unfortunately a common and not unwarranted concern that may inhibit communities from participating in CBHP studies. Although the health program itself may benefit individual participants, such benefits may not be immediately noticeable or may be overshadowed by other aspects of their lives (e.g., underemployment, racism, discrimination).

Using community-based participatory research methods, described above, is one important way to avoid this negative outcome. By involving community members from the outset, longer-term community needs can

be identified and strategies for transferring project ownership over time can be instituted. One way to build community capacity is by providing job training and employment during the project, which may lead to new skills and job opportunities. For example, rather than sending research assistants into churches, programs may hire and train community members to conduct focus groups, recruitment, intervention, and/or evaluation activities. For example, church members may learn how to conduct evaluation interviews, how to conduct physical measurements (e.g., height and weight, blood pressure, or exercise tests) or provide intervention services (e.g., educational sessions, training of lay health advisors) (6). In addition, program materials and equipment can be donated to the church for their continued use. If there is interest on the part of the church in seeing the program continued, the health organization may consider assisting the church in identifying and obtaining other sources of funding. This may include assisting the church in identifying grant opportunities, helping with grant writing, or partnering with other programs and agencies that can provide ongoing support.

PROGRAM EXAMPLE: BODY & SOUL

The Body & Soul program exemplifies the process of moving from initial efficacy testing of researcher-driven, church-based interventions to full dissemination of a CBHP program that is delivered entirely by church members. Body & Soul was constructed from two independently developed interventions that were efficacious in separate randomized studies (Black Churches United for Better Health and Eat for Life) (10, 50). In creating the aggregate intervention, the project team was guided by two overarching parameters: (a) The intervention component was “essential,” i.e., it accounted for at least part of the positive effects observed in the parent trials, and (b) the intervention component had the potential to be widely disseminated and

adopted. Using these criteria, the following components were selected: church-wide nutrition activities including a kick-off and at least three church-wide project events, self-help materials that included a cookbook and nutrition video, at least one policy or environmental change (such as serving F&V at food events), and peer counseling calls using motivational interviewing by trained lay church members (48).

The effectiveness trial included 15 churches from California, Georgia, North Carolina, South Carolina, Virginia, and Delaware, which were randomized to either treatment or control groups. Churches collected self-administered baseline and follow-up surveys and received up to \$500 at each time point (\$5 per completed survey up to 100 surveys). At six-month follow-up, participants in the intervention group reported significantly greater consumption of F&V than did those in the comparison group (48). The adjusted post-test difference based on the two-item measure was 0.7 servings per day, and for the 17-item measure, 1.4 servings. In addition, intervention-group participants reported lower fat consumption based on the National Cancer Institute (NCI) fat screener and greater increases in self-efficacy, intrinsic (autonomous) motivation for change, and social support. A mediation analysis (23) demonstrated significant mediation of the intervention effect by social support and self-efficacy, explaining 25% of the variance in F&V improvement. Process evaluation data indicated that participants who attended the project events (kick-offs and church-wide educational events) and recalled receiving self-help materials were more likely to have increased F&V at follow-up. Higher perceived motivational interviewing (MI) quality of peer counseling calls, rather than total number of calls received, was also associated with consuming more F&V at follow-up (12).

After the Body & Soul effectiveness trial was completed, NCI made the decision to move Body & Soul to national scale as part of a trans-NCI strategic dissemination

initiative to increase F&V consumption among African Americans. NCI has designated Body & Soul as one of its research-tested intervention programs (RTIPs) (42a). Further, NCI staff have described Body & Soul as “a proven intervention for which there was a unique opportunity to take an evidence-based disparity-reducing cancer prevention intervention nationwide” (A. Williams, personal communication). In the Body & Soul strategic dissemination phase, the essential elements of the original American Cancer Society (ACS) Body & Soul program were retained; however, many important modifications were made in the NCI program. In the new version of Body & Soul, 4 pillars of the intervention address several levels of the socioecological model. These include pastoral support, environmental change activities, church educational and promotional activities, and peer counseling. The primary differences involve creating a stand-alone manualized program with no researcher involvement and minimal NCI staff involvement in training or implementation so that (a) dissemination is done by national meetings of denominational and secular groups and radio and TV spots focusing on African Americans, rather than by staff recruitment, and (b) the peer counselor training now occurs via a new DVD and supportive manuals and is led entirely by church members.

An evaluation of the NCI version of Body & Soul is currently underway. The evaluation, funded by a Centers for Disease Control and Prevention (CDC) grant, will assess both outcomes and process measures using the RE-AIM framework (25). Sixteen churches from four different geographic regions of the United States (Southeast, Northeast, Midwest, West) are being recruited from a master list of churches that have requested Body & Soul from NCI. Once churches agree to participate in the evaluation, they are randomized to two Body & Soul intervention groups: early intervention and delayed intervention/comparison churches. Following recruitment, all participating church members

complete a self-administered baseline survey assessing F&V consumption, demographics, health, and potential psychosocial mediators including self-efficacy, social support, intrinsic/extrinsic motivation, and perceived access to and availability of F&V. After baseline data are collected, the churches randomized to early intervention begin the Body & Soul program activities and conduct their peer counselor training. On-site observations of the training and activities are conducted as part of the process evaluation; however, no other “expert” involvement is provided. Six months after baseline, all participants complete a second survey and peer counselors are interviewed by telephone. One early finding from this evaluation is that the repeated telephone contact from the University of North Carolina staff necessary to enroll churches in the evaluation and obtain the survey data constitutes a form of technical and social support that may be critical for successful dissemination. Without any calls or personal contact with someone knowledgeable about the program, many church liaisons have reported that they would not have started the program.

CHURCH-BASED HEALTH PROMOTION: ISSUES AND DILEMMAS

Partnering with African American churches for health promotion interventions presents many opportunities, but also raises some important and complex challenges for public health researchers. These challenges include the following.

- **Mistrust:** Mistrust of medical research may pose a potential barrier to participation among pastors and the congregation (38). The legacy of Tuskegee is well known, but as noted above, other sources of mistrust may include concerns about the community being used and then dropped by researchers. Honest and thoughtful communication throughout a study, including clear definitions of study purpose and expected

roles and responsibilities, opens the door to establishing trust between researchers and the faith community. This process is not automatic, but instead is developed through multiple interactions over time, based on a reciprocal partnership in which there is an ongoing, comfortable, and fair exchange of information and resources (26, 45). The challenge researchers face is that this process of trust-building may span months or even years, potentially conflicting with funder-imposed deadlines. One way to address this challenge is to maintain continuous relationships with faith communities that are not dependent on grant funding. In practical terms, this action requires researchers being involved and accessible before, during, and after interventions as an available and reliable resource. Demonstrating such commitment to the faith community could take the form of a researcher conducting an educational presentation in the area of his/her expertise, providing referrals to other academic resources, or lending his/her talents to assist with community grant writing as a part of his/her commitment to that congregation.

- Separation of church and state: For many churches, the primary mission is to save souls, which may include evangelism. Churches may be truly interested in promoting health but may also see the program and accompanying resources as an opportunity to recruit new members. Some pastors and religious leaders are very concerned about maintaining separation of church and state and may choose not to participate in programs funded by the government especially if there is financial reporting or potential auditing involved. In addition, the church calendar may be quite full, and competing priorities may render it difficult to participate in research programs. In the WATCH project, we in-

terviewed 23 pastors about their decision to participate or to decline participation in the study. Contrary to our expectations, the topic of colon cancer was not cited as a barrier. The two issues cited by pastors who declined to participate were competing priorities and separation of church and state (M.K. Campbell, unpublished data).

- Respect and values: Health promotion programs implemented in churches must consider the mission, belief systems, values, and cultural norms of faith-based settings. Researchers must demonstrate respect for church values and customs, being careful to avoid crossing the line into manipulation or trivialization of churches' spiritual beliefs. At times, religious values may conflict with researcher agendas, e.g., a religious group may be unwilling to discuss homosexuality or deal with sexually transmitted diseases or HIV prevention (13). Involving the church early in the research design process is an important strategy to develop a practical and respectful intervention that considers the values of all parties.
- Respect of religious differences. Respect and sensitivity for church norms and customs is vital; however, it is often the case that members of the research team may be unfamiliar with the religious beliefs or social norms of the church into which they are entering. This lack of knowledge can lead to personal and project dilemmas at varying levels of intensity. For example, research staff from other religious orientations may feel uncomfortable participating in a different religious worship service and/or may not know what is expected (what to wear, how much to put in the collection plate, etc.). Participation in CBHP as a multicultural and multi-religious team with all levels of personnel from PI to undergraduates sharing responsibility for

attending is really important. Church members invariably have been welcoming and accepting of this transparent approach. In our previous studies, church members expressed appreciation that the principal investigator and various members of the research team attended church-related events. They felt that this added legitimacy to the study and demonstrated sincere researcher involvement and commitment to research partnerships. Additionally, church diversity/sensitivity training of local pastors can increase knowledge of and comfort with church customs and expectations and can decrease anxiety for the research team.

- Ethical dilemmas: Engaging churches in public health interventions may raise serious ethical dilemmas. First, consider study design. Is it unethical to recruit comparison churches that receive no intervention or a delayed intervention? Is the option of a different intervention for these churches a reasonable and ethical alternative? Concerns about the potential for cross-contamination may lead some researchers to shy away from this approach. However, offering a tangible benefit to comparison churches promotes the research principle of justice, valuing all participating churches for their contribution. As increasingly more churches are being asked to participate in research and churches are becoming more educated about the research process, this issue has become more compelling for communities and researchers. For example, a recently funded CDC grant (Special Interest Project, Cooperative agreement U48/DP000059, Increasing CRC Screening in Urban African American Communities via Churches) to conduct participatory research with urban Black churches to promote colon cancer screening uses a randomized study design, with intervention churches re-

ceiving the cancer-screening intervention and comparison churches receiving the Body & Soul F&V intervention. Both interventions include community participation and peer-counseling training for church members regarding the respective health behavior change. Although peer reviewers raised the issue of possible contamination, they accepted the argument that the risk was minimal and the grant was funded. From the community's perspective, it would have been very difficult for them to endorse a design that required recruiting a no-intervention control group. Such design decisions are necessary to ensure a strong partnership with the community that will lead to greater participation, enthusiasm, and engagement in the study as a whole.

IMPLICATIONS AND CONCLUSIONS

CBHP offers tremendous opportunity to reach a potential audience of millions of Americans using targeted, meaningful, and effective health promotion programs and messages. Capitalizing on the strengths of faith organizations is important, especially in an era when other organizational and social ties, such as workplaces, may be less stable. The studies reviewed here demonstrate significant effects of CBHP on a number of health-promoting behaviors, including nutrition, physical activity, smoking cessation, and screening. The review was limited, however, by the relative paucity of studies that have included strong evaluations and outcome measures.

Much of the published research to date has been focused on African Americans and the Black church, and evidence indicates that CBHP can be successful in this population. More research is needed to design and tailor CBHP programs for other ethnic and religious organizations, although research is occurring in some of these other faith-based groups, which will soon add to the literature in this area (4, 7, 60).

Enduring issues and challenges include the need to build trust and create long-term partnerships based on principles of community-based participatory research. These partnerships must balance the needs of both researchers and church congregations, recognizing and understanding their common and divergent values, beliefs, and missions and finding common ground where possible.

Interventions will be most successful if they utilize existing strengths and expertise within the church and build the capacity for churches to be empowered to deliver and sustain interventions over time. This type of research can be tremendously demanding and time consuming for both partners, but is necessary if we are to overcome health disparities in our society.

ACKNOWLEDGMENTS

The authors thank Carol Carr and Joan Walsh for their very helpful input on and assistance with this manuscript. We cannot acknowledge by name all the many churches, pastors, community members, researchers, and practitioners whose wisdom has guided much of our work in church-based health promotion. We owe a special debt of gratitude in this regard to Ethel Jean Jackson. Work on this paper was supported in part by NIH grant DK56350.

LITERATURE CITED

1. *Faith-based and community initiatives*. Accessed April 25, 2006. <http://www.whitehouse.gov/government/fbci/legislation.html>
2. Akbar N. 1984. Afrocentric social sciences for human liberation. *J. Black Stud.* 14(4):395–414
3. Ammerman A, Corbie-Smith G, St. George DM, Washington C, Weathers B, Jackson-Christian B. 2003. Research expectations among African American church leaders in the PRAISE! project: a randomized trial guided by community-based participatory research. *Am. J. Public Health* 93(10):1720–27
4. Arredondo EM, Elder JP, Ayala GX, Campbell NR. 2005. Is church attendance associated with Latinas' health practices and self-reported health? *Am. J. Health Behav.* 29(6):502–11
5. Bandura A. 1989. Human agency in social cognitive theory. *Am. Psychol.* 44:1175–84
6. Baskin ML, Resnicow K, Campbell MK. 2001. Conducting health interventions in Black churches: a model for building effective partnerships. *Ethn. Dis.* 11(4):823–33
7. Bowen DJ, Beresford S, Vu T, Shu J, Feng Z, et al. 2004. Design and baseline findings for a randomized intervention trial of dietary change in religious organizations. *Prev. Med.* 39(3):602–11
8. Braithwaite RL, Taylor SE. 2001. *Health Issues in the Black Community*. San Francisco: Jossey-Bass. 2nd ed.
9. Campbell M, Havas S, Demark W, Damron D, Jackson B, et al. 2001. Five a Day interventions in special populations. In *5 a Day for Better Health Program*. Washington, DC: Natl. Cancer Inst. Monogr. 151–187
10. Campbell MK, Demark-Wahnefried W, Symons M, Kalsbeek WD, Dodds J, et al. 1999. Fruit and vegetable consumption and prevention of cancer: the Black Churches United for Better Health project. *Am. J. Public Health* 89(9):1390–96
11. Campbell MK, James A, Hudson MA, Carr C, Jackson E, et al. 2004. Improving multiple behaviors for colorectal cancer prevention among African American church members. *Health Psychol.* 23(5):492–502

12. Campbell MK, Resnicow K, Carr C. 2006. Process evaluation of an effective church-based diet intervention: Body & Soul. *Health Edu. Behav.* In press
13. Chatters LM, Levin JS, Ellison CG. 1998. Public health and health education in faith communities. *Health Educ. Behav.* 25(6):689–99
14. Cochran S, Mays V. 1993. Applying social-psychological models to predicting HIV-related sexual risk behaviors among African Americans. *J. Black Psychol.* 19:142–54
15. Cohen J. 1992. A power primer. *Psychol. Bull.* 112(1):155–59
16. Corbie-Smith G, Ammerman AS, Katz ML, St George DM, Blumenthal C, et al. 2003. Trust, benefit, satisfaction, and burden: a randomized controlled trial to reduce cancer risk through African-American churches. *J. Gen. Intern. Med.* 18(7):531–41
17. DeHaven MJ, Hunter IB, Wilder L, Walton JW, Berry J. 2004. Health programs in faith-based organizations: Are they effective? *Am. J. Public Health* 94(6):1030–36
18. Demark-Wahnefried W, McClelland JW, Jackson B, Campbell MK, Cowan A, et al. 2000. Partnering with African American churches to achieve better health: lessons learned during the Black Churches United for Better Health 5 a day project. *J. Cancer Educ.* 15(3):164–67
19. Duan N, Fox SA, Derosé KP, Carson S. 2000. Maintaining mammography adherence through telephone counseling in a church-based trial. *Am. J. Public Health* 90(9):1468–71
20. Eng E, Hatch J, Callan A. 1985. Institutionalizing social support through the church and into the community. *Health Educ. Q.* 12(1):81–92
21. Erwin DO, Spatz TS, Stotts R, Hollenberg JA. 1999. Increasing mammography practice by African American women. *Cancer Pract.* 7(2):78–85
22. Fiala W, Bjorck J, Gorsuch R. 2002. The religious support scale: construction, validation, and cross-validation. *Am. J. Comm. Psychol.* 30 (6):761–86
23. Fuemmeler BF, Masse LC, Yaroch AL, Resnicow K, Campbell MK, et al. 2006. Psychosocial mediation of fruit and vegetable consumption in the Body and Soul effectiveness trial. *Health Psychol.* 25(4):474–83
24. Glanz K, Rimer BK. 1997. Theory at a glance. A guide for health promotion practice. *NIH Pub. No. 97—3896*. U.S. Dep. Health Hum. Serv., Natl. Cancer Inst., Natl. Inst. Health, Washington, DC
25. Glasgow RE, Vogt TM, Boles SM. 1999. Evaluating the public health impact of health promotion interventions: the RE-AIM framework. *Am. J. Public Health* 89(9):1322–27
26. Goldmon MV, Roberson JTJ. 2004. Churches, academic institutions, and public health: partnerships to eliminate health disparities. *N.C. Med. J.* 65(6):368–72
27. Harris N. 1992. A philosophical basis for an Afrocentric orientation. *West. J. Black Stud.* 6(3):154–59
28. Hatch JW, Cunningham AC, Woods WW, Snipes FC. 1986. The Fitness Through Churches project: description of a community-based cardiovascular health promotion intervention. *Hygie* 5(3):9–12
29. Havas S, Heimendinger J, Damron D, Nicklas TA, Cowan A, et al. 1995. 5 A Day for better health—nine community research projects to increase fruit and vegetable consumption. *Public Health Rep.* 110(1):68–79
30. Heaney CA, Israel BA. 2002. Social networks and social support. In *Health Behavior and Health Education: Theory, Research, and Practice*, ed. K Glanz, FM Lewis, BK Rimer, pp. 185–209. San Francisco: Jossey-Bass. 3rd ed.
31. Holt CL, McClure SM. 2006. Perceptions of the religion-health connection among African American church members. *Qual. Health. Res.* 16(2):268–81

32. Kark J, Shemi G, Friedlander Y, Martin O, Manor O, Blondheim SH. 2006. Does religious observance promote health? Mortality in secular versus religious kibbutzim in Israel. *Am. J. Public Health* 86(3):341–46
33. Kosmin BA, Mayer E, Keysar A. 2006. *American religious identification survey*. http://www.gc.cuny.edu/faculty/research/briefs/aris/aris_index.htm
34. Kreuter MW, McClure SM. 2004. The role of culture in health communication. *Annu. Rev. Public Health* 25:439–55
35. Kumanyika SK, Charleston JB. 1992. Lose weight and win: a church-based weight loss program for blood pressure control among black women. *Patient Educ. Couns.* 19(1):19–32
36. Lasater TM, Becker DM, Hill MN, Gans KM. 1997. Synthesis of findings and issues from religious-based cardiovascular disease prevention trials. *Ann. Epidemiol.* 7(57):s47–53
37. Lincoln C, Mamiya L. 1990. *The Black Church in the African American Experience*. Durham: Duke University Press.
38. Markens S, Fox SA, Taub B, Gilbert ML. 2002. Role of Black churches in health promotion programs: lessons from the Los Angeles Mammography Promotion in Churches Program. *Am. J. Public Health* 92(5):805–10
39. Mays B, Nicholson J. 1933. *The Negro's Church*. New York: Russell and Russell
40. McLeroy KR, Bibeau D, Steckler A, Glanz K. 1988. An ecological perspective on health promotion programs. *Health Educ. Q.* 15(4):351–77
41. McNabb W, Quinn M, Kerver J, Cook S, Karrison T. 1997. The PATHWAYS church-based weight loss program for urban African-American women at risk for diabetes. *Diabetes Care* 20(10):1518–23
42. Minkler M, Wallerstein N. 2003. *Community-Based Participatory Research in Health*. San Francisco: Jossey-Bass
- 42a. National Cancer Institute. *Research-tested intervention programs*. Accessed September 2, 2006. <http://cancercontrolplanet.cancer.gov>
43. Nobles W, Goddard L, Cavil W, George P. 1993. An African-centered model of prevention for African-American youth at high risk. In *An African-centered model of prevention for African-American youth at high risk*, ed. LL Goddard, pp. 115–29. Dep. Health Hum. Serv., Public Health Service, Substance Abuse and Mental Health Services Administration, Rockville, MD
44. Oman D, Reed D. 1998. Religion and mortality among the community-dwelling elderly. *Am. J. Public Health* 88(10):1469–75
45. Peterson J, Atwood JR, Yates B. 2002. Key elements for church-based health promotion programs: outcome-based literature review. *Public Health Nurs.* 19(6):401–11
46. Prochaska JO, DiClemente CC. 1992. Stages of change in the modification of problem behaviors. *Progress. Behav. Mod.* 28:183–218
47. Resnicow K, Baranowski T, Ahluwalia JS, Braithwaite RL. 1999. Cultural sensitivity in public health: defined and demystified. *Ethn. Dis.* 9(1):10–21
48. Resnicow K, Campbell MK, Carr C, McCarty F, Wang T, et al. 2004. Body and Soul. A dietary intervention conducted through African-American churches. *Am. J. Prev. Med.* 27(2):97–105
49. Resnicow K, Jackson A, Blissett D, Wang T, McCarty F, et al. 2005. Results of the healthy body healthy spirit trial. *Health Psychol.* 24(4):3339–348
50. Resnicow K, Jackson A, Wang T, De AK, McCarty F, et al. 2001. A motivational interviewing intervention to increase fruit and vegetable intake through Black churches: results of the Eat for Life trial. *Am. J. Public Health* 91(10):1686–93
51. Resnicow K, Taylor R, Baskin M, McCarty F. 2005. Results of Go Girls: a weight control program for overweight African-American adolescent females. *Obes. Res.* 13(10):1739–48

52. Simons-Morton BG, Donohew L, Crump AD. 1997. Health communication in the prevention of alcohol, tobacco, and drug use. *Health Educ. Behav.* 24(5):544–54
53. Smedley BD, Syme SL. 2000. *Promoting Health: Intervention Strategies from Social and Behavioral Research*. Washington, DC: Natl. Acad. Press
54. Thomas SB, Quinn SC, Billingsley A, Caldwell C. 1994. The characteristics of northern black churches with community health outreach programs. *Am. J. Public Health* 84(4):575–79
55. Thumma S. 2001. *Megachurches today 2000: summary of data from the Faith Communities Today 2000 project*. http://hirr.hartsem.edu/org/faith_megachurches.FACTsummary.html
56. Voorhees CC, Stillman FA, Swank RT, Heagerty PJ, Levine DM, et al. 1996. Heart, body, and soul: impact of church-based smoking cessation interventions on readiness to quit. *Prev. Med.* 25(3):277–85
57. Welsh AL, Sauaia A, Jacobellis J, Min SJ, Byers T. 2005. The effect of two church-based interventions on breast cancer screening rates among Medicaid-insured Latinas. *Prev. Chronic. Dis.* 2(4):A07
58. Wiist WH, Flack JM. 1990. A church-based cholesterol education program. *Public Health Rep.* 105(4):381–88
59. Willett W. 2003. Lessons from dietary studies in Adventists and questions for the future. *Am. J. Clin. Nutr.* 78(Suppl. 3):539S–43
60. Winett RA, Anderson ES, Wojcik JR, Winett SG, Bowden T. 2006. *Guide to health: outcomes of a group-randomized trial of an Internet-based, health behavior intervention in churches*. Pap. Ann. Behav. Med. In press
61. Yanek LR, Becker DM, Moy TF, Gittelsohn J, Koffman DM. 2001. Project Joy: faith based cardiovascular health promotion for African American women. *Public Health Rep.* 116(Suppl. 1):68–81
62. Young DR, Stewart KJ. 2006. A church-based physical activity intervention for African American women. *Fam. Community Health* 29(2):103–17
63. Zimmerman MA, Rappaport J. 1988. Citizen participation, perceived control, and psychological empowerment. *Am. J. Community Psychol.* 16(5):725–50



Contents

Symposium: Public Health Preparedness

Introduction: Preparedness as Part of Public Health <i>Nicole Lurie</i>	xiii
Assessing Public Health Emergency Preparedness: Concepts, Tools, and Challenges <i>Christopher Nelson, Nicole Lurie, and Jeffrey Wasserman</i>	1
Quality Improvement in Public Health Emergency Preparedness <i>Michael Seid, Debra Lotstein, Valerie L. Williams, Christopher Nelson, Kristin J. Leuschner, Allison Diamant, Stefanie Stern, Jeffrey Wasserman, and Nicole Lurie</i>	19
Risk Communication for Public Health Emergencies <i>Deborah C. Glik</i>	33
First Responders: Mental Health Consequences of Natural and Human-Made Disasters for Public Health and Public Safety Workers <i>David M. Benedek, Carol Fullerton, and Robert J. Ursano</i>	55

Epidemiology and Biostatistics

Network Analysis in Public Health: History, Methods, and Applications <i>Douglas A. Luke and Jenine K. Harris</i>	69
Methods for Improving Regression Analysis for Skewed Continuous or Counted Responses <i>Abdelmonem A. Afifi, Jenny B. Kotlerman, Susan L. Ettner, and Marie Cowan</i>	95
New Challenges for Telephone Survey Research in the Twenty-First Century <i>Angela M. Kempf and Patrick L. Remington</i>	113
Seasonality of Infectious Diseases <i>David N. Fisman</i>	127

Health Impact Assessment: A Tool to Help Policy Makers Understand Health Beyond Health Care <i>Brian L. Cole and Jonathan E. Fielding</i>	393
---	-----

Social Environment and Behavior

Physical Activity and Weight Management Across the Lifespan <i>Jennifer H. Goldberg and Abby C. King</i>	145
The Hitchhiker's Guide to Tobacco Control: A Global Assessment of Harms, Remedies, and Controversies <i>Ronald M. Davis, Melanie Wakefield, Amanda Amos, and Prakash C. Gupta</i>	171
Youth Violence Prevention Comes of Age: Research, Training, and Future Directions <i>Kara Williams, Lourdes Rivera, Robert Neighbours, and Vivian Reznik</i>	195
Church-Based Health Promotion Interventions: Evidence and Lessons Learned <i>Marci Kramish Campbell, Marlyn Allicock Hudson, Ken Resnicow, Natasha Blakeney, Amy Paxton, and Monica Baskin</i>	213
Risk Communication for Public Health Emergencies <i>Deborah C. Glik</i>	33

Environmental and Occupational Health

The Epidemiology of Autism Spectrum Disorders <i>Craig J. Newschaffer, Lisa A. Croen, Julie Daniels, Ellen Giarelli, Judith K. Grether, Susan E. Levy, David S. Mandell, Lisa A. Miller, Jennifer Pinto-Martin, Judy Reaven, Ann M. Reynolds, Catherine E. Rice, Diana Schendel, and Gayle C. Windham</i>	235
Beryllium: A Modern Industrial Hazard <i>Kathleen Kreiss, Gregory A. Day, and Christine R. Schuler</i>	259
Adverse Late Effects of Childhood Cancer and Its Treatment on Health and Performance <i>Kirsten K. Ness and James G. Gurney</i>	279
First Responders: Mental Health Consequences of Natural and Human-Made Disasters for Public Health and Public Safety Workers <i>David M. Benedek, Carol Fullerton, and Robert J. Ursano</i>	55

Health Services

Managed Behavioral Health Care Carve-Outs: Past Performance and Future Prospects <i>Richard G. Frank and Rachel L. Garfield</i>	303
---	-----

Rationale and Public Health Implications of Changing CHD Risk Factor Definitions <i>Robert M. Kaplan and Michael Ong</i>	321
Delivery of Health Services to Migrant and Seasonal Farmworkers <i>Thomas A. Arcury and Sara A. Quandt</i>	345

Public Health Practice

Lessons from Cost-Effectiveness Research for United States Public Health Policy <i>Scott D. Grosse, Steven M. Teutsch, and Anne C. Haddix</i>	365
Health Impact Assessment: A Tool to Help Policy Makers Understand Health Beyond Health Care <i>Brian L. Cole and Jonathan E. Fielding</i>	393
How Can We Increase Translation of Research into Practice? Types of Evidence Needed <i>Russell E. Glasgow and Karen M. Emmons</i>	413
Community Factors in the Development of Antibiotic Resistance <i>Elaine Larson</i>	435
Assessing Public Health Emergency Preparedness: Concepts, Tools, and Challenges <i>Christopher Nelson, Nicole Lurie, and Jeffrey Wasserman</i>	1
Quality Improvement in Public Health Emergency Preparedness <i>Michael Seid, Debra Lotstein, Valerie L. Williams, Christopher Nelson, Kristin J. Leuschner, Allison Diamant, Stefanie Stern, Jeffrey Wasserman, and Nicole Lurie</i>	19

Indexes

Cumulative Index of Contributing Authors, Volumes 19–28	449
Cumulative Index of Chapter Titles, Volumes 19–28	454

Errata

An online log of corrections to *Annual Review of Public Health* chapters (if any, 1997 to the present) may be found at <http://publhealth.annualreviews.org/>