



# Progress in Community Health Partnerships: Research, Education, and Action

---

## ORIGINAL RESEARCH

- 499 Psychosocial Intervention for Rural Women with Breast Cancer: The Sierra Stanford Partnership  
*K. L. Angell; M. A. Kreshka; R. McCoy et al.*
- 508 Identifying Older Chinese Immigrants at High Risk for Osteoporosis  
*D. S. Lauderdale; V. Kuohung; S.-L. Chang et al.*
- 516 Encouraging Vietnamese-American Women to Obtain Pap Tests Through Lay Health Worker Outreach and Media Education  
*T. K. Lam; S. J. McPhee; J. Mock et al. Lam T.K.; McPhee S.J.; Mock J*

---

## POLICY AND PRACTICE

- 525 Internet Access and Empowerment: A Community-based Health Initiative  
*C. M. Masi; Y. Suarez-Balcazar; M. Z. Cassey et al.*
- 531 Trust, Benefit, Satisfaction, and Burden: A Randomized Controlled Trial to Reduce Cancer Risk Through African- American Churches  
*G. Corbie-Smith; A. S. Ammerman; M. L. Katz et al.*
- 542 A Community-centered Approach to Diabetes in East Harlem  
*C. R. Horowitz; L. Williams; N. A. Bickell et al.*

---

## THEORY AND METHODS

- 558 Community Action Against Asthma: Examining the Partnership Process of a Community-based Participatory Research Project  
*E. A. Parker; B. A. Israel; M. Williams et al.*
- 568 Improving the Nutritional Resource Environment for Healthy Living Through Community-based Participatory Research  
*D. C. Sloane; A. L. Diamant; L. B. Lewis et al.*

---

## EDUCATION AND TRAINING

- 558 Community Action Against Asthma: Examining the Partnership Process of a Community-based Participatory Research Project  
*E. A. Parker; B. A. Israel; M. Williams et al.*
- 568 Improving the Nutritional Resource Environment for Healthy Living Through Community-based Participatory Research  
*D. C. Sloane; A. L. Diamant; L. B. Lewis et al.*

---

## SYSTEMATIC REVIEWS

- 558 Community Action Against Asthma: Examining the Partnership Process of a Community-based Participatory Research Project  
*E. A. Parker; B. A. Israel; M. Williams et al.*
- 568 Improving the Nutritional Resource Environment for Healthy Living Through Community-based Participatory Research



THE JOHNS HOPKINS UNIVERSITY PRESS  
JOURNALS PUBLISHING DIVISION

Dear Reader,

*Progress in Community Health Partnerships: Research, Education, and Action* addresses topics focusing on the growing field of community-based participatory research (CBPR) while promoting further collaboration and elevating the visibility and stature of CBPR as a means toward eliminating health disparities and improving health outcomes. Sponsored by The Johns Hopkins Urban Health Institute in conjunction with the W. K. Kellogg Foundation, the journal features peer-reviewed articles, scholarly reviews on the broad range of topics relevant to CBPR, community/policy briefs on all original research, and systematic review articles.

Available in both print and electronic formats, *Progress in Community Health Partnerships: Research, Education, and Action* offers discussion about how a participatory approach should be applied methodologically including but not limited to the relationships between research processes and outcomes; how research can be translated into information communities can use; and other issues in the field. The journal also aims to facilitate the dissemination and use of effective programs that employ the principles of CBPR; to advance research and education in CBPR; and to promote sound evaluation of CBPR to strengthen its validity and acceptance as a research method.

Please support the growing field of community-based participatory research by starting a subscription to *Progress in Community Health Partnerships: Research, Education, and Action*. To subscribe visit <http://pchp.press.jhu.edu> or call The Johns Hopkins University Press at 1-800-548-1784. Individual annual subscriptions are available for \$75.00 and institutional subscriptions \$175.00.

Thank You,

William Breichner  
Journals Publisher, The Johns Hopkins University Press

P.S. For additional information on the journal, a list of the editorial team, information on upcoming issues, and much more visit: <http://pchp.press.jhu.edu>



# Progress in Community Health Partnerships: Research, Education, and Action

## EDITORIAL TEAM

### EDITOR-IN-CHIEF

Eric B. Bass, MD, MPH  
*The Johns Hopkins University School of Medicine*

### DEPUTY EDITOR

S. Darius Tandon, PhD  
*The Johns Hopkins University School of Medicine*

### MANAGING EDITOR

Mark Newgent  
*The Johns Hopkins University Urban Health Institute*

### ASSOCIATE EDITORS

Lee R. Bone, MPH  
*The Johns Hopkins University Bloomberg School of Public Health*

George Barnes II  
*St. John AME Church, Baltimore, MD*

Pamela Bohrer Brown  
*Highlandtown Community Health Center, Baltimore, MD*

Kathleen Cagney, PhD  
*The University of Chicago, Department of Health Studies*

Tiffany L. Gary, PhD  
*The Johns Hopkins University Bloomberg School of Public Health*

Miyong T. Kim, PhD, RN  
*The Johns Hopkins University School of Nursing*

David Levine, MD, MPH, ScD  
*The Johns Hopkins University School of Medicine*

Emmanuel Price  
*Community Building In Partnership Inc., Baltimore, MD*

Kim Dobson Sydnor, PhD  
*Morgan State University, School of Public Health and Policy*

### EDITORIAL FELLOWS

Bryan C. Bordeaux, DO, MPH  
*The Johns Hopkins University School of Medicine*

Karran Phillips, MD, MS  
*The Johns Hopkins University School of Medicine*

Monique A. Tello, MD  
*The Johns Hopkins University School of Medicine*

Nadra C. Tyus, DrPH  
*The Johns Hopkins University Bloomberg School of Public Health*

Crystal Wiley, MD, MPH  
*The Johns Hopkins University School of Medicine*

## EDITORIAL BOARD

### CHAIR

Claude Earl Fox, MD, MPH  
*University of Miami Miller School of Medicine*

### BOARD MEMBERS

Alex J. Allen, III  
*Isles Inc., Trenton, NJ*

Diane M. Becker, MPH, ScD  
*The Johns Hopkins University Bloomberg School of Public Health*

Bonnie Duran, DrPH  
*University of New Mexico*

Eugenia Eng, DrPH  
*University of North Carolina School of Public Health*

Kaytura Felix-Aaron, MD  
*Centers for Disease Control, Rockville, MD*

Lawrence Green, DrPH  
*University of California, San Francisco*

Ella Greene-Moton  
*Flint Odyssey House, Inc., Flint, MI*

Barbara Israel, DrPH  
*University of Michigan School of Public Health*

Thomas Lasater, PhD  
*Brown University School of Medicine*

Leandris Liburd, PhD, MPH  
*Centers for Disease Control, Atlanta, GA*

Bengt Lindstrom, MD, PhD, DrPH  
*Folkhalsan Research Centre, Helsinki, Finland*

David MacLean, MD, MHS  
*Simon Fraser University*

Meredith Minkler, DrPH  
*University of California, Berkeley, School of Public Health*

Adeline Nyamathi, PhD, ANP, FAAN  
*University of California, Los Angeles*

Moisés Pérez  
*Alianza Dominicana, New York, NY*

David R. Reese, MA, MPH  
*Kentucky River District Health Department, Hazard, KY*

Lucille H. Webb  
*Strengthening the Black Family, Inc., Raleigh, NC*

## Every Effect Has Its Cause

Claude Earl Fox, Chair, *PCHP* Editorial Board

It is with great pleasure that we launch the journal *Progress in Community Health Partnerships: Research, Education, and Action (PCHP)* as part of a new and hopefully expanding effort to improve the health of our communities. The Johns Hopkins University Urban Health Institute, the home of this new journal, was established six years ago with just this charge from Johns Hopkins leadership. By providing a grant to the Institute to fund this new journal, the W. K. Kellogg Foundation recognized the importance of community-based participatory research (CBPR) and its great potential benefit to community health. There is much to do to achieve the goal of true CBPR, and we believe *PCHP* will be a significant step forward.

In examining how research and program implementation in community health have been carried out, we almost always find that academic centers and communities find themselves at either one end or the other of a spectrum. On the one end is research with little or no community involvement; on the other are health projects or interventions in communities, divorced from academic institutions or with such late or peripheral involvement that they add little or nothing to our evidence-based knowledge. In addition, government agencies often are not involved despite the expertise and resources they could offer. The landscape of my own career has been littered with admirable community health-care projects involving numerous nongovernmental organizations and community groups usually with the afterthought that we should have worked with our local academic or government partner. This failure to collaborate dooms us to “continue asking the same question and wonder why we are getting the same answer.”

As we go forward, it is our hope that *PCHP* will act as a bridge for us to better understand and work with one another.

Effective community–academic partnerships are possible and productive, as many have already demonstrated. Unfortunately, they are often not initiated due to “academic conceit,” which still exists in more quarters than most of us in these settings would care to admit. Conversely, communities are often unwilling to let go of their belief that they are “being used” and that “we are just part of another experiment.” We must learn to talk with each other and find new ways to work together or risk failure to improve the health of our communities.

We must be frank and honest with ourselves and with each other and face the following questions with open minds and in a spirit of cooperation: What are the incentives for an academic institution to involve community in an early and continuous way in its business? Who is the community and how do we make sure we are engaging a broad enough constituency? Is an egalitarian relationship really possible? Can academic institutions make training new and existing faculty in CBPR principles a priority? How can academic institutions really be accountable to communities when they “hold so many of the cards”? What is the incentive for local groups to trust and be willing to allow themselves to be vulnerable in their academic relations? How can we minimize the either perceived or actual devaluation of the community by the academics? How can we ensure that in the process of CBPR the community becomes less the community and more the academic? What is the most effective way to involve community in research without controlling the process through the intimidation of the “degree?”

We must answer these and other questions, and expand the inventory of effective models of cooperation. As the editors of *PCHP* indicate in their “Vision for Progress in Community Health Partnerships,”<sup>1</sup> much work needs to be

done. Every effect has its cause. If, through a better understanding and application of CBPR principles, we can change the cause, I firmly believe a more positive effect on our communities will be felt. At the very least I hope that this journal can in some ways become a blog for CBPR that can improve our dialogue, catalyze our efforts, expand our

knowledge, and open new doors to truly being partners in our mutual desire to have a healthier community.

## REFERENCE

1. Tandon SD, Phillips K, Bordeaux B, et al. A vision for community health partnerships. *Progress in Community Health Partnerships: Research, Education, and Action*. 2006; 1(1): forthcoming.

## A Vision for Progress in Community Health Partnerships

S. Darius Tandon, PhD<sup>1</sup>, Karran Phillips, MD, MS<sup>1</sup>, Bryan Bordeaux, DO, MPH<sup>1</sup>, Lee Bone, MPH<sup>2</sup>, Pamela Bohrer Brown<sup>3</sup>, Kathleen Cagney, PhD<sup>4</sup>, Tiffany Gary, PhD<sup>2</sup>, Miyong Kim, PhD, RN<sup>5</sup>, David M. Levine, MD, MPH, ScD<sup>1</sup>, Emmanuel Price<sup>6</sup>, Kim Dobson Sydnor, PhD<sup>7</sup>, Kim Stone, MD<sup>8</sup>, and Eric B. Bass, MD, MPH<sup>1</sup>

(1) The Johns Hopkins University School of Medicine; (2) The Johns Hopkins University Bloomberg School of Public Health; (3) Highlandtown Community Health Center, Baltimore Medical System; (4) University of Chicago, Department of Health Studies; (5) The Johns Hopkins University School of Nursing; (6) Community Building in Partnership, Inc; (7) Morgan State University, School of Public Health and Policy; (8) Greater Baltimore Medical Center

### Abstract

Community-based participatory research (CBPR) is an increasingly used approach for conducting research to improve community health. Using Rogers' diffusion of innovations theory as a framework, it follows that future adoption of CBPR will occur if academic and community partners perceive CBPR to have greater relative advantage, compatibility, trialability, and observability, and less complexity than other research approaches. We propose that articles published in our new peer-reviewed journal—*Progress in Community Health Partnerships: Research, Education, and Action (PCHP)*—can influence academic and community partners' perceptions of CBPR that promote its adoption. Eight areas of scholarly activity are described that can promote health partnership research, education, and action: (1) original research, (2) work-in-progress and lessons learned, (3) policy and practice,

(4) theory and methods, (5) education and training, (6) practical tools, (7) systematic reviews, and (8) community perspectives. These eight areas correspond with the eight main sections of *PCHP*. A brief description of each area's importance in promoting CBPR is provided along with examples of completed and ongoing work. Specific recommendations are made regarding issues, problems, and topics within each area on which CBPR work should focus. These recommendations, which present a vision for progress in community health partnerships, are based on idea generation and prioritization by a group of CBPR experts—*PCHP*'s editors and editorial board.

### Keywords

Community-based participatory research, health partnerships, Delphi process

Community-based participatory research (CBPR) is an overarching term used to characterize approaches to biomedical, behavioral, and public health research that incorporates interrelated components of participation, research, and action. Isreal et al.'s definition of CBPR highlights these components: “a collaborative approach to research that equitably involves, for example, community members, organizational representatives, and researchers in all aspects of the research process. The partners contribute unique strengths and shared responsibilities to enhance understanding of a given phenomenon and the social and cultural dynamics of the community, and integrate the

knowledge gained with action to improve the health and well-being of community members.”<sup>1</sup>

### GROWTH IN CBPR IN NORTH AMERICA

The past two decades have seen rapid growth in the amount of CBPR conducted in North America. Many researchers, practitioners, and communities—heartened by the involvement of stakeholders in the research process and the potential to address important health concerns that “traditional” academic-driven approaches to research have not solved—have begun to use CBPR. In 2001, the Agency for Healthcare Research and Quality, on recommendation

from several federal agencies and the W.K. Kellogg Foundation, commissioned a systematic review of the peer-reviewed literature on CBPR in English-speaking North America, and its role in improving community health.<sup>2</sup> The resulting evidence report<sup>3</sup> summarized the literature on CBPR in three areas—definitions, intervention studies, and funding. Concurrent with the increase in researchers conducting CBPR has been an increase in academic and nonacademic institutions developing a focus on, and infrastructure for, conducting CBPR,<sup>4–8</sup> and funding opportunities for CBPR.<sup>9,10</sup> Herein, we use the phrase *institutional partner* to refer to academic and nonacademic institutions (e.g., public health departments) collaborating with communities.

### CBPR AS AN INNOVATION FOR FURTHER ADOPTION

Given CBPR's focus on promoting community involvement in the research process and ensuring action that benefits the involved communities, CBPR is increasingly being viewed as an alternative to the “traditional” research paradigm characterized by detachment between institutions and communities.<sup>11,12</sup> As such, Rogers' diffusion of innovation theory<sup>13</sup> is a useful framework in examining how CBPR is being adopted by institutional and community partners conducting health research. Rogers proposes that innovation is adopted slowly as it is first introduced. Then, as the number of individuals adopting the innovation increases, the diffusion of innovation moves at a faster rate. Five characteristics influence the pace with which an innovation is adopted: relative advantage, compatibility, complexity, trialability, and observability (Table 1). Innovations perceived as having greater relative advantage, compatibility, trialability,

observability, and less complexity will be adopted more quickly than other innovations.

Considerable work has been done in the last ten years to describe the potential relative advantage of CBPR for improving health outcomes,<sup>1,3,12,14</sup> as well as to highlight how CBPR's principles are compatible with institutional and community partners' focus on improving health status and access for communities. Moreover, this seminal work in CBPR has heightened the observability of CBPR and decreased its perceived complexity; key characteristics and principles of CBPR have been clearly described. CBPR case studies published in the last 10 to 15 years have demonstrated implementation of CBPR studies, thus highlighting CBPR's trialability. Thus, although it is difficult to estimate precisely how widespread CBPR's adoption has been in the last 10 years, it is clear that the rate of CBPR adoption is increasingly swift.

Given the increasing number of researchers conducting CBPR, the growing infrastructure in academic and nonacademic institutions to conduct CBPR, and increasing funding and legitimacy from private foundations and public agencies, we believe that we are at a moment in time when increasingly rapid adoption of CBPR will occur. Accordingly, we believe that continued efforts need to highlight the relative advantage, compatibility, trialability, and observability of CBPR while minimizing its complexity for potential adopters. Our journal *Progress in Community Health Partnerships: Research, Education, and Action (PCHP)* has an opportunity to facilitate this process. By publishing peer-reviewed articles in key areas related to health partnerships, we believe that *PCHP* fills an important niche.

**Table 1. Definitions of Key Characteristics Influencing the Pace of Innovation**

Characteristic	Definition
Relative Advantage	The degree to which an innovation is perceived as better than the idea it supersedes.
Compatibility	The degree to which an innovation is perceived as being consistent with existing values, past experiences, & needs of potential adopters
Complexity	The degree to which an innovation is perceived as difficult to understand and use
Trialability	The degree to which an innovation may be experimented with on a limited basis
Observability	The degree to which the results of an innovation are visible to others

## FOCUS OF THIS MANUSCRIPT

This manuscript has two specific objectives. First, we describe eight areas of scholarly activity that can promote health partnership research, education, and action. These areas correspond with the main sections of *PCHP*. We describe the importance of each area in promoting CBPR; estimate the volume of work being conducted in North America; and present examples to illustrate completed or ongoing work. Second, we provide a vision for future health partnership research by providing specific recommendations on issues, problems, and topics within each area on which CBPR articles should focus. These recommendations are based on idea generation and prioritization by *PCHP*'s editors and Editorial Board.

### Areas of Scholarly Activity That can Promote Health Partnership Research, Education, and Action

Several areas of scholarly activity can promote health partnership research, education, and action. These areas of scholarly activity need to be widely disseminated to facilitate the adoption and implementation of health partnership research. We have categorized these areas of scholarly activity into eight main areas:

1. Original research
2. Work-in-progress and lessons learned
3. Policy and practice perspectives
4. Theory and methods
5. Education and training
6. Practical tools
7. Systematic reviews
8. Community perspectives

These are the eight main areas in which *PCHP* will accept manuscript submissions.

### Original Research

Original research conducted through mid-2003 using a CBPR approach was summarized in the evidence report noted earlier.<sup>3</sup> This report divided CBPR into two categories—intervention and nonintervention studies. Among intervention studies, experimental, quasi-experimental, and nonexperimental designs were used; most nonintervention

studies used nonexperimental designs and were conducted as exploratory research. The studies found in the evidence report, as well as studies published after the cutoff for report inclusion, focused on an array of health issues, including, but not limited to, asthma and other respiratory illnesses,<sup>15–17</sup> alcohol and substance abuse,<sup>18–20</sup> intimate partner violence,<sup>21,22</sup> lead exposure,<sup>23</sup> immunization,<sup>24</sup> HIV/AIDS,<sup>25–27</sup> hypertension,<sup>28</sup> cancer,<sup>29–33</sup> cardiovascular disease,<sup>34,35</sup> diabetes,<sup>36–38</sup> nutrition,<sup>39</sup> pesticide exposure,<sup>40</sup> and occupational health.<sup>41,42</sup> CBPR can also be categorized by the racial/ethnic groups with whom studies have been conducted, including, but not limited to, Aboriginal communities,<sup>43,44</sup> African Americans,<sup>45–49</sup> Filipino Americans,<sup>50</sup> Korean Americans,<sup>31,51</sup> South Asians,<sup>34,52</sup> Latinos,<sup>37,53,54</sup> Native Hawaiians,<sup>32,55</sup> Native Americans,<sup>23,56,57</sup> and Vietnamese Americans.<sup>58</sup> Additionally, CBPR has worked with other hard-to-reach and/or underserved populations such as migrant workers<sup>40,59</sup>; individuals with disabilities<sup>60,61</sup>; and lesbian, gay, and transgendered individuals.<sup>62,63</sup>

### Work-in-Progress and Lessons Learned

Many CBPR studies describe the use of formative research to help design interventions,<sup>22,37,64–68</sup> and other studies have used formative research to adapt or modify an existing intervention,<sup>38</sup> develop culturally relevant theories that guide future research,<sup>56</sup> refine conceptual frameworks and study constructs,<sup>67</sup> and identify health problems on which a health partnership will focus.<sup>69,70</sup> Although examples of formative CBPR exist in the peer-reviewed literature, “work-in-progress” articles are less likely to be published because they typically do not provide information on changes in health outcomes. These articles are vital to the development of the field of CBPR, however, because they highlight how community–institutional partnerships can use formative research to develop and/or adapt subsequent activities. Many of these articles may come from institutional and community partners doing CBPR for the first time or using CBPR in innovative ways. Moreover, because many partnerships develop over several years, publishing works-in-progress allows partnerships to disseminate preliminary findings without having to wait for completion of an intervention that examines individual- or community-level health outcomes.



Several other CBPR studies describe lessons learned from community–institutional partnerships. Although many publications describe lessons learned, some place a more explicit focus on describing these lessons.<sup>15,71–75</sup> These studies illustrate researchers’ perspectives on challenges and obstacles they faced while developing and implementing various phases of a project. Often, these studies provide suggestions on how researchers can overcome these barriers in future studies.

### Policy and Practice

A hallmark of CBPR is its focus on promoting tangible benefits for the community in which a study is conducted.<sup>1,12</sup> These tangible benefits may take many forms, including developing policy and improving community or clinical practice. CBPR projects have influenced policy in numerous areas, including environmental health,<sup>76</sup> smoking and tobacco,<sup>77</sup> violence prevention,<sup>78</sup> continuity of healthcare,<sup>79</sup> occupational health,<sup>80,81</sup> youth access to alcohol,<sup>18</sup> and community reintegration of drug users,<sup>82</sup> with these policy changes occurring at the neighborhood, city, and state levels. Along with influencing policy change using CBPR findings, Freudenberg et al.<sup>83</sup> have highlighted an approach to policy analysis that uses principles of CBPR. In this model of “participatory policy research,” community and institutional partners select methods that facilitate an understanding of a policy context to facilitate policy changes.

### Theory and Methods

Previous work<sup>84,85</sup> has highlighted the theoretical influences on CBPR, including critical social theory,<sup>86,87</sup> feminist theory,<sup>88,89</sup> community organizing,<sup>90,91</sup> action research,<sup>92</sup> and popular education.<sup>93</sup> In addition to describing theoretical influences promoting the development of CBPR, the literature has described (1) theoretical frameworks for sustaining community-based interventions<sup>94,95</sup>; (2) the importance of group dynamics theory for developing and sustaining partnerships<sup>96</sup>; (3) ecological theory as a framework for understanding and working with the interrelated systems found in communities<sup>97,98</sup>; and (4) frameworks for understanding and dealing with race, class, and gender issues within partnerships.<sup>98–100</sup>

Considerable attention has been paid to the methods

used while conducting CBPR.<sup>101–103</sup> Israel et al.’s<sup>101</sup> book on CBPR methods provides a useful framework for thinking about the varied uses of methods within a partnership. They highlight five phases during which various methods may be used: (1) partnership formation and maintenance, (2) community assessment and diagnosis, (3) issue definition, (4) documentation and evaluation of the partnership process, and (5) feedback, interpretation, dissemination, and application of results. Several research methods not typically used in “traditional” research may be appropriate during these phases, including photovoice,<sup>26,104,105</sup> concept mapping,<sup>106</sup> nominal group technique,<sup>107</sup> Delphi Process,<sup>108,109</sup> and walking and windshield tours.<sup>110</sup>

### Education and Training

As CBPR has become increasingly endorsed as an approach for promoting community health, there has been a concurrent need to train institutional and community partners to conduct CBPR. In fact, the Institute of Medicine has recommended that CBPR be taught to all public health students.<sup>111</sup> Many higher education institutions with faculty who conduct CBPR offer doctoral-level coursework in CBPR; a handful of these syllabi appear on the Community–Campus Partnerships for Health website.<sup>112</sup> Also found on this website are two CBPR curricula developed to train postdoctoral fellows within schools of medicine.<sup>113</sup> Another website, developed with funding from the Centers for Disease Control and Prevention, has been established to provide a CBPR curriculum that covers several aspects of community–institutional partnerships.<sup>114</sup> At the national level, training in CBPR is provided by the Kellogg Foundation’s Community Health Scholars program, the American Public Health Association’s annual meeting, and the Community–Campus Partnerships for Health annual conference. Several regional and local CBPR education and training opportunities also take place annually.

### Practical Tools

The growth in CBPR has stimulated an increasing need for “practical tools” to help overcome various challenges to conducting CBPR. Because the challenges are found throughout the trajectory of a project, these practical tools are linked to different phases of CBPR. Two books on CBPR

provide several practical tools for community and institutional partners engaged in health partnership research.<sup>12,101</sup> Along with these books, several publications, book chapters, and unpublished reports also provide practical tools. Examples of practical tools include a guide to promote policy research and analysis using CBPR principles,<sup>115</sup> approaches to ensure culturally competent research,<sup>116</sup> instruments to determine the extent to which a project adheres to CBPR principles and involves community partners,<sup>14,117</sup> instruments to document partnership effectiveness,<sup>118,119</sup> and frameworks for disseminating findings.<sup>120,121</sup> Many practical tools have been created that highlight approaches, techniques, and considerations in developing and maintaining partnerships.<sup>122,123</sup> A practical tool that facilitates communication among community and institutional partners is the CBPR listserv cosponsored by Community–Campus Partnerships for Health and the Wellesley Institute.<sup>124</sup>

### Systematic Reviews

To date, there has been only one systematic review of CBPR.<sup>3</sup> This review summarized the defining features of CBPR, how CBPR has been implemented with regard to quality of methodology and community involvement, evidence that CBPR projects have produced desired outcomes, and criteria for reviewing CBPR in grant proposals.

### Community Perspective

Little published work documents community partners' perspectives on working in a community health partnership. Many articles and book chapters include community partners as co-authors, although these publications do not typically distinguish community and institutional partners' perspectives. As a result, it is unclear precisely what community partners' perceptions are of the partnership on which they work. There are exceptions, however, that clearly present community partners' perspectives. For example, Kelly et al.'s<sup>125</sup> description of a 10-year community–institutional partnership presents the perspective of the community–university liaison person from that partnership. Using a different approach for amplifying community partners' perspectives, Chene et al.<sup>126</sup> transcribed presentations given by members of a community advisory board as part of a training institute and included these transcripts in an article

describing themes related to conducting CBPR in the areas of mental health and primary care. Other articles have elicited community members' perspectives on their involvement in community health partnerships using qualitative and quantitative methods<sup>49,127,128</sup>; however, community members' perspectives are typically summarized in these articles by institutional partners with whom they worked.

### RECOMMENDATIONS ON ISSUES, PROBLEMS, AND TOPICS ON WHICH CBPR ARTICLES SHOULD FOCUS

Although not intended to be a systematic review, the previous pages provide an overview of the scope of work that has been conducted in the eight areas of scholarly activity that will be featured in *PCHP*. *PCHP* views itself as a vehicle for community and institutional partners to publish work similar to that described in the previous section as well as to begin publishing in areas not currently found in the literature.

### Methods

To generate recommendations on issues, problems, and topics on which articles in *PCHP*'s eight main areas should focus, we elicited the perspectives of *PCHP*'s editors and external board. We used a group judgment technique—Delphi Process—to elicit these perspectives; the Delphi Process is a commonly used method to gather opinions of expert leaders.<sup>107</sup> Recommendations were generated in the eight domains in which *PCHP* accepts manuscript submissions. The modified Delphi Process was granted exempt status by the Institutional Review Board at the Johns Hopkins University School of Medicine. Thus, signed informed consent was not required for each participant. The entire process was completed between February and August 2006.

*Stage 1—Idea Generation.* The first stage was completed by *PCHP*'s core team of editors. The editors are seventeen individuals with varying levels of CBPR experience; fourteen were primarily affiliated with academic institutions and three were primarily affiliated with community organizations. An open-ended questionnaire was sent via e-mail to the editors, with instructions to return the completed questionnaire to the lead author via e-mail, fax, or at a regularly scheduled editorial team meeting. Individuals who did not return a completed questionnaire within two weeks were

followed up with individually. The majority of editors provided responses in written format; two members provided their responses orally to the lead author. For each area, editors were asked to use brief phrases to “provide specific recommendations on the most important issues, problems, or topics on which [area] articles published in *PCHP* should focus.” No limit was given to the number of responses an editor could provide for each area.

Responses were collected, transcribed, and reviewed by three authors (D.T., K.P., and B.B.) for redundancy. Identical responses were combined; if there was any ambiguity about whether responses were identical, responses were not combined. This process generated a list of specific recommendations within the eight areas. These recommendations were presented to the editors at an editorial meeting. At that meeting, recommendations within an area were clustered together into larger thematic concepts. For example, recommendations to conduct CBPR on several discrete health issues (e.g., diabetes, HIV) were clustered into a larger thematic concept of “research related to specific health issues.” Specific recommendations were generated for each of the eight areas, as well as the larger thematic concepts (see Appendix A).

*Stage 2—Idea prioritization.* The second stage of the Delphi Process asked *PCHP*'s external editorial board to prioritize which thematic concepts within each of the eight areas they felt were most important for CBPR articles submitted to *PCHP* to address. The editorial board consisted of seventeen individuals who are experts in the field of CBPR; eleven were primarily affiliated with academic institutions, two with federal agencies, and four with community organizations.

Editorial board members were sent three documents via e-mail—a cover letter explaining the purpose of, and giving instructions on, the Delphi Process; a document listing each thematic concept in the eight areas as well as the specific recommendations that comprised each concept; and a response sheet on which to indicate which thematic concepts they felt were the most important areas on which articles should focus. Editorial board members were instructed to “check the topics that you feel are the highest priority for *PCHP* articles in each of the following sections.” For

Practical Tools and Community Perspectives, editorial board members were instructed to check five topics; for Original Research, Education, and Training, Policy and Practice, and Theory and Methods four topics; and for Work-in-Progress and Systematic Reviews two topics.

## RESULTS

We obtained responses from all seventeen editors (100%) invited to participate in Stage 1. We obtained responses from twelve of the seventeen (71%) editorial board members. Stage 1 generated 318 unique recommendations across the eight *PCHP* domains. Specifically, Stage 1 generated sixty-two Original Research, thirty-five Works-in-Progress, forty Policy and Practice, forty-one Theory and Methods, forty-eight Education and Training, thirty-seven Practical Tools, twenty-four Systematic Reviews, and thirty-one Community Perspective recommendations. The mean number of responses generated across editors was 26.4 (SD, 10.8), with a range of 10 to 56. The 318 recommendations were collapsed into sixty-two thematic concepts.

In Stage 2, the editorial board prioritized the topics in each area that they felt were most important for publication (Table 2). The most commonly rated priority for Original Research was translation of research into policy and practice ( $n = 11$ , 92%). Building community partnerships ( $n = 7$ , 58%) and challenges in conducting CBPR ( $n = 7$ , 58%) were most often selected in the Work-in-Progress/Lessons Learned domain. In Policy and Practice, engaging community members in policy/practice was most commonly selected ( $n = 11$ , 92%) and for Theory and Methods, research methods was most commonly selected ( $n = 10$ , 83%). For Education and Training, CBPR curriculum and graduate medical education reform ( $n = 9$ , 75%) and training new investigators ( $n = 9$ , 75%) were most commonly selected by editorial board members. Resources to develop community partners' skills ( $n = 9$ , 75%) and to evaluate projects ( $n = 9$ , 75%), were the highest priorities for Practical Tools. The highest priority areas in Systematic Reviews were reviews on CBPR methods ( $n = 10$ , 83%) and CBPR effectiveness ( $n = 10$ , 83%). In Community Perspectives, the most commonly given priority was community members' perspectives on research usefulness ( $n = 11$ , 92%).

Table 2. Number and Percent of Editorial Board Members Who Prioritized Each Thematic Area, by Domain

Domain and Thematic Area	Endorsement*	Domain and Thematic Area	Endorsement*
<b>1. Original Research</b>		<b>6. Practical Tools</b>	
Translation of research into policy and practice	11 (92%)	Resources/tools to develop community partners' skills	9 (75%)
Partnership challenges and relationship to health outcomes	9 (75%)	Resources re: evaluation strategies	8 (67%)
CBPR methods	9 (75%)	Resources re: instruments/tools	6 (50%)
Health disparities	5 (42%)	Systematic guidelines for translation and validating behavioral intervention to culturally diverse groups	5 (42%)
Social determinants of health	4 (33%)	Resources re: partnerships	5 (42%)
Experimental designs to assess CBPR impact	4 (33%)	The success/failure of university-based research centers whose explicit aim is to connect community members and researchers who share interests	5 (42%)
Research related to specific health issues	4 (33%)	Online resources	4 (33%)
Sustainability	1 ( 8%)	How to use local, state, and national data sources to help community partners with their service delivery and grant opportunities	4 (33%)
<b>2. Works in Progress and Lessons Learned</b>		How to provide effective feedback and communication skills	3 (25%)
Building community partnerships	7 (58%)	Effective recruitment and dissemination tools	3 (25%)
Challenges in conducting CBPR	7 (58%)	Resources re: career development	2 (17%)
Sustainability, dissemination, community change	5 (42%)	For academics: easily readable and understood for general level; will help all the data to be important for communities	2 (17%)
Formative work	3 (25%)	To more effectively assess political context in new community	1 ( 8%)
Human subjects issues	2 (17%)	<b>7. Systematic Review</b>	
<b>3. Policy and Practice</b>		Reviews re: CBPR methods	10 (83%)
Engaging community members in policy/practice	11 (92%)	Reviews re: CBPR effectiveness	10 (83%)
Implementing policy/practice based on CBPR findings	9 (75%)	Reviews re: specific health/disease areas	3 (25%)
Description of how CBPR findings have influenced policy	7 (58%)	Role of CBPR in facilitating linkages beyond initial project	0 ( 0%)
Description of how policy has/should be changed to support CBPR	6 (50%)	<b>8. Community Perspective</b>	
Working with legislation/legislators	4 (33%)	Community perspectives on research usefulness	11 (92%)
Advocacy	3 (25%)	Problems community would like addressed	8 (67%)
Topical areas in which to influence policy	3 (25%)	Community perspectives on roles in CBPR projects	8 (67%)
Sustainability	1 ( 8%)	Community perspectives on how CBPR should be conducted	8 (67%)
<b>4. Theory and Methods</b>		Advice for academics	6 (50%)
Research methods	10 (83%)	Perspectives on involving multiple community partners	5(42%)
Use of theoretical/conceptual framework	9 (75%)	Community-based training	4 (33%)
Design issues	8 (67%)	Resources available to facilitate CBPR	4 (33%)
Intervention issues	7 (58%)	Impact of neighborhood characteristics on health	4 (33%)
Communication and dissemination issues	5 (42%)	Opinion about any recent health policy or national debate such as immigrant policy changes or welfare reform, etc.	2 (17%)
Analysis issues	4 (33%)		
CBPR definitional issues	1 ( 8%)		
<b>5. Education and Training</b>			
CBPR curriculum & graduate medical education reform	9 (75%)		
Training new investigators	9 (75%)		
Training community partners	8 (67%)		
Developing infrastructure to support CBPR	6 (50%)		
Cultural relevance and sensitivity training	5 (42%)		
Evaluation of CBPR training	4 (33%)		
Using learning techniques/approaches	4 (33%)		

\* Number and percentage of Editorial Board members who endorsed thematic area.

## FUTURE DIRECTIONS

Our modified Delphi Process generated many recommendations for future work that needs to be published about CBPR. These recommendations (Appendix A) provide an array of topics, issues, and problems that need to be addressed to promote adoption and implementation of CBPR. We encourage community and institutional partners to review this list and determine whether they are doing work that can amplify these issues. The following pages provide a more in-depth discussion of the thematic areas that *PCHP*'s editorial board recommended as most important to be addressed in manuscripts submitted to *PCHP*. Given our board's level of expertise conducting CBPR, their historical perspective on the development of CBPR, and their own writing on CBPR, we feel these recommendations highlight priority areas for manuscripts submitted to *PCHP* and other journals.

### Original Research

Editorial board members most often recommended “translation of research into policy and practice” as a key topic for Original Research. To guide this process, community and institutional partners can consult Themba and Minkler's<sup>129</sup> overview of different conceptual frameworks for influencing policy using CBPR. One approach to translating research into policy and practice is using CBPR to enhance the adaptation of evidence-based interventions and clinical research into practice. Hohmann and Shear<sup>130</sup> note that community-based intervention trials (i.e., effectiveness research) that attempt to translate an intervention in a community setting face unique challenges, including determining (a) community acceptance of the intervention, (b) relevance of outcomes to key stakeholders, and (c) mechanisms to sustain the intervention. As such, articles describing processes used by health partnerships to negotiate these, and other tensions, of adapting evidence-based interventions into community settings will help advance the state of the science.

### Work-in-Progress and Lessons Learned

“Challenges in conducting CBPR” was highlighted as a key topic on which *PCHP* articles should focus. Articles describing CBPR challenges ideally can highlight whether strategies were implemented to overcome challenges,

whether those strategies were successful, and if the strategies are generalizable to other partnerships. Another frequently endorsed topic was “building community partnerships.” As noted, several resources exist on this topic; nonetheless, this area is vital because a strong, egalitarian community–institutional health partnership must be created prior to conducting research, policy, or practice-related work that influences community health. Articles can describe many aspects of the partnership building process, including, but not limited to, selecting institutional and community partners; defining partners' roles and responsibilities; creating operating procedures and norms for partnership functioning; addressing issues of race, class, and gender; developing power-sharing agreements; developing clear methods of communication; describing approaches to handling conflict; developing new partnership leadership; celebrating partnership successes; and engaging in the process of selecting health issues on which to focus.

### Policy and Practice

Editorial board members highlighted “engaging community members in policy and practice” as a key area on which *PCHP* articles should focus. By definition, CBPR projects involve the participation of community members throughout the research process, including the process of influencing policy and practice. Accordingly, articles submitted to *PCHP* describing policy and practice work should not only describe the policy and practice changes that emerged from a project, but also emphasize (a) the processes used to engage community partners in influencing policy and practice and (b) how community partners were involved in influencing policy and practice. These descriptions will help other partnerships determine effective strategies for engaging community partners in influencing policy and practice.

### Theory and Methods

“CBPR methods” was selected most frequently by editorial board members as a key area on which articles should focus within the Theory and Methods domain. As noted, several methods have been used in CBPR studies. These methods (e.g., photovoice, nominal group technique, windshield tours) appear to be valuable tools, particularly to help



partnerships conduct community assessments and define health issues. We encourage partnerships to continue describing their experiences using these methods, including whether the methods needed to be adapted to make them suitable to a particular community or cultural context. We also encourage partnerships to consider using, and describe their use of, other methods throughout the trajectory of a project. For example, qualitative methods such as diary and journal entries and oral histories may be appropriate for documenting partnership processes and outcomes.

### Education and Training

Editorial board members highlighted “CBPR curriculum and graduate medical education reform” and “training new investigators” as areas on which articles should focus. Although no formal survey has been conducted, it is likely that many CBPR courses exist that provide an overview of CBPR principles and rationale; as noted, some course syllabi appear on the Community–Campus Partnerships for Health website.<sup>112</sup> However, it is unclear the extent to which undergraduates, graduate students, postdoctoral fellows, faculty members, and community partners have opportunities to engage in a CBPR curriculum that moves beyond a single course. We encourage institutional and community partners who have developed CBPR curricula to submit for publication these models of training. We also encourage the creation of CBPR curricula using principles of curriculum development<sup>131</sup> as well as evaluation of these curricula to ensure that identified goals and objectives are met.

### Practical Tools

Editorial board members most frequently identified “resources to develop community partners’ skills” as a Practical Tools topic for articles. Given CBPR’s defining feature of ongoing community collaboration, these resources may develop partners’ skills throughout a project. For example, the United Way of America’s logic model framework<sup>132</sup> that shows connections between program activities and outcomes may help community partners at the onset of a project whereas resources that help community partners interpret quantitative data may help toward the end of a project. We encourage partnerships to submit articles that describe resources they have developed, as well as resources

developed by others. For example, partnerships may use different web-based resources, books, or monographs to help develop partners’ skills. Description of how these resources were selected and used, as well as their influence on community partners’ skills, would benefit other partnerships searching for similar resources.

### Systematic Reviews

Systematic reviews related to “CBPR effectiveness” and “CBPR methods” were the topics most frequently identified by editorial board members as areas on which systematic reviews should focus. As noted, a systematic review of CBPR effectiveness was recently conducted.<sup>3</sup> Given the rapidly growing number of funded and published CBPR interventions, an updated systematic review of CBPR effectiveness may be warranted. Moreover, with the growing number of CBPR interventions, it may be possible in subsequent systematic reviews to examine CBPR effectiveness related to different health outcomes (e.g., hypertension control, HIV prevention) or geographic location (e.g., urban, rural). A systematic review of CBPR methods could magnify different types of quantitative and qualitative methods used in CBPR projects, as well as what methods were used in projects addressing different outcomes. A review of CBPR methods could also examine the extent to which community partners were involved in selecting methods, whether methods were adapted based on community partners’ feedback, and if researcher- and community-developed methods were simultaneously used to measure the same construct.

### Community Perspective

Editorial board members most often identified “community perspectives regarding research usefulness” as an area of focus for articles. Although it is likely that many institutional partners elicit their community partners’ perspectives on research usefulness during the course of their ongoing collaboration, these perspectives are rarely found in the literature. Hearing directly from community partners about what aspects of a partnership were most useful, processes used to maximize a partnership’s usefulness to community partners, and issues that minimized a partnership’s usefulness, can serve as a valuable resource for other partnerships.

## DISCUSSION

The recommendations presented in the Results section highlight the perspectives of *PCHP*'s core editorial team and external editorial board. Three limitations should be considered in interpreting these findings. First, the editorial team, which included five editorial fellows, had varying levels of experience in CBPR. As such, the team's views reflect the fresh perspective of young team members as well as the experience of seasoned investigators and community representatives. Second, both the core editorial team and the editorial board had more institutional representatives than community representatives. Had more community representatives participated in the idea generation and prioritization phases, our recommendations could have been different. Third, because of space limitations and our small sample sizes, we did not separate the responses of institutional representatives and community representatives. Looking at each group's idea generation and prioritization findings separately may have illuminated differences of opinion about issues on which *PCHP* needs to focus.

The growing interest in CBPR is welcome for those who have worked in this area and believe in a health research paradigm that emphasizes active collaboration of communities and researchers. This interest presents challenges for the field of CBPR, as increased numbers of community and institutional partners are becoming familiar with, beginning

to experiment with, and making judgments about the relative value of using CBPR to improve health outcomes. In turn, these partners are looking for resources to facilitate their work and evidence of partnerships that have improved community health outcomes. Framed in terms of diffusion of innovations, the coming years are important ones as potential adopters of CBPR will need to observe that community health partnerships have value in promoting health outcomes, are compatible with their own values and needs, and are not too complex to use. The previous pages have highlighted areas in which information can be disseminated to foster continued progress in the adoption and use of community health partnerships. We believe that such dissemination will help to fulfill the vision of CBPR leaders for using community health partnerships as a central paradigm for improving health outcomes nationally and internationally.

## ACKNOWLEDGMENTS

This work is supported in part by the W. K. Kellogg Foundation. We thank Ella Green-Moton, Meredith Minkler, DrPH, Sarena Seifer, MD, Michael Fagen, DrPH, and James G. Kelly, PhD, for their helpful comments on the manuscript. We also thank the *PCHP* Editorial Board for their participation in the prioritization of topics listed in the manuscript.

## REFERENCES

1. Israel BA, Schulz A, Parker E, Becker AB. Review of community-based research: assessing partnership approaches to improve public health. *Annu Rev Public Health*. 1998; 19: 173-202.
2. Community-based participatory research. Conference summary. Agency for Healthcare Research and Quality, Rockville, MD; 2002.
3. Viswanathan M, Ammerman A, Eng E, Gartlehner G, Lohr Kathleen N, Griffith D, Rhodes S, Samuel-Hodge C, Maty S, Lux L, Webb L, Sutton SF, Swinson T, Jackman, A, Whitener, L. Community-based participatory research: assessing the evidence. Evidence Report/Technology Assessment No. 99. AHRQ Publication 04-E022-2. 2004. Rockville, MD, Agency for Healthcare Research and Quality.
4. Carey T, Howard DL, Goldmon M, Roberson JT, Godley PA, Ammerman A. Developing effective interuniversity partnerships and community-based research to address health disparities. *Acad Med*. 2005; 80: 1039-45.
5. Minkler M, Wallerstein N. Appendix H: Selected Centers and Other Resources for Participatory Research in North America. In: Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health*. San Francisco, CA: Jossey Bass, 2002.
6. Metzler MM, Higgins DL, Beeker CG, Freudenberg N, Lantz PM, Senturia KD, et al. Addressing urban health in Detroit, New York City, and Seattle through community-based participatory research partnerships. *Am J Public Health*. 2003; 93: 803-11.
7. Wells KB, Staunton A, Norris KC, Bluthenthal R, Chung B, Gelberg L, et al. Building an Academic-Community Partnered Network for Clinical Services Research: The Community Health Improvement Collaborative (CHIC). *Ethn Dis*. 2006; 16 (Suppl 1): 3-17.

8. Nyden P. Academic Incentives for Faculty Participation in Community-Based Participatory Research. *J Gen Intern Med.* 2003; 18: 576-85.
9. National Institutes of Health. Community Participation in Research. PA Number: PAR-05-026. 2004.
10. National Institutes of Health. NCMHD Community Participation in Health Disparities Intervention Research. National Institutes of Health, National Center on Minority Health and Health Disparities. 2004.
11. Lather P. Research as praxis. *Harv Educ Rev.* 1986; 56: 257-77.
12. Minkler M, Wallerstein N. *Community-based participatory research for health.* San Francisco, CA: Jossey-Bass, 2003.
13. Rogers E. *Diffusion of Innovations, 5th Edition.* New York: Free Press, 2003.
14. Green L, George M, Daniel M, Frankish C, Herbert C. *Study of participatory research in health promotion.*: Institute of Health Promotion Research, University of British Columbia, and the B.C. Consortium for Health Promotion Research, Ottawa Ontario Canada, 1995.
15. Krieger J, Allen C, Cheadle A, Ciske S, Schier JK, Senturia K, et al. Using Community-Based Participatory Research to Address Social Determinants of Health: Lessons Learned From Seattle Partners for Healthy Communities. *Health Educ Behav.* 2002; 29: 361-82.
16. Perera FP, Illman SM, Kinney PL, Whyatt RM, Kelvin EA, Shepard P, et al. The challenge of preventing environmentally related disease in young children: community-based research in New York City. *Environ Health Perspect.* 2002; 110: 197-204.
17. Parker EA, Israel BA, Williams M, Brakefield-Caldwell W, Lewis TC, Robins T, et al. Community action against asthma: examining the partnership process of a community-based participatory research project. *J Gen Intern Med.* 2003; 18: 558-67.
18. Wagenaar AC, Gehan JP, Jones-Webb R. Communities Mobilizing for Change on Alcohol: Lessons and results from a 15-community randomized trial. *J Community Psychol.* 1999; 27: 315-26.
19. Baldwin JH, Rawlings A, Marshall ES, Conger CO, Abbott KA. Mom empowerment, too! (ME2): a program for young mothers involved in substance abuse. *Public Health Nurs.* 1999; 16: 376-83.
20. Factor SH, Galea S, de Duenas Geli LG, Saynisch M, Blumenthal S, Canales E, et al. Development of a "survival" guide for substance users in Harlem, New York City. *Health Educ Behav* 2002; 29: 312-25.
21. Frasier PY, Belton L, Hooten E, Campbell, MK, DeVellis B, Benedict S, et al. Disaster Down East: Using Participatory Action Research to Explore Intimate Partner Violence in Eastern North Carolina. *Health Educ Behav* 2004; 31: 69-84.
22. Sullivan M, Bhuyan R, Senturia K, Shiu-Thornton S, Ciske S. Participatory Action Research in Practice: A Case Study in Addressing Domestic Violence in Nine Cultural Communities. *J Interpers Violence.* 2005; 20: 977-95.
23. Kegler M, Malcoe L, Lynch R, et al. A Community-based intervention to reduce lead exposure among Native-American children. *Environ Epidemiol Toxicol.* 2000; 2: 121-32.
24. Rosenberg Z, Findley S, McPhillips S, Penachio M, Silver P. Community-based strategies for immunizing the "hard-to-reach" child: the New York State immunization and primary health care initiative. *Am J Prev Med.* 1995; 11: 14-20.
25. Veinot T, Flicker SE, Skinner H A, McClelland A, Saulnier P, Read SE, et al. "Supposed to Make You Better but it Doesn't Really": HIV Positive Youths' Perceptions of HIV Treatment. *J Adolesc Health.* 2006; 38: 261-7.
26. Hergenrather K, Rhodes S, Clark G. Windows to Work: Exploring Employment-Seeking Behaviors of Persons with HIV/AIDS Through Photovoice. *AIDS Educ Prev.* 2006; 18: 243-58.
27. Flaskerud JH, Nyamathi AM, Uman GC. Longitudinal effects of an HIV testing and counseling programme for low-income Latina women. *Ethn Health* 1997; 2: 89-103.
28. Levine DM, Green LW, Deeds SG, Chwalow J, Russell, RP, Fnalay, J. Health education for hypertensive patients. *J Am Med Assoc.* 1979; 241: 1700-3.
29. Koopman C, Angell K, Turner-Cobb JM, Kreshke MA, Donnelly P, McCoy R, et al. Distress, Coping, and Social Support Among Rural Women Recently Diagnosed with Primary Breast Cancer. *Breast J.* 2001; 7: 25-33.
30. Angell KL, Kreshka MA, McCoy R, Donnelly P, Turner-Cobb JM, Graddy K, et al. Psychosocial intervention for rural women with breast cancer: The Sierra-Stanford Partnership. *J Gen Intern Med.* 2003; 18: 499-507.
31. Wismer BA, Moskowitz JM, Min K, Chen AM, Ahn Y, et al. Interim assessment of a community intervention to improve breast and cervical cancer screening among Korean American women. *J Public Health Manag Pract.* 2001; 7: 61-70.
32. Gotay CC et al. Impact of a culturally appropriate intervention on breast and cervical screening among native Hawaiian women. *Prev Med* 2000; 31: 529-37.
33. Corbie-Smith G, Ammerman AS, Katz ML, St George DM, Blumenthal C, Washington C, et al. Trust, benefit, satisfaction, and burden: a randomized controlled trial to reduce cancer risk through African-American churches. *J Gen Intern Med.* 2003; 18: 531-41.
34. Kalra P, Srinivasan S, Ivey S, Greenlund K. Knowledge and Practice: The Risk of Cardiovascular Disease Among Asian Indians: Results for Focus Groups Conducted in Asian Indian Communities in Northern California. *Ethn Dis.* 2004; 14: 497-504.
35. Macaulay AC, Paradis G, Potvin L, Cross EJ, Saad-Haddad C, McComber A, et al. The Kahnawake Schools Diabetes Prevention Project: intervention, evaluation, and baseline results of a diabetes primary prevention program with a native community in Canada. *Prev Med* 1997; 26: 779-90.
36. Garvin C, Cheadle A, Chrisman N, Chen R, Brunson E. A Community-Based Approach to Diabetes Control in Multiple Cultural Groups. *Ethn Dis.* 2004; 14: 83-92.



37. Kieffer EC, Willis SK, Odoms-Young AM, Guzman JR, Allen AJ, Two Feathers J, Loveluck J. Reducing disparities in diabetes among African-American and Latino residents of Detroit: the essential role of community planning focus groups. *Eth Dis.* 2005; 14: 27-37.
38. Sarkisian, CA, Brusuelas RJ, Steers WN, Davidson MB, Brown, AF, Norris KC, et al. Using focus groups of older African Americans and Latinos with diabetes to modify a self-care empowerment intervention. *Eth Dis.* 2005; 15: 283-91.
39. Sloane DC, Diamant AL, Lewis LB, Yancey AK, Flynn G, Nascimento LM, et al. Improving the nutritional resource environment for healthy living through community-based participatory research. *J Gen Intern Med.* 2003; 18: 568-75.
40. Arcury TA, Austin CK, Quandt SA, Saavedra R. Enhancing community participation in intervention research: farmworkers and agricultural chemicals in North Carolina. *Health Educ Behav.* 1999; 26: 563-78.
41. McQuiston TH. Empowerment evaluation of worker safety and health education programs. *Am J Ind Med.* 2000; 35: 584-97.
42. Baker EA, Israel BA, Schurman SJ. A participatory approach to worksite health promotion. *J Ambul Care Manage.* 1994; 17: 68-81.
43. Potvin L, Cargo M, McComber AM, Delormier T, Macaulay AC. Implementing participatory intervention and research in communities: lessons from the Kahnawake Schools Diabetes Prevention Project in Canada. *Social Sci Med.* 2003; 56: 1295-305.
44. Dickson G. Aboriginal grandmothers' experience with health promotion and participatory action research. *Qual Health Res.* 2000; 10: 188-213.
45. Marcus M et al. Community-based participatory research to prevent substance abuse and HIV/AIDS in African-American adolescents. *J Interprof Care.* 2004; 18: 347-59.
46. Caldwell CH, Wright JC, Zimmerman MA, Walsemann KM, Williams D, Isichei PA. Enhancing adolescent health behaviors through strengthening non-resident father-son relationships: a model for intervention with African-American families. *Health Educ Res.* 2004; 19: 644-56.
47. Levine DM et al. A partnership with minority populations: a community model of effectiveness research. *Ethn Dis.* 1992; 2: 296-305.
48. Schultz A, Parker EA, Israel BA, Allen A, Decarlo M, Lockett M. (2002). Addressing Social Determinants of Health Through Community Based Participatory Research: The East Side Village Health Worker Partnership. *Health Educ Behav.* 2002; 29: 326-41.
49. Ammerman A, Corbie-Smith G, St George DM, Washington C, Waethers B, Jackson-Christian B. Research expectations among African American church leaders in the PRAISE! Project: a randomized trial guided by community-based participatory research. *Am J Public Health.* 2004; 93: 1720-1727.
50. Chung P, Borneo H, Kilpatrick SD, Lopez DM, Travis R, Lui C, et al. Parent-adolescent communication about sex in Filipino American families: a demonstration of community-based participatory research. *Ambul Pediatr.* 2005; 5: 50-55.
51. Wismer BA, Moskowitz JM, Chen AM, Kang SH, Novotny TE, Min K, et al. Rates and independent correlates of Pap smear testing among Korean-American women. *Am J Public Health.* 1998; 88: 656-60.
52. Islam N, Kwon SC, Ahsan H, Senie RT. New York AANCART: Using Participatory Research to Address the Health Needs of South Asian and Korean Americans in New York City. *Cancer* 2005; 104: 2931-6.
53. Kim S, Flaskerud J, Koniak-Griffin D, Dixon E. Using community-partnered participatory research to address health disparities in a Latino community. *J Prof Nurs.* 2005; 21: 199-209.
54. Maciak BJ, Guzman R, Santiago A, Villalobos G, Israel BA. Establishing LA VIDA: a community-based partnership to prevent intimate violence against Latina women. *Health Educ Behav.* 1999; 26: 821-40.
55. Matsunaga DS, Enos R, Gotay CC, Banner RO, DeCambra H, Hammond OW, et al. Participatory research in a Native Hawaiian community. The Wai'anae Cancer Research Project. *Cancer.* 1996; 78: 1582-6.
56. Schell L, Ravenscroft J, Cole M, Jacobs A, Akwesasne Task Force on the Environment. Health Disparities and Toxicant Exposure of Akwesasne Mohawk Young Adults: A Partnership Approach to Research. *Environ Health Perspect.* 2005; 113: 1826-32.
57. Holkup PA, Tripp-Reimer T, Salois EM, Weinert C. Community-based participatory research: an approach to intervention research with a Native American community. *Adv Nurs Sci.* 2004; 27: 162-75.
58. Lam TK, McPhee SJ, Mock J, Wong C, Doan HT, Nguyen T, et al. Encouraging Vietnamese-American women to obtain pap tests through lay health worker outreach and media education. *J Gen Intern Med.* 2003; 18: 516-24.
59. McCauley LA, Beltran M, Phillips J, Lasarev M, Sticker D. The Oregon migrant farmworker community: an evolving model for participatory research. *Environ Health Perspect.* 2001; 109 Suppl 3: 449-55.
60. Brydon-Miller M. Breaking Down Barriers: Accessibility Self-Advocacy in the Disabled Community. In: Park P, Brydon-Miller M, Hall B, Jackson T, eds. *Voices of Change: Participatory Research in the United States and Canada.* Westport, CT: Bergin & Garvey, 1993: 125-43.
61. Stewart R, Bhagwanjee A. Promoting group empowerment and self-reliance through participatory research: a case study of people with physical disability. *Disabil Rehabil.* 1999; 21: 338-45.
62. Clements-Nolle K, Bachrach A. Community-Based Participatory Research with a Hidden Population: The Transgender Community Health Project. In: Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health.* San Francisco, CA: Jossey-Bass, 2003: 332-44.
63. Stevens PE, Hall JM. Participatory action research for sustaining individual and community change: a model of HIV prevention education. *AIDS Educ Prev.* 1998; 10: 387-402.

64. Nyamathi A, Knoiak-Griffin D, Tallen L, Gonzalez-Figueroa E, Levson L, Mosley Y, et al. Use of community-based participatory research in preparing low income and homeless minority populations for future HIV vaccines. *J Interprof Care*. 2004; 18: 369-80.
65. Rhodes SD, Hergenrather KC, Wilkin A, Alegria-Ortega J, Montano J. Preventing HIV infection among young immigrant Latino men: results from focus groups using community-based participatory research. *J Natl Med Assoc*. 2006; 98: 564-73.
66. Burroughs E, Peck LE, Sharpe PA, Granner ML, Bryant CA, Fields R. Using focus groups in the consumer research phase of a social marketing program to promote moderate-intensity physical activity and walking trail use in Sumter County, South Carolina. *Prev Chronic Dis*. 2006; 3: 1-13.
67. Schulz A, Parker EA, Israel BA, Becker AB, Maciak BJ, Hollis R. Conducting a participatory community-based survey for a community health intervention on Detroit's East Side. *J Public Health Manag Pract*. 1998; 4: 10-24.
68. Smith A, Christopher S, McCormick AKHG. Development and Implementation of a culturally sensitive cervical health survey: a community-based participatory approach. *Women Health*. 2004; 40: 67-86.
69. Wang CC. Using Photovoice as a Participatory Assessment and Issue Selection Tool: A Case Study with the Homeless in Ann Arbor. In: Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2003: 179-96.
70. Ayala G, Maty S, Cravey A, Webb L. Mapping Social and Environmental Influences on Health: A Community Perspective. In: Israel BA, Eng E, Schulz AJ, Parker E, eds. *Methods in Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2005: 188-209.
71. Potvin L, Cargo M, McComber AM, Delormier T, Macaulay AC. Implementing participatory intervention and research in communities: lessons from the Kahnawake Schools Diabetes Prevention Project in Canada. *Soc Sci Med*. 2003; 56: 1295-305.
72. Flick LH, Reese CG, Rogers G, Fletcher P, Sonn J. Building community for health: lessons from a seven-year-old neighborhood/university partnership. *Health Educ Q*. 1994; 21: 369-80.
73. Shoultz J, Oneha MF, Magnussen L, Hla MM, Brees-Saunders Z, Cruz MD, et al. Finding solutions to challenges faced in community-based participatory research between academic and community organizations. *J Interprof Care*. 2006; 20: 133-44.
74. Burhansstipanov L, Christopher S, Schumacher SA. Lessons learned from community-based participatory research in Indian Country. *Cancer Control*. 2005; 12 Suppl 2: 70-76.
75. Israel BA, Parker EA, Rowe Z, Salvatore A, Minkler M, Lopez J, et al. Community-based participatory research: lessons learned from the Centers for Children's Environmental Health and Disease Prevention Research. *Environ Health Perspect*. 2005; 113: 1463-71.
76. Vasquez VB, Minkler MSP. Promoting environmental health policy through community based participatory research: a case study from Harlem, New York. *J Urban Health*. 2006; 83: 101-10.
77. Ribisl KM, Steckler A, Linnan L, Patterson CC, Pevzner ES, Markatos E, et al. The North Carolina Youth Empowerment Study (NCYES): a participatory research study examining the impact of youth empowerment for tobacco use prevention. *Health Educ Behav*. 2004; 31: 597-614.
78. Wang CC, Morrel-Samuels S, Hutchison PM, Bell L, Pestronk RM. Flint Photovoice: community building among youths, adults, and policymakers. *Am J Public Health*. 2004; 94: 911-3.
79. Minore B, Boone M, Katt M, Kinch P, Birch S. Addressing the realities of health care in northern aboriginal communities through participatory action research. *J Interprof Care*. 2004; 18: 360-8.
80. Lee PT, Krause N. The Impact of a Worker Health Study on Working Conditions. *J Public Health Policy*. 2002; 23: 268-85.
81. O'Fallon LR, Deary A. Community-based participatory research as a tool to advance environmental health sciences. *Environ Health Perspect*. 2002; 110: 155-9.
82. van Olphen J, Freudenberg N, Galea S, Palermo AG, Ritas C. Advocating Policies to Promote Community Reintegration of Drug Users Leaving Jail. In: Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2003: 371-89.
83. Freudenberg N, Rogers M, Ritas C, Nerney M. Policy Analysis and Advocacy: An Approach to Community-Based Participatory Research. In: Israel BA, Eng E, Schulz AJ, Parker E, eds. *Methods for Conducting Community-Based Participatory Research for Health*. San Francisco, CA: Jossey Bass, 2005: 349-70.
84. Wallerstein N, Duran B. The Conceptual, Historical, and Practice Roots of Community Based Participatory Research and Related Participatory Traditions. In: Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health*. San Francisco, CA: Jossey Bass, 2002: 27-52.
85. Minkler M. Community-based research partnerships: challenges and opportunities. *J Urban Health*. 2005; 82: ii3-ii11.
86. Held D. *Introduction to Critical Social Theory: Horkheimer to Habermas*. Berkeley, CA: University of California Press, 1980.
87. Habermas J. *Theory and Practice (J. Viertel, Trans.)*. London: Heinemann, 1974.
88. Reinharz S. *Feminist Methods in Social Research*. London: Oxford University Press, 1992.
89. Hesse-Biber S, Gilmartin C, Lydenberg R. *Feminist Approaches to Theory and Methodology*. New York: Oxford University Press, 1999.
90. Biklen D. *Community Organizing: Theory and Practice*. Englewood Cliffs, NJ: Prentice Hall, 1983.
91. Alinsky S. *Reveille for Radicals*. New York: Random House, 1946.

92. Lewin K. Action Research and Minority Problems. *J Soc Issues*. 1951; 2: 34-46.
93. Freire P. *Pedagogy of the Oppressed*. New York: Herder and Herder, 1972.
94. Shediak-Rizkallah MC, Bone LR. Planning for the sustainability of community-based health programs: conceptual frameworks and future directions for research, practice and policy. *Health Educ Res*. 1998; 13: 87-108.
95. Altman DG. Sustaining Interventions in Community Systems: On the Relationship Between Researchers and Communities. *Health Psychol*. 1995; 14: 526-36.
96. Becker A, Isreal BA, Allen A. Strategies and Techniques for Effective Group Process in CBPR Partnerships. In: Israel BA, Eng E, Schulz AJ, Parker E, eds. *Methods in Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2005: 52-72.
97. Kelly J G. Ecological Constraints on Mental Health Services. *Am Psychol*. 1966; 21: 535-9.
98. Minkler M. Ethical challenges for the “outside” researcher in community-based participatory research. *Health Educ Behav*. 2004; 31: 684-97.
99. Jones CP. Levels of Racism: A Theoretical Framework and a Gardener’s Tale. *Am J Public Health*. 2000; 8: 1212-5.
100. Chavez V, Duran B, Baker QE, Avila MM, Wallerstein N. The Dance of Race and Privilege in Community-Based Participatory Research. In: Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2003: 81-97.
101. Israel BA, Eng E, Schulz AJ, Parker EA. *Methods in Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2005.
102. Stoecker R. *Research Methods for Community Change: A Project-Based Approach*. Thousand Oaks, CA: Sage Publications, 2005.
103. Blumenthal D, DiClemente R. *Community-Based Health Research: Issues and Methods*. New York City: Springer Publishers, 2003.
104. Carlson E, Engebretson J, Chamberlain R. Photovoice as a Social Process of Critical Consciousness. *Qual Health Res*. 2006; 16: 836-52.
105. Wang C, Yi W, Carovano K. Photovoice as a participatory health promotion strategy. *Health Promot Int*. 1998; 13: 75-86.
106. Trochim WMK. An Introduction to Concept Mapping for Planning and Evaluation. *Eval Program Plann*. 1989; 12: 1-16.
107. Delbecq AL, Vande Ven AH, Gustafson DH. *Group Techniques for Program Planners*. Glenview, IL: Scott Foresman and Company, 1975.
108. Patel KK, Koegel P, Booker T, Jones L, Wells K. Innovative Approaches to Obtaining Community Feedback in the Witness for Wellness Experience. *Ethn Dis*. 2006; 16 Suppl: S1-35-S1-42.
109. Linstone H, Turoff M. *The Delphi Method: Techniques and Application*. Reading, MA: Addison-Wesley, 1975.
110. Minkler M, Hancock T. Community-Driven Asset Identification and Issue Selection. In: Minkler M, Wallerstein N, eds. *Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2003: 135-54.
111. Gebbie K, Rosenstock L, Hernandez L. *Who Will Keep the Public Healthy? Educating Health Professionals for the 21st Century*. Washington DC: National Academy Press, 2003.
112. Community-Based Participatory Research Syllabi and Course Materials. Community-Campus Partnerships for Health. 2006.
113. Tandon, Darius. A Community-Based Participatory Research Curriculum for General Pediatrics Fellows. Community-Campus Partnerships for Health. <http://depts.washington.edu/ccph/2002fellows-tdandon.html>. 2005.
114. The Examining Community-Institutional Partnerships for Prevention Research Group. Developing and Sustaining Community-Based Participatory Research Partnerships: A Skill-Building Curriculum. [www.cbprcurriculum.info](http://www.cbprcurriculum.info). 2006.
115. Ritas, Cassandra. Speaking truth, creating power: a guide to policy work for community-based participatory research practitioners. 2003. Seattle, WA, Community-Campus Partnerships for Health. <http://mailman1.u.washington.edu/mailman/listinfo/cbpr>.
116. Shiu-Thornton S. Addressing cultural competency in research: integrating a community-based participatory research approach. *Alcohol Clin Exp Res*. 2003; 27: 1361-4.
117. Brown L, Vega W. A protocol for community-based research. *Research Linkages Between Academia and Public Health Practice* 1996.
118. Schulz A, Israel BA, Lantz PM. Instrument for evaluating dimensions of group dynamics within community-based participatory research partnerships. *Eval Program Plann* 2003; 26: 249-62.
119. Israel BA, Lantz P, McGranaghan R, Kerr Diana, Guzman R. Documentation and Evaluation of CBPR Partnerships: In-Depth Interviews and Closed-Ended Questionnaires. In: Israel BA, Eng E, Schulz AJ, Parker E, eds. *Methods in Community-Based Participatory Research for Health*. San Francisco, CA: Jossey Bass, 2005: 255-78.
120. Baker E, Motton F. Creating Understanding and Action Through Group Dialogue. In: Israel B, Eng E, Schulz A, Parker E, eds. *Methods in Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2005: 307-25.
121. Parker E et al. Developing and Implementing Guidelines for Dissemination. In: Israel B, Eng E, Schulz A, Parker E, eds. *Methods in Community-Based Participatory Research for Health*. San Francisco, CA: Jossey-Bass, 2005: 285-306.
122. Community-Campus Partnerships for Health. Principles of Partnership. 2006.
123. Wallerstein N, Duran B, Minkler M, Foley Kevin. Developing and Maintaining Partnerships with Communities. In: Israel BA, Eng E, Schulz AJ, Parker E, eds. *Methods in Community-Based Participatory Research for Health*. San Francisco, CA: Jossey Bass, 2005: 31-51.

124. Community-Campus Partnerships for Health and Wellesley Institute. Community-Based Participatory Research Listserv. <http://mailman1.u.washington.edu/mailman/listinfo/cbpr>. 2006.
125. Kelly JG, Azelton LS, Lardon C, et al. On community leadership: Stories about collaboration in action research. *Am J Community Psychol*. 2004; 33: 205-16.
126. Chene R et al. Mental Health Research in Primary Care: Mandates from a Community Advisory Board. *Ann Fam Med*. 2005; 3: 70-2.
127. Wolff M, Maurana C. Building effective community-academic partnerships to improve health: a qualitative study of perspectives from communities. *Acad Med*. 2001; 76: 166-72.
128. Kone A et al. Improving collaboration between researchers and communities. *Public Health Rep*. 2000; 115: 243-8.
129. Themba M, Minkler M. Influencing policy through community based participatory research. In: Wallerstein N, Minkler M, eds. *Community-Based Participatory Research for Health*. San Francisco, CA: Jossey Bass, 2005: 349-70.
130. Hohmann A, Shear MK. Community-based intervention research: coping with the “noise” of real life in study design. *Am J Psychiatry* 2002; 159: 201-7.
131. Kern D, Thomas P, Howard D, Bass E. *Curriculum Development for Medical Education: A Six-Step Approach*. Baltimore, MD: Johns Hopkins University Press, 1998.
132. United Way of America. Measuring program outcomes: A practical approach. 1996. Alexandria, VA, United Way of America.

# Fit for Life Steps: Results of a Community Walking Intervention in the Rural Mississippi Delta

Jamie Zoellner, PhD<sup>1</sup>, Carol Connell, PhD<sup>2</sup>, Ross Santell PhD<sup>3</sup> et al.

(1) The University of Southern Mississippi, Department of Nutrition and Food Systems; (2) Alcorn State University, Department of Human Sciences; (3) USDA/Agricultural Research Service–Delta Nutrition Intervention Research Initiative

## PURPOSE

- The purpose of this study was to develop and implement a walking intervention in Hollandale, a rural town in Mississippi, through the use of community-based participatory research (CBPR) methods. Located in the Mississippi Delta, Hollandale has a population that is 83% African American. Local levels of income, education, and literacy are low in comparison with both state and national averages. The research partnership included people from Hollandale working with others from the U.S. Department of Agriculture (USDA)/Agricultural Research Service (ARS) and from three nearby educational institutions, namely, Alcorn State University, The University of Southern Mississippi, and the Mississippi State University Cooperative Extension Service.
- The walking intervention lasted for 6 months. It focused on improving the physical activity levels and the health of Hollandale residents who joined in walking groups led by local volunteers. The walking group participants also had access to monthly classes in nutrition and physical activity. They engaged in self-monitoring to gauge their level of involvement.
- This study had the following two major aims:
  1. To assess the feasibility of developing and implementing an exercise intervention in Hollandale using a CPBR approach.
  2. To evaluate a number of key physical measures three times—at the study's outset, halfway through the intervention (after 3 months), and at the end of the intervention (after 6 months). These measures were body mass index, or BMI, which provides a measure of body weight status, percentage of body fat, waist circumference, blood pressure, blood glucose, and blood lipid profile.
- A secondary aim of the study was to test the application of two health behavior change theories. One was the social support theory; the other, the transtheoretical model (TTM).

## RECOMMENDATIONS FOR POLICY AND PRACTICE

- The authors gleaned several lessons through this work that they believe may apply to other collaborations between community, university, and government partners. One important lesson was the need for ample time for capacity building and the development of an intervention. Another lesson involved the value of offering a number of different avenues for community members' involvement. A third lesson was the need to recognize the limitations of using existing health behavior surveys among members of minority groups.



- Funding agencies must be flexible with CBPR projects. Although such projects do set out to answer a research question, they also involve certain time-consuming tasks that set them apart from traditional research projects. These slow but vital tasks include steps such as building collaborative relationships, creating social change, and developing the research skills of a community. Such accomplishments are hard to measure.
- This intervention revealed an important limitation of CBPR, namely, the challenge of accounting for social, cognitive, and physiologic changes that were likely to be taking place during the prolonged capacity-building phase that took place before the actual start of the intervention. In this project, this capacity-building period lasted nearly two years.

### HOW FINDINGS SUPPORT RECOMMENDATIONS

- This research demonstrated that CBPR is a useful approach in a poor, largely African American communities. Community members meaningfully helped to assess the target problem, identify and plan the intervention, and collect and evaluate data.
- During a two-part workshop, community members began contributing their ideas regarding the nature of the key problems, the causes of those problems, and the kinds of activities that might best solve them. One key problem that emerged was inadequate physical activity. Causes included lack of local role models for activity, lack of will power and self-esteem, and lack of physical activity education and trainers. Through this workshop, a clearer picture emerged of the community's nutrition and health priorities. This in turn led to the creation of a walking trail and to the 6-month walking intervention.

### RESULTS

- After the intervention, participants showed significant improvements in measures of waist circumference, systolic blood pressure, and high-density lipoprotein (HDL) cholesterol. Fifty-seven percent of the participants reported an improvement in their intentions and activities related to increased walking. No significant positive changes occurred in the other behavior theory variables such as social support and self-efficacy.
- All parties involved in the long process of developing and implementing this walking intervention in Hollandale viewed the project as a success. Members of the local community actively contributed to each phase of the research. They applied basic research components and formed sustainable partnerships. Furthermore, those who walked significantly improved their health status as indicated by several key biological measures.

---

Zoellner J, Connell C, Santell R, et al. Fit for life steps: Results of a community walking intervention in the rural Mississippi Delta. *Progress Community Health Partnerships*. 2006; 1: forthcoming. The Community Policy Brief is intended to inform community based organizations, public health policy makers, and other individuals whose primary interest is not research, but who would be interested in the application and translation of research findings for practical purposes.

## Fit for Life Steps: Results of a Community Walking Intervention in the Rural Mississippi Delta

Jamie Zoellner, PhD<sup>1</sup>, Carol Connell, PhD<sup>1</sup>, Ross Santell, PhD<sup>2</sup>, Thomas Fungwe, PhD<sup>2</sup>, Earline Strickland<sup>3</sup>, Amanda Avis-Williams, MPH<sup>1</sup>, Kathleen Yadrick, PhD<sup>1</sup>, Kristi Lofton, MS,<sup>1</sup> Marjuyua Rowser, MS<sup>1</sup>, Alicia Powers<sup>1</sup>, Gwendolyn Lucas, MS<sup>2</sup>, Margaret Bogle, PhD<sup>3</sup>

(1) The University of Southern Mississippi, Department of Nutrition and Food Systems; (2) Alcorn State University, Department of Human Sciences; (3) USDA/ARS–Delta Nutrition Intervention Research Initiative

This research was supported by ARS/USDA cooperative agreement no. 6251-52000-0020-000.

### Abstract

**Background:** A collaborative community–university–U.S. Department of Agriculture(USDA)/Agricultural Research Service (ARS) partnership developed and implemented a 6-month walking intervention whereby volunteer coaches were trained to lead community walking groups in a rural Mississippi Delta communities.

**Objective:** Assess the feasibility of implementing community-based participatory research (CBPR), increase physical activity, and improve anthropometric and biological measures.

**Methods:** This quasi-experimental design examined body mass index, percent body fat, waist circumference, blood pressure, blood glucose, lipid profile, self-reported walking, stages of change, social support, self-efficacy, and decisional balance at enrollment, 3 months, and 6 months. Participants were primarily African American (99%) women (97%). Changes were evaluated using repeated measures analysis of variance (ANOVA) and Friedman's test.

**Results:** Community members actively participated in assessing the problem, identifying the intervention, inter-

vention planning, data collection, and evaluation. Of the 83 enrolled participants, 66 (80%) completed the intervention. Participants exhibited significant improvements in waist circumference (−1.4 inches), systolic blood pressure (−4.3 mmHg), and high-density lipoprotein (HDL) cholesterol (+7.9 mg/dL;  $P < .001$ ). Self-reported walking per day was 44.8 (SD+52.2) minutes at enrollment, 76.6 (SD+166.6) minutes at 3-months, and 65.9 (SD+89.7) minutes at 6 months ( $P = .154$ ). A positive stage of change shift occurred in 57% of participants; however, no significant positive changes occurred in the other psychosocial variables.

**Conclusion:** The process of developing and implementing this CBPR walking intervention was considered successful as evidenced by the community's active contribution and participation in each phase of this research, the undertaking and application of basic research components, significant improvements in several anthropometric and biological values, and sustainability of the collaborative partnership.

### Keywords

Nutrition, exercise, vulnerable populations, health priorities, rural health

Mississippi, Louisiana, and Arkansas repeatedly receive the worst rankings in state health standings owing in large part to the vulnerable population living in the Lower Mississippi Delta (Delta) region.<sup>1</sup> The region is predominantly rural, with a high concentration of African Americans, high rates of poverty, and low educational achievement.<sup>2</sup> Residents in the Delta suffer a

disproportionate amount of chronic diseases including obesity, heart disease, diabetes, and hypertension.<sup>3,4</sup> Because a variety of individual, community, and environmental factors affect the health patterns of Delta residents, opportunities for interventions to improve the health and nutritional status of this population appear abundant.<sup>5</sup> However, utilizing traditional research techniques and experimental

methodologies in the Delta population is extremely problematic because of the geographical location of this population, difficulties in recruiting and retaining minorities, low literacy rates, lack of local health professionals and services, and lack of local qualified researchers to oversee intervention activities.<sup>6–8</sup> Consequently, community-based participatory research (CBPR) methodologies linking community members with academic and government partners to collaboratively identify and prioritize health problems, and develop and implement intervention strategies, has far-reaching potential in Delta communities.<sup>9</sup>

The Lower Mississippi Delta Nutrition Intervention Research Initiative (Delta NIRI) was established to assess the nutrition and health status of Delta residents and develop and evaluate sustainable CBPR nutrition interventions.<sup>10</sup> This tri-state consortium consists of three rural Delta communities (one each in Mississippi, Louisiana, and Arkansas), the USDA/ARS, seven university partners, and each state's cooperative extension service. Early phases of this initiative assessed the nutrition and health needs of Delta residents to help direct intervention research.<sup>3,5,9</sup> Each state then established a community participatory structure to evaluate the nutrition and health needs of its individual community. In the most recent phase, a variety of CBPR interventions are being conducted within each community to improve the nutrition and health of Delta residents.

This paper describes the CBPR methods and *Fit for Life Steps* intervention in Hollandale, Mississippi. The Hollandale Nutrition Intervention Research Initiative (HNIRI), in collaboration with USDA/ARS, Alcorn State University, The University of Southern Mississippi, and the Mississippi State University Cooperative Extension Service developed and implemented a walking intervention in Hollandale, which consisted of training and empowering community volunteers to lead community members in walking groups. The primary aims were to (1) assess the feasibility of developing and implementing a CBPR intervention in Hollandale, (2) increase physical activity of community members, and (3) improve anthropometric and biological measures related to physical activity. Secondary aims were to test the application of two behavioral theories, including social support and the transtheoretical model (TTM), and improve psychosocial constructs related to physical activity behaviors.

## METHODS

### The Hollandale Community and Hollandale Nutrition Intervention Research Initiative

Hollandale, Mississippi is a community of approximately 3,440 residents located in Washington County.<sup>2</sup> African Americans comprise 83% of this community, as compared to 36% in Mississippi and 12% nationally. The median income, educational achievement, and literacy proficiencies of residents are low compared to state and national averages.<sup>2,8</sup> Hollandale has one school district, a city government with one mayor and five aldermen, twenty-six churches, and seven eating establishments. HNIRI was established in 2003 to unite community members and researchers in evaluating and improving the nutrition and health status of Hollandale residents. This group meets monthly and includes approximately 20 community members, seven university representatives, one ARS representative and one extension representative.

### Obtaining Community Input

Hollandale community members were involved in every phase of the CBPR process including assessing the problem, identifying the intervention, intervention planning, data collection, and evaluation. A two-part Comprehensive Participatory Planning and Evaluation (CPPE) Causal Analysis Workshop was held in July and October of 2003.<sup>12</sup> The CPPE approach was used to engage community members in comprehensive intervention planning. Twenty-one community members, one ARS, and nine university representatives participated in the first workshop. Nine members each from the community and the universities and one ARS representative attended the second workshop. The primary workshop objectives were to (1) identify key problems and issues contributing to the nutrition and health status of the community, (2) identify individual, behavioral, and environmental skill targets and resource factors associated with key problems, and (3) identify objectives and activities to address key problems. The top three nutrition and health problems identified included lack of physical activity, intake of unhealthy food, and lack of nutrition knowledge. Workshop participants developed causal models to identify root causes for these problems, and identified objectives and activities to address root causes.



In May 2004, HNIRI collaborated with the City of Hollandale and local businesses to build a walking trail. Prior to the installation of the walking trail, no other physical activity facility, such as a gym, health club, or track, was available. The one-eighth mile oval walking trail was built around an established community playground. The resulting CPPE workshop achievements and installation of the walking trail signified capacity building within the community, and the community urged researchers to initiate an intervention promoting the walking trail. In response to the physical activity causal model and literature on community-based approaches to promote walking,<sup>13–15</sup> the proposal evolved to empower walking coaches to lead walking groups.

### Theoretical Framework of Walking Intervention

Two theoretical frameworks, social support and TTM, were applied to understand exercise-related psychosocial changes.<sup>16</sup> Previous research establishes that social support predicts high physical activity levels and is associated with the adoption of exercise.<sup>17,18</sup> Social interactions have been cited as a primary motivation for wanting to exercise.<sup>19</sup> These findings imply that social aspects of physical activity should be emphasized and people should be encouraged to engage in exercise with partners.

The TTM provides an integrative structure for exploring exercise-related behaviors and has three central constructs including the stages of change, self-efficacy, and decisional balance.<sup>20–22</sup> The stages of change focus on both current behavior and behavioral intention by having participants indicate their readiness to engage in exercise. *Self-efficacy* refers to the participants' confidence about performing exercise under different situations or conditions and is built on the premise that a person's confidence about performing exercise is highly associated with actual ability to exercise. Decisional balance requires participants to assess the benefits (pros) and costs (cons) of exercise. The present and future likelihood to participate in exercise is related to the benefits outweighing barriers.

Both theories provided a conceptual framework for planning, implementing, and evaluating intervention components. Although both theories have been applied in multiple research contexts for a variety of populations, little

research, including development and validation of measurement instruments, has been conducted in disadvantaged African American populations.<sup>16,23,24</sup> Therefore, a secondary aim of the research was to test the internal reliability of previously validated instruments and assess the utility of these questionnaires in the Hollandale community.<sup>21,25,26</sup>

### Intervention Design

This 6-month intervention focused on improving physical activity and health through walking teams led by supportive coaches, self-monitoring, and monthly nutrition and physical activity educational sessions. Coaches were trained to lead a walking group, contact walking members, and document intervention-related contacts. Participants were instructed to set weekly personal walking goals. No defined amount of walking was required to participate in the intervention. Coaches were asked to contact group members a minimum of one time per week to encourage goal setting and walking. Group walking was encouraged, but not required. Coaches were responsible for collecting and submitting weekly walking logs to the HNIRI office, and received six \$25 monthly incentives for turning in completed contact and walking logs and assisting with intervention-related activities.

Five 1-hour education sessions were delivered, one each month of the intervention. Education session topics included (1) goal setting and motivation, (2) healthy body mass index (BMI) and caloric needs, (3) label reading and portion control, (4) beverage consumption, and (5) recipe modification. Water bottles, recipe boxes, pot holders, and measuring spoons were given to encourage attendance. The sixth and final session was a celebration. At each session, coaches received a report on their group's walking activity to share with their team members. The walking logs and educational sessions were the process data component of this intervention and a complete and accurate description of analyses and results are not possible within this manuscript's framework.

### Recruiting and Training Coaches

The HNIRI committee nominated adult community members as potential coaches. These individuals were invited to an orientation session, which included an explanation of

the research study design and intervention activities, health benefits of walking, and responsibilities of coaches. Those interested in serving as a coach were invited to attend a three-part coaches training session. A community–university–government committee developed the content, agenda, and schedule for the coaches’ training sessions. Attendance records were kept to ensure each coach participated in all training sessions.

### Recruiting and Training Walking Participants

Coaches were responsible for recruiting community members to participate and for communicating intervention-related activities and participation requirements to walking group members. Coaches invited identified participants to visit the HNIRI office for step-count gait assessment and instruction on pedometer use and walking logs. Subsequently, walking members participated in each data collection.

### Recruiting and Training Data Collectors

Local and neighboring community members were recruited to serve as data collectors. Job announcements included flyers posted around the Hollandale community and an advertisement in the daily newspaper serving the community. A community–university–government hiring committee screened, interviewed, and hired data collectors. University partners developed training protocols and manuals, and scheduled and conducted the training sessions. All community data collectors were required to attend a two-day training and certification session. Attendance and certification records were kept to ensure adequate training of all data collectors.

### Outcome Measures

Outcome measures included anthropometric measurements, biological values, self-reported walking, and psychosocial constructs at enrollment, 3 months, and 6 months. All outcome data were collected at the HNIRI office. At enrollment, all participants completed a medical disclaimer and informed consent as approved by University of Southern Mississippi’s and Alcorn State University’s Institutional Review Boards. Height was measured without shoes using a stadiometer (Shorr Height Measuring Board, Olney, MD).

Waist circumference was determined using a nonstretchable flexible measuring tape. Body weight, BMI, and body composition were determined by bioimpedance analysis using model TBF 310 Tanita scale (TANITA Corporation of American, Inc., Arlington Heights, IL). The validity of this instrument has been previously established.<sup>27</sup> Blood pressure was measured with the OMRON HEM-907XL (OMRON Healthcare, Inc., Vernon Hills, IL). Fasting total cholesterol (TC), (HDL-C), (LDL-C), triglycerides (TG), and glucose levels were determined via finger stick method using the Cholestech LDX (Cholestech Corporation, Hayward, CA).

At each measurement point, participants also completed face-to-face interview-administered questionnaires, including past week physical activity, social support, stages of change, self-efficacy, and decisional balance. Previously developed and validated instruments and scoring procedures were used. The Past Week Physical Activity Recall was originally developed for use in the U.S. Centers for Disease Control and Prevention (CDC) Behavioral Risk Factor Surveillance Survey and subsequently used in the Jackson Heart Study.<sup>28,29</sup> Participants were shown a calendar of the past seven days and asked to report the days per week and minutes per day they “walked for at least 10 minutes at a time while at work, for recreation, exercise, to get to and from places, or for any other reason.” Social support for exercise from family and friends were both assessed using the same 13-item questionnaire.<sup>26</sup> Participants identified how often on a 5-point Likert scale, ranging from none (1) to very often (5), friends and family provided support for exercise in different situations. The social support instrument yields two subscales for family and one subscale for friends. Stage of change was measured by each participant reporting their readiness to adopt regular outdoor exercise on an 8-point scale ranging from negative precontemplation (1) to long-term maintenance (8).<sup>25</sup> Self-efficacy was assessed using a 16-item questionnaire that required participants to indicate their level of confidence to exercise on a 5-point Likert scale ranging from not at all confident (1) to completely confident (5).<sup>21</sup> This instrument yields a total self-efficacy score and six subscales of self-efficacy, including negative affect, excuse making, must exercise alone, inconvenience to exercise, resistance from others, and bad weather. Decisional balance was assessed by participants indicating

how important 16 different statements were in impacting their decision to exercise.<sup>21</sup> The 5-point Likert scale ranged from not at all important (1) to extremely important (5). This instrument yields a total decisional balance score, a pro subscale, and a con subscale.

At each data collection point, participants received a \$20 incentive and a “Know Your Numbers” card with their recorded anthropometrics and biological values. After all

outcome data were analyzed, walking participants were invited to attend a meeting where overall intervention findings and implications were discussed.

### Quality Control

At each data collection, one ARS member and three university members were present to ensure quality control of data collection procedures. A data collection manager

**Table 1. Gender, Race, Age, Marital Status, and Education Level of Coaches and Walking Participants Completing the Intervention**

Demographic Variables	Coaches (n = 8)		Participants (n = 58)		Total (N = 66)	
	Count	%*	Count	%*	Count	%*
<b>Gender</b>						
Female	8	100	56	97	64	97
Male	0	0	2	4	2	3
<b>Race</b>						
African American	8	100	57	98	65	99
Other	0	0	1	2	1	2
<b>Age at enrollment (yrs)</b>						
< 20	0	0	1	2	1	2
20–29	0	0	6	10	6	9
30–39	1	13	14	24	15	23
40–49	3	38	10	17	13	20
50–59	2	25	20	35	22	33
60–69	2	25	5	9	7	11
≥ 70	0	0	2	3	2	3
<b>Marital status</b>						
Now married	5	63	25	43	30	46
Widowed, divorced, or separated	1	13	11	19	12	18
Never married	2	25	22	38	24	36
<b>Highest level of education completed</b>						
< 6th grade	0	0	1	2	1	2
6–9th grade	0	0	2	3	2	3
10–11th grade	2	25	4	7	6	9
12th grade (HS or GED)	1	13	19	33	20	30
Trade or vocational school	0	0	3	5	3	5
Some college	2	25	11	19	13	20
College degree	0	0	12	21	12	18
Some graduate/professional school	1	13	2	3	3	5
Graduate level/professional degree	2	25	4	7	6	9

\* Because of rounding, values may not equal 100%.

reviewed all data forms for completeness of data, unrealistic values, and readability of hand writing. Data records were transmitted to University of Southern Mississippi where university partners directed data entry, management, and analyses.

### Statistical Analysis

Descriptive statistics were used to assess recruitment and participation rates, demographics, and attendance records for coaches training and data collectors training. For participants completing all three data collections, changes in anthropometric measures, biological measures, and average daily minutes of walking activity were evaluated. Repeated measures analyses of variance (ANOVA) were used to evaluate data meeting the assumptions of normality, and the Friedman's test was used to analyze nonparametric data. Internal reliability of the psychosocial instruments was tested with the enrollment data using Cronbach's  $\alpha$ . If the psychosocial instruments were found reliable as evidenced by a Cronbach's  $\alpha > .70$ , repeated measures ANOVA were used to evaluate changes in social support, self-efficacy, and decisional balance. Descriptive statistics were used to describe shifts in stages of change. For all ANOVA and Friedman's tests,  $P$ -values  $\leq .05$  were considered significant.

### RESULTS

Approximately 40 adult community members were nominated to serve as potential coaches, 19 attended the first orientation session, 11 expressed interest, and eight completed all three training sessions and led walking groups for the duration of the intervention. These eight coaches identified a total of 88 potential walking members for their teams. Of these 88, 75 participated in the first enrollment data collection, 69 participated in the 3-month data collection, and 58 completed the entire 6-month intervention. Total retention rate for coaches and all walking participants from enrollment to the 6-month follow-up was 80%. As classified the CDC BMI criteria, this was a primarily overweight and obese population. Of the 83 participants (eight coaches and 75 walking members), eight (10%) were normal weight, 18 (22%) were overweight, and 57 (69%) were obese. These participants were primarily African American (99%) women (97%) with an average age of 46.1 ( $\pm$ SD = 12.8) years (Table 1). Although there were no significant differences in race, marital status, education, or income between the 83 participants who enrolled and the 66 participants who completed the intervention, younger participants were significantly more likely to drop out.

**Table 2. Anthropometrics, Biological Measures, and Average Daily Minutes of Walking at Enrollment, 3 Months, and 6 Months ( $N = 66$ )**

Measures	Enrollment Mean (SD)	3-Month Mean (SD)	6-Month Mean (SD)	P-Value
BMI ( $\text{kg}/\text{m}^2$ )	34.4 (9.4)	34.3 (9.6)	34.1 (9.4)	.297*
Waist circumference (cm)	40.4 (7.7)	40.4 (7.7)	39.0 (7.0)	< .001*
Systolic blood pressure (mm/Hg)	139.6 (18.6)	130.0 (17.7)	135.3 (18.5)	< .001*
Diastolic blood pressure (mm/Hg)	87.9 (10.4)	85.5 (8.9)	88.1 (10.6)	.052*
Glucose (mg/dL)	105.0 (33.6)	106.6 (41.4)	106.6 (44.3)	.852*
Total cholesterol (mg/dL)	181.6 (45.2)	188.4 (43.7)	190.3 (39.6)	.059*
LDL-C (mg/dL)	113.3 (40.9)	101.7 (45.6)	109.8 (42.3)	.169*
HDL-C (mg/dL)	49.3 (12.0)	51.2 (13.1)	57.2 (13.4)	< .001*
Triglycerides (mg/dL)	97.5 (43.8)	127.6 (107.0)	109.3 (56.7)	.233†
Body fat (%)	42.7 (9.6)	43.2 (8.1)	43.6 (7.5)	.165*
Average daily walking (min)	44.8 (52.2)	76.6 (166.6)	65.9 (89.7)	.154†

Notes. SD, standard deviation; LDL-C, low-density lipoprotein cholesterol; HDL-C, high-density lipoprotein cholesterol.

\* ANOVA test.

† Friedman's test.

Thirty-one applicants responded to the initial community data collector job announcement, and 18 were interviewed. Nine data collectors were employed, attended all mandatory training, and passed required competencies. A sufficient number of data collectors were retained for the 3-month time point and a required 2-hour mini retraining session was held. For the second job announcement at 6 months, 17 applicants responded, 10 were interviewed, and five were hired, attended all required training, and passed competencies.

Triglycerides and average minutes reported walking were analyzed using Friedman’s test because the data did not meet the assumptions of normality. ANOVA tests were used to analyze all other normally distributed anthropometric, biological, and psychosocial data. Participants exhibited significant improvements in waist circumference (–1.4 inches), systolic blood pressure (–4.3 mmHg), and HDL-C

(+7.9 mg/dL) from baseline to 6 months. Diastolic blood pressure, BMI, percent body fat, blood glucose, total cholesterol, LDL-C, and TG did not change significantly. Although not significant, there was a trend for average minutes reported walking to increase from baseline to 3 months (+31.76 min/day) and then decline from 3 months to 6 months (–10.7 min/day), with an overall net increase in walking (Table 2).

With the exception of the family rewards and punishment social support score, Cronbach’s  $\alpha$  met the typically defined 0.7 value indicative of sufficient internal reliability (Table 3). However, no significant positive changes resulted in any of the psychosocial variables as a result of this intervention (Table 3). From enrollment to 6 months, 57% of participants indicated a positive shift in stages of change, 23% remained in the same stage, and 20% indicated a negative shift (Figure 1).

**Table 3. Internal Consistency and Social Support, Self-Efficacy, and Decisional Balance Measures at Enrollment, 3 Months, and 6 Months (N = 66)**

Measures	Number of Items	Cronbach’s $\alpha$ at Enrollment	Enrollment Mean (SD)	3-Month Mean (SD)	6-Month Mean (SD)	P-Value
Family social support: participation and involvement	10	.92	25.1 (11.2)	24.7 (11.0)	24.5 (11.7)	.856
Family social support: family rewards and punishment	3	.14*	4.3 (1.8)	4.5 (2.4)	4.5 (2.0)	.724
Friends social support: participation and involvement	10	.91	23.2 (10.3)	24.2 (11.7)	22.3 (10.9)	.183
Self-efficacy (total score)	16	.88	3.5 (0.7)	3.4 (0.7)	3.4 (0.8)	.424
Negative affect (SS)	3	.75	3.3 (1.0)	3.3 (1.0)	3.2 (1.1)	.812
Excuse making (SS)	3	.85	2.9 (1.0)	2.8 (0.9)	2.9 (1.0)	.262
Must exercise alone (SS)	2	NA†	4.2 (0.9)	4.2 (0.7)	4.1 (0.9)	.640
Inconvenience to exercise (SS)	2	NA†	4.1 (0.8)	4.2 (0.7)	3.9 (0.9)	.011
Resistance from others (SS)	2	NA†	4.1 (0.7)	4.0 (0.7)	3.9 (1.0)	.103
Bad weather (SS)	4	.77	3.1 (1.0)	3.0 (1.1)	3.0 (1.1)	.747
Decisional balance (total score)	16	.83	1.9 (1.1)	1.7 (1.1)	1.7 (1.1)	.152
Pro score (SS)	10	.89	4.6 (0.6)	4.4 (0.7)	4.4 (0.7)	.006
Con score (SS)	6	.80	2.7 (1.1)	2.7 (1.0)	2.7 (1.0)	.857

Notes. SD, standard deviation; SS, subscore.

\* Cronbach’s  $\alpha$  indicates low internal reliability; interpret ANOVA cautiously.

† Cronbach’s  $\alpha$  only determined for subscores with  $\geq 3$  questions.

**DISCUSSION**

The development and implementation of this CBPR walking intervention was considered successful as evidenced by the community’s active contribution and participation in each research phase, the undertaking and application of basic research components, significant improvements in several anthropometric and biological values, and the sustainability of the partnerships formed through this intervention. The CPPE workshop was instrumental in initiating the capacity building process, and the regular monthly meetings were essential in fostering a cohesive relationship of trust and understanding among all team members. The recruitment response rates and retention rates for coaches and walking members were sufficient for a successful intervention. The pool of applicants responding to data collector announcements provided enough qualified candidates to employ and train local community members for data collection. The undertaking and application of basic research components indicated that community members and researchers were able to collaborate and effectively execute the intervention.

In further support of the success of this intervention, participants exhibited significant improvements in waist

circumference, systolic blood pressure, and HDL-C. The non-normality of TG data was attributed to the large percent of enrolled participants with metabolic syndrome. Using standard classification criteria, 41% of walking participants had three or more of the five defined metabolic syndrome criteria at baseline.<sup>30</sup> Triglycerides are known to be elevated in individuals with metabolic syndrome.<sup>31</sup> This rate of metabolic syndrome is alarming, warrants further evaluation, and deserves consideration in future interventions. There was no significant change in BMI. Although energy intake was not measured, it is feasible that participants increased caloric intake to compensate for increased activity, resulting in no significant weight changes. Monthly educational sessions incorporated nutrition messages, but these components may not have been intensive enough to produce weight loss.

Although not significant, there was a trend for an overall net increase in walking. The average minutes reported walking remained nonsignificant after controlling for a few outliers and applying nonparametric statistical methods. The non-normality and large standard deviations reflected in these self-reported walking data are consistent with previous self-reported physical activity research.<sup>23,32</sup> Although the

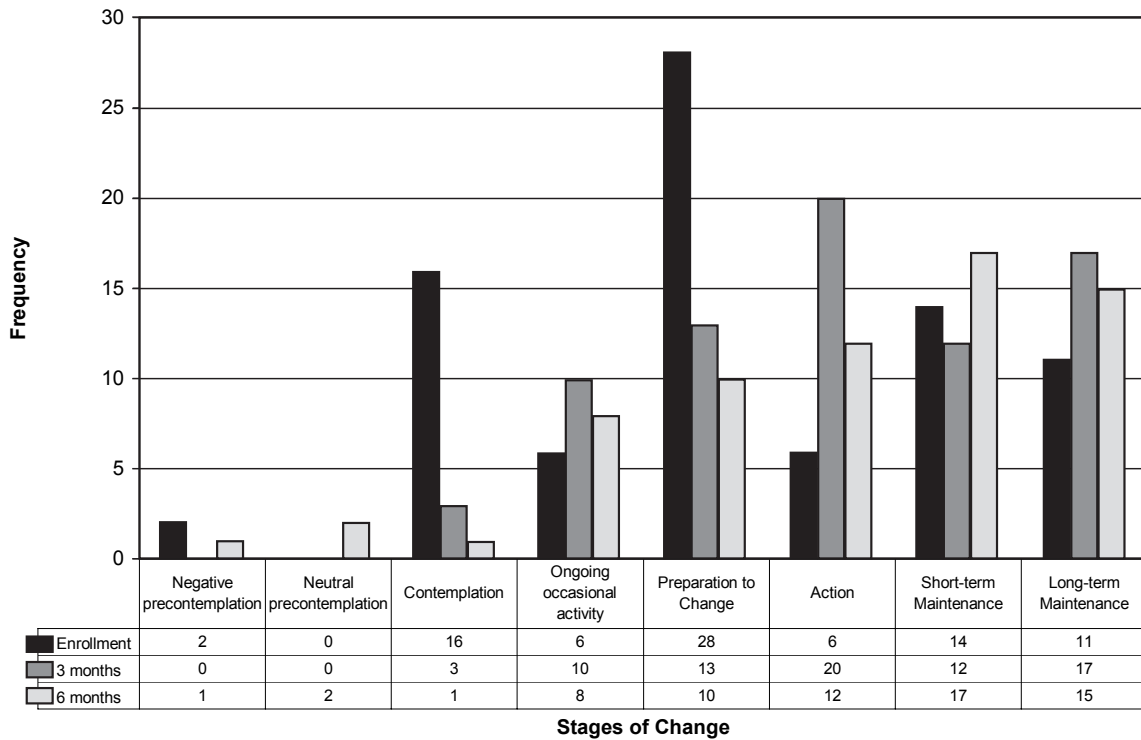


Figure 1. Shifts in stages of change at enrollment, 3 months, and 6 months (N = 66).

Past Week Physical Activity Recall was the most practical instrument for assessing physical activity in this community-based intervention, the literature is replete with the difficulties and methodologic limitations in accurately measuring physical activity.<sup>33–35</sup> Average minutes spent walking per day was surprisingly high at baseline and indicates participants were already meeting CDC recommendations for at least 30 minutes of moderate-intensity physical activities on five or more days of the week.<sup>36</sup> The walking trail was installed almost a year before the intervention and observations indicate the trail was used frequently in the months preceding intervention kick-off.

The majority of participants made a positive shift in the stages of change. However, this study provided limited support to the hypotheses that social support, self-efficacy, and decisional balance as related to physical activity behaviors would improve as a result of this walking intervention. Most of the Cronbach's  $\alpha$  met the defined 0.7 value indicative of sufficient internal reliability, yet no significant positive changes resulted from this intervention. Social support for exercise was directly targeted in the intervention through coaches regularly contacting walking participants to encourage walking and attendance of monthly educational meetings, but did not change significantly throughout the intervention. At enrollment the walking groups had already been formed and participants were aware that coaches would be assisting them in initiating and maintaining a walking program. Perhaps participants perceived adequate social support at enrollment in response to the social support received in encouraging them to participate in this intervention, leaving little room for improvement at subsequent time points.

Neither total self-efficacy nor total decisional balance score changed significantly. However, the self-efficacy inconvenience to exercise subscore and the decisional balance pro subscore significantly changed in a direction opposite than hypothesized. At enrollment, participants may have minimized the inconvenience to exercise, and during the intervention discovered that maintaining a walking program was difficult and imposed inconvenience. Similarly, participants may have rated the pro score high at first believing that regular physical activity would provide tremendous

benefits, and subsequently discovered these benefits were not as great as initially perceived.

It remains unclear if these psychosocial findings were truly due to lack of improvement in psychosocial variables or due to lack of instrument responsiveness in this population. Methodologic limitations exist in using internal consistency reliability to reflect instrument responsiveness.<sup>37</sup> Although HNIRI researchers were aware of potential limitations with these instruments, because of building momentum and desire to initiate the intervention, the time involved to properly tailor data collection instruments and develop scoring procedures would have significantly delayed the intervention and frustrated the community. Research is emerging on the unique psychosocial factors impacting physical activity in African American populations as well as the distinct challenges of environmental factors impacting physical activity in rural areas.<sup>23,24,38</sup> The unique psychosocial determinants and correlates of physical activity in rural minority populations and the need to develop culturally sensitive instruments should be a research priority.

Several limitations exist with this CBPR intervention. Immeasurable social, cognitive, and physiological changes were likely occurring from July 2003 to April 2005 as a result of the community–university–government partnership formed and increased exposure to the HNIRI messages promoting improved health. The nature of CBPR makes it extremely difficult to control for these changes. Another concern with self-reported instruments is the social desirability bias, whereby participants may have either consciously or unconsciously presented themselves in an overly positive manner. Additionally, the quasi-experimental design and resulting sample size may not have been sensitive enough to detect other significant changes.

The overall planning, delivery, and evaluation of the *Fit for Life Steps* intervention was successful and the sustainable partnerships will bring long-term opportunities to the community. Partners involved in this research experience have gained a greater appreciation for the continuous demand for mutual understanding and trust. The community now has confidence in the ability of university partners to deliver a structured intervention, and the researchers value the unique needs and dynamics of the community. Plans are currently



underway to build on the mutual trust to develop and implement a second CBPR intervention. Although all successful partnerships are not alike, several lessons learned through this intervention may be generalizable to other community–university–government partnerships and are summarized here:

1. Allow sufficient time for capacity building and intervention development. Building person-to-person relationships between community members and researchers, and organization-to-organization relationships between community and academic organizations is time consuming. It was nearly 2 years from the initial CPPE workshop to the intervention kickoff. Nevertheless, nurturing this relationship and ensuring that the community was a central partner in all phases of the research was critical to the success of this intervention.
2. Offer multiple involvement opportunities for community members. Different options for involvement including the CPPE process, monthly HNIRI meetings, coaches training, walking participation, and data collection appealed to a variety of community members and greatly contributed to the overall success of this intervention. Although employment of community members for data collection added a unique challenge for the researchers to develop and deliver appropriate training, the intensive contact and relationships formed in training and execution of data collection made this an extremely rewarding element of the partnership.
3. Understand the limitations of using previously developed health-related psychosocial instruments. Future researchers embracing the CBPR model in minority populations will encounter similar difficulties in select-

ing and developing health-related psychosocial instruments. The lack of valid and reliable theory-based behavioral instruments for minority populations is problematic. Developing and validating tailored instruments is a time-consuming component of the already lengthy CBPR process.

4. Funding agencies need to be flexible and appreciate the complexity of CBPR projects. Although funding agencies rightfully require documented improved community outcomes, capturing these outcomes is more complex than traditional community-based research. CBPR is more than just answering a research question; it also encompasses time-intensive components much more difficult to measure, such as building collaborative relationships, creating social change, and developing a community's research skills.

#### ACKNOWLEDGMENTS

The authors acknowledge contributions from all members of the Hollandale NIRI Community Committee, with special thanks to Hollandale NIRI Chairperson Helen Perkins, Hollandale NIRI staff members Demetric Warren and Shirley Vassar, and Karen Vassel with the Mississippi State University Cooperative Extension Service. We also appreciate Doris Thompson's assistance in reviewing the manuscript and the statistical support provided by Ann Beardshall and J. T. Johnson.

#### BEYOND THE MANUSCRIPT

An edited transcript of our *Beyond the Manuscript* post-study interview with the lead author and community partner will appear after the article in the first issue of *PCHP*. An audio podcast of the interview is available at the Journal's website <http://pchp.press.jhu.edu>. *Beyond the Manuscript* podcasts are also available from iTunes.



## REFERENCES

1. *Morgan Quitno's Healthiest State Award 2005*. Lawrence, KS: Morgan Quitno Press; 2005.
2. U.S. Census Bureau [homepage on the Internet]. Washington, DC: [Updated 2006 March 28; cited 2006 December 1]. Available from [www.census.gov](http://www.census.gov).
3. Lower Mississippi Delta Nutrition Intervention Research Consortium. Self-reported health of residents of the Mississippi Delta. *J Health Care Poor Underserved*. 2004; Nov; 15(4): 645–662.
4. Smith J, Lensing S, Horton J, Lovejoy JA, Zaghoulou S, Forrester I, et al. Prevalence of self-reported nutrition-related health problems in the Lower Mississippi Delta. *Am J Public Health*. 1999; 89: 1418–1421.
5. Yadrick K, Horton J, Stuff J, McGee B, Bogle M, Davis L, et al. Perceptions of community nutrition and health needs in the Lower Mississippi Delta: A key informant approach. *J Nutr Edu*. 2001; 33: 266–277.
6. Warren-Findlow J, Prohaska T, Freedman D. Challenges and opportunities in recruiting and retaining underrepresented populations into health promotion research. *Gerontologist*. (2003); 43: 37–47.
7. Flaskerud J, Winslow B. Conceptualizing vulnerable populations health-related research. *Nurs Res*. 1998; 47: 69–78.
8. Adult Literacy Estimates [homepage on the Internet]. San Diego: CASAS. [updated 22 May 2005; cited 2006 December 1]. Available from [www.casas.org/lit/litcode/Search.cfm](http://www.casas.org/lit/litcode/Search.cfm).
9. Israel B, Schulz A, Parker E, Becker A. Review of community based research: Assessing partnership approaches to improve public health. *Annu Rev Public Health*. 1998; 19: 173–202.
10. Schwenk F. History and overview of the Lower Mississippi Delta Nutrition Intervention Research Initiative. In: Harrison G, editor. *Nutrition and health status in the Lower Mississippi Delta of Arkansas, Louisiana, and Mississippi: A review of existing data*. Rockville, MD: Westat 1997. p. 1–3.
11. Champagne C, Bogle M, McGee B, Yadrick K, Allen HR, Kramer TR, et al. Dietary intake in the Lower Mississippi Delta Region: Results for the Foods of Our Delta Study. *J Am Diet Assoc*. 2004; 104: 199–207.
12. Ndirangu M. *Evaluating the effectiveness of the Delta Nutrition Intervention Research Initiative (NIRI) community-academic coalitions as perceived by community partners* [dissertation]. Hattiesburg (MS): The University of Southern Mississippi, Department of Nutrition and Food Systems; 2005.
13. Brownson R, Baker E, Boyd R, Caito NM, Duggan K, Housemann RA, et al. A community-based approach to promoting walking in rural areas. *Am J Prev Med*. (2004); 27: 28–34.
14. Lamb S, Bartlett H, Ashley A, Bird D. Can lay-led walking programs increase physical activity in middle aged adults? A randomized controlled trial. *J Epidemiol Community Health*. 2002; 56: 246–252.
15. Mettler M, Stone W, Herrick A, Klein D. Evaluation of a community-based physical activity campaign via the transtheoretical model. *Health Promot Pract*. 2000; 1: 351–359.
16. Sherwood N, Jeffrey R. The behavioral determinants of exercise: Implications for physical activity interventions. *Annu Rev Nutr*. 2000; 20: 21–44.
17. Sallis J, Hovell M, Hofstetter C, Barrington E. Explanation of vigorous activity during two years using social learning variable. *Soc Sci Med*. 1992; 34: 25–32.
18. Carron A, Hausenblaus H, Mack D. Social influence and exercise: A meta-analysis. *J Sport Exerc Psychol*. 1996; 18: 1–16.
19. Sallis J, Hovell M, Hofstetter C. Predictors of adoption and maintenance of vigorous physical activity in men and women. *Prev Med*. 1992; 21: 237–251.
20. Marcus B, Eaton C, Rossi JS, Harlow LL. Self-efficacy, decision-making, and stages of change: An integrative model of physical exercise. *J Appl Soc Psychol*. 1994; 24(6): 489–508.
21. Marcus B, Selbry V, Niaura R, Rossi J. Self-efficacy and the stages of exercise behavior change. *Res Q Exerc Sport*. 1992; 63: 60–66.
22. Prochaska J, DiClemente C, Norcross J. In search of how people change: Applications to addictive behaviors. *Am Psychol*. 1992; 47: 1102–1114.
23. Castro CM, Sallis JF, Hickman SA, Lee RE, Chen AH. A prospective study of psychosocial correlates of physical activity for ethnic minority women. *Psychol Health*. 1999; 14: 277–293.
24. Ainsworth BE, Anderson LA, Becker DM, Blalock SJ, Brown DR, Brownson RC, et al. Community prevention study: contributions to women's health and prevention research. *J Womens Health Gend Based Med*. 2001; 10: 913–920.
25. Miilunpalo S, Nupponen R, Laitakari J, Martila T, Paronen O. Stages of change in two modes of health-enhancing physical activity: Methodological aspects and promotional implications. *Health Educ Res*. 2000; 15: 435–448.
26. Sallis J, Grossman R, Pinski R, Patterson T, Nader P. The development of scales to measure social support for diet and exercise behaviors. *Prev Med*. 1987; 16: 825–836.
27. Rubiano F, Nunez C, Heymsfield, S. A comparison of body composition techniques. *Ann N Y Acad Sci*. 2000; 904: 335–338.
28. Ainsworth BE, Bassett DR, Stratch SJ, Swartz AM, O'Brien WL, Thompson RW, et al. Comparison of three methods for measuring the time spent in physical activity. *Med Sci Sports Exerc*. 2000; 32 Suppl 9: S457–S464.
29. Dubbert P, Carithers T, Ainsworth B, Taylor H, Wilson G, Wyatt S. Physical activity assessment methods in the Jackson Heart Study. *Ethn Dis*. 2005; 15 Suppl S6: 56–60.
30. Alexander C, Landsman P, Teutsch S, Haffner S. NCEP-defined metabolic syndrome, diabetes, and prevalence of coronary heart disease among NHANES III participants age 50 years and older. *Diabetes*. 2003; 52: 1210–1214.

31. Zimmet P, Magliano D, Matsuzawa Y, Alberti G, Shaw J. The metabolic syndrome: a global public health problem and a new definition. *J Atheroscler Thromb*. 2005; 12: 295–300.
32. Smith D, Domholdt E, Coleman K, del Aguila M, Boone D. Ambulatory activity in men and diabetes: relationship between self-reported and real-world performance-based measures. *J Rehabil Res Dev*. 2004; 41: 571–580.
33. Klesges R, Eck L, Mellon M, Fulliton W, Somes G, Hanson C. The accuracy of self-reports of physical activity. *Med Sci Sports Exerc*. 1990; 22: 690–697.
34. Bassett DJ. Validity and reliability issues in objective monitoring of physical activity. *Res Q Exerc Sport*. 2000; 71 Suppl: S30–S36.
35. Haskell W, Kiernan M. Methodologic issues in measuring physical activity and physical fitness when evaluating the role of dietary supplements for physically active people. *Am J Clin Nutr*. 2000; 72 Suppl: 541S–550S.
36. Center for Disease Control and Prevention [homepage on internet]. Atlanta: Centers for Disease Control [updated 25 April 2006; cited 2006 December 1]. *Physical Activity for Everyone Recommendations*. Available from [www.cdc.gov/nccdphp/dnpa/physical/recommendations/index.htm](http://www.cdc.gov/nccdphp/dnpa/physical/recommendations/index.htm).
37. Puhon, MA, Bryant D, Guyatt GH, Heels-Ansdell D, Schunemann HJ. Internal consistency reliability is a poor predictor of responsiveness. *Health Qual Life Outcomes*. 2005; 3: 33.
38. James A, Hudson M, Campbell M. Demographics and psychosocial correlates of physical activity among African Americans. *Am J Health Behav* 2003; 27: 421–431.

## Using Information Technology to Improve Health Quality and Safety in Community Health Centers

Neil Calman, MD, Kwame Kitson, MD, Diane Hauser, MPA

Institute for Urban Family Health, New York, NY

### Abstract

**Problem:** Community health centers (CHCs) face a unique set of challenges and can learn much from each other as they prepare for the adoption of health information technology (HIT).

**Purpose:** This paper presents a research agenda aimed at providing information CHCs will need to successfully implement HIT.

**Key Points:** Community health centers must be able to evaluate whether an investment in HIT is the best way to

achieve improvements in health outcomes for their communities given the limited resources and high demands they face. Community health centers need better information to guide them in selecting and implementing information technology that will result in improved health quality and safety. Guidance in optimal use of the system, particularly in the effective use of data made available through electronic health records, is needed to realize health care goals. Community health centers need to be active participants in HIT developments in their communities to ensure that their patients benefit from technological advancements that improve health care.

Community health centers (CHCs), like many other health care settings, are expanding their use of information technology to improve health care and health outcomes for their patients. *Health information technology* (HIT) has been defined as “the application of information processing involving both computer hardware and software that deals with the storage, retrieval, sharing, and use of health care information, data, and knowledge for communication and decision-making.”<sup>1</sup> It is considered fundamental to improving the quality of health care.<sup>2</sup>

At our organization, the Institute for Urban Family Health, we implemented a fully integrated electronic health record (EHR) and practice management system at our primary care practice sites four years ago. Drawing on our experience using EHRs and our review of the medical literature on the impact of HIT on the quality and safety of patient care at CHCs and other primary care sites, we have developed a set of research questions for the CHC community to consider as it moves forward in the implementation of HIT.

### STRATEGIC PLANNING FOR HEALTH QUALITY AND SAFETY IMPROVEMENTS

#### How Do CHCs Determine Whether an Investment in HIT will help?

As HIT proliferates throughout the country, we must assess the extent to which it will achieve expected goals. The health care system does not have sufficient resources to engage in this expensive new technology without tracking its return on investment—not only financially, but in terms of quality improvement and improved efficiency. This is particularly true for CHCs, which serve many of the nation’s neediest people.

Community health centers have an obligation to use retained earnings to meet their strategic goals and to expand the public benefits they offer. Thus, they must ask fundamental questions. Is HIT the best use of the limited funds available to a health center for quality improvement linked to the center’s strategic plan? Can we predict the public benefit that will accrue from the implementation of HIT in the

care related to any single disease or preventive measure? If a health center discovers that late diagnosis of breast cancer is a major community health problem, will an investment in HIT be likely to improve this problem? Would it be more effective to hire an outreach worker?

The expansion of technology must be developed on a solid base of evidence that critically examines the cost/value of HIT development against other potential care improvement interventions. At present, such evidence is limited. We do know that, although EHRs are a central component of HIT, the ultimate goal is not merely to have paperless records. The goal is to make patient data more available for care decisions across a range of health care providers, and to use the power of programmed decision supports to produce prompts and reminders for providers to ensure that best practices are observed and opportunities for preventive health are not missed. One large health maintenance system described its “unsuccessful run at creating an automated medical record” that focused on eliminating a paper record, and reports on a more successful approach that is built on uses such as point-of-service care delivery, epidemiologic research, long-term care management, and guideline development.<sup>3</sup>

The need for clinical decision supports is evidenced by a much-cited study that found that, despite the promise of evidence-based medicine and the development of clinical guidelines, patients in the United States receive recommended care only half of the time.<sup>4</sup> Studies of the use of clinical decision support software in primary care practice have found increases in the quality of care provided, such as increased use of preventive measures and risk assessments in an urban pediatric primary care center,<sup>5</sup> improved care management for diabetic patients in a multispecialty group practice,<sup>6</sup> improved triage decisions for possible skin cancer in city health clinic and HMO practices,<sup>7</sup> and increased tuberculosis infection screening for at-risk community health center patients.<sup>8</sup>

Within our own organization, the decision to invest in an EHR system was prompted by our need to monitor enhancements in the quality of care throughout the 20 locations in our multisite practice. The use of clinical reminders built into our EHRs has resulted in greater adherence to clinical guidelines, such as administering pneumococcal

vaccines for elderly and at-risk patients. Reminders related to care of diabetes patients have led to a steady decline in the number of patients with uncontrolled diabetes over the past three years.

It has been noted that inappropriate prescribing is the cause of 20% of drug-related adverse events.<sup>9</sup> Clinical decision supports have been used to address adverse drug events. One study found the alerts had an impact on the ordering of the needed laboratory tests at a primary care safety net health center, especially when alerts indicated that relevant laboratory values were unknown for the patient for whom the prescription was being ordered.<sup>10</sup> A computerized prescription alert feature available to Canadian physicians was found to reduce the initiation of inappropriate prescriptions, but had a variable effect on discontinuation of such prescriptions.<sup>11</sup> The ability to order diagnostic tests, a feature included in many EHR systems, has the potential to influence providers’ test ordering behavior through automated alerts.<sup>12,13</sup>

A recent meta-analysis of studies examining the use of clinical decision supports in a variety of settings identified four features of such systems that are associated with improvements in clinical practice.<sup>14</sup> These features include decision support that is provided automatically as part of clinician workflow; that is delivered when and where decisions are being made; that provides “actionable” recommendations; and that used a computer to generate decision support. Further study is needed to examine the magnitude of outcomes, and identify which features have the largest impact.

## SELECTING HEALTH INFORMATION TECHNOLOGY

### How Do CHCs Determine What Type of HIT to Implement?

Community health centers across the country are in vastly different stages of development in relation to HIT. Eight percent of CHCs currently use EHRs, although 86% use either disease-specific registries, practice management systems, or both.<sup>15</sup> Important research questions arise from the potential outcomes of various levels of HIT investment and from the variety of systems being offered to CHCs nationally.

Although EHRs have been evaluated in technology jour-

nals and by professional associations, we did not find a single reference to the effectiveness of different products with respect to quality and safety improvements as we searched for the optimal system. Although this critical information is missing, much is known about effective methods of providing decision supports in EHRs, types of reports that are useful in patient tracking and recall, and other features of EHRs that will assist in improving quality outcomes. A particularly useful text in this regard is “Improving Outcomes with Clinical Decision Support: An Implementer’s Guide.”<sup>16</sup>

At the institute, we chose to implement a completely integrated EHR and practice management system (Epic System Corp., Madison, WI), because the company has a stellar record of successful implementations and the software is designed to support community-based primary care settings. We were also impressed that Epic’s client portfolio contained many of the leading health care systems in the United States. The Epic system enables us to pursue the practice of population-based medicine, enhances our outreach efforts through the creation of computerized patient lists, and provides easier access to patient education materials—all important functions of a CHC.

## HIT IMPLEMENTATION

### What Strategies Show the Most Promise for Use in CHCs?

As CHC implementation of HIT evolves, it is important for “first adopters” to document and evaluate the HIT implementation process itself.<sup>17</sup> Each center’s experience should improve the odds for success at the centers that come after it. Thus, the research agenda should assess both successes and failures in CHC HIT implementation to identify best practices.

Many implementation issues are ripe for research, including the characteristics of health centers that are associated with successful HIT implementation; the approach to implementation, whether incremental or “big-bang,” has a factor in success; and the timing of implementation. The unique needs of CHCs and their patients may lead to specific types of HIT implementation and attention to special issues, such as sliding fee scales, specialist referrals and tracking, and offering health education information in multiple languages.

For example, there are many models for incorporating existing paper records into a new EHR. We devised a method that worked exceptionally well for us, but may not be suitable for other settings. After being trained on Epic, providers abstracted a new problem list, entered historical immunizations, created an up-to-date medication list, and had medical records staff scan important documents into the records. Providers were encouraged to do this off-hours for their regular patients before the go-live date for the EHR. This allowed them to practice using the system and reduced delays when patients made their first visit after implementation.

## MONITORING HIT USE AND IMPACT

### How do CHCs Ensure That Goals are Met?

Health information technology is a tool for improving health care quality by making information available. Health care providers must use it fully for it to have the desired impact. Although we noted studies in which clinical decision supports have an impact on provider adherence to clinical guidelines, other studies have found that decision supports have no impact<sup>18</sup> or that provider adherence is variable. The Veterans’ Administration, for example, found high overall adherence (86%) to clinical reminders, but the frequency of reminders may affect adherence rates.<sup>19</sup> Another study found that physicians often do not notice clinical reminders on the screen and do not always agree with the suggested action.<sup>20</sup> Although the study reported that the surveyed physicians were generally in favor of clinical decision supports, it concluded that prompts need to be brief, actionable, and based on endorsed guidelines to be accepted by physicians. Similarly, another study documented physicians’ decisions to override prescription alerts, and found that physicians deemed one third of the alerts inappropriate.<sup>21</sup>

It is clear that installing these systems will not be enough to improve health care quality. Community health centers will need to identify ways to realize the potential of clinical decision supports by implementing systems that providers accept and find useful. Furthermore, additional resources may be needed to care for the problems that providers identify. Prompting providers to screen for depression, for example, leads to an increased need for mental health workers.

Staff training in the use of EHRs and decision supports is a critical element in HIT implementation. Methods of initial training and ongoing optimization of system use by staff have been developed both by HIT product vendors and users. An internal survey of our providers at the institute revealed that different features of our EHR are used by providers to vastly different extents, although nearly 100% of all progress reports and orders are made in the system. Should health centers insist on a consistent use of the system? Studies are needed to determine the relationship between the use of the system features and clinical outcomes that are achieved by the providers.

## USE OF SYSTEM REPORTS

### What Types of Data Are Most Useful?

With the implementation of an EHR comes a plethora of data that are stored indefinitely and accumulate rapidly. These data have many implications for research and raise many questions. What types of reports are useful for quality improvement? What is the value of each report to improvements in quality and safety? How does a CHC prioritize their activities when little evidence is available to guide them?

In the first year of our EHR implementation, the institute built a library of decision support tools for providers at the point of care. Because we had been involved in the diabetes collaborative sponsored by the Health Resources and Services Administration, we started by developing a set of measures related to diabetes care. After a year of collecting data electronically, we began an outreach program for patients who had not met certain clinical guidelines.

As we began to produce reports, we became rapidly overwhelmed by the implications of our work. We created listings of diabetics who had not been in the center for over 3 months and whose records indicated poorly controlled diabetes, patients on cholesterol-lowering medication who had not had their liver function tested within recommended guidelines, and those with elevated creatinine levels, indicating possible early kidney failure. Every report we ran resulted in lists of dozens of patients.

There is little knowledge base available to help EHR users compare the relative risks of patients with a variety of

missed diagnostic or therapeutic interventions. And no CHC, perhaps no health care system of any kind, has the resources to follow-up on all these issues all the time. Research is needed to accompany diagnostic and therapeutic interventions that help to delineate the risk of these measures not being followed. Guidelines are needed to help EHR users prioritize their outreach efforts and prevent data from overwhelming staff.

## POTENTIAL OF HIT IN COMMUNITY HEALTH CENTERS

### What Will HIT Look Like in the Future?

There is great potential for HIT to transform the office visit. In the future, patients will be able to book their own appointments on-line and verify their registration information prior to office visits. Electronic interfaces with other data sets prior to patients' appointment can ensure that relevant information is available when needed. Insurance coverage and deductible levels can be verified through an interface with insurance companies. A Regional Health Information Organization database, populated by data from pharmacies, visiting nurse services, laboratories, emergency rooms, hospitals, specialists, and diagnostic centers will be searched to flag available patient information. A public health data bank can be scanned for infectious diseases or other health department alerts and appropriate prompts sent to providers.

When a patient arrives at the HIT-enabled center, a nurse will measure his or her blood pressure, blood sugar, temperature, weight, pulse, and respirations with a single device that is connected electronically to the EHR. In the examination room, a computer screen displaying the patient's medical record is visible for review by both the provider and the patient. Clinical alerts and any outside information can be reviewed as the provider engages in the office visit. As pertinent medical history is noted, additional questions appear on the screen that are programmed from evidence-based clinical guidelines.

The computer scans information from the history and physical, and suggests appropriate material from the multilingual patient education database. It can notify providers if programmed algorithms are violated, such as an order for hormone replacement therapy for a patient who has not had



a screening for cervical cancer. Laboratory tests are ordered and bar-coded labels are printed in the laboratory to accompany the specimen, with results to be returned through an electronic interface. X-ray orders are sent directly to the appropriate facility based on practice location and appointment availability. Images can be made available immediately upon completion of the x-ray.

The technology to carry out all these functions is currently available. The limited penetration of information technology in the health care industry and the lack of interoperable communication keep us from implementing some of these features now. Experiments in the sharing of information across hospitals, home nursing services, physician offices, health centers, pharmacies, and patients are taking place across the country.<sup>22</sup> It is critical that health centers find a seat at the table as these developments take place, representing both themselves as health care providers and the medically needy populations they serve. Further, CHCs will need to determine how we can help our patients to achieve the technological sophistication they will need to participate in these advancements.

Health information technology has great potential for involving patients in their own health care to a much greater extent than they are now. Part of this involvement will require that patients learn to use computers and have access them. In a demonstration project taking place at Settlement Health in East Harlem in New York City, computers are made available to community residents to search and obtain health information. Librarians at the New York Academy of Medicine Library provide training for the local residents who, together with center providers, review health information available on websites.<sup>23</sup> Similar projects may need to be developed across the country to ensure that CHC patients are not left behind as technology is used increasingly to improve and manage health care.

## ROLE OF COMMUNITY HEALTH CENTERS IN ADVANCING KNOWLEDGE

### How Can Community Health Centers Use Technology to Advance Knowledge in Clinical Practice?

Data collected in the course of clinical encounters are often inadequate for research; they are incomplete and col-

lected by a variety of people who have not been trained or required to collect it in a consistent manner. For example, our EHR has data on the race of over 96% of patients, but inconsistency in collection methods may make some uses of those data inexact. The ability to correlate race with clinical processes or outcomes is important to CHCs to understand if our work is decreasing racial health disparities, but cannot be done if patients' race data are not collected properly.

Despite limitations, mining data collected in CHC's EHRs may lead to new knowledge. The use of EHRs combined with artificial intelligence is an as yet underdeveloped field. As both fields evolve, combining artificial intelligence with electronic databases of symptoms, signs, and laboratory values may result in the discovery of unexpected correlations that are beyond our ability to calculate.

Information technology also offers many possibilities for facilitating clinical trials. Decision supports can identify trial candidates from EHR data and facilitate referral to a trial coordinator for further evaluation. People of color and low-income people have been historically underrepresented in clinical trials, thus bringing into question the applicability of the results of those trials to the patients we treat.<sup>24,25</sup> Enrolling more CHC patients in clinical trials would greatly enhance the state of clinical information available in the United States.

## CONCLUSION

The interplay between the rapid development of HIT and the imperative to improve the care of the patients in our community is complex. Although HIT is an important tool for quality improvement, the expense of purchasing, maintaining, training, and using an EHR must be balanced with other quality improvement initiatives. Community health centers must get involved now as networks of providers begin to use HIT to improve care, but careful research and evaluation of these developments is needed to optimize the use of financial and human resources.

## REFERENCES

1. Health Information Technology Leadership Panel. *Final report*. Falls Church: Lewin Group 2006 [updated 15, May 2006; cited 2006 December 1]. Available from [www.hhs.gov/healthhit/HITFinalReport.pdf](http://www.hhs.gov/healthhit/HITFinalReport.pdf).
2. Committee on Enhancing Federal Healthcare Quality Programs, Institute of Medicine. *Leadership by example: Coordinating government roles in improving health care policy*. Washington, DC: National Academies Press; 2002.
3. Goverman IL. Orienting health care information systems toward quality: How Group Health Cooperative of Puget Sound did it. *Journal of Quality Improvement*. 1994; 20: 595–605.
4. McGlynn EA, Asch SM, Adams J, Keesey J, Hicks J, et al. The quality of health care delivered to adults in the United States. *N Engl J Med* 2003; 348: 2635–2645.
5. Adams WG, Mann AM, Bauchner H. Use of an electronic medical record improves the quality of urban pediatric primary care. *Pediatrics*. 2003; 111: 626–632.
6. Baker AM, Lafata JE, Ward RE, Whitehouse F, Divine G. A web-based diabetes care management support system. *Jt Comm J Qual Improv*. 2001; 27: 179–190.
7. Gerbert B, Bronstone A, Maurer T, Hofmann R, Berger T. Decision support software to help primary care physicians triage skin cancer: A pilot study. *Arch Dermatol*. 2000; 136: 187–192.
8. Steele AW, Eisert S, Davidson A, Sandison T, Lyons P, Garrett N, et al. Using computerized clinical decision support for latent tuberculosis infection screening. *Am J Prev Med*. 2005; 28: 281–284.
9. Tamblyn R, Huang A, Perreault R, Jacques A, Roy D, Hanley J, et al. The medical office of the 21st century (MOXXI): Effectiveness of computerized decision-making support in reducing inappropriate prescribing in primary care. *Can Med Assoc J*. 2003; 169: 549–556.
10. Steele AW, Eisert S, Witter J, Lyons P, Jones MA, Gabow P, et al. The effect of automated alerts on provider ordering behavior in an outpatient setting. *PloS Medicine*. 2005; 2: 864–870.
11. Tamblyn R, Huang A, Perreault R, Jacques A, Roy D, Hanley J, et al. The medical office of the 21st century (MOXXI): Effectiveness of computerized decision-making support in reducing inappropriate prescribing in primary care. *Can Med Assoc J*. 2003; 169: 549–556.
12. Bindels RP, De Clercq A, Winkens RA, Hasman A. A test ordering system with automated reminders for primary care based on practice guidelines. *Abbreviation: Int J Med Inform*. 2000; 58-59: 219–233.
13. Bindels R, Hasman A, Kester AD, Talmon JL, De Clercq PA, Winkens RA. The efficacy of an automated feedback system for general practitioners. *Inform Prim Care*. 2003; 11: 69–74.
14. Kawamoto K, Houlihan CA, Balas EA, Lobach DF. Improving clinical practice using clinical decision support systems: A systematic review of trials to identify features critical to success. *Br Med J*. 2005; 330: 765–768.
15. National Association of Community Health Centers. Washington, DC: [2006 survey of health center use of electronic health information]. Unpublished data; 2006.
16. Osheroff JA, Pifer EA, Teich JM, Sittig DF, Jenders RA. *Improving outcomes with clinical decision support: An implementer's guide*. Chicago: Health Information and Management Systems Society; 2005.
17. Fiscella K, Geiger HJ. Health information technology and quality improvement for community health centers. *Health Aff*. 2006; 25: 405–412.
18. Tierney WM, Overhage JM, Murray MD, Harris LE, Zhou XH, Eckert GJ, et al. Effects of computerized guidelines for managing heart disease in primary care. *J Gen Intern Med*. 2003; 18: 967–976.
19. Agrawal A, Mayo-Smith MF. Adherence to computerized clinical reminders in a large healthcare delivery network. *Medinfo*. 2004; 11: 111–114.
20. Sequist TD, Gandhi TK, Karson AS, Fiskio JM, Bugbee D, Cook EE, et al. A randomized trial of electronic clinical reminders to improve quality of care for diabetes and coronary artery disease. *J Am Med Assoc*. 2005; 293: 431–437.
21. Schellhase KG, Koepsell TD, Norris TE. Providers' reactions to an automated health maintenance reminder system incorporated into the patient's electronic medical record. *J Am Board Fam Pract*. 2003; 16(4): 312–317.
22. McDonald, CJ, Overhage JM, Barnes M, Schadow G, Blevins L, Dexter PR, et al. The Indiana Network for Patient Care: A working local health information infrastructure. *Health Aff*. 2005; 24: 1214–1220.
23. New York Academy of Medicine. (2005, September 13). *Unique East Harlem library resource charts 200+ requests first quarter* [Press release]. Retrieved August 24, 2006 from [www.nyam.org/news/2571.html](http://www.nyam.org/news/2571.html).
24. Svensson CK. Representation of American blacks in clinical trials of new drugs. *J Am Med Assoc*. 1989; 261: 263–265.
25. Murthy VH, Krumholz HM, Gross CP. Participation in cancer clinical trials: Race-, sex-, and age-based disparities. *J Am Med Assoc*. 2004; 291: 2720–2726.



**NEW JOURNAL!**  
**Progress in  
 Community Health Partnerships:  
 Research, Education, & Action**

*Eric B. Bass, MD, MPH, Editor in Chief, The Johns Hopkins University*

An international peer-reviewed journal dedicated to community-based participatory research (CBPR) for health, *Progress in Community Health Partnerships: Research, Education, and Action* features peer-reviewed articles of original CBPR findings, scholarly reviews on the broad range of topics relevant to CBPR, and works that address current issues such as the definition of community and the distinction between community-placed and community-based research. The Journal addresses topics that focus on the growing field of CBPR while promoting further collaboration and elevating the visibility and stature of CBPR as a means toward eliminating health disparities and improving health outcomes. *Progress in Community Health Partnerships: Research, Education, and Action* encourages discussion about how CBPR should be applied methodologically; about the relationships between research processes and outcomes; about how research can be translated into information communities can use; and about other emerging issues as they arise.



*Published quarterly in March, June, September, and December for The Johns Hopkins University Urban Health Institute, with the generous support of the W. K. Kellogg Foundation.*  
**Volume 2 (2007).**

*Prepayment is required. Annual subscriptions:* \$75.00, individuals; \$175.00, institutions (paper or online); \$245.00, institutions (paper & online). **Foreign postage:** \$6.60, Canada & Mexico; \$15.80, outside North America. **Single issues:** \$23.00, individuals; \$53.00, institutions. **Sales tax:** Residents of CT, DC, GA, and MD add applicable sales tax. For orders shipped to Canada add 6% GST (#124004946RT).

**Print ISSN:** 1557-0541 / **E-ISSN:** 1557-055X

**Send orders to:**



**THE JOHNS HOPKINS UNIVERSITY PRESS**  
 P.O. Box 19966  
 Baltimore, MD 21211-0966 U.S.A.

**To order using American Express, Discover, MasterCard, or Visa:**

**Call toll-free: 1-800-548-1784, outside the U.S. call: 410-516-6987, fax: 410-516-3866, or order online: <http://pchip.press.jhu.edu>.**



# CALL FOR PAPERS

*Progress in Community Health Partnerships: Research, Education, and Action* welcomes submissions of manuscripts that deal with any health related application of community-based participatory research and evaluation, along the continuum of research from works in progress through translation into routine practice. Health related applications may include articles on health determinants, health outcomes, health services, health promotion, and diagnosis or treatment of disease. The Journal is particularly interested in studies that seek to improve health or healthcare delivery in underserved communities. For additional information visit:

**<http://pchp.press.jhu.edu>**



## TYPES OF ARTICLES

### **1. ORIGINAL RESEARCH**

The Journal seeks to publish original research conducted using a participatory approach. The Journal is interested in a variety of research designs (experimental and observational) and methods (qualitative, quantitative and mixed-method). The Editors will ask the authors of selected manuscripts to identify institutional and community partners who could be interviewed about the project described in the accepted manuscript.

### **2. WORK-IN-PROGRESS AND LESSONS LEARNED**

Work-in-Progress manuscripts should describe quantitative and/or qualitative data that was collected during the early stages of a participatory research or evaluation project. Lessons Learned manuscripts should describe “process” issues, challenges, and problem solutions related to one or more aspects of a participatory research or evaluation project.

### **3. COMMUNITY PERSPECTIVE**

The Journal seeks manuscripts that are explicitly written for general audiences. These submissions may focus on issues related to community health research, education, policy, or practice and they should be written in a style and manner that reflect the language of the public. These manuscripts or essays need not follow a traditional format. Authors are encouraged to be creative.

### **4. POLICY AND PRACTICE**

The Journal seeks manuscripts that cover a wide range of current or emerging issues related to how community health partnerships may influence health policy and practice. Submissions related to policy and practice should reflect a commitment to action and social change.

### **5. THEORY AND METHODS**

This section of the Journal seeks submissions describing theoretical, methodological, and/or analytic techniques and approaches useful in the conduct of research involving community health partnerships.

### **6. EDUCATION AND TRAINING**

This section of the Journal seeks to publish articles that describe and evaluate training and education involving community health partnerships, including workshops, classes, seminars, Webcasts, or other learning methods.

### **7. PRACTICAL TOOLS**

The Journal seeks manuscripts that describe practical tools and resources that facilitate the work of community health partnerships.

### **8. SYSTEMATIC REVIEWS**

The Journal will consider systematic reviews using evidence-based methods, outcomes, and approaches.

### **9. INVITED EDITORIALS**

The Editor will solicit editorials of about 1,000 words on some of the manuscripts that are selected for publication.

**For additional information visit: <http://pchp.press.jhu.edu>**

# LIBRARY RECOMMENDATION FORM



TO: Librarian/Library Acquisition Committee

FROM: \_\_\_\_\_

Position: \_\_\_\_\_ Department: \_\_\_\_\_

Email: \_\_\_\_\_ Phone: \_\_\_\_\_

I recommend that our library subscribe to the following journal:

## Progress in Community Health Partnerships: Research, Education, and Action

ISSN: 1557-0541. E-ISSN: 1557-055X. Published quarterly.

**SUBSCRIPTIONS:** Individual, \$75.00; Student, \$40.00; Institutional, \$175.00 (paper or online); Institutional, \$245.00 (paper & online). **SALES TAX:** Residents of MD 5% / DC 5.75% / CT 6% / GA 4%; 7% Canadian Goods & Services Tax (GST #124004946RT). **FOREIGN POSTAGE FOR SUBSCRIPTIONS:** 1-yr: Canada & Mexico, \$6.00; outside North America, \$16.00.

Please visit <http://pchp.press.jhu.edu> for more information.



### Important uses of *Progress in Community Health Partnerships* would include:

- REFERENCE:** For current research articles as I find them through citations in related journals or books.
- STUDENT READING:** I plan to scan the contents of new issues regularly to add to my students' reading lists.
- PUBLICATION OUTLET:** My current research requires a publication outlet in this area. I need this journal to keep up to date with its editorial direction and interests.
- PREDICTED BENEFIT FOR LIBRARY:** My evaluation of this journal's content and direction is very high and it is cited and/or indexed heavily. Including this journal in our library will, in my assessment, add to the library's success in fulfilling overall department, faculty, and student needs.
- PERSONAL AFFILIATION & DISSEMINATION:** I regularly receive my own personal copy of the journal and will be recommending articles on a regular basis to students and colleagues. The library's help in providing this material is most appreciated.
- OTHER:** \_\_\_\_\_

TO ORDER: Please visit our website at [www.press.jhu.edu/journals](http://www.press.jhu.edu/journals)



THE JOHNS HOPKINS  
UNIVERSITY PRESS

Journals Publishing Division, P.O. Box 19966, Baltimore, MD 21211-0966, U.S.A.  
Toll-free: 1-800-548-1784 • Non-toll-free (outside the U.S.A.): 1-410-516-6987  
Fax: 410-516-3866 • Email: [jrnlcirc@press.jhu.edu](mailto:jrnlcirc@press.jhu.edu) • [www.press.jhu.edu/journals](http://www.press.jhu.edu/journals)



## MISSION

The mission of the Journal is to facilitate dissemination of programs that use community partnerships to improve public health, to promote progress in the methods of research and education involving community health partnerships, and to stimulate action that will improve the health of people in communities. Communities, as defined by the Journal, may be based on geography, shared interests, or social networks. The Journal is dedicated to supporting the work of community health partnerships that involve ongoing collaboration between community representatives and academic or governmental partners. This area of research and evaluation may be referred to as community-based participatory research (CBPR). The W. K. Kellogg Foundation defines CBPR as a collaborative approach to research that equitably involves all partners in the research process and recognizes the unique strengths that each brings.

Published for the Urban Health Institute of The Johns Hopkins University  
by The Johns Hopkins University Press

