

# Community Health Workers as Interventionists in the Prevention and Control of Heart Disease and Stroke

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**Abstract:** A considerable body of research indicates that community health workers (CHWs) are effective in improving chronic disease care and health outcomes. Much of the focus of cardiovascular research involving CHWs has been on hypertension because of its high prevalence and because it is a major risk factor for cardiovascular, cerebrovascular, and renal diseases. Adding CHWs to the patient-provider team has a beneficial effect on the quality of care for populations most in need. CHWs have contributed to significant improvements in community members' access to and continuity of care and adherence to treatment for the control of hypertension. CHWs assume multiple roles, including patient and community education, patient counseling, monitoring patient health status, linking people with health and human services, and enhancing provider patient communication and adherence to care. Current recommendations for CHWs to be interventionists on healthcare teams and in community-based research increase opportunities for CHWs to play an important role in eliminating disparities in heart disease and stroke. Adequate translation of research into clinical practice remains a major challenge, however. Addressing this issue, which has national implications, will require sustainable funding; appropriate reimbursement; enhanced efforts to incorporate CHWs into healthcare teams; better utilization of their skills; improved CHW supervision, training, and career development; policy changes; and ongoing evaluation, including a reporting of costs.

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## Introduction

Heart disease and stroke, the first and third leading causes of death in the United States, contributed to 39% of all deaths in 2000, and frequently cause premature permanent disability.<sup>1</sup> By itself, heart disease accounts for almost 30% of the gap in life expectancy between blacks and whites.<sup>2</sup> In all population subgroups, rates of cardiovascular disease (CVD) are highest in people of low socioeconomic status.<sup>1</sup> Overall, low-income Americans are 2.5 times as likely to die of CVD than the highest-income Americans.<sup>3</sup> For both men and women in lower-income groups, the disparity in cardiovascular disease mortality is increasing.<sup>4</sup>

## Barriers to Implementation of Guidelines

Although national guidelines have sought to prevent new cases of heart disease and stroke and to improve treatment of existing cases, little progress has been

made in meeting national health goals for blood pressure, heart disease, and stroke. Less than 50% of patients have their risk factors assessed, treated, or controlled.<sup>5</sup> Explanations for this lack of progress include nonaggressive treatment by physicians and barriers to patient self-management. Additional explanatory factors include lack of effective physician-patient communication, and a lack of skills, time, and resources for providers to manage chronic illness.<sup>6-10</sup>

Uncontrolled high blood pressure is a major risk factor for both heart disease and stroke; at present 50 million Americans are hypertensive and 45 million are prehypertensive (blood pressure of 120 to 139 mmHg [systolic] or 80 to 89 mmHg [diastolic]).<sup>1</sup> Unfortunately, >70% of people with hypertension do not have it under control.<sup>11</sup> Hypertension is particularly common in black Americans, whose prevalence of hypertension is 30% higher than that for whites. On average, blacks suffer hypertension-related deaths earlier than whites, and have a higher rate of complications such as stroke, left ventricular hypertrophy, and acute myocardial infarction.<sup>12</sup>

## Community Health Workers' Roles in Reducing Barriers

One "best practice" for reducing CVD risk and improving outcomes, especially in high-risk minority popula-

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tions, involves using trained lay people called community health workers (CHWs) (also known as *promotoras*, peer educators, community health advisors, community health representatives [CHRs], health promoters, or outreach workers).<sup>13</sup> CHWs are trusted, respected members of the community, and their informal, but direct, involvement enhances the delivery of health-related services. As health advocates, CHWs promote and encourage positive, healthful behaviors among their peers and the communities they serve. Important roles assumed by CHWs include bridging cultural, linguistic, and literacy differences between community members and the health and social services system.<sup>13–15</sup> These workers successfully facilitate social support, community education, access, and adherence to preventive care and monitoring of risk, adherence to treatment recommendations, promotion of self-care skills, and other follow-up care.<sup>16–21</sup> CHWs serve as patient and community advocates, “coaches” for disease management, and as “navigators” for patients, guiding them through the healthcare system. They also strengthen community understanding and acceptance of medical care.<sup>18–25</sup> Interventions employing CHWs have been successful in various populations with such chronic conditions as hypertension,<sup>26–32</sup> and these successes are reinforced with recommendations for CHWs as interventionists.<sup>22,33–41</sup> The Institute of Medicine’s (IOM) *Report on Unequal Treatment: Confronting Racial and Ethnic Disparities*<sup>33</sup> states that CHWs “offer promise as a community-based resource to increase racial and ethnic minorities’ access to health care and to serve as a liaison between healthcare providers and the communities they serve.” The report recommends supporting CHWs as part of a comprehensive, multidisciplinary team and as “a strategy for improving care delivery, implementing secondary prevention strategies, and enhancing risk reduction.”<sup>33</sup>

The purpose of this paper is to highlight key strategies and results of randomized controlled studies (RCTs) involving trained CHWs as interventionists for blood pressure control (primarily in inner-city Baltimore), and to make recommendations for research, translation, and practice.

### **Community Health Worker Practice Models**

Community health workers have delivered successful health interventions in many community-based agencies.<sup>13–20,42</sup> The largest U.S. healthcare system that formally uses CHWs, who are called community health representatives (CHRs), is the Indian Health Service. These CHWs bridge the gap between Native-American populations and traditional healthcare resources. The Health Care Resources Administration developed “health disparities collaboratives” in order to improve health care and to eliminate health disparities in its federally qualified community health centers (FQCHCs). They use the

chronic care model of systematic management, which integrates CHWs into healthcare delivery teams.<sup>43,44</sup> Unfortunately, a significant barrier to the integration of CHWs into most CHCs is the lack of federal- or state-mandated funding to pay for CHW services.

An example of a successful practice model is the Gateway FQCHC in Laredo Texas. Providers and CHWs (promotoras) collaborated to develop patient evaluation documents. The clinic provides 250 hours of training, including medical record and electronic data entry. Promotoras document patients’ progress in setting goals, addressing barriers, achieving successes, and improving their scores on a depression scale.<sup>45</sup> Providers review this documentation at the time of the patient visit.<sup>45</sup> Promotoras participate in staff meetings. Thus, a routine feedback loop is established among providers, patients, and promotoras. Gateway has a three-tiered structure to allow for different levels of promotoras supportive services (Level 1: conduct community outreach, patient recruitment, and registration; Level 2: teach culturally appropriate, popular courses on diabetes and CVD self-management; Level 3: certified promotoras follow strict clinic protocols and provide patient services). As a result of these policy and systems changes, improvements are being seen in patient-provider communications, patient adherence, health outcomes, disease complications, and cost savings.<sup>45</sup> Clinic administrators are searching for sustainable funding because salaries for CHWs end with the current study.<sup>46</sup>

### **Enhancing the CHW Model**

An analysis of 140 U.S. CHW programs revealed that well-developed strategies for CHW recruitment, selection, retention, and supervision are the keys to successful programs.<sup>47</sup> Effective and respectful communication is needed that keeps CHWs informed of program results, encourages the sharing of information, fosters team building, and mentoring of CHWs by other staff members.<sup>47</sup> Matching CHWs’ skills with appropriate tasks, offering adequate initial and continuous training, providing flexible work schedules, encouraging goal setting, and offering leadership opportunities are integral to effective programs.<sup>47</sup> CHW programs must establish clear performance standards (including a reasonable workload), meaningful work, and opportunities for career/employment development and advancement.<sup>47</sup> Providing realistic expectations of what the work entails is a significant factor in preventing CHW burnout.<sup>48</sup>

### **Community Health Worker Research Studies in Hypertension Care and Control**

Research in reducing the risk of CVD requires community-based and comprehensive approaches using multi-

disciplinary teams that integrate psychosocial, economic, and biomedical approaches. For  $\geq 30$  years, outreach workers have been successful in both detecting and screening for hypertension in churches, supermarkets, schools, community-based organizations, and people's homes.<sup>48–50</sup> These methods have been generalized and incorporated into many of the multisite controlled trials to treat or prevent hypertension, including the Multiple Risk Factor Intervention Trial (MRFIT), Treatment of Mild Hypertension Study (TOHMS) and Trial of Preventing Hypertension (TOPH).<sup>51–53</sup> The Hypertension Detection and Follow-up Program (HDFP) tested the effectiveness of comprehensive treatment to control hypertension and reduce complications.<sup>54,55</sup> This included clinic-based care using a multidisciplinary team, community outreach, free medication and transportation, and committed staff. Morisky et al.<sup>56</sup> used a factorial design to test three complementary interventions: (1) exit interviews of patients after clinic visits, (2) group educational sessions, and (3) home visits by outreach workers to mobilize the patient's support system. Of the three interventions, the home visits were the most effective strategy to control blood pressure and reduce associated mortality, but each intervention contributed to improved outcomes with the greatest improvements seen in combined interventions. Hypertension-related mortality rates were 53.2% lower in the combined interventions experimental group than in the control group.<sup>56</sup>

In the 1970s and 1980s, the National Heart, Lung and Blood Institute funded seven statewide coordinated hypertension programs. In Maryland, an urban and a rural pilot demonstration were developed to test a CHW outreach model to enhance hypertension detection, care, and control. These demonstrations were designed, implemented, and evaluated by an academic-community advisory committee that incorporated the principals of community-based participatory research (CBPR). Building on these experiences, the state health department funded a project to increase hypertension referral and follow-up using CHWs in the emergency department. CHWs were recruited from the community, trained, and salaried to provide blood pressure monitoring, education, and follow-up services as part of the nurse practitioner urgent care practice. CHWs functioned as members of the Johns Hopkins Hospital emergency department team, linking hypertensive patients to the general medical clinic for continuing care. The CHW intervention resulted in significant increases in appointment keeping and continuity of care for hypertension.<sup>23</sup>

More-targeted approaches were developed to reach African-American men aged 18 to 50, who were the subset of the population least likely to be detected with hypertension, to be treated, and to achieve blood pressure control. This led to an RCT,

in East Baltimore, of 204 African-American males aged 18 to 49, who were recruited, followed, and evaluated by a nurse-CHW-physician team. Results of this study found that entry into care was increased and blood pressure was lowered.<sup>27</sup> A follow-up RCT testing the effectiveness of an intervention that included high blood pressure care and treatment (free antihypertensive medications) and CHW home visits (to educate the patient and the family and mobilize family support) led to better care for blood pressure and better control than traditional medical care over a 3-year period.<sup>31</sup> An RCT was conducted during the same period in an urban high-risk community in West Baltimore, which integrated common features of successful CBPR models, including building on strengths and resources within the community and academia, thus enhancing the capacity and leadership skills necessary to conduct the research, and develop collaborative and equitable involvement of all partners. It also included a long-term commitment by all the partners with the potential to bridge the cultural gaps that may exist between academia and the community.<sup>32</sup>

The community was involved in all phases of the research, including recruiting, selecting, and hiring study interviewers and CHWs from the neighborhood. This partnership guided the intervention, evaluation, and dissemination of study impact and results. Nurse-supervised CHWs were trained and certified in blood pressure measurement by the Maryland State Department of Health and Mental Hygiene. They also received certificates from Johns Hopkins in managing hypertension monitoring, education, counseling, and follow-up; mobilizing patients; providing a social support system; and serving as liaisons in linking participants with health and human services. This study was designed to test two different levels of home-based intervention intensity (more intensive, up to six home visits, and less intensive, only one home visit) on increasing the control of hypertension. The study demonstrated significant increases in both groups, from baseline to final follow-up, in the number of community participants who had their blood pressure under control.<sup>32</sup> In the more intensive intervention group, blood pressure control increased from 16% to 36%; in the less intensive group blood pressure control increased from 18% to 34%.<sup>32</sup>

In another CHW home-based outreach study in Baltimore, in a Medicaid population with diabetes and hypertension, there was a 40% decline in total emergency department visits, a 33% decline in emergency department admissions to hospitals, and a yearly cost savings of \$2245 per patient.<sup>29</sup> This study demonstrates the positive effects of outreach interventions using CHWs in urban African-American populations with hypertension and diabetes.

## Limitations

The following limitations were common to the RCT studies: (1) only one community was investigated (including a second community would have increased generalizability); and (2) loss of participants to follow-up due to mortality or geographical movement. In one RCT, information was missing about hypertension care at various intervals throughout the study; interim evaluation measurements are essential to capturing data over the course of a study.

## Implications for Research

Fuller descriptions are needed, in published research and reports, of CHWs' previous experience and training, and roles in interventions. In order to better understand and replicate successful CHW heart disease and stroke programs, the following areas need further study<sup>57</sup>:

Interventions in similar as well as additional high-risk, under-served populations and geographic areas in order to identify which populations benefit most

Assessments of CHW performance, patient satisfaction, system changes, cost-effectiveness (including CHW training and service costs), and contributions of quality services to the effectiveness of the healthcare and other systems

Assessment of home visits, including the added value to patients, families, and communities

Best methods to recruit, train, supervise, integrate, and sustain CHWs in health services delivery systems, and in other community settings and organizations

Translational research is necessary to broadly disseminate and sustain CHW models to reduce disparities in heart disease and strokes. CHWs are important players not only in the research effort, but also in sustaining the efforts of the health programs initiated within communities. Researchers will need to develop the necessary translation skills and partner with healthcare delivery systems, state health departments, and other organizations to implement and evaluate demonstration projects of CHW best practices. Researchers need to distill the features of the CHW model so that it can be effectively disseminated and replicated. Areas of translation should include examining the following areas:

Competency-based training/education/skills/tools/implementation strategies required to optimize the CHW role

Methods by which CHWs produce desired outcomes<sup>57</sup>

Methods for CHWs to improve outcomes across the continuum of care

Methods to educate providers/systems who may be resistant to using the services of CHWs beyond improving access to and continuity of care

CHWs' role in stroke and heart disease prevention and treatment

Assessments of the challenges that CHWs face in helping to provide support for heart and cerebrovascular disease-self management in under-served, vulnerable populations<sup>58</sup>

## Implications for Policy, Practice, and Sustainability

Numerous CHW challenges and issues need to be addressed if the field is to advance. These include improving stable levels of funding and improving credibility through quality training and evaluation. The greatest challenge for CHW programs is sustainability. Economic, social, and political factors are suppressing more widespread application of the CHW model. A bias against funding disease prevention programs has existed for many years. Instead, time-limited categorical grant funding that focuses on clients already affected with diseases drives the CHW field. Despite recommendations by the IOM for the integration of CHWs into healthcare delivery teams and their acceptance by the American Medical Association, CHWs are not being hired because of a lack of mandated funding and the inability to obtain reimbursement for CHW services. Many CHW programs rely on short-term grants or on vulnerable local or state funding.

Another significant challenge for practice is that of credentialing: some of its advantages include greater recognition and credibility; increased opportunities for stable funding (especially through Medicaid and Medicare); increased opportunities for a career ladder (including opportunities for specialization, payment, and benefits); increased protection from liability suits; improved training; and the development of practice guidelines that describe the necessary duties, skills, and competencies.<sup>59</sup> Only Texas and Ohio currently certify CHWs. The Trenton Indian Service Unit has certified CHRs as "qualified service personnel," and is able to bill for certain services (C. Stueckemann, Indian Health Service, personal communication, 2005).

The following policy and systems changes are needed to enhance the sustainability of CHWs' practice in clinics and other organizations serving disparate populations:

Development of Department of Labor job classifications for CHWs and cultivation of CHW workforce development

Opportunities for career development

New reimbursement strategies for CHW services must be devised and supported by public and private payers

Integration into healthcare practice and organizational support for their role as members of the service delivery team



Dedicating trained CHWs to work with patients who are at risk or have heart or cerebrovascular disease and diabetes

Expanding the CHW role to include providing information and support; preventing or minimizing acute exacerbations of chronic conditions through disease management; addressing the needs of patients and communities; addressing barriers to care; and building capacity at the individual, healthcare system, and community level to prevent and manage chronic disease

Educating healthcare staff, administrators, and payers in order to improve understanding and acceptance of CHWs and the unique contributions they make

Improving opportunities for long-term planning

Maintaining high-quality CHW care through credentialing or other quality assurance methods

Enhancing the sustainability of CHW services

As evidence for the added benefit of CHWs mounts, the challenge of incorporating them broadly into healthcare services becomes more of a national priority. While we have advanced in our knowledge of CHW effectiveness in outreach, prevention, and control of diseases and risk factors, we have not kept pace in our knowledge gain of how to incorporate and sustain their roles within healthcare systems and at the community level. While there is yet much to be learned, certain characteristics are essential, such as planning for sustainability from the outset; curricula that emphasize integration of community health workers with other healthcare team members; enhanced skill development in communication with patients, providers, and the community; and mentoring in regard to career development. Strong partnership relationships between healthcare institutions and communities they serve further enhance the stability of effort.

### National Efforts to Build a Sustainable Model

Within the American Public Health Association (APHA), the Community Health Workers Special Interest Group actively keeps issues involving CHWs and their successes at the forefront of the public health agenda. State, regional, and local CHW associations are similarly engaged. It is often through these and other efforts, such as presentations at annual APHA conferences and regional and state conferences that CHW program outcomes are reported. Advocacy is needed for creating the political will to ensure support for the CHW model. Additionally, efforts to develop consensus around "best practice" approaches to CHW college-supported and competency-based education and a CHW National Workforce Study are underway and hold promise for further advancing the CHW field ([www.chw-nec.org](http://www.chw-nec.org)).

### Conclusions

Randomized controlled studies, involving CHWs as interventionists, reported significant improvements in participants' blood pressure care and control. Including payers and decision makers in the policy realm will be essential in planning, implementing, and sustaining model heart disease and stroke CHW programs. Researchers, healthcare educators, policy developers, and practitioners can play pivotal roles in creating viable options around key issues related to implementing current IOM recommendations on integrating CHWs into healthcare teams. CHWs offer important contributions that have the potential to enhance the quality of care and health status of the U.S. population and to eliminate heart disease and stroke disparities. Realizing this potential requires better translation of our current research on CHWs into practice and policy, as well as future research in these areas.

CHWs can be the main drivers toward building healthier communities. Given the natural strength of CHWs in enhancing cultural competency and health literacy in many disadvantaged communities, the CHW model should be actively pursued as a viable means to reduce heart disease and stroke disparity among these populations.

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