1
2 **Cardiovascular Disease Prevention and Control: Interventions**
3 **Engaging Community Health Workers (CHWs)**
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5 **Task Force Finding and Rationale Statement**
6
7 **Definition.** Community health workers—including promotores de salud, community

8 health representatives, community health advisors, and others—are frontline public

9 health workers who serve as a bridge between communities and healthcare systems.

10 They are from, or have an unusually close understanding of, the community served.

11 Community health workers are trained to provide culturally appropriate health

12 education and information, offer social support and informal counseling, connect

13 people with the services they need, and in some cases deliver health services such

14 as blood pressure screening. Because community health workers are considered

15 informed and trusted community members, they are uniquely positioned to advocate

16 on behalf of individuals and communities and help build capacity. Community health

17 workers often receive on-the-job training and work without professional titles.

18 Organizations may hire paid community health workers or recruit volunteers to act in

19 this role.

20

21 Community health workers may address a broad range of health issues.

22 Interventions that engage community health workers to focus on cardiovascular

23 disease (CVD) prevention implement one or more of the following models of care:

24 • Screening and Health Education. Community health workers screen for high

25 blood pressure, cholesterol, and behavioral risk factors recommended by the

26 United States Preventive Services Task Force (USPSTF); deliver individual or

27 group education on CVD risk factors; provide adherence support for

28 medications; and offer self-management support for health behavior

29 changes, such as increasing physical activity and smoking cessation.

30 • Outreach, Enrollment, and Information. Community health workers reach out

31 to individuals and families who are eligible for medical services, help them

32 apply for these services, and provide proactive client follow-up and

33 monitoring, such as appointment reminders and home visits.

34 • Team-Based Care. In a team-based care arrangement, community health

35 workers partner with patients and licensed providers, such as physicians and

36 nurses, to improve coordination of care and support for patients.

37 • Patient Navigation. Community health workers help individuals and families

38 navigate complex medical service systems and processes to increase their

39 access to care.

40 • Community Organization. Community health workers facilitate self-directed

41 change and community development by serving as liaisons between the

42 community and healthcare systems.

43

44 **Task Force Finding.** The Community Preventive Services Task Force recommends

45 interventions that engage community health workers to prevent cardiovascular

46 disease (CVD). There is strong evidence of effectiveness for interventions that

47 engage community health workers in a team-based care model to improve blood

48 pressure and cholesterol in patients at increased risk for CVD. There is sufficient

49 evidence of effectiveness for interventions that engage community health workers for

50 health education, and as outreach, enrollment, and information agents to increase

51 self-reported health behaviors (e.g., physical activity, healthful eating habits,

52 smoking cessation) in patients at increased risk for CVD.

53

54   Additionally, a small number of studies suggest that engaging community health

55   workers improves appropriate use of healthcare services and reduces morbidity and

56   mortality related to CVD. When interventions engaging community health workers

57   are implemented in minority or underserved communities, they can improve health,

58   reduce health disparities, and enhance health equity.

59

60   **Rationale**

61   **Basis of Finding.** The Task Force findings are based on evidence from 31

62   evaluations of interventions that engaged community health workers (CHWs) to

63   prevent CVD among persons at increased risk (search period through July 2013). To

64   be included in the review, evaluated interventions had to address patients' high

65   blood pressure or high cholesterol.

66

67   Included studies evaluated interventions that engaged CHWs as health education

68   providers (31 study arms), outreach, enrollment, and information agents (20 study

69   arms), members of care delivery teams (17 study arms), patient navigators (8 study

70   arms), and community organizers (4 study arms).

71

72   Large improvements in blood pressure and cholesterol outcomes were seen in

73   interventions that engaged CHWs in a team-based care model where they often

74   worked alongside physicians and nurses (Table 1). Improvements in blood pressure

75   and cholesterol outcomes also were found for models using CHWs for outreach,

76   enrollment, and information; patient navigation; and health education; however

77   improvements were smaller when team-based care studies were removed from

78   analysis.

79

Table 1. Blood Pressure and Cholesterol Outcomes

Outcome Measure	Results[a] from Studies with a Team-Based Care Model	Results[a] from Studies without a Team-Based Care Model
Proportion of Participants with BP at Goal	**Greatest/moderate suitability of study design[b]** (4 studies): Median increase of 17.6 pct pts (range: 3.8 to 22.5 percentage points). **Least suitable study design[c]** (2 studies): Increases of 10.8 pct pts (95%CI: 3.2 to 18.3 pct pts) and 14.5 pct pts (95%CI: 11.1 to 18.0 pct pts)	**Greatest/moderate suitability of study design** (3 studies): Median decrease of 2.4 pct pts (range: -11.0 to 3.0 percentage points) **Least suitable study design** (2 studies): Increases of 1.6 pct pts (95%CI: -10.6 to 13.8 pct pts) and 4.5 pct pts (95%CI: -2.4 to 11.0 pct pts)
Change in Mean Systolic Blood Pressure (SBP)	**Greatest/moderate suitability of study design** (6 studies [7 study arms]): Median decrease of 6.0 mmHg (IQI: -6.4 to 2.4 mmHg) **Least suitable study design** (4 studies): Median decrease of 11.2 mmHg (Range: -17.9 to -2.0 mmHg)	**Greatest/moderate suitability of study design** (5 studies): Median decrease of 2.2 mmHg (IQI: -4.1 to 4.2 mmHg) **Least suitable study design** (2 studies): An increase of 2.3 mmHg (not significant) and a decrease of 3.9 mmHg (p<0.05)
Change in Mean Diastolic Blood Pressure (DBP)	**Greatest/moderate suitability of study design** (6 studies [7 study arms]): Median decrease of 1.1 mmHg (IQI: -4.0 to 0.21 mmHg) **Least suitable study design** (3 studies): Median decrease of 4.2 mmHg (Range: -11.4 to 5.0 mmHg)	**Greatest/moderate suitability of study design** (5 studies): Median decrease of 1.3 mmHg (IQI: -2.7 to 7.4 mmHg) **Least suitable study design** (1 study): Increase of 0.05 mmHg (not significant)
Proportion of Participants with Total Cholesterol at Goal	**Greatest/moderate suitability of study design** (1 study): Increase of 7.0 pct pts (95%CI: -5.5 to 19.5) **Least suitable study design** (0 studies)	**Greatest/moderate suitability of study design** (2 studies): Increases of 8.1 pct pts (95%CI: 3.3 to 12.7 pct pts) and 0.4 pct pts (95%CI: -0.4 to 5.2 pct pts) **Least suitable study design** (0 studies)
Proportion of	**Greatest/moderate suitability of**	**Greatest/moderate suitability**

Participants with LDL-Cholesterol at Goal	**study design** (2 studies): Increases of 28.9 pct pts and 3.2 pct pts (95%CI:-6.1 to 12.5 pct pts) **Least suitable study design** (1 study): Increase of 10.0 pct pts (95%CI: -1.0 to 2.1 pct pts)	**of study design** (1 study): Decrease of 1.1 pct pts (95%CI: -6.6 to 4.6 pct pts) **Least suitable study design** (0 studies)
Change in Mean Total Cholesterol	**Greatest/moderate suitability of study design** (2 studies): Decrease of 19.7 mg/dL (p<0.05) and 0.4 mg/dL (not significant) **Least suitable study design** (1 study): Increase of 1.5 mg/dL (not significant)	**Greatest/moderate suitability of study design** (4 studies): Median decrease of 8.3 mg/dL (Range: -12.7 to 0.8 mg/dL) **Least suitable study design** (1 study): Decrease of 15.4 mg/dL (p<0.05)
Change in Mean LDL-Cholesterol	**Greatest/moderate suitability of study design** (3 studies): Median decrease of 15.5 mg/dL (Range: -15.9 to -2.7 mg/dL) **Least suitable study design** (3 studies): Median decrease of 15.0 mg/dL (Range: -22.0 to 3.2 mg/dL)	**Greatest/moderate suitability of study design** (3 studies): Median decrease of 7.4 mg/dL (-11.8 to 5.0 mg/dL) **Least suitable study design** (1 study): Decrease of 11.4 mg/dL (p<0.05)
Change in Mean HDL-Cholesterol	**Greatest/moderate suitability of study design** (3 studies): Median of 0 (Range: -0.4 to 0.8 mg/dL) **Least suitable study design** (2 studies): Increase of 1.0 mg/dL (not significant) and decrease of 2.1 mg/dL (not significant)	**Greatest/moderate suitability of study design** (4 studies): Median increase of 1.3 mg/dL (range: 0 to 2.1 mg/dL) **Least suitable study design** (1 study): Decrease of 3.3 mg/dL (p<0.05)
Change in Mean Triglycerides	**Greatest/moderate suitability of study design** (3 studies): Median decrease of 8.0 mg/dL (Range: -16.3 to 2.7 mg/dL) **Least suitable study design** (2 studies): Decrease of 23.0 mg/dL (p<0.05) and increase of 1.7 mg/dL (not significant)	**Greatest/moderate suitability of study design** (1 study): Increase of 8.7 mg/dL (not significant) **Least suitable study design** (1 study): Decrease of 3.4 mg/dL (not significant)

80 [a]Results shown in table were those reported at the end of each intervention
81 [b]Includes the following study designs: Individual RCT, group RCT, non-randomized trial,
82 prospective cohort, case-control, other design with concurrent comparison group
83 [c]Includes the following study design: before-after without comparison group

84   CI, confidence interval; IQI, interquartile interval; pct pts, percentage points

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86

87   Modest improvements in health behavior outcomes were found in studies that

88   engaged CHWs as health education providers or as outreach, enrollment, and

89   information agents (Table 2). For these studies, researchers most often used before-

90   after study designs without comparison groups, and health behavior outcomes were

91   largely self-reported. Only a few of these studies reported health behavior outcomes

92   associated with CHWs engaged in a team-based care model and they did not provide

93   enough data to reach conclusions on this model of care.

Table 2. Health Behavior Change Outcomes

Outcome Measure	Results[a] from Studies with Health Education Model	Results[a] from Studies with Outreach, Enrollment, and Information Model
Physical Activity Outcomes	**Greatest/moderate suitability of study design[b]** (2 studies): One study reported statistically significant improvements in physical activity outcomes and one reported non-significant improvements **Least suitable study design[c]** (5 studies [6 study arms]): Six study arms reported statistically significant improvements in physical activity outcomes	**Greatest/moderate suitability of study design** (2 studies): One study reported statistically significant improvements in physical activity outcomes and one reported non-significant improvements **Least suitable study design** (3 studies [4 study arms]): Four study arms reported statistically significant improvements in physical activity outcomes
Nutrition Outcomes	**Greatest/moderate suitability of study design** (2 studies): Two studies reported statistically significant improvements in nutrition outcomes **Least suitable study design** (5 studies [6 study arms]): Six study arms reported statistically significant improvements in nutrition outcomes	**Greatest/moderate suitability of study design** (2 studies): Two studies reported statistically significant improvements in nutrition outcomes **Least suitable study design** (3 studies [4 study arms]): Four study arms reported statistically significant improvements in nutrition outcomes
Proportion of	**Greatest/moderate suitability of**	**Greatest/moderate suitability of**

Current Smokers	**study design** (3 studies): Median decrease of 0.5 pct pts (Range: -1.9 to 1.0 pct pts) **Least suitable study design** (2 studies): Decreases of 3.7 pct pts (95%CI: -10.7 to 3.3 pct pts) and 0.6 pct pts (95%CI: -4.4 to 3.3 pct pts)	**study design** (2 studies): Decreases of 1.9 pct pts (95%CI: -5.1 to 1.3 percentage points) and 0.5 pct pts (95%CI: -2.5 to 1.5 pct pts) **Least suitable study design** (0 studies):

94   [a]Results reported in table were those reported at the end of each intervention
95   [b]Includes the following study designs: Individual RCT, group RCT, non-randomized trial,
96   prospective cohort, case-control, other design with concurrent comparison group
97   [c]Includes the following study design: before-after without a comparison group
98   CI, confidence interval; IQI, interquartile interval; pct pts, percentage points
99
100

101   There was not enough evidence to draw conclusions on interventions engaging CHWs

102   as patient navigators or as community organizers.

103

104   A small number of included studies in this review also reported improvements in

105   appropriate use of healthcare services (i.e., increases in the proportion of clients who

106   obtained health insurance or a physician for hypertension care, and decreases in the

107   length of hospital stays and costs to be reimbursed by Medicaid; 2 studies); a

108   statistically significant increase in the proportion of clients screened for CVD risk

109   factors (1 study); and reductions in hospital admissions, emergency room visits and

110   admissions, and in-hospital deaths from CVD (2 studies).

111

112   Most included studies engaged CHWs to work with underserved groups suggesting

113   these interventions can be effective in improving minority health and reducing health

114   disparities related to CVD.

115

116   **Applicability and Generalizability Issues**

117   Included studies were mostly conducted in the U.S. (28 studies), with two studies in

118   Canada and one in the Netherlands. Most studies were in urban areas (22 studies)

119 with only four studies in rural areas. CHWs delivered services in the community (11

120 studies), the healthcare system (13 studies), or both (7 studies). Studies that

121 evaluated the use of CHWs in healthcare settings typically incorporated a team-

122 based care model whereas programs delivered in community settings incorporated

123 other models of care (i.e., health education or outreach, enrollment, and

124 information). The number of CHWs engaged and clients served was reported in 22

125 studies; the median number of CHWs included per study was 11, and the median

126 number of clients served was 270. Only five studies served more than 500 clients,

127 and outcomes reported from these studies showed improvements.

128

129 Regarding the populations that CHWs served, 23 studies included adult clients ages

130 18-64 years, and 5 studies included older adults ≥65 years. Gender was evenly

131 distributed across most studies, though 10 studies reported study populations that

132 were more than 75% female. Results from these 10 studies were mixed for CVD risk

133 factor outcomes and mostly favorable for health behavior outcomes. Included studies

134 provided limited information to draw conclusions in regards to clients' education,

135 sexual orientation, disability status, or insurance status.

136

137 Twenty-two studies evaluated programs that enrolled clients from underserved

138 groups, defined here as ≥75% African-American, ≥75% Hispanic, or ≥75% classified

139 as low-income. Based on this evidence, CHW interventions targeted to underserved

140 groups are likely effective in addressing health disparities.

141

142 High blood pressure was the most common CVD risk factor among clients in the

143 included studies, followed by obesity, high cholesterol, diabetes, and current

144 smoking. Six studies reported the proportion of clients with multiple CVD risk factors

145 and found generally favorable results.

146

Data Quality Issues

148 Included study designs consisted primarily of before-after designs without

149 comparison groups (13 studies), followed by individual randomized controlled trials

150 (RCTs; 7 studies), group RCTs (4 studies), non-randomized trials (3 studies), other

151 designs with concurrent comparison groups (2 studies), a prospective cohort (1

152 study), and a case-control (1 study). Common limitations affecting this body of

153 evidence were loss to follow-up, significant differences between intervention and

154 comparison groups at baseline (for studies including a comparison group), and, for

155 studies without a comparison group, insufficient reporting of sampling methods and

156 potential for self-selection bias.

157

158 Calculating overall effect estimates for physical activity and nutrition was not

159 possible owing to the inconsistent measures used for these outcomes. Therefore,

160 findings for these measures could only be summarized qualitatively.

161

Other Benefits and Harms

163 One study included counseling services for depression in addition to providing

164 services for CVD risk factors, suggesting that other conditions may be addressed

165 concurrently with CVD prevention. No harms to clients, communities, or CHWs were

166 identified from the review or the broader literature.

167

168 **Economic Efficiency.** Economic Review In Progress

169

Considerations for Implementation

171 The 2013 ruling by the Centers for Medicaid Services (CMS) allows states to provide

172 Medicaid reimbursement for USPSTF recommended preventive services when

173 "recommended by a physician or other licensed practitioner" and delivered by a

174 broad array of health professionals, including CHWs. Under this ruling, states

175 determine which services will be covered, who will provide them (including any

176 required education, training, experience, credentialing, certification, or registration),

177 and how providers will be reimbursed. Therefore, implementers of CHW interventions

178 should consider these state-specific regulations when making decisions about CHW

179 engagement in their organizations.

180

181 Previous experience, education, and training of CHWs need to be considered,

182 including training specific to CVD prevention that addresses collaboration with other

183 healthcare providers. CHWs' years of experience and educational attainment were

184 not reported in most included studies. Six studies reported CHWs had "some" prior

185 experience but did not provide enough information to draw meaningful conclusions

186 about the value of this experience. Most studies reported that CHWs received "some"

187 form of training, usually focused on CVD risk factors, but there was limited evidence

188 on the specific types and methods of training received and it was unclear whether

189 training contributed to program success. Supervision and performance feedback and

190 coaching should also be addressed.

191

192 Implementers should consider how CHWs deliver their services and the interaction

193 frequency between community health workers and clients. In 18 of the included

194 studies, CHWs used more than one mode of delivery to communicate with clients,

195 the most common combination being face-to-face sessions accompanied by

196 telephone contact. Although these studies reported improvements in blood pressure,

197 cholesterol, and health behavior outcomes overall, there was not enough evidence to

198 determine whether the mode of delivery had an effect on each individual outcome. A

199 few studies reported on interaction frequency between CHWs and clients (e.g.,

200 weekly, bimonthly), but there were not enough data to assess effects on outcomes.

201

202 Other implementation considerations include how CHWs are matched to the

203 populations they serve and the specific services they deliver. In the included studies,

204 CHWs were frequently matched with populations by location, race or ethnicity,

205 and/or language. CHWs usually provided clients with culturally appropriate

206 information and education on CVD risk factors, lifestyle counseling to help build

207 individual capacity, informal counseling and social support, information on

208 community resources, and conducted home visits to ensure clients got the services

209 they needed.

210

211 To address implementation barriers, included studies commonly worked to achieve

212 community buy-in during the planning phase, addressed issues related to gender

213 and culture, and provided periodic quality assurance checks to assess intervention

214 adaptation to different cultures or intervention fidelity. Future interventions should

215 also aim to allocate program resources adequately, ensure sustainability mechanisms

216 are in place, implement strategies to reduce loss to follow-up, involve CHWs in the

217 planning phase, have reimbursement mechanisms in place as well as strategies to

218 ensure CHWs have manageable workloads, and support state legislation and policies

219 that define CHW duties.

220

221 It is essential for CHWs to have a clear scope of work and open lines of

222 communication with other licensed healthcare providers. When CHWs are engaged to

223 provide direct health services, consideration should be given to issues of privacy,

224 liability, and the Health Insurance Portability and Accountability Act (HIPAA).

225

226   **Evidence Gaps**

227   Most included studies evaluated outcomes at 12 months, a relatively short follow-up

228   time for some CVD risk factors, especially at a population level. More evidence is

229   needed on programs evaluated over a longer time period. It also would be useful to

230   have more evidence on larger-scale interventions (i.e., >500 patients) and

231   interventions conducted in rural areas or worksite settings. Evidence is needed to

232   assess intervention effectiveness among a wider range of population subgroups,

233   based on characteristics such as comorbidity, insurance, education, sexual

234   orientation, disability, and race/ethnicity (in addition to African American and

235   Hispanic populations).

236

237   More evidence is needed on CVD screening outcomes, especially among clients who

238   do not have a usual source of healthcare. It also would be beneficial to know

239   whether CHWs are effective in helping clients access care for their CVD risk factors,

240   especially those from medically underserved groups.

241

242   In the included studies, CHWs usually delivered services in either community or

243   healthcare settings. More evidence is needed on the effectiveness of CHWs who work

244   interchangeably in both community and healthcare settings to determine whether

245   they can build and enhance community–clinical linkages or provide more informed

246   and coordinated navigation of clients to healthcare services and patient navigation

247   within the services they are intended to receive.

248

249   Among interventions that use a team-based care model, more evidence is needed on

250   the incremental value of having CHWs on the team. Future studies that use models

251 of care focused on culturally appropriate health education and engage CHWs as

252 outreach, enrollment, and information agents (without a team-based care approach)

253 should assess intervention effects on CVD risk factor outcomes (e.g., blood pressure

254 and cholesterol). More evidence is needed also on the effectiveness of engaging

255 CHWs as community organizers and patient navigators.

256

257 Specific to the CHWs themselves, it would be useful to know more about effective

258 methods for recruiting, training, supervising, and evaluating CHWs; the importance

259 of prior experience and educational attainment; and the necessary frequency and

260 duration of CHW–client interactions.

261

262 Finally, more information is needed on the overall administration of these

263 interventions, including sustainability and reimbursement arrangements. Because

264 most studies were funded by public grants, it would be useful to understand whether

265 CHW interventions funded by other mechanisms are equally effective, and how well

266 interventions that use a community-based participatory approach work to prevent

267 CVD.

268 Review Completed: March 2015

269 The data presented on this page are preliminary and are subject to change as the systematic review goes

270 through the scientific peer review process.

271