

# Health Evidence Review Commission (HERC)

## Multisector Intervention Report: Community Health Workers for Patients with Chronic Disease

Approved 11/14/2019

### Multisector Interventions

To improve beneficial outcomes in patients with chronic conditions, the preponderance of evidence supports that community health workers (CHWs) serving as a part of an integrated care team appear to improve outcomes in:

- Children with asthma with preventable emergency department visits
- Adults with uncontrolled diabetes or uncontrolled hypertension

This evidence includes an emphasis on minority and low-income populations.

Characteristics of effective interventions include:

- Higher intensity interventions including longer duration
- Targeting populations with more severe chronic disease at baseline

Limited or insufficient evidence is available on the use of CHWs to improve outcomes for the following:

- HIV
- Serious mental illness
- Congestive heart failure

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## Rationale for development of coverage guidances and multisector intervention reports

Coverage guidances are developed to inform coverage recommendations for public and private health plans in Oregon as plan administrators seek to improve patients' experience of care, population health, and the cost-effectiveness of health care. In the era of public and private sector health system transformation, reaching these goals requires a consideration of population-based health interventions from a variety of sectors in addition to individually focused clinical care. Multisector intervention reports will be developed to address these population-based health interventions or other types of interventions that occur outside of the typical clinical setting.

HERC uses the following principles in selecting topics for its reports to guide public and private payers:

- Represents a significant burden of disease or health problem
- Represents important uncertainty with regard to effectiveness or harms
- Represents important variation or controversy in implementation or practice
- Represents high costs or significant economic impact
- Topic is of high public interest

HERC bases its reports on a review of the best available research applicable to the intervention(s) in question. For coverage guidances, which focus on diagnostic and clinical interventions, evidence is evaluated using an adaptation of the Grading of Recommendations, Assessment, Development, and Evaluation (GRADE) methodology. For more information on coverage guidance methodology, see Appendix A.

Multisector interventions can be effective ways to prevent, treat, or manage disease at a population level. In some cases, HERC has reviewed evidence and identified effective interventions, but has not made formal coverage recommendations when these policies are implemented in settings other than traditional health care delivery systems because effectiveness could depend on the environment in which the intervention is implemented.

## Evidence Table for Community Health Worker Interventions

Outcomes	Estimate of Population Health Effect <i>Evidence Type</i>	Resource Allocation	Values and Preferences	Other Considerations
<p><b>Disease-specific morbidity measures</b> <i>(Critical outcome)</i></p>	<p>The preponderance of evidence supports the effectiveness of CHW interventions to improve disease-specific morbidity measures such as HbA1c, blood pressure, and asthma symptom-free days.</p> <p>Evidence type: Systematic reviews of RCTs, observational studies, and quasi-experimental studies</p>	<p>Paying CHWs to engage in long duration, high-intensity interventions likely entails moderate cost. However, many of the studies indicate cost-effectiveness and sometimes cost-savings. Prioritizing the use of CHWs for patients with preventable utilization and more severe chronic disease is likely an effective use of resources.</p>	<p>Patients would likely strongly value culturally and linguistically specific interventions. There is likely moderate variability in patients' desire to engage with CHWs that is likely dependent on the location and type of intervention.</p>	<p>For Oregon's Coordinated Care Organizations (CCOs), CHWs can be funded through health-related services, but there is variability among the CCOs in terms of funding sources.</p>

Outcomes	Estimate of Population Health Effect <i>Evidence Type</i>	Resource Allocation	Values and Preferences	Other Considerations
<b>Emergency department visits</b> <i>(Critical outcome)</i>	<p>The preponderance of evidence supports the effectiveness of CHW interventions for reducing preventable utilization of the emergency department and inpatient care, and economic analyses suggest that CHW interventions are cost-saving or cost-effective (at a willingness-to-pay threshold of \$50,000 per quality-adjusted life-year (QALY)).</p> <p>Evidence type: Systematic reviews of RCTs, observational studies, quasi-experimental studies, and economic analyses</p>			

Outcomes	Estimate of Population Health Effect <i>Evidence Type</i>	Resource Allocation	Values and Preferences	Other Considerations
<b>Hospitalizations</b> <i>(Important outcome)</i>	<p>The preponderance of evidence supports the effectiveness of CHW interventions for reducing preventable utilization of the emergency department and inpatient care, and economic analyses suggest that CHW interventions are cost-saving or cost-effective (at a willingness-to-pay threshold of \$50,000 per QALY).</p> <p>Evidence type: Systematic reviews of RCTs, observational studies, quasi-experimental studies, and economic analyses</p>			
<b>Medication adherence</b> <i>(Important outcome)</i>	<p>The preponderance of evidence supports the effectiveness of CHW interventions for improving medication adherence (particularly for antiretroviral and antihypertensive drugs).</p> <p>Evidence type: Systematic reviews of RCTs, observational studies, and quasi-experimental studies</p>			
<b>Harms</b> <i>(Important outcome)</i>	<p>Harms of CHW interventions were generally not reported in the summary literature; although some studies found no evidence of effectiveness, very few studies identified negative effects of CHWs on reported outcomes.</p> <p>Evidence type: Systematic reviews of RCTs, observational studies, and quasi-experimental studies</p>			

## Background

The American Public Health Association (APHA, 2018) defines a CHW as “a frontline public health worker who is a trusted member of and/or has an unusually close understanding of the community served. This trusting relationship enables the worker to serve as a liaison/link/intermediary between health/social services and the community to facilitate access to services and improve the quality and cultural competence of service delivery.”

In Oregon, CHWs can receive certification from the Oregon Health Authority (OHA) or the Oregon Home Care Commission. CHWs are part of a broader group of traditional health workers, which also includes personal health navigators, peer support specialists, peer wellness specialists, birth doulas, family support specialists, and youth support specialists (Oregon Department of Human Services, n.d.). To be certified as a CHW in Oregon, applicants must meet all these criteria:

- Be 18 years or older
- Not be listed on the [Medicaid provider exclusion list](#)
- Have successfully completed all [training requirements for certification](#)
- Submit all required documentation and a completed application
- Pass a criminal background check

In lieu of the training requirement, applicants can instead submit the following by June 30, 2021:

- (A) A minimum of one letter of recommendation from any previous employer for whom traditional health worker services were provided between January 1, 2008, and June 30, 2021; and
- (B) Verifiable evidence of working or volunteering in the capacity of a community health worker, peer wellness specialist, or personal health navigator for at least 3,000 hours between January 1, 2008, and June 30, 2021; or
- (C) Verifiable evidence of working or volunteering in the capacity of a peer support specialist for at least 2,000 hours between January 1, 2008, and June 30, 2021 (OHA, n.d.).

To maintain certification status, all CHWs must complete 20 hours of approved continuing education plus one and half to three hours of an oral health training during every three-year renewal period (OAR 410-180-0325).

## Evidence Review

### Scott et al., 2018

This is a fair-quality meta-review that aggregates systematic reviews of CHW interventions published between 2005 and 2017. The review was prepared on behalf of the World Health Organization. The quality assessment reflects concerns about the overlapping inclusion of individual studies in the aggregated reviews and about the authors’ search strategy failing to identify the Jack et al. systematic review (2016) that is summarized below. Overall, the authors identified 122 reviews, of which 29 were pertinent to CHW interventions in high-income countries (countries with gross national income exceeding approximately \$12,000 per capita). The authors adopted a broad definition of CHWs as “health workers based in communities (i.e., conducting outreach from their homes and beyond primary health care facilities or based at peripheral health posts that are not staffed by doctors or nurses) who are either paid or volunteer, who are not professionals, and who have fewer than 2 years of training, but at least some training, if only for a few hours.” The individual systematic reviews that were identified

through the meta-review as pertinent to the scope statement for this coverage guidance are summarized in Table 1.

**Table1. Relevant Systematic Reviews Included in Scott et al., 2018**

Author, Year  Focus of review  k (# of included studies) Study types  QA (as assessed in the meta-review)	Definition of CHW and/or types of Interventions	Effectiveness and cost-effectiveness findings	Relevant subgroup analyses or patient characteristics
Viswanathan et al., 2009  AHRQ review of CHW interventions for multiple conditions or health promotion activities  k = 68 RCTs and comparative observational studies  High	“A CHW: • Performs health-related tasks to create a bridge between community members, especially hard-to-reach populations, and the health care system (i.e., performs tasks extending beyond peer counseling or peer support alone). • Has health training associated with the intervention; training is shorter than that of a professional worker (i.e., training does not form part of a tertiary education certificate). • Is recognized (or can be identified) as a member of the community in which he or she works, defined by but not limited to, geographic location,	Two studies in patients with diabetes found statistically significant improvements in HbA1c (range -0.5% to -2%) with CHW interventions; two studies found no difference in HbA1c  Among three studies examining hypertension outcomes, one cohort study found that a CHW intervention improved the proportion of patients achieving blood pressure less than 160/95, but two RCTs did not find significant between-group differences in BP control; a fourth study found that patients who received CHW visits were more likely to follow-up on their blood pressure in the emergency department than a control group	The two studies that showed improvement in HbA1c used high-intensity interventions  Three of the four hypertension studies focused on African American or Latino participants in large cities

	<p>race or ethnicity, and exposure or disease status.”</p>	<p>One RCT comparing assertive community treatment (ACT) to ACT plus CHWs or brokered case management for patients with serious mental illness found no significant difference in days in stable housing between the three groups, but the ACT and ACT+CHW arms showed significantly improved Brief Psychiatric Rating Scale Symptom scores compared to the case management group; there was no difference in health care utilization between the ACT and ACT+CHW arms; an economic analysis found no difference in total costs between arms over 18 months</p> <p>Two RCTs of high-intensity CHW interventions for children with persistent asthma reached mixed results; one trial (comparing high-intensity CHW to low-intensity CHW) found no significant differences in symptomatic days; the second trial (comparing high-intensity CHW to an educational booklet) found that the CHW intervention resulted in fewer symptoms among the group of children who were not on a</p>	<p>Participants in the SMI study were homeless or at risk of homelessness</p>
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		controller medication; both studies found significant reductions in unscheduled medical care for the high-intensity CHW arms; an economic analysis from the first trial suggested that high-intensity CHW interventions saved \$57 to \$80 per child over a two-month period and that the program would be cost-effective if the reduced utilization continued for three to four years	
<p>Hunt et al., 2011</p> <p>Review of community health advisors (CHA) for people with diabetes</p> <p>k = 16</p> <p>RCTs, nonrandomized controlled trials, quasi-experimental studies</p> <p>Very low</p>	<p>Interventions describing the following were included: CHAs, lay health educators, peer advisors, peer coaches, CHWs, community diabetes advisors, community health ambassadors, church diabetes advisors, peer supporters, and promotoras</p> <p>CHA characteristics were “underreported” but generally were of the same ethnic group as participants</p> <p>Training for CHAs “varied greatly” across studies</p> <p>CHA roles and activities included supporting,</p>	<p>Among studies reporting on change in HbA1c, seven studies found significant reductions in HbA1c; one study found a statistically nonsignificant reduction in HbA1c</p> <p>Two studies assessing LDL and triglycerides found significant improvements in these indices</p> <p>Blood pressure was significantly reduced in one study; two studies found nonsignificant reductions in blood pressure</p> <p>In one study, a CHW intervention decreased mean expenditure for health service</p>	

	educating, advocating, and facilitating	reimbursement through reductions in emergency department and inpatient utilization; in a second study a combined nurse care manager and CHW intervention reduced emergency department visits	The two studies reporting reductions in utilization studied African American patients and one examined Medicaid beneficiaries
Abbott et al., 2017  Review of home visiting programs (including but not limited to paraprofessionals and CHWs) to eliminate health disparities  k = 39 Experimental or quasi-experimental designs  Very low	Paraprofessionals and CHWs were not defined, but they were distinguished from other home visiting professionals including nurses, firefighters, physicians, pharmacists, and social workers	Two studies reported on asthma outcomes and one study reported on HIV outcomes  The first study recruited children from 4 zip codes with a recent emergency department visit or hospitalization for asthma and found significant pre-post reductions in emergency department visits, hospitalizations, symptom scores, and missed school or work days after an intervention that included nurse case management and home visits by nurses or CHWs; using a comparison of the intervention group with a matched community cohort, the authors calculated that the intervention was cost-saving with a return on investment ratio of 1.46	Participants in this study were mainly low-income African Americans or Latinos

		<p>The second study compared a CHW intervention (Healthy Homes program) to usual care for children with uncontrolled asthma; the intervention group had statistically significant increases in symptom-free days and reduced urgent health care visits</p> <p>The third study reported significantly greater antiretroviral adherence and viral suppression for patients receiving nurse and CHW structured home visits compared to a usual care group</p>	<p>The participants in this study were Medicaid beneficiaries and mainly Latino and African American</p> <p>The majority of patients in this study were over age 60</p>
<p>Palmas et al., 2015</p> <p>Systematic review and meta-analysis of CHW interventions for people with diabetes</p> <p>k = 13 (9 with at least 12-month follow-up included for meta-analysis)</p> <p>RCTs</p> <p>High</p>	<p>Varied across included studies</p> <p>Eight studies examined CHW-only interventions; other interventions used CHWs in conjunction with certified diabetes educators, nurses, or dietitians</p> <p>CHW training varied significantly across studies</p> <p>CHW activities included education, support, and advocacy in most studies</p>	<p>For the primary meta-analysis of mean reduction in HbA1c at 12 months or beyond, CHW interventions resulted in greater HbA1c reduction than controls (mean difference -0.21%, 95% CI -0.11 to -0.32, I<sup>2</sup>=37%)</p>	<p>Two studies with the greatest number of CHW contacts reported the largest reductions in HbA1c (-0.4% and -0.57%)</p> <p>Meta-regression showed participants with higher baseline HbA1c had the largest improvement with the intervention</p>
Raphael et al., 2013	Lay health workers (LHWs) were defined as “individuals	Among seven studies deemed to be at low (or unclear) risk of	Most of the studies in pediatric asthma focused on urban minority

<p>Systematic review of LHWs for pediatric chronic disease</p> <p>k = 17 RCTs</p>	<p>who were specifically trained to deliver a health-related intervention but who had no formal professional or paraprofessional training in health care”</p> <p>Theoretical frameworks included cognitive theory, self-efficacy theory, and social support theory</p> <p>Most LHWs were selected for “social congruence” with the study population; limited information on training or supervision</p> <p>LHW roles included support, education, modeling, and coaching, and modes of delivery included home visits, phone calls, group meetings, and e-mails</p> <p>“Interventions were heterogeneous in frequency, mode, and duration of interactions between lay health workers and subjects. Several interventions were multifaceted, including both one-on-one and group interactions.”</p>	<p>bias examining LHW interventions for asthma, four found improvements in asthma symptoms; three reported no significant differences; one study found that LHW interventions decreased missed school or work days, whereas two studies did not find a difference in this outcome; among five studies reporting on urgent health care utilization, two found a statistically significant decrease in the LHW group, whereas three found no significant differences; one of the studies reported an incremental cost-effectiveness ratio for the LHW intervention of -\$597 per asthma exacerbation-free day gained (indicating that the intervention was cost-saving)</p> <p>Among two studies reporting on clinical outcomes for children with type 1 diabetes, both reported that LHW interventions significantly improved glycemic control and reduced emergency department visits and hospitalizations</p>	<p>populations and populations with low socioeconomic status</p>
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<p>Shommu et al., 2016</p> <p>Scoping review of community navigators for immigrants and ethnic minorities</p> <p>k = 30</p> <p>Study designs not specified</p> <p>Very low</p>	<p>“Community navigators are trained, culturally perceptive healthcare workers who serve as a link between patients and healthcare providers in order to reduce healthcare disparities. They may also be referred to as patient navigators, CHWs, outreach workers, promotoras, lay health educators, health advocates, peer counselors or medical assistants.”</p> <p>“Navigators were selected from the community based on their cultural competence, interpersonal skills and helping attitude towards their community and were given comprehensive training by health professionals. Major roles of the navigators included providing culturally tailored health education, lifestyle workshops, self-care training and guidance to overcome barriers to accessing the healthcare system...The navigators also distributed educational materials and videos describing healthy diet, exercise, self-monitoring of health risk factors, handling</p>	<p>Two studies of Reaching Immigrants through Community Empowerment (RICE) that focused on Sikh and Korean immigrants at risk of diabetes examined glucose measurements; one study found a significant reduction in glucose levels; the other did not find a statistically significant difference</p> <p>Five studies of Spanish-speaking community navigators for patients with type 2 diabetes found statistically significant reductions in HbA1c and one study found a significant reduction in emergency department visits; in two other studies there was no significant difference in HbA1c between navigator and control groups; in one study reporting an economic analysis navigator interventions for diabetes had a cost-effectiveness of \$33,319 per QALY gained</p> <p>Eight studies found that community navigators using the NHLBI Heart Health curriculum led to significant improvements</p>	<p>HbA1c reduction was positively correlated with more frequent navigator contacts in one of the studies</p> <p>These studies were conducted in Latino, Black, South Asian, and Filipino populations in the U.S.</p>
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	emergency conditions and medication adherence.”	in cardiovascular risk factors including blood pressure and lipids	
<p>Brownstein et al., 2007</p> <p>Systematic review of CHW interventions for hypertension</p> <p>k = 14</p> <p>RCTs, quasi-experimental, and observational studies</p> <p>Low</p>	<p>“Community health workers were broadly defined as any health workers who carried out functions related to healthcare delivery, were trained as part of an intervention, had no formal paraprofessional or professional designation, and had a relationship with the community being served.”</p> <p>“The characteristics of CHWs were not as well described as those of the study participants. The CHWs, predominantly women, were recruited from the community, and resembled the participants in race/ethnicity and socioeconomic background.”</p> <p>Roles included education, adherence assessment, BP measurement, and navigation/mediation</p>	<p>Five studies found significant improvements in antihypertensive adherence in the CHW groups</p> <p>Nine of the 10 studies reporting on blood pressure control found statistically significant improvements in blood pressure with the CHW intervention; one study did not find a significant difference in blood pressure control between the CHW and control arms</p>	<p>These studies mainly targeted middle-aged minority populations in the U.S., and four of the studies were exclusively conducted among African Americans living in Baltimore</p>

The authors of the meta-review reached the following conclusions from the studies in Table 1 about CHW interventions in high-income countries:

- There is mixed evidence that CHW interventions modestly reduce hyperglycemia in diabetic patients
- There is inconsistent evidence that CHW interventions for children with asthma increase the number of symptom-free days, and insufficient evidence in adolescents with asthma
- CHW interventions may lead to modest reductions in health care utilization and fewer missed school days for children with chronic diseases
- CHW interventions may lead to improvements in blood pressure in adults with hypertension and improve adherence to antihypertensive medications

The authors made several observations that pertain to features associated with the success of various CHW outcomes, although in most cases these features were not studied to ascertain their effects on clinical outcomes:

- Although training improves the knowledge and skills of CHWs, there is no direct evidence linking training to health outcomes
- Few CHW programs adequately describe the details of supervisory structures, and this lack of attention to supervision could reduce CHW empowerment
- Although CHWs with higher levels of education may be more effective at certain tasks, these CHWs may also have higher rates of attrition
- There is “very little” evidence that supervisory performance evaluations for CHWs correlate with performance measured in research settings
- CHW satisfaction with incentives or remuneration is associated with CHW motivation and performance
- Community acceptance of CHWs is associated with CHW retention, motivation, and performance

Ultimately, the authors of the meta-review concluded that the evidence on CHW effectiveness can “help policymakers identify a range of options to consider,” but they cautioned that evidence must be “contextualized and adapted in different contexts to inform policy practice.”

## **Jack et al., 2016**

This is a good-quality systematic review of the effects of CHWs on health care utilization in the United States. It was not included in the meta-review discussed above. The review included studies of CHW interventions for adults or children with at least one chronic disease. CHWs were defined as “individuals who work primarily in a health-related role, have no professional or paraprofessional training in healthcare or social work, and were selected for their role largely because of their familiarity with a community or population.” Eligible studies were cohort studies, quasi-experimental studies, or RCTs that reported quantitatively on health care costs or utilization. Overall, the authors identified 34 studies: 16 RCTs, eight pre-post studies, six cohort studies, and four cost-effectiveness analyses. These studies examined CHW interventions of variable intensity for asthma (14 studies), diabetes (six studies), hypertension (one study), HIV (one study), and stroke (one study). Patients with “prior preventable health care use” were the focus of 14 studies, and 14 studies focused on low-income populations including Medicaid beneficiaries and uninsured patients. The following were the key findings:

- 19 studies examined changes in emergency department visits
  - Three of eight RCTs found significant reductions in emergency department visits with CHW interventions, the remaining five found no statistically significant differences
  - Five of eight pre-post studies found significant reductions in emergency department visits with CHW interventions, one found no statistically significant difference, and two did not report tests of statistical significance
  - Two of three cohort studies found significant reductions in emergency department visits with CHW interventions; one study found no statistically significant difference
- 17 studies examined changes in hospital admissions
  - Six of seven RCTs found no significant reductions in admissions with CHW interventions; one study found a statistically significant decrease in admissions
  - Five of seven pre-post studies found significant reductions in admissions with CHW interventions; two did not report tests of statistical significance
  - Two of three cohort studies found significant reductions in admissions with CHW interventions; one study reported decreased hospitalization costs without a test of statistical significance
- Eight studies examined changes in urgent care visits
  - Two of four RCTs found significant reductions in urgent care visits with CHW interventions; two found no statistically significant decreases
  - Three of four pre-post studies found significant reductions in urgent care visits with CHW interventions; one study showed a nonsignificant increase
- Nine studies examined changes in medication adherence
  - Three of three RCTs found no statistically significant differences in medication adherence with CHW interventions
  - Three of four pre-post studies found improved medication adherence with CHW interventions
  - One cohort study found improved medication adherence with CHW interventions
- Eight of 11 studies found that CHW interventions reduced overall costs; three studies concluded that CHW interventions did not result in cost savings
- Two studies reporting cost-effectiveness estimates of CHW interventions for patients with diabetes found that the cost per QALY ranged from \$10,995 to \$33,319

Jack et al. observed that certain groups appeared more likely to benefit from CHW interventions including children with asthma, diabetic patients, and patients with low socioeconomic status or public insurance. Comparing RCTs that showed significant reductions in utilization measures to those that found no significant differences, positive trials were more likely to focus on people with prior preventable utilization, describe the CHW as integrated into a care team, and have an intervention lasting at least one year.

The authors cautioned that the review was limited by the high degree of heterogeneity in the interventions, populations, and outcome measurements. They also raised the concern of publication bias, particularly among nonrandomized studies. Lastly, they noted that savings from CHW

interventions might accrue over many years and studies might not accurately estimate the long-term effects of these interventions.

## **Centers for Disease Control and Prevention (CDC) Community Guide, 2017**

This is a non-published systematic review of CHW interventions for diabetes management prepared on behalf of the Community Preventive Services Taskforce, which included 44 studies.

Overall, the Community Guide estimated that CHW interventions for diabetes management led to a:

- Median increase of 6.6% in proportion of patients with HbA1c at goal of < 7.0% (seven studies)
- Median decrease in mean HbA1c of 0.49% (36 studies)
  - For patients with baseline HbA1c > 9%, the mean decrease in HbA1c was 1.85%
- 26% decrease in the number of emergency department visits (one study), 44% reduction in the rate of emergency department visits (one study), and 0.18 fewer emergency department visits per person (one study)
- 5% reduction in the rate of emergency department visits (one study) or 0.45 more admissions per person (one study)
- Median increase of 7% in proportion of patients with total cholesterol at goal (one study)

The authors observed that the improvement in glycemic control was similar for CHW interventions alone and when CHWs were integrated in team-based care models.

The authors also summarized 13 economic analyses and concluded that CHW interventions for diabetes management had a median cost per person of \$585 per year (13 studies), resulted in a median change in per-person health care costs of -\$72 per year (four studies), and that the median cost per QALY gained was \$38,276 (five studies).

The Community Guide recommendations resulting from this evidence review are summarized in the guidelines section of this coverage guidance.

## **CDC Community Guide, 2015**

This is a non-published systematic review of CHW interventions for cardiovascular disease prepared on behalf of the Community Preventive Services Taskforce. The methods are not specifically described on the CDC community guide website, but presumably followed the standard methods established by this group. The review identified 31 studies, of which 18 studies used designs considered to be of “greatest/moderate suitability” and 13 studies used designs deemed “least suitable.”

For greatest/moderate suitability studies of CHWs in a team-based care model, the Community Guide estimated that CHW interventions led to a:

- Median increase of 17.6% in proportion of patients with blood pressure at goal (four studies)
- Median reduction of systolic blood pressure of 6.0 mmHg (six studies)
- Median reduction of diastolic blood pressure of 1.1 mmHg (six studies)
- Median increase of 7% in proportion of patients with total cholesterol at goal (one study)

The authors observed that other CHW intervention models resulted in smaller or nonsignificant improvements in these outcomes.

The authors also summarized nine economic analyses and concluded that CHW interventions had a median cost per person of \$329 per year (eight studies), resulted in a median change in per person in health care costs of \$82 per year (seven studies), and that the median cost per QALY gained was \$17,670 (four studies).

The Community Guide recommendations resulting from this evidence review are summarized in the guidelines section of this coverage guidance.

## Evidence Summary

Although results from individual studies are mixed and there are few meta-analytic estimates of effect owing to the high degree of heterogeneity in these studies, it appears that the preponderance of evidence related to CHW interventions for adults and children with chronic conditions in high-income countries supports the conclusion that CHWs improve various chronic-disease-specific health outcomes, reduce emergency department visits and hospitalizations, and are cost-saving or cost-effective at commonly established willingness-to-pay thresholds. There is relatively more evidence in support of CHWs for children with asthma and adults with diabetes or hypertension; there is relatively less evidence for patients with HIV or serious mental illness. In some studies, greater improvement in outcomes was associated with higher-intensity interventions or in populations with more severe chronic disease at baseline. In addition, some studies suggest that interventions targeting individuals with prior preventable utilization, longer interventions, and interventions that use CHWs as part of an integrated care team are associated with greater reductions in health care utilization.

These conclusions are limited by an extraordinarily high degree of heterogeneity in nearly every aspect of CHW studies (including heterogeneity in target populations, CHW definitions, intervention components, intervention intensity, and the theoretical basis of the intervention). In addition, authors of several systematic reviews raised concerns about the possibility of publication bias in this body of literature. Finally, in some studies, CHW interventions were combined with other interventions such as case management or assertive community treatment, which makes it difficult to establish the precise contribution of CHWs to the observed effects. In spite of these limitations, most authors regard CHW interventions as potentially promising for improving outcomes among underserved and vulnerable populations in high-income countries.

## Policy Landscape

### Policies

The National Academy for State Health Policy (NASHP) has an online database of CHW models across the 50 states (NASHP, 2018). About 25% of states have a certification program for CHWs, although the certification is voluntary in some states. At least three states, Oregon, Alaska, and Minnesota, require CHWs to be certified in order for these services to be reimbursed by Medicaid.

State Medicaid programs are diverse in their models for using and funding CHWs. About 50% of states pay for CHWs with Medicaid funds. Most of these states are paying for CHWs through managed care contracts. In states where Medicaid is not paying for CHWs, grants and other funding sources are

sometimes used to fund CHW interventions. In the states using other funds, CHWs are often hired through federally qualified health centers (FQHCs), community-based organizations, and universities.

## Recommendations from Others

Two sources were identified in the search for recommendations on the use of CHWs: The Community Guide from the Community Preventive Services Task Force (CPSTF) and guidelines from the World Health Organization (WHO).

### Community Preventive Services Task Force

The CPSTF recommends interventions that engage CHWs for cardiovascular disease prevention, diabetes prevention, and diabetes management. All three of these intervention areas were rated as being cost-effective (The Community Guide, n.d.).

The CPSTF defines CHWs as frontline public health workers who serve as a bridge between underserved communities and health care systems. CHWs can be from or have a unique understanding of the community being served.

#### *Cardiovascular Disease Prevention*

Strong evidence was found on effectiveness in improving blood pressure and cholesterol when CHWs are engaged in a team-based care model. Sufficient evidence was found for the effectiveness of CHW interventions for health education and to increase self-reported health behaviors in clients at increased risk for cardiovascular disease. These CHW interventions aim to reduce cardiovascular risk factors by providing culturally appropriate education, social support, informal counseling, and connection with services (The Community Guide, 2015).

#### *Diabetes Prevention*

Sufficient evidence was found on the effectiveness of CHW interventions in improving glycemic level control and weight-related outcomes among people at increased risk for type 2 diabetes. These interventions aim to reduce risk factors for type 2 diabetes by improving diet, physical activity, and weight management. The programs may include education about diabetes prevention and lifestyle changes, informal counseling, and extended support, delivered one-on-one or in group sessions in homes or community-based settings (The Community Guide, 2016).

#### *Diabetes Management*

Strong evidence was found on the effectiveness of CHW interventions in improving glycemic and lipid control and reducing health care use among patients with type 2 diabetes. These interventions aim to improve diabetes care and self-management behaviors among patients through education, coaching, or social support to improve diabetes testing and monitoring, medication adherence, diet, physical activity, or weight management. CHWs deliver these programs one-on-one or in group sessions in patients' homes, or in community or clinical settings (The Community Guide, 2017).

## World Health Organization

The WHO published a guideline in 2018 on health policy and system support for CHW programs (WHO, 2018). The WHO guidelines list the following primary health care services for which there is some evidence of CHW effectiveness:

- Maternal and newborn health—Reducing neonatal mortality and morbidity through home-based preventive and curative care; promoting the uptake of reproductive, maternal,

newborn and child health behaviors and services, including antenatal care and promotion of breastfeeding

- Child health—Immunization uptake, integrated management of newborn and childhood illnesses (e.g., for malaria, pneumonia, and diarrhea); health education
- Communicable diseases—Prevention, diagnosis, treatment, and care of malaria and tuberculosis; counseling, treatment and care for HIV/AIDS; control of neglected tropical diseases (e.g., Buruli ulcer), influenza prevention
- Noncommunicable diseases—Behavior change (diet change, physical activity); increased care utilization (cancer screening, making and keeping appointments); diabetes, hypertension, and asthma management and care
- Public health and global health security—Working as cultural brokers and facilitating patient access to care for underserved groups
- Mental health—Providing psychosocial, and/or psychological interventions to treat or prevent mental, neurological, or substance abuse disorders
- Sexual and reproductive health—Providing contraception; increasing uptake of family planning

The WHO guideline also includes a series of recommendations in the areas of selection, education, and certification of CHWs, management and supervision, and integration into and support by health systems and communities.

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Coverage guidance is prepared by the Health Evidence Review Commission (HERC), HERC staff, and subcommittee members. The evidence summary is prepared by the Center for Evidence-based Policy at Oregon Health & Science University (the Center). This document is intended to guide public and private purchasers in Oregon in making informed decisions about health care services.

The Center is not engaged in rendering any clinical, legal, business or other professional advice. The statements in this document do not represent official policy positions of the Center. Researchers involved in preparing this document have no affiliations or financial involvement that conflict with material presented in this document.

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## Appendix A. Evidence Table Element Descriptions

Element	Description
Balance of benefits and harms	The larger the difference between the desirable and undesirable effects, the higher the likelihood that a strong recommendation is warranted. An estimate that is not statistically significant or has a confidence interval crossing a predetermined clinical decision threshold will be downgraded.
Quality of evidence	The higher the quality of evidence, the higher the likelihood that a strong recommendation is warranted
Resource allocation	The higher the costs of an intervention—that is, the greater the resources consumed in the absence of likely cost offsets—the lower the likelihood that a strong recommendation is warranted
Values and preferences	The more values and preferences vary, or the greater the uncertainty in values and preferences, the higher the likelihood that a weak recommendation is warranted
Other considerations	Other considerations include issues about the implementation and operationalization of the technology or intervention in health systems and practices within Oregon.

## Appendix B. Methods

### Scope Statement

#### *Populations*

Adults or children with at least one of the following: asthma, diabetes, hypertension, heart failure, HIV, serious mental illness, high utilizers

*Population scoping notes: Exclude studies from low- and middle-income countries, patients with substance use disorders, doulas, prenatal programs*

#### *Interventions*

Engagement with a community health worker (CHW)

*Intervention exclusions: None*

#### *Comparators*

Usual care without a CHW; other methods of patient engagement and activation

#### *Outcomes*

Critical: Disease-specific morbidity measures, emergency department visits, hospitalizations

Important: Medication adherence, harms

*Considered but not selected for the GRADE table: Engagement or patient activation scores*

#### *Key Questions*

KQ1: What is the effectiveness of CHWs for improving health outcomes and reducing health care utilization in adults and children with chronic diseases?

KQ2: Does the effectiveness of CHWs vary by:

- a. Patient characteristics
- b. Type of chronic condition(s) being addressed
- c. Comorbid conditions
- d. Characteristics of CHW intervention (intensity, setting, methods of engagement)
- e. Characteristics of the CHWs

KQ3: What are the harms of CHWs?

### Search Strategy

A full search of the core sources was conducted to identify systematic reviews, meta-analyses, and technology assessments that meet the criteria for the scope described above. Searches of core sources were limited to citations published after 2014.

The following core sources were searched:

Agency for Healthcare Research and Quality (AHRQ)  
Canadian Agency for Drugs and Technologies in Health (CADTH)  
Cochrane Library (Wiley Online Library)  
Institute for Clinical and Economic Review (ICER)

Medicaid Evidence-based Decisions Project (MED)  
National Institute for Health and Care Excellence (NICE)  
Tufts Cost-effectiveness Analysis Registry  
Veterans Administration Evidence-based Synthesis Program (ESP)  
Washington State Health Technology Assessment Program

A MEDLINE® search was also conducted to identify systematic reviews using the search terms community health worker and traditional health worker. The search was limited to publications in English published since 2014.

Searches for clinical practice guidelines were limited to those published since 2014. A search for relevant clinical practice guidelines was also conducted using MEDLINE® and the following sources:

Australian Government National Health and Medical Research Council (NHMRC)  
Canadian Agency for Drugs and Technologies in Health (CADTH)  
Centers for Disease Control and Prevention (CDC), Community Preventive Services  
National Institute for Health and Care Excellence (NICE)  
Scottish Intercollegiate Guidelines Network (SIGN)  
United States Preventive Services Task Force (USPSTF)  
Veterans Administration/Department of Defense (VA/DoD) Clinical Practice Guidelines

### **Inclusion/Exclusion Criteria**

Studies were excluded if they were not published in English, did not address the scope statement, or were study designs other than systematic reviews or clinical practice guidelines.