

The Use of Community Health Workers in Community Health Centers

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Background: Until 2016, community health centers (CHCs) reported community health workers (CHWs) as part of their overall enabling services workforce, making analyses of CHW use over time infeasible in the annual Uniform Data System (UDS).

Objective: The objective of this study was to examine changes in the CHW workforce among CHCs from 2016 to 2018 and factors associated with the use of CHWs.

Research Design, Subjects, Measures: The two-part model estimated separate effects for the probability of using any CHW and extent of CHW full-time equivalents (FTEs) reported in those CHCs, using a total of 4102 CHC-year observations from 2016 to 2018. To estimate the extent to which increases in CHW workforce are attributable to real growth or rather are a consequence of a change in reporting category, we also conducted a difference-in-differences analysis to compare non-CHW enabling services FTEs between CHCs with and without CHWs before (2013–2015) and after (2016–2018) the reporting change in 2016.

Results: The rate of CHCs that employed CHWs rose from 20.04% in 2016 to 28.34% in 2018, while average FTEs stayed relatively flat (3.32 FTEs). Patient visit volume (larger CHCs) and grant funding (less reliant on federal but more reliant on private funding) were significant factors associated with CHW use. However, we found

that a substantial portion of this growth was attributable to a change in UDS reporting categories.

Conclusion: While we do not address the reasons why CHCs have been slow to use CHWs, our results point to substantial financial barriers associated with CHCs' expanding the use of CHWs.

Key Words: community health worker, enabling services, community health center, underserved population

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Community health centers (CHCs) are the backbone of primary care for 29 million people, the majority of whom are low-income, underserved, and rural populations. CHCs have their roots in the War on Poverty movement of the 1960s and were built on the premise that health and community are intertwined and inexorably linked.¹ Federally qualified health centers receive federal grants through Section 330 of the Public Health Services Act to offset the costs of uninsured and underinsured patients and provide nonclinical services that are critical to the health of individuals and their communities. These nonclinical “enabling” services include patient and community outreach, health education, case management, transportation, interpreter services, and legal services.² Given the complex needs of CHC patients, demand for enabling services often exceeds available resources at the CHC site.

Some CHCs include community health workers (CHWs) in their enabling services workforce. The “CHW” term encompasses a variety of roles and staffing classifications (eg, outreach workers, promotores, community health representatives, or patient navigators), but refers to lay members of the community who share similar cultural and experiential backgrounds with underserved patients, providing a vital link between community residents and health and social supports.³ The CHW workforce is largely comprised of women and persons of color.^{4,5} Their cultural and linguistic concordance with patients has been shown to be a factor in successful CHW-related interventions.⁶

The use of CHWs to address chronic disease management has been studied extensively in community-based and health care settings, including CHCs.^{7,8} A systematic review of CHWs to improve outcomes among CHC patients with cancer found positive results in all 24 studies included in the review.⁹ The use of lay health workers at a CHC was associated with better mammography screening outcomes compared with the

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usual source of care in a randomized controlled trial of African American patients.¹⁰ Increased screening for colorectal cancer was also seen in CHC populations,^{11,12} with 1 pilot randomized controlled trial finding that patients with navigators were 4 times more likely to be screened for colonoscopy than the non-navigator group.¹³ However, similar studies at other CHCs did not see improvements compared with customary care.^{14,15} Several studies of CHC-related interventions for cardiovascular disease showed improvements in standard metrics such as decreased cholesterol levels, triglycerides, and other markers,¹⁶ improved blood pressure, eating habits, and exercise among Hispanic women,¹⁷ lower glycosylated hemoglobin levels among African American and Latino patients,¹⁸ immigrant and ethnic minorities,¹⁹ and patients in rural CHCs.²⁰ No differences in outcomes between CHW and non-CHW care were seen in other studies of diabetes care among Latino adults²¹ or with patients with depression at 2 health centers.²²

The number of CHWs employed at health centers has likely grown since 2013 with the requirement from the Health Resources and Services Administration (HRSA) for each CHC to add at least 1 new outreach and enrollment staff position to help patients navigate Medicaid and marketplace coverage as a result of the Affordable Care Act. Funding for the outreach and enrollment staff eventually became part of the CHC's federal grant, and some portion of these workers transitioned to other types of community outreach and CHW services.²³ For many CHCs, however, funding to support CHW positions is a chronic challenge. CHW services are commonly supported by grants from philanthropic or governmental organizations that offer opportunities to develop and grow CHC capacity but lack long-term sustainability.²⁴ Nevertheless, CHW use is common in managed care. A 2017 Kaiser Family Foundation survey of Medicaid managed care organizations found that 67% of plans used CHWs to address social determinants of health in the previous 12 months.²⁵ While CHWs have traditionally not been reimbursed by public and private insurers, a growing number of states are using funding mechanisms such as Medicaid State Plan Amendments, Section 1115 Demonstration Waivers, and legislative statutes to reimburse for CHW services.

Until 2016, CHCs reported CHW staffing as part of their overall enabling services workforce, making analyses of CHW use and growth over time infeasible with available data sources. This changed in 2016 with separate reporting of CHWs in the annual Uniform Data System (UDS), the principal mechanism used to track CHC operations and performance. This study uses data from UDS from 2016 to 2018 to quantify overall CHW staffing in CHCs and identify CHC characteristics associated with CHW use. Given the change in classification of CHW employment, it also estimates the extent to which increases in CHW workforce are attributable to real growth or rather are a consequence of a change in the reporting category.

METHODS

Data and Study Population

Our data source was the 2016–2018 UDS, collected and maintained by the Bureau of Primary Health Care (BPHC)

under HRSA. Each year CHCs that receive funding from Section 330 under the Public Health Service Act report grantee-level information to the system, including staffing, service utilization, patient profiles, quality outcomes, and finances. We limited our sample to CHCs located in the 50 states and the District of Columbia. A total of 4102 CHC-year (pooled) observations—1367 CHCs in 2016, 1373 CHCs in 2017, and 1362 CHCs in 2018—were included in the analysis.

Measures

The outcome of interest was the newly added CHW full-time equivalents (FTEs) variable. We documented the change in the CHW workforce from 2016 to 2018 in the postreporting change period and factors associated with the use of CHWs. Report staff into the CHW workforce include all individuals who are a part of the regular workforce (full-time and part-time staff). Due to limitations of UDS reporting, we were unable to include volunteer CHWs. We identified possibly important factors associated with the use of CHWs raised in the previous literature. Patient characteristics included race/ethnicity (% White non-Hispanic),²⁶ insurance type (% Medicaid),^{26,27} sex (% female),²⁶ and special population (% limited English proficiency, % human immunodeficiency virus diagnosis, and % substance use disorder).^{26,28,29} We included CHC characteristics such as volume (total patient visits),^{26,30} and geographic location (whether or not located in a rural area or a state with an approved DSRIP program).^{26,31} We also assessed the relationship between the use of CHWs and variations in the CHC funding environment,^{26–28,32} by exploring whether CHCs' financial reliance on BPHC grants (% BPHC grants over total revenue) or foundation/private grants (% foundation/private grants over total revenue) promoted use of CHWs.

Analytic Approach

We first conducted a descriptive analysis on changes in the CHW workforce among CHCs from 2016 to 2018 and factors associated with the use of CHWs. We used the two-part model because the outcome variable of interest (CHW FTEs) had a large fraction of true zeros (75.77%), while the remaining values were positive and continuous.³³ The two-part model allowed estimating separate effects for the probability of using any CHW and extent of CHW FTEs reported in those CHCs. A change in a covariate has 2 effects on the dependent variable—one on the probability that the dependent variable is positive, and the other on the value of the dependent variable conditional on being positive. In the first part, a logistic regression model predicted whether CHCs used any CHW using the entire sample (4102 CHC-year observations); in the second part, an ordinary least squares model predicted CHW FTEs, conditional on any CHW, for the subsample with positive values (994 CHC-year observations). Combining the 2 parts, the marginal effects using the entire sample (4102 CHC-year observations) were calculated. To test the significance of marginal effects for the combined model, the delta-method for approximating the SEs of the average marginal effects was used.³⁴ We included year dummies to control for unobserved time trends. Robust SEs were also used to account for nonindependence of observations from the same facility in all regressions.

Further, as an extension, to alleviate concerns that the changes in CHW workforce might be a consequence of the reporting change, we conducted a difference-in-differences (DD) analysis to compare non-CHW enabling services FTEs between CHCs with and without CHWs before (2013–2015) and after (2016–2018) the reporting change. Other enabling service personnel included case managers, patient/community education specialists, outreach workers, transportation staff, eligibility assistance workers, interpretation staff, and unspecified enabling services workers. We used the non-CHW enabling services FTEs as the outcome. CHCs that reported use of CHWs since 2016 were the treated CHCs, and other CHCs served as the comparison CHCs. The DD regression controlled for CHC fixed effects, year fixed effects, and the same time-varying control variables included in the main analysis. The DD model does rely on the assumption that CHCs with and without CHWs would exhibit similar trends before the reporting change. To test the validity of this assumption, we tested whether trends in non-CHW enabling services FTEs before the reporting change were the same for CHCs with and without CHWs using multiple t-tests and found that there were no significant differences in trends between CHCs with and without CHWs before the reporting change. Detailed regression results of the DD model are available in Supplemental Digital Content 1 (<http://links.lww.com/MLR/C300>).

This study was ruled exempt by George Washington University's Institutional Review Board. All statistical analyses were performed using Stata 15.

RESULTS

Use of Community Health Workers in Community Health Centers, 2016–2018

From 2016 to 2018, there were substantial increases in the proportion of CHCs that reported use of CHWs (Fig. 1). The rate of CHCs that employed any CHW rose from 20.04% in 2016 to 28.34% in 2018 (an average growth rate of 41%). Over the same time period, the average CHW FTEs employed in those CHCs were 3.32 (SD = 4.33).

Table 1 presents descriptive statistics for key covariates, separated into CHCs with and without CHWs.

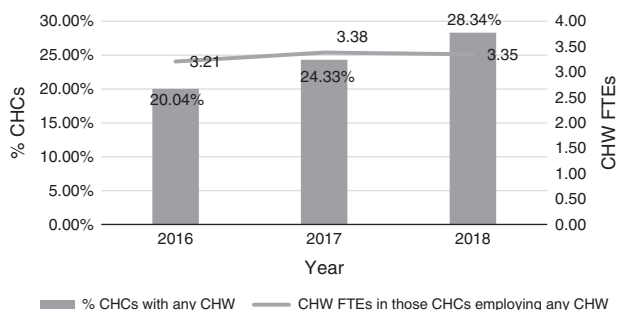


FIGURE 1. Use of CHWs in CHCs, 2016–2018. The percentages of CHCs with any CHW FTEs are shown for years 2016, 2017, and 2018 in bar. Among the percentages of CHCs with any CHW FTEs, the actual CHW FTEs are shown in line. CHC indicates community health center; CHW, community health worker; FTE, full-time equivalent.

TABLE 1. Mean Characteristics of CHCs in the Study, 2016–2018

Characteristics	Mean (SD)		P*
	CHCs With Any CHW	CHCs With No CHW	
Patient profile			
Race/ethnicity			
% White non-Hispanic	34.64 (28.17)	43.69 (30.60)	<0.001
% Black non-Hispanic	20.95 (24.92)	18.17 (22.62)	0.001
% Hispanic	30.11 (27.82)	25.62 (26.70)	<0.001
Insurance type			
% No insurance	24.66 (18.30)	25.51 (18.29)	0.201
% Medicaid	46.84 (19.06)	42.63 (19.37)	<0.001
% Dually eligible	4.03 (2.93)	3.77 (2.79)	0.014
% Medicare	9.77 (6.46)	10.89 (7.29)	<0.001
% Private insurance	17.62 (12.18)	20.30 (12.99)	<0.001
% Female	30.66 (21.08)	33.13 (22.62)	0.002
% Limited English proficiency	23.10 (24.24)	17.57 (22.12)	<0.001
Special population			
% HIV diagnosis	7.37 (9.43)	5.04 (8.25)	<0.001
% Substance use disorder	3.09 (5.26)	2.25 (4.05)	<0.001
CHC profile			
Total visits (in 1000)	109 (136)	71 (102)	<0.001
Grants over total revenue			
% BPHC grants	61.01 (23.61)	70.59 (22.84)	<0.001
% Foundation/private grants	9.98 (11.37)	6.76 (10.57)	<0.001
Rural	0.30 (0.46)	0.49 (0.50)	<0.001
State with DSRIP program approved	0.37 (0.48)	0.31 (0.46)	<0.001
Year			
2016	274 (20.04)	1093 (79.96)	
2017	334 (24.33)	1039 (75.67)	
2018	386 (28.34)	976 (71.66)	

BPHC indicates Bureau of Primary Health Care; CHC, community health center; CHW, community health worker; DSRIP, Delivery System Reform Incentive Payment; HIV, human immunodeficiency virus.

*P-value based on t test.

Compared to CHCs without CHWs, CHCs that reported use of CHWs since 2016 tended to serve Black (20.95% vs. 18.17%), Hispanic (30.11% vs. 25.62%), and Medicaid (46.84% vs. 42.63%) patients, as well as patients with special needs such as limited English proficiency (23.10% vs. 17.57%), human immunodeficiency virus diagnosis (7.37% vs. 5.04%), and substance use disorder (3.09% vs. 2.25%). CHCs with CHWs were larger in patient visit volume, serving an average of 109,000 visits per year over the study period, as compared with 71,000 for CHCs without CHWs. The reliance on BPHC grants over total revenue was lower for CHCs with CHWs (61.01% vs. 70.59%), while reliance on foundation/private grants was higher for CHCs with CHWs (9.98% vs. 6.76%). In addition, CHCs with CHWs tended to be located in urban areas and in states with an approved DSRIP program. A majority of differences between CHCs with and without CHWs on each set of characteristics was significant with a P-value < 0.001.

Factors Associated With the Use of Community Health Workers in Community Health Centers

Table 2 presents factors associated with the use of CHWs from the two-part regression results. Again, a change in a covariate has 2 effects on the dependent variable.

TABLE 2. Factors Associated With the Use of CHWs in CHCs: A Two-Part Model

Characteristics	Part I: Logistic Regression (N = 4102)		Part II: Linear Regression Conditional on Any CHW (N = 994)		Combined Expected Values (N = 4102)	
	OR (95% CI)	P	β (SE)	P	AME (SE)	P
Patient profile						
% White non-Hispanic	0.998 (0.993, 1.004)	0.540	-0.018 (0.009)	0.054	-0.005 (0.003)	0.054
% Medicaid	1.001 (0.994, 1.007)	0.874	0.004 (0.011)	0.739	0.001 (0.003)	0.716
% Female	0.994 (0.990, 0.999)	0.015	-0.021 (0.009)	0.020	-0.008 (0.003)	0.001
% Limited English proficiency	1.006 (0.999, 1.012)	0.086	0.006 (0.010)	0.553	0.004 (0.003)	0.146
% HIV diagnosis	1.006 (0.993, 1.018)	0.364	0.021 (0.021)	0.310	0.008 (0.006)	0.179
% Substance use disorder	1.031 (1.009, 1.053)	0.006	0.020 (0.029)	0.493	0.021 (0.009)	0.025
CHC profile						
Total visits (in 1000)	1.002 (1.000, 1.003)	0.027	0.010 (0.003)	0.002	0.003 (0.001)	<0.001
% BPHC grants	0.992 (0.987, 0.998)	0.006	-0.012 (0.010)	0.209	-0.007 (0.003)	0.012
% Foundation/private grants	1.011 (1.000, 1.021)	0.041	0.028 (0.019)	0.155	0.012 (0.005)	0.026
Rural	0.695 (0.521, 0.925)	0.013	1.665 (0.608)	0.006	0.212 (0.162)	0.192
State with DSRIP program approved	0.858 (0.652, 1.127)	0.270	-0.324 (0.430)	0.452	-0.159 (0.128)	0.213
Year						
2017	1.370 (1.217, 1.541)	<0.001	0.394 (0.192)	0.041	0.239 (0.052)	<0.001
2018	1.737 (1.500, 2.012)	<0.001	0.462 (0.259)	0.075	0.395 (0.074)	<0.001

In the first part, a logistic regression model predicted whether CHCs used any CHW using the entire sample (4102 CHC-year observations); in the second part, an ordinary least squares model predicted CHW FTEs, conditional on any CHW, for the subsample with positive values (994 CHC-year observations). Combining the 2 parts, the marginal effects using the entire sample (4102 CHC-year observations) were calculated. Robust SEs were used to account for nonindependence of observations from the same facility in the first and second parts. To test the significance of marginal effects for the combined model, the delta-method for approximating the SEs of the average marginal effects was used.

AME indicates average marginal effect; BPHC, Bureau of Primary Health Care; CHC, community health center; CHW, community health worker; CI, confidence interval; DSRIP, Delivery System Reform Incentive Payment; HIV, human immunodeficiency virus; OR, odds ratio.

Combining the 2 parts, the marginal effects are presented in the far right-hand side column of Table 2.

For example, CHCs serving 1000 more visits per year were 1.002 times more likely to have any CHW ($P=0.027$); and the CHW FTEs, conditional on any CHW, increased by 0.010 ($P=0.002$). Combining the 2 parts, the marginal effect of this variable was an increase in the CHW FTEs of 0.003 ($P<0.001$) compared with CHCs without CHWs. Besides the volume, CHCs' financial reliance on federal and other grants appears to be an important determinant. A 1 percentage point more reliance on BPHC grants was 0.992 times less likely to have any CHW ($P=0.006$); and the CHW FTEs, conditional on any CHW, decreased by 0.012 ($P=0.209$). Combining the 2 parts, the marginal effect of this variable was a decrease in the CHW FTEs of 0.007 ($P=0.012$) compared with CHCs without CHWs. On the contrary, CHCs' financial reliance on foundation/private grants promoted the use of CHWs. A 1 percentage point more reliance on foundation/private grants was 1.011 times more likely to have any CHW ($P=0.041$); and the CHW FTEs, conditional on any CHW, increased by 0.028 ($P=0.155$). Combining the 2 parts, the marginal effect of this variable was an increase in the CHW FTEs of 0.012 ($P=0.026$) compared with CHCs without CHWs. Interestingly, CHCs in rural areas were less likely to employ any CHW (odds ratio = 0.695; 95% confidence interval: 0.521, 0.925). However, among CHCs having any CHW, CHCs in rural areas employed more CHWs by 1.665 FTEs than CHCs in urban areas ($P=0.006$). Combining the 2 parts, the marginal effect of this variable was not statistically significant.

With respect to the effect size, the magnitudes of marginal effects on each of patient and organizational factors were modest in size on average and might not be sufficient to be significant determinants of using CHWs. Instead, year dummies were significantly associated with the 2 parts and the magnitudes of year dummies were also greater than those of patient and organizational factors, which might suggest that the changes in CHW workforce might be a consequence of the reporting change, as explored in the next section.

Use of Other Enabling Services Staff in Community Health Centers

As an extension, we conducted a DD analysis to compare non-CHW enabling services FTEs between CHCs with and without CHWs before and after the reporting change in 2016. The first row in Table 3 reports the summary statistics of non-CHW enabling services staff FTEs using data from 2013 to 2018. The mean number of non-CHW enabling services staff FTEs for CHCs that reported use of CHWs since 2016 was 19.25 (SD = 24.70), while the value for CHCs without CHWs was 11.73 (SD = 17.56).

The first column on each panel reports the predicted values of non-CHW enabling services staff FTEs over time from the DD regression results; the second column reports the percent changes. The percent changes in the 2 groups were similar in the year preceding the reporting change, then deviated substantially in 2016 when CHCs began reporting CHW FTE as a separate line item under the category of enabling services FTEs (0.69% vs. 7.49%), suggesting that the changes in CHW workforce might be, in part, a consequence of the reporting

TABLE 3. Use of Other Enabling Services Staff in CHCs, 2013–2018

Mean (SD)	CHCs With Any CHW (Since 2016)		CHCs With No CHW (Since 2016)	
	FTEs	Percent Change	FTEs	Percent Change
	19.25 (24.70)		11.73 (17.56)	
Year	FTEs	Percent Change	FTEs	Percent Change
2013	17.66		9.79	
2014	18.72	5.98	11.09	13.25
2015	19.01	1.54	11.25	1.43
2016	19.14	0.69	12.09	7.49
2017	19.91	4.03	12.70	5.01
2018	20.79	4.43	13.23	4.14

Personnel performing other enabling service activities include case managers, patient/community education specialists, outreach workers, transportation staff, eligibility assistance workers, and interpretation staff. The first row reports the summary statistics (mean and SD) of other enabling services staff FTEs using data from 2013 to 2018. The first column on each panel reports the predicted values of other enabling services staff FTEs over time from the difference-in-differences regression results; and the second column on each panel reports the percent changes. The regression controls for CHC fixed effects, year fixed effects, and the following time-varying control variables: patient characteristics (% White non-Hispanic, % Medicaid, % female, % limited English proficiency, % human immunodeficiency virus diagnosis, and % substance use disorder), CHC characteristics (total visits, % BPHC grants over total revenue, % Foundation/private grants over total revenue, rural location, and whether or not located in a state with DSRIP program approved). Detailed regression results are available in Supplemental Digital Content 1 (<http://links.lww.com/MLR/C300>).

BPHC indicates Bureau of Primary Health Care; CHC, community health center; CHW, community health worker; DSRIP, Delivery System Reform Incentive Payment; FTE, full-time equivalent.

change instead of actual growth. The estimate on a DD model also showed a significant decrease in non-CHW enabling services staff FTEs by 0.87 ($P=0.045$) for CHCs with CHWs after the reporting change in 2016 (Supplemental Digital Content 1, <http://links.lww.com/MLR/C300>). This suggests that about one third of the changes in CHW workforce we observed might be a consequence of the reporting change in 2016, compared with a mean of 3.32 FTEs.

DISCUSSION

This analysis examines the characteristics of CHCs that employ CHWs and the factors that may be associated with their use. We found CHCs reporting CHW FTE grew 41% from 2016 to 2018, while average FTEs stayed relatively flat, with about 4% growth over the same time period. Our analyses indicate that a substantial portion of this growth (about one third) may be attributable to a change in UDS reporting categories.

In our unadjusted models, we find that CHCs with larger in patient visit volume, more diverse patient populations, in urban settings are more likely to employ any CHWs. These factors remained significant after adjusting our models.

CHCs with larger patient visit volumes, which tend to have more resources and are better equipped to apply for grant funding and participate in quality-related initiatives, appear to be in a stronger position to bring CHWs on board. In our adjusted models, larger CHCs were more likely to employ CHWs and, if employed, had more CHW FTE. Grant funding is also an important determinant. Given the challenges of creating a financially sustainable model for CHW staffing, CHCs often turn to external grants to support special initiatives

involving CHWs. Conversely, CHCs that depend more heavily on HRSA grants have more limited funding streams to bring CHWs on board. While many CHCs support CHW FTE through enabling services funding, competing priorities for these limited funds can make adding new professions to the enabling services workforce particularly difficult.

Our study uncovers an interesting twist related to CHC geographic location and the use of CHWs. Rural CHCs are less likely to employ CHWs; but if they have CHWs, they employ them more. On average, rural CHCs with CHWs reported 1.665 more FTEs compared with CHW FTEs in urban CHCs. Using more CHWs in rural settings that have already decided to integrate CHWs into their enabling services workforce is a research question that should be explored in future studies.

Our study indicates that the majority of CHCs are not taking advantage of the opportunities that CHWs present for CHC patient populations. In 2018, only 28.3% of health centers reported some CHW FTE. While our study does not address the reasons why health centers have been slow to add CHWs to their enabling services workforce, our results are consistent with prior research that points to substantial financial barriers associated with CHCs' expanding the use of CHWs in their clinics.^{8,35} CHCs are resource-strained safety net organizations that face chronic funding challenges among a growing and increasingly complex patient population. Lack of investment in CHWs is a missed opportunity from a quality of care and financial perspective; a 2020 study of a CHW intervention calculated a return of \$2.47 for every dollar invested by an average Medicaid payer in the program.²⁶

Our findings indicate that Medicaid coverage is not associated with greater use of CHWs, which should not be surprising since state Medicaid programs have only recently accelerated opportunities to support CHWs (and many other enabling services workers) as part of care team covered services. Medicaid is the largest funder of health center services, with nearly half of health center patients covered by the program.³⁶ Its commitment to integrating CHWs into FHQCs more broadly could greatly expand these services as part of its commitment to a more equitable delivery system. Nearly 7 of 10 health centers to not employ CHWs, despite growing recognition of the importance of incorporating community-based interventions to reduce disparities among low-income, underserved, diverse populations, which are the mainstay of CHC patients. Policy change—including strengthening Medicaid provisions to explicitly include CHW services as reimbursable under state Medicaid programs would help to expand the use of CHWs across CHCs nationwide.

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