

Improving Depression Care for Adults With Serious Mental Illness in Underresourced Areas: Community Coalitions Versus Technical Support

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Objective: Community Partners in Care (CPIC) was a group-randomized study of two approaches to implementing expanded collaborative depression care: Community Engagement and Planning (CEP), a coalition approach, and Resources for Services (RS), a technical assistance approach. Collaborative care networks in both arms involved health care and other agencies in five service sectors. This study examined six- and 12-month outcomes for CPIC participants with serious mental illness.

Methods: This secondary analysis focused on low-income CPIC participants from racial-ethnic minority groups with serious mental illness in underresourced Los Angeles communities (N=504). Serious mental illness was defined as self-reported severe depression (≥ 20 on the Patient Health Questionnaire-8) at baseline or a lifetime history of bipolar disorder or psychosis. Logistic and Poisson regression with multiple imputation and response weights, controlling for covariates, was used to model intervention effects.

Results: Among CPIC participants, 50% had serious mental illness. Among those with serious mental illness, CEP relative

to RS reduced the likelihood of poor mental health-related quality of life (OR=.62, 95% CI=.41-.95) but not depression (primary outcomes); reduced the likelihood of having homelessness risk factors and behavioral health hospitalizations; increased the likelihood of mental wellness; reduced specialty mental health medication and counseling visits; and increased faith-based depression visits (each $p < .05$) at six months. There were no statistically significant 12-month effects.

Conclusions: Findings suggest that a coalition approach to implementing expanded collaborative depression care, compared with technical assistance to individual programs, may reduce short-term behavioral health hospitalizations and improve mental health-related quality of life and some social outcomes for adults with serious mental illness, although no evidence was found for long-term effects in this subsample.

Psychiatric Services 2018; 69:195–203; doi: 10.1176/appi.ps.201600514

Depression was recently identified as the leading cause of adult disability worldwide (1). In the United States, disparities in access to, quality of, and outcomes for depression care exist by race, ethnicity, and socioeconomic status (2). People with serious mental illnesses have an estimated lifetime prevalence of comorbid depression of up to 50% (3–5). Recent policy changes, such as the Helping Families in Mental Health Crisis Act and states' adoption of Medicaid home and community-based services, incentivize increased collaboration among health care and community-based service providers for people with serious mental illnesses (6–8). Collaborations among health care, social services, and community-based services are effective at addressing the mental health and social needs of those with serious mental illness (9–13), but a 2015 Cochrane review reported finding only one “high-quality” study on the specific issue of the

added value of coalition-based versus non-coalition-based interventions to improve the health of minority communities—Community Partners in Care (CPIC) (14,15). This article presents results from a subanalysis focusing on CPIC participants with serious mental illness.

CPIC was a group-level randomized comparative effectiveness trial that compared two approaches to implementing an expanded model of collaborative depression care (15,16). CPIC was conducted in 95 programs in two under-resourced Los Angeles communities in five sectors: outpatient primary care, outpatient mental health care, substance abuse treatment services (residential and outpatient), homeless services, and other community-based services (for example, faith-based programs, parks-and-recreation-operated community/senior centers, exercise clubs, and hair salons). The study compared Resources for Services (RS) versus Community

Engagement and Planning (CEP), implemented at the program level in the five sectors by using an evidence-based tool kit for collaborative depression care. RS used expert technical assistance for providers, administrators, and other staff, and CEP used a coalition approach to plan, colead, and monitor training and implementation.

At six-month follow-up, compared with RS, participants in CEP experienced greater improvements in mental health-related quality of life and mental wellness, increased physical activity, reduced risk factors for homelessness, and fewer behavioral health hospitalizations (15). At 12-month follow-up, primary analyses suggested statistically significant, modest improvements in mental health-related quality of life and fewer hospitalizations for CEP versus RS; these findings remained in the same direction but were statistically significant in some but not all sensitivity analyses (for example, longitudinal analyses without response weights) (16).

CPIC differed from most collaborative depression care studies by including health care and non-health care agencies as sites for recruitment and intervention; by focusing on safety-net programs in diverse, urban, underresourced communities (87% of participants identified as Latino or African American, and nearly three-quarters lived below the federal poverty level); and by applying few exclusions (participants with comorbid disorders were not excluded) (15).

All CPIC participants had depression severity corresponding to a score of ≥ 10 on the eight-item Patient Health Questionnaire (PHQ-8). This study focused on those who also met study criteria for serious mental illness, a pre-specified subgroup analysis documented in study protocols (17). Serious mental illness has been variously defined in the literature by specific diagnoses—psychotic illnesses, bipolar disorder, and sometimes major depressive disorder—and in epidemiologic and policy contexts by functional limitations in one or more life activities (18,19). We defined serious mental illness of CPIC participants as severe symptoms of depression or lifetime histories of bipolar disorder or psychosis and explored the sensitivity of intervention effects to different definitions.

The first study aim was to describe the prevalence of serious mental illness among CPIC participants by the sector in which they were initially screened, which is important given that few studies identify participants from the breadth of service sectors used in CPIC. The second aim was to explore whether some of the benefits observed for CEP versus RS participants in the parent study were also observed among participants with serious mental illness, which is particularly important because many collaborative depression care studies exclude people with histories of bipolar disorder or psychosis. We hypothesized that CPIC's CEP approach to depression care quality improvement would lead to significantly improved mental health and social outcomes for those with serious mental illness, compared with RS, particularly in the first six months of follow-up, in which intervention effects were strongest in the parent study. Alternatively, because of the limited tailoring of trainings and

services for those with serious mental illness, there may have been few differences in outcomes for CEP versus RS participants. We also explored whether outcomes differed for CPIC participants with and without serious mental illness, hypothesizing no significant interaction of intervention $\times$ serious mental illness as further potential support for consistency of intervention effects between this subsample and the larger sample in the parent study.

METHODS

Study Design and Population

A secondary analysis of six- and 12-month outcomes data for CPIC participants with serious mental illness (15,16) was conducted. CPIC was a community-partnered participatory study emphasizing equal partnership among community and academic partners, facilitated by a partnered oversight council. CPIC was conducted in two communities in Los Angeles: Hollywood–Metro Los Angeles and South Los Angeles. Partners nominated four vulnerable populations for intentional sampling by inclusion of programs serving these groups: substance abuse treatment clients, African Americans, individuals who were homeless, and seniors.

Agencies and programs in the five sectors described above were enrolled from November 2008 through August 2010. Within each community, a multistage process involving county lists and partner nominations was used to identify and contact potentially eligible agencies (15). These programs were randomly assigned to RS or CEP. To reduce intervention cross-over, programs with strong preexisting referral relationships were grouped for randomization to CEP or RS. Postrandomization, program eligibility and enrollment were finalized at site visits. [A figure in an online supplement to this article illustrates the recruitment process.]

Client enrollment occurred from March to November 2010. A sampling strategy was developed for different types of locations (for example, groups and waiting rooms). All English- and Spanish-speaking adults (≥ 18 years old) receiving services (or parents of children receiving services) at participating programs were identified during a screening and enrollment period and then approached for screening for study eligibility. All who were present were approached simultaneously (for example, in the case of small groups) or were approached by using random number tables. RAND staff blinded to intervention status approached 4,645 people for screening, and 4,440 (95.6%) agreed. Adults providing contact information who had depression severity indicated by PHQ-8 score of ≥ 10 were included (15,20,21). RAND staff excluded individuals unable to answer screening items because of gross cognitive impairment. Of those screened, eligible, and enrolled, 1,018 completed baseline or six- or 12-month follow-up surveys [see online supplement]. Of these, 504 met criteria for serious mental illness (see below) and constituted the analytic subsample. This study and all procedures were approved by the RAND Institutional

Review Board and by participating agencies that required separate review.

Interventions

RS and CEP, both active interventions, were implemented by using an expanded collaborative depression care tool kit that included materials from Partners in Care, WeCare, IMPACT, and Mental Health Infrastructure and Training (22). The tool kit (which was available to programs in hard copy, online, and on USB drives) included resources on clinical assessment, psychotropic medication management, psychotherapy, skill building for case managers and community health workers, and patient education. The tool kit included training on assessment and management of clients with histories of bipolar or psychotic disorders (treatment engagement and referral to specialty mental health services).

In RS, using a train-the-trainer approach, an expert study team (psychiatrist, psychologist, care manager, collaborative depression care leader, community outreach expert, and staff) offered 12 Webinars via phone or online to all RS programs plus one site visit for each primary care program in each community. There was no intentional promotion of agency collaboration.

CEP programs provided one or more liaisons for biweekly coalition planning meetings for four months to adapt tool kits and write a training and implementation plan incorporating community preferences and strengths, supported by \$15,000 provided to each coalition (equivalent value of RS resources). CEP explicitly promoted networking among programs to encourage referrals and sharing of collaborative care tasks to increase capacity. CEP coalitions adapted tool kits by incorporating alternative therapies into medication management, providing training sessions on provider self-care and listening skills, and piloting innovative case management and psychoeducation strategies (23). Compared with RS, CEP was associated with increased participation in training by programs and providers, increased use of psychotherapeutic skills by case managers, and more time spent providing community services by case managers (23–25).

With use of an encouragement design, programs were encouraged but not required to use tool kit resources, and individual participants were free to seek services as they wished (26). Program administrators in CEP, but not in RS, were provided lists of their program's participants for safe-keeping in a secure file, except for one agency with a shared waiting room for CEP and RS programs, where both were given lists.

Baseline Measures

Baseline measures (screeners and telephone) included demographic factors (age and sex), having three or more of 18 chronic health conditions (for example, diabetes, cancer, and heart disease), education level, and race-ethnicity; physical health component summary score and mental

health component summary score (MCS-12) from the 12-item Short Form Health Survey (15,27). The Mini-International Neuropsychiatric Interview–6 was included to assess for probable 12-month *DSM-IV* diagnoses of major depressive or dysthymic disorder, current or past hypomania or mania, recent anxiety disorders (one-month panic disorder, social anxiety disorder, and posttraumatic stress disorder or six-month generalized anxiety disorder), and 12-month alcohol abuse or use of illicit drugs. Psychosis history was assessed at baseline with a four-item screener of ever receiving a diagnosis by a physician of schizophrenia or schizoaffective disorder or ever being hospitalized for experiences such as hearing voices others could not hear, believing that people were trying to hurt you, feeling that you could hear another person's thoughts, or feeling someone was putting thoughts in or taking thoughts out of you mind (28). Depression was assessed with the PHQ-8 at baseline and PHQ-9 at six- and 12-month follow-up (20,21).

For this study, CPIC participants were defined as having serious mental illness if they met criteria for severe depression at baseline (PHQ-8 score ≥ 20), had a lifetime history of hypomania or mania consistent with bipolar disorder (MINI), or had a lifetime history of psychosis (four-item screener). Sensitivity analyses were conducted for two subgroups: those also reporting poor mental health–related quality of life at baseline, defined as an MCS-12 score ≤ 40 , one standard deviation below the population mean, and a lifetime history of bipolar disorder or psychosis.

Outcome Measures

The two primary outcomes were poor mental health–related quality of life (MCS-12 ≤ 40) and probable depression (PHQ-9 ≥ 10) at six- and 12-month follow-up. Secondary outcomes prioritized by community partners through a pre-specified participatory process included mental wellness (a response of at least “a good bit of the time” in the prior 4 weeks to feeling calm or peaceful, having energy, or being happy); homelessness risk, defined as current homelessness or living in a shelter or having ≥ 2 risk factors (e.g., no place to stay for ≥ 2 nights or eviction from a primary residence, financial crisis, or food insecurity in the past 6 months); and self-reported behavioral health hospitalizations. (15,16). This study did not include measures of psychosis symptom severity.

Secondary self-reported outpatient and community-sector service use outcomes were examined at six and 12 months. Self-report data were collected for total visits and visits with depression-related services; names and locations were documented for up to four providers for visits with depression-related services for each of seven service categories (mental health specialty care, primary care, substance abuse treatment services, social services, faith-based programs, parks-and-recreation centers, and other community programs) for six months prior to baseline and at six- and 12-month follow-up. Self-report data on program locations for depression-related services were used to describe service

TABLE 1. Illness characteristics of Community Partners in Care participants by screening location^a

Illness category	Overall (N=1,018)		Primary care (N=290)		Mental health care (N=195)		Substance abuse treatment (N=230)		Homeless services (N=162)		Social and community services (N=141)	
	N	%	N	%	N	%	N	%	N	%	N	%
Serious mental illness	504	50	117	41	107	55	144	64	92	56	45	32
Severe major depressive disorder	171	17	38	14	43	22	41	18	30	19	19	13
Serious mental illness with poor mental health–related quality of life	308	30	75	26	70	37	87	38	52	32	23	17
Bipolar disorder or psychosis, lifetime history	419	41	97	33	90	47	123	54	77	47	32	23

^a Data were multiply imputed and weighted for eligible sample for enrollment. N, unweighted; %, weighted. Chi-square tests were used to compare differences across five service settings. Serious mental illness was defined as the presence of one or more of the following: severe major depressive disorder (score of ≥ 20 on the eight-item Patient Health Questionnaire) or a lifetime history of bipolar disorder or psychosis. Poor mental health–related quality of life at baseline was defined as a score of ≤ 40 on the mental health component summary from the 12-item Short Form Health Survey (one standard deviation below population mean).

use from programs in the assigned and the opposite intervention arms.

Statistical Analysis

We conducted univariate analyses to describe the sample and bivariate analyses to compare screening locations (primary care, mental health care, substance abuse treatment services, homeless services, and social and community services) by participants' serious mental illness status. We examined intervention effects among those with serious mental illness to determine whether CEP was more effective than RS in improving mental health and service utilization. We described baseline differences between CEP and RS by using bivariate analyses. We conducted intention-to-treat analysis with regression analyses: logistic regression for dichotomous outcomes and Poisson regression for counts. The independent variable was intervention status (CEP or RS). Covariates for the models were the baseline status of the dependent variable, age, race-ethnicity, 12-month depressive disorder, and community.

CPIC used nonresponse weighting to address missing data for nonenrollment among eligible clients and for attrition (29,30). We used a hot-deck multiple imputation technique for item nonresponse and an approximate Bayesian bootstrap for unit nonresponse among the analytic sample (31). For these subanalyses, we used Taylor series linearization with a "subpopn" statement in SUDAAN, version 11.1, accounting for clustering (clients within programs), weighting, and multiple imputations (32,33). Significance of intervention effects was assessed by using contrasts among regression coefficients. Results from logistic regression models are presented as odds ratios (ORs) and Poisson regression models are presented as incidence rate ratios (IRR) with 95% confidence intervals. We supplemented adjusted models with unadjusted raw data to assess robustness.

For sensitivity analyses, we examined variations in intervention effects at six months by three definitions of serious mental illness (described above). We fit models by using the full parent study sample, including indicators of

intervention status, serious mental illness, and their interaction. We also conducted longitudinal analyses [for further details on these analyses, see the online supplement].

RESULTS

Baseline Prevalence of Serious Mental Illness by Sector

At baseline, half (50%) of the parent study sample met criteria for serious mental illness, with a prevalence rate of 41% in primary care programs (Table 1). Significant differences ($p < .05$) were noted in prevalence of serious mental illness across the five sectors, with the highest proportions in substance abuse treatment (64%) and homeless services (56%).

Study Participants

All baseline characteristics of participants with serious mental illness were similar between CEP and RS arms (Table 2). Thirty-two percent of the sample identified as Latino and 53% as African American. Forty-three percent had less than a high school education, 76% had a family income below the federal poverty level, and 57% were uninsured. [Screening, recruitment, and survey completion data by service sector are summarized in a table in the online supplement.]

Intervention Effects

At six-month follow-up, participants with serious mental illness in CEP versus RS had a significantly lower likelihood of poor MHRQL (OR=.62) and higher likelihood of mental wellness (OR=1.98) (Table 3). CEP participants were significantly less likely than RS participants to have two or more risk factors for homelessness at follow-up (OR=.48) or to have a behavioral health hospitalization (OR=.45). No significant difference between the two arms was found at six months in participants' likelihood of having depression severity of PHQ-9 ≥ 10 . Participants in CEP reported significantly fewer specialty mental health medication management visits, compared with RS participants

(IRR=.44) and significantly fewer mental health counseling visits (IRR=.55). However, the mean number of visits to faith-based programs for depression services was higher at six months among CEP participants compared with RS participants (IRR=2.94) (Table 4). For the 12-month follow-up, no significant outcome differences were found between CEP and RS [see tables in online supplement].

Sensitivity analyses using more restrictive clinical and policy definitions of serious mental illness showed similar patterns of intervention effects on primary, community-prioritized, and service use outcomes (Tables 3 and 4). Sensitivity analyses with longitudinal modeling among participants with serious mental illness showed patterns of outcomes at six months similar to those reported above, except for behavioral health hospitalizations (in one of two models) and visits to faith-based programs for depression, which were not statistically different between CEP and RS [see tables in online supplement]. The above results at six months were also confirmed in the change from baseline analyses in mental wellness, behavioral health hospitalizations, specialty mental health medication visits, and counseling visits. No significant intervention $\times$ serious mental illness status interaction effects were observed [see tables in online supplement].

Service Use in Assigned and Opposite Treatment Arms

Self-reported raw data indicated that 64% of RS participants and 61% of CEP participants used depression services in programs in their assigned treatment arms in the six months prior to baseline; these percentages were 56% and 45%, respectively, at six-month follow-up, and 33% and 40%, respectively, at 12 months. Self-reported data indicated rates of intervention cross-over as follows: 16% for RS and 23% for CEP in the six months prior to baseline, declining to 13% and 14%, respectively, at six months and to 11% and 13%,

respectively, at 12 months. These rates are similar to rates for the overall study sample (34).

DISCUSSION

CPIC was conducted in underresourced communities with a sample of participants who were predominantly from racial-ethnic minority groups and who were served by safety-net programs. Given the absence of clinical exclusion criteria, we found a high prevalence of serious mental illness across sectors, as illustrated by a rate of 41% in primary care, which is similar to other safety-net studies (35,36). We also found a high prevalence of socioeconomic risk factors, such as unemployment and low income. We examined the added value of a multisector coalition approach above technical assistance to implement expanded collaborative depression

TABLE 2. Characteristics at baseline of Community Partners in Care participants with serious mental illness (N=504), by intervention group^a

Characteristic	Overall (N=504)		RS (N=234) ^b		CEP (N=270) ^c	
	N	%	N	%	N	%
Female	264	51	113	46	151	55
Race-ethnicity						
Latino	156	32	74	32	82	32
African American	280	53	123	52	157	54
Non-Hispanic white	48	10	22	10	26	11
Other	20	5	15	6	6	4
Married or living with partner	95	19	47	20	48	18
Less than high school education	220	43	102	44	117	43
≥ 3 chronic medical conditions	306	61	149	64	157	59
Family income under federal poverty level	382	76	182	78	200	74
No health insurance	285	57	139	60	146	55
12-month depressive disorder	383	76	180	77	203	75
Alcohol abuse or use of illicit drugs, past 12 months	241	48	99	44	141	53
Mental wellness ^d	152	30	70	30	82	30
Homelessness or ≥ 2 risk factors for homelessness ^e	303	62	155	68	148	56
Working for pay	62	12	35	14	28	11
Illness subgroups						
Serious mental illness with poor mental health-related quality of life	308	61	145	62	163	60
Bipolar disorder or psychosis, lifetime history	419	83	189	81	230	85
Age (M $\pm$ SD)	45.8 $\pm$ 12.0		45.2 $\pm$ 11.3		46.2 $\pm$ 12.6	
PHQ-8 (M $\pm$ SD score) ^f	16.7 $\pm$ 4.5		17.0 $\pm$ 4.5		16.5 $\pm$ 4.4	
MCS-12 (M $\pm$ SD) ^g	37.8 $\pm$ 7.1		37.6 $\pm$ 7.1		38.0 $\pm$ 7.0	

^a Data were multiply imputed and weighted for eligible sample for enrollment. Chi-square tests were used to compare differences across five service settings. Serious mental illness was defined as the presence of one or more of the following: severe major depressive disorder (score of ≥ 20 on the eight-item Patient Health Questionnaire [PHQ-8]) or a lifetime history of bipolar disorder or psychosis. Poor mental health-related quality of life at baseline was defined as a score of ≤ 40 on the mental health component summary from the 12-item Short Form Health Survey (MCS-12) (one standard deviation below the population mean).

^b RS, Resources for Services

^c CEP, Community Engagement and Planning

^d At least a good bit of time on any of three items: feeling peaceful or calm, being a happy person, having energy

^e Homeless or living in a shelter or at least two of four risk factors (at least two nights homeless, food insecurity, eviction, or financial crisis)

^f Possible scores range from 0 to 24, with higher scores indicating greater depression severity.

^g Possible scores range from 0 to 100, with higher scores indicating better mental health-related quality of life.

TABLE 3. Intervention effects on primary and community-prioritized outcomes at six months among Community Partners in Care participants with serious mental illness^a

Variable		N of clients	Unadjusted estimates ^b						Adjusted analysis (CEP versus RS) ^e		
			RS ^c			CEP ^d					
			Total N	N	%	Total N	N	%	N	OR	95% CI
With serious mental illness											
Primary outcomes											
Poor mental health–related quality of life (MCS-12 ≤40) ^f	359	171	104	61	188	94	50	504	.62	.41–.95	
PHQ-9 ≥10 ^g	358	171	142	83	187	133	71	504	.59	.29–1.18	
Community-prioritized (secondary) outcomes											
Mental wellness ^h	360	170	39	23	190	70	37	504	1.98	1.11–3.55	
Homelessness or ≥2 risk factors for homelessness ⁱ	360	171	87	51	189	54	29	504	.48	.29–.80	
Any behavioral health hospitalizations in past 6 months	361	171	27	16	190	17	9	504	.45	.22–.88	
With serious mental illness and poor mental health–related quality of life											
Primary outcomes											
Poor mental health–related quality of life (MCS-12 ≤40) ^f	215	106	71	67	109	59	54	308	.61	.35–1.04	
PHQ-9 ≥10 ^g	215	106	92	87	109	85	78	308	.61	.21–1.75	
Community-prioritized (secondary) outcomes											
Mental wellness ^h	215	105	20	19	110	35	32	308	1.84	.92–3.70	
Homelessness or ≥2 risk factors for homelessness ⁱ	216	106	59	56	110	32	29	308	.45	.26–.78	
Any behavioral health hospitalizations in past 6 months	216	106	16	15	110	8	7	308	.43	.14–1.29	
With bipolar disorder or psychosis, lifetime history											
Primary outcomes											
Poor mental health–related quality of life (MCS-12 ≤40) ^f	290	134	84	63	156	73	47	419	.54	.33–.90	
PHQ-9 ≥10 ^g	289	134	113	84	155	110	71	419	.58	.29–1.15	
Community-prioritized (secondary) outcomes											
Mental wellness ^h	291	133	33	25	158	58	37	419	1.85	1.00–3.44	
Homelessness or ≥2 risk factors for homelessness ⁱ	291	134	69	52	157	45	29	419	.51	.30–.88	
Any behavioral health hospitalizations in past 6 months	292	134	24	18	158	14	9	419	.42	.22–.81	

^a Serious mental illness was defined as the presence of one or more of the following: severe major depressive disorder (score of ≥ 20 on the eight-item Patient Health Questionnaire [PHQ]) or a lifetime history of bipolar disorder or psychosis.

^b Raw data without weighting or imputation

^c RS, Resources for Services

^d CEP, Community Engagement and Planning

^e Adjusted analyses used multiply imputed data, weighted for eligible sample for enrollment; logistic regression models adjusted for baseline status of the dependent variable, age, race-ethnicity, education, 12-month depressive disorder, and community and accounted for the design effect of the cluster randomization.

^f Mental health component summary from the 12-item Short Form Health Survey. Possible scores range from 0 to 100, with higher scores indicating better mental health–related quality of life.

^g Nine-item PHQ. Possible scores range from 0 to 27, with higher scores indicating greater depression severity.

^h At least a good bit of time on any of three items: feeling peaceful or calm, being a happy person, having energy

ⁱ Homeless or living in a shelter or at least two of four risk factors (at least two nights homeless, food insecurity, eviction, or financial crisis)

care for CPIC participants meeting study criteria for serious mental illness.

Findings from this prespecified subgroup analysis were consistent with the parent study's outcomes at six months, even with a smaller sample (50% of the parent study

sample), including statistically significant improvement for CEP versus RS groups on one of two primary outcomes and on three community-prioritized outcomes. Furthermore, we found that these comparisons remained significant or borderline significant in longitudinal models (except for

behavioral health hospitalizations, which was significant in one of two longitudinal models). Thus all significant comparisons (four of five outcomes) were in the hypothesized direction favoring CEP.

We found no main intervention effects on outcomes at 12-month follow-up, which could be attributable to a lack of significant long-term intervention differences in this subsample or to limited power (because of the smaller sample size) for detecting the smaller intervention effects at 12 months in the parent study. We also found some reduction in CEP versus RS in specialty mental health medication and counseling visits, which also could have contributed to the lack of significant 12-month findings, particularly because people with serious mental illness may require more specialty services. Nevertheless, both the general pattern of similarity to the overall sample at six months and the lack of significant intervention $\times$ serious mental illness interaction effects may suggest that the parent study's findings at six and 12 months generally apply to this subsample.

We also found that the overall pattern of outcomes favoring CEP at six months was consistent in subgroups defined by more restrictive definitions of serious mental illness: those with serious mental illness and poor mental health-related quality of life at baseline and people with a history of bipolar or psychotic illnesses.

Aspects of the CEP intervention that were similar to evidence-based interventions for persons with serious

TABLE 4. Intervention effects on service use at six months among Community Partners in Care participants with serious mental illness^a

Variable ^f	Unadjusted estimates ^b						Adjusted analysis (CEP versus RS) ^e	
	RS ^c			CEP ^d				
	Total N	M	SD	Total N	M	SD	IRR ^g	95% CI
With serious mental illness								
Health care sector visits for depression ^h	170	19.9	38.5	186	18.7	35.2	.87	.57–1.33
Outpatient primary care services for depression	170	1.3	3.4	188	1.5	2.9	1.12	.74–1.68
Mental health outpatient visits	171	15.2	33	189	10.6	2.9	.69	.43–1.11
Mental health outpatient visits, received advice about medication	171	9.1	28.6	189	4.3	7.7	.44	.29–.67
Mental health outpatient visits received counseling	171	12.7	31.5	189	7.0	13.2	.55	.35–.86
Community sector visits for depression ⁱ	171	4.9	21.3	190	6.0	22.3	1.36	.66–2.78
Religious services for depression	171	.6	2.2	190	1.4	6.1	2.94	1.19–7.25
With serious mental illness and poor mental health–related quality of life ^j								
Health care sector visits for depression ^h	106	21.8	41.2	108	17.6	34.1	.88	.53–1.47
Outpatient primary care services for depression	106	1.8	4.1	108	2.0	3.3	1.07	.66–1.72
Mental health outpatient visits	106	16.0	34.6	110	9.2	15.7	.66	.39–1.12
Mental health outpatient visits, received advice about medication	106	9.9	3.7	110	4.0	5.0	.45	.26–.79
Mental health outpatient visits received counseling	106	14.3	33.7	110	7.0	11.3	.53	.31–.90
Community sector visits for depression ⁱ	106	6.1	25.1	110	4.0	12.2	.87	.27–2.79
Religious services for depression	106	.7	2.5	110	1.0	4.3	2.08	.66–6.56
With bipolar disorder or psychosis, lifetime history								
Health care sector visits for depression ^h	133	22.0	42.5	154	19.6	37.9	.86	.54–1.36
Outpatient primary care services for depression	133	1.2	2.9	156	1.4	2.9	1.28	.80–2.05
Mental health outpatient visits	134	17.1	36.5	157	1.4	21.7	.65	.38–1.11
Mental health outpatient visits, received advice about medication	134	1.3	31.8	157	4.5	8.2	.40	.26–.63
Mental health outpatient visits received counseling	134	14.1	34.9	157	6.8	13.7	.50	.30–.83
Community sector visits for depression ⁱ	134	5.5	23.8	158	6.4	23.8	1.31	.59–2.92
Religious services for depression	134	.7	2.5	158	1.6	6.7	2.89	1.20–6.99

^a Serious mental illness was defined as the presence of one or more of the following: severe major depressive disorder (score of ≥ 20 on the eight-item Patient Health Questionnaire) or a lifetime history of bipolar disorder or psychosis.

^b Raw data without weighting or imputation

^c RS, Resources for Services

^d CEP, Community Engagement and Planning

^e Adjusted analyses used multiply imputed data, weighted for eligible sample for enrollment; logistic regression models adjusted for baseline status of the dependent variable, age, race-ethnicity, education, 12-month depressive disorder, and community and accounted for the design effect of the cluster randomization.

^f For all service settings, depression-related visits were defined as services at which clients reported talking about depression or medications for depression; services at which clients received counseling for depression, stress, or emotional problems; or referral to specialty mental health services.

^g Incidence rate ratio

^h Health care sector visits for depression were defined as outpatient primary care services for depression; emergency or urgent care visits for alcohol, drug, or mental health problems; mental health specialty outpatient visits; and outpatient substance abuse services for depression.

ⁱ Community sector visits for depression were defined as homeless services and social and community sector services for depression.

^j Poor mental health-related quality of life was defined as a mental health component summary score of ≤ 40 (one standard deviation below the population mean).

mental illness may have contributed to the positive six-month outcomes in this subsample and overall: multisector collaboration, task sharing, relationship building across sectors, and building staff knowledge and capacity to work with those with mental illness (9–11,13,37). CEP promoted sharing of screening and engagement activities with non-health care sectors (for example, social services, recreation centers, and faith-based organizations) and nonlicensed providers and enabled participants largely from minority groups to receive supports within familiar, trusted locations.

Community partnerships and multisector care are emerging approaches to the growing realization that unmet social needs exacerbate health disparities for at-risk groups, including persons with serious mental illness and racial-ethnic minority populations (38). Many collaborative care studies exclude those with serious mental illness. These findings, although exploratory to inform future research, suggest that individuals with serious mental illness may have experienced improvements in short-term outcomes from a coalition model similar to those experienced by the parent study sample. This finding may support inclusion of people with comorbid psychiatric diagnoses in collaborative depression care research and services, an issue for future research. Inclusion may involve further tailoring of interventions to the needs of those with serious mental illness, such as a greater focus on specialty consultation. In this respect, our study may add to the existing literature suggesting that multisector collaboration, including communitywide models of collaborative depression care, may improve some outcomes for those with serious mental illness (38–41). Future research may also focus on how to strengthen and extend outcome improvements.

This study had important limitations. Randomization occurred within communities, with potential for intervention cross-over. Self-reported cross-over rates were non-trivial during the active intervention (but highest in the six months preceding baseline), comparable to the overall study. Such cross-over would lead to underestimation of CEP effects. Missing data resulting from participant dropout were handled by using weighting and item- and wave-level imputation in intention-to-treat analyses. CEP programs were given lists of clients who were enrolled from their site, whereas RS programs were not. These lists could have contributed in part to the positive effects seen in the CEP arm, but the lists were kept in secure files and were not a registry. In addition, prior studies have indicated that the provision of lists to providers about the depression status of patients is generally not effective alone in improving the detection of depression, rates of intervention, or outcomes (42,43). Implementation was tracked by using service utilization measures, rather than programs' use of tool kit manuals and forms. The study was limited to two urban settings and use of client self-report. Psychosis history was defined by self-report. This subsample may have been too

small to detect modest outcome differences between CEP and RS (for example, outcomes at 12 months).

CONCLUSIONS

CPIC was conducted in full partnership with community stakeholders, and the findings apply to a highly racially-ethnically diverse and socially at-risk sample subject to disparities. This secondary analysis suggested that intervention effects of CEP versus RS for participants with serious mental illness were largely consistent, at least at six months, with the overall study findings, including improvement in one primary outcome (mental health-related quality of life) and all community-prioritized outcomes (improved mental wellness and reduced behavioral health hospitalizations and homelessness risk). Future research should use standard diagnostic and outcome measures for serious mental illness, tailor interventions to this population, and address continuity and sustainment of services through innovations in case management and technology. This study may serve as an important step toward developing and evaluating communitywide coalition approaches to reduce mental health disparities that may include people with serious mental illness.

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The authors report no financial relationships with commercial interests.

Received November 7, 2016; revisions received March 15 and July 28, 2017; accepted August 11, 2017; published online October 15, 2017.

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