

Comparing Rates of Multiple Chronic Conditions at Primary Care and Mental Health Visits to Community Health Centers Versus Private Practice Providers

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Abstract: This study identifies differences in rates of multiple chronic conditions at primary care and mental health visits to Community Health Centers and private practice providers using 2013 National Ambulatory Medical Care Survey data. Community health center visits had higher rates of 1 or more, 2 or more, and 3 or more chronic conditions for working-age patient visits (ages 18–64). There were no differences in other age groups. After controlling for age and other covariates using logistic regression, community health center visits had 35% higher odds of having any chronic condition and 31% higher odds of having 2 or more chronic conditions. **Key words:** *Community Health Centers, federally qualified health centers, multiple chronic conditions, primary care*

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A FUNDAMENTAL COMPONENT of moving the US health care system toward lower-cost, higher-quality, and more coordinated care is effectively managing clinically complex individuals, especially those with concurrent chronic conditions, also called multiple chronic conditions (MCC). Multiple chronic conditions is defined as having 2 or more chronic conditions that last more than 1 year and require ongoing medical attention or limit activities of daily living (U.S. Department of Health & Human Services [DHHS], 2010). Approximately 4 in 10 (42%) Americans have MCC, and that rate climbs to 81% for those aged 65 years and older (Buttorff et al., 2017). Care quality, outcomes, and quality of life decline as a person experiences more chronic conditions—including premature death, receipt of conflicting health advice, chance of hospitalizations, and poorer day-to-day functioning (Anderson, 2010). Seventy-one percent of health care spending goes toward treating people with

MCC (Gerteis et al., 2014) and those with MCCs account for 93% of total Medicare fee-for-service spending (Centers for Medicare & Medicaid Services, 2012).

Having concurrent chronic conditions expands the level of complexity in managing patient health care needs (DHHS, 2010), particularly for populations experiencing socioeconomic factors that impede their ability to access and effectively use high-quality primary care. Many studies have shown that these groups have higher rates of MCC, including older populations (Buttorff et al., 2017); low-income populations (National Center for Health Statistics [NCHS], 2018); publicly insured populations (Ashman & Beresovsky, 2013; Ward et al., 2014), especially dually eligible populations (Centers for Medicare & Medicaid Services, 2012) and nonelderly Medicaid beneficiaries (NCHS, 2018); and some racial or ethnic minority groups (Freid et al., 2012; NCHS, 2018). These populations are overwhelmingly served by the nation's primary health care safety net, yet little is known about the role of safety net providers in managing patients with MCC and, by extension, the role safety net providers may play in transforming the health care system toward greater value-driven care delivery.

Community Health Centers (CHCs) are the largest network of safety net primary care providers, serving more than 28 million patients—roughly 1 in 12 residents—across the United States (Health Resources and Services Administration, 2019). Community Health Centers must provide a comprehensive set of services that compliment and improve access to primary care, serve everyone no matter their insurance status or ability to pay, be overseen by patient-majority governing boards to ensure responsiveness to community needs, and locate in or serve federally designated medically underserved areas or populations. In 2018, 91% of patients had incomes at or below 200% of the federal poverty level, nearly half (48%) were enrolled in Medicaid, 23% were uninsured, and 63% were members of racial/ethnic minority groups (Bureau of Primary Health Care [BPHC], 2019). That same year, CHCs served

a diverse range of special populations, including 995 000 agricultural workers, 1.4 million patients with experiencing homelessness, 4.4 million patients living in or near public housing, and 6.7 million patients best served in a language other than English.

Only 1 previous study (Shi et al., 2010) examined MCC across the CHC population and compared it with the general population utilizing private practices for ambulatory care, finding no significant difference in the average count of chronic conditions between care settings. This study, however, did not control for differences in patient populations and used data from 2006. Given the rapid growth in the Health Center Program following the Affordable Care Act of 2010, the patient population accessing CHCs and experiencing MCCs may look different today.

This study seeks to provide a comprehensive and more up-to-date analysis of the rate of MCC within the CHC patient population in comparison with the general population receiving primary care at private practices. Because populations served by the primary care safety net may experience different mixes and rates of MCC, documenting the differences between the health care safety net and non-safety net providers can help inform policy makers, payers, and providers about the resources, capacity, infrastructure, and competencies necessary to effectively identify and manage these complex patients, improve outcomes and health equity, and control costs. This study may also inform risk stratification models, thereby assisting providers with targeting appropriate interventions such as care coordination for the most at-risk patient populations. It may also inform risk adjustment methodologies as payers increasingly turn to alternative payment models that place providers at some level of financial risk for population outcomes.

METHODS

Data source

Our analysis combined data from the CHC and private practice physician (PPPs) samples

of the 2013 National Ambulatory Medical Care Survey (NAMCS), which is the most recent year available for CHC data, although data on PPPs are available for later years. National Ambulatory Medical Care Survey is an annual, nationally representative survey of ambulatory care visits to nonfederal, office-based physicians (PPPs) and includes a stand-alone national survey of CHCs using the same survey instrument and reporting period (December 24, 2012, through December 22, 2013), although the sampling methods for the PPP and the CHC NAMCS differ.

The PPP NAMCS used a 2-stage probability sample that first selected physicians within specified geographies and then patient visits within practices. The PPP sampling frame drew from all physicians in the master files maintained by the American Medical Association and the American Osteopathic Association and sampled up to 30 physician visits within a randomly assigned week for each private practice. Of the 6999 in-scope physicians sampled, PPP NAMCS collected responses from 2879 physicians for a response rate of 41% and 54 873 visits.

The CHC NAMCS utilized a 3-stage probability sample based on (1) selecting service delivery sites within specified geographies, (2) selecting providers within a site, and (3) sampling visits from providers. The sampling frame drew from a list of delivery sites provided by Health Resources and Services Administration, then sampled up to 3 physicians and nonphysician clinicians within service delivery sites, and finally collecting up to 30 visits within a randomly assigned week for each provider. The 2013 CHC NAMCS collected responses from 1340 services delivery sites and 2289 providers for a 2-stage response rate of 62% and 50 814 visits.

Definitions

We limit our analysis to visits drawn from primary care physicians and psychiatrists because (a) the CHC NAMCS also sampled nonphysician clinicians and (b) the PPP NAMCS also includes specialists who are uncommon in CHCs. Primary care physicians include general and family practice, internal medicine, pediatrics, and OB/GYNs. All results are inter-

preted in patient visits to primary care physicians and psychiatrists, rather than patients themselves.

Data for chronic conditions were drawn from checkboxes (Yes/No) embedded in the NAMCS survey instrument, which captures 14 chronic conditions: arthritis, asthma, cancer, cerebrovascular disease, congestive heart failure, chronic obstructive pulmonary disease, chronic renal failure, depression, diabetes, hypertension, hyperlipidemia, ischemic heart disease, obesity, and osteoporosis. These data were extracted from the patient medical record, with a checked box indicating that a patient was diagnosed at some point previously and not necessarily at the current visit. We also created binary variables for any chronic condition (1 or more), 2 or more, and 3 or more chronic conditions.

Analysis

The combined CHC and PPP NAMCS public use files contained 105 687 observations in all (50 814 in CHC NAMCS and 54 873 in PPP NAMCS). We removed 50 838 sampled visits (48% of total observations) that were not seen by a primary care physician or a psychiatrist as defined previously (23 440 [46%] for CHCs and 27 398 [50%] for PPPs). Next, we removed 1068 observations (2% of sampled visits to primary care physicians and psychiatrists) where checkboxes for chronic conditions were blank or unknown (421 [2%] for CHCs and 647 [2%] for PPPs). Our final sample after these exclusions was 53 781 visits (26 953 for CHCs and 26 828 for PPPs). The logistic regression models (described later) further excluded 3503 responses (7% of our final sample) where the expected source of payment was blank or unknown (1519 [6%] for CHCs and 1984 [7%] for PPPs). These exclusions were similarly proportionate across variables in the PPP and CHC sample of primary care providers and psychiatrists.

We used 2 analyses to capture a comprehensive description of chronic conditions at patient visits to primary care physicians and psychiatrists at CHCs and PPPs. The first analysis measured overall presence of chronic conditions at CHCs and PPPs using χ^2 tests for specific chronic conditions (eg, arthritis,

asthma, etc) as well as for counts of chronic conditions (categorized as 1 or more, 2 or more, and 3 or more chronic conditions). In addition, we tested for differences in prevalence among age groups, including those aged 65 years and older, working age (18-64 years), and children (younger than 18 years).

Second, we compared the odds of having any chronic condition, 2 or more chronic conditions, or 3 or more chronic conditions at visits to CHCs and PPPs while controlling for important covariates using logistic regression. In total, we ran 3 regression models—1 for each binary dependent variable (having any chronic condition, 2 or more, and 3 or more chronic conditions). Each model assumed a binomial distribution with a logit link function and adjusted for survey weights and the NAMCS complex sampling design. The independent variable of interest for each model was whether the visit occurred at a CHC or a PPP. We controlled for data collection methods, expected source of payment, and a limited number of patient characteristics; these include (a) the type of provider sampled for the visit (categorical); (b) whether the visit is from a new or established patient (categorical), which is important for how the chronic conditions checkbox data were collected; (c) 4 binary variables for the expected source of payment (private insurance, Medicare, Medicaid, or uninsured); (d) age (continuous), which was truncated at age 87 years for consistency between CHC and PPP samples; (e) sex (male/female); and (f) urban/rural geography, represented as inside or outside a metropolitan statistical area. The binary variable for no insurance was created by combining responses indicating that the expected source of payment was either self-pay or no charge/charity.

The logistic regression models do not control for race/ethnicity. Given that our study is interested in describing the rates of chronic conditions for the CHC patient population, which represents a confluence of social factors associated with chronic conditions, we decided not to adjust for race/ethnicity. In addition, there is a large and uneven amount of imputed records for this variable. For PPP NAMCS, 37.9% of responses were missing

race, ethnicity, or both (NCHS, 2017). This was the case for 21.2% of responses to the CHC NAMCS (NCHS, 2019). Similarly, we did not control for patient income because NAMCS stopped providing the poverty rate for patient zip codes in the public use files in 2012, and this measure was unavailable for our analyses.

Our analyses were conducted using R, version 3.5.3, using the “*srvyr*” package (Ellis et al., 2019). All estimates and standard errors account for the complex sampling design of NAMCS by incorporating visit-level survey weight, masked clustered stratum, and primary sampling unit (a masked service delivery site marker in CHC NAMCS and a physician marker in PPP NAMCS) variables provided in the NAMCS public use files. The NAMCS survey weights account for all sampling stages and adjust for nonresponse bias, allowing our weighted estimates to be nationally representative. Bonferroni corrections for multiple comparisons were applied to χ^2 tests and logistic regression models based on a significance level of $P \leq .05$.

RESULTS

Table 1 shows weighted estimates of the variables included in our analyses. The age distribution in patient visits to CHCs and PPPs is very distinct for the youngest and oldest age groups after applying survey weights. Community Health Centers see a large proportion of children younger than 18 years (32.8%) compared with PPPs (23.6%). Conversely, PPPs see more than double the estimated proportion of visits from elderly patients (22.2%) than CHCs (10.3%).

These distinctive age demographics impacted the results from the χ^2 analyses of the prevalence of MCC. There were no significant differences in the count of chronic conditions for visits from all patients, children, or the elderly. When looking at visits from working age patients, however, CHC patient visits had higher rates of any chronic condition (63%), 2 or more chronic conditions (34.6%), and 3 or more chronic conditions (16.9%) compared with PPP visits (56.4%, 27.7%, and 13.2%, respectively), as shown in Table 2.

Table 1. Selected Characteristics of Visits to Primary Care Physicians and Psychiatrists in Community Health Centers Versus Private Practices, United States, 2013

Variable	Category	Community Health Centers N = 30,880 k ^a Weighted Percent ^b (95% CI)	Private Practice Physicians N = 524,750 k ^a Weighted Percent ^b (95% CI)	All Visits N = 555,629 k ^a Weighted Percent ^b (95% CI)
Age (Binned), y	<18	32.8 (28.2-37.3)	23.6 (20.7-26.4)	24.1 (21.3-26.8)
	18-34	18.5 (16.6-20.5)	16.7 (15-18.4)	16.8 (15.2-18.4)
	35-44	11.3 (10.4-12.3)	10.2 (9.5-11)	10.3 (9.6-11)
	45-64	27.1 (24.6-29.5)	27.3 (25.8-28.9)	27.3 (25.8-28.8)
	65+	10.3 (8.6-12)	22.2 (20.4-23.9)	21.5 (19.9-23.2)
Sex	Female	60.5 (58.9-62.1)	60.4 (58.9-62)	60.4 (59.6-61.9)
	Male	39.5 (37.9-41.1)	39.6 (38.4-41)	39.6 (38.1-41)
Urban/rural	MSA	86.3 (83.4-89.3)	90.4 (88.5-92.3)	90.2 (88.4-92)
	Non-MSA	13.7 (10.7-16.6)	9.6 (7.7-11.5)	9.8 (8-11.6)
Physician specialty	General and family practice	57.7 (51.5-63.9)	39.7 (35.5-43.8)	40.7 (36.8-44.6)
	Psychiatry	3 ^c (-0.2 to 6.3)	6.8 (5-8.6)	6.6 (4.9-8.3)
	Internal medicine	10.6 (7.1-14.1)	23.6 (19.7-27.4)	22.9 (19.2-26.5)
	Pediatrics	23.9 (18.7-29.2)	18.9 (16.1-21.7)	19.2 (16.5-21.9)
	OB/GYN	4.8 (3-6.5)	11 (8.7-13.4)	10.7 (8.4-12.9)
New or established patient	Established patient	85.2 (82.6-87.8)	89.5 (88.3-90.7)	89.3 (88.1-90.4)
	New patient	14.8 (12.2-17.4)	10.5 (9.3-11.7)	10.7 (9.6-11.9)
Expected source of payment ^d	Private	18 (15.1-21)	59.7 (57.2-62.2)	57.4 (55-59.8)
	Medicare	13 (11-15.1)	21 (19.1-22.9)	20.6 (18.8-22.3)
	Medicaid	50 (46.4-53.5)	16.5 (14.5-18.4)	18.3 (16.4-20.2)
	Uninsured	11.9 (10.1-13.6)	4.2 (3.3-5.2)	4.7 (3.8-5.5)
	Unknown/blank observations ^e	5.2 (3.8-6.7)	5.5 (4.4-6.7)	5.5 (4.4-6.6)

Abbreviations: CI, confidence interval; k, thousands; MSA, metropolitan statistical area.

^aThese figures reflect estimates of the total number of visits in each setting and are rounded to the nearest 1000 based on guidelines from the National Center for Health Statistics (NCHS). The estimated total visits to Community Health Center and Private Practice Physicians do not sum precisely to the "All Visits" estimate due to rounding. The unweighted number of observations used in this analysis is 53 781 (26 953 for Community Health Centers and 26 828 for private practice physicians).

^bSurvey weights used in the analysis are provided by NCHS in the National Ambulatory Medical Care Survey public use files and account for all sampling stages and adjust for nonresponse bias.

^cEstimate considered unreliable due to a relative standard error greater than 30%.

^dPercentages may not add up to 100% because visits may have more than 1 expected source of payment.

^eRemoved from sample for logistic regression models.

Table 2. Prevalence of Any or Multiple Chronic Conditions at Visits to Primary Care Physicians and Psychiatrists in Community Health Centers Versus Private Practices by Age, United States, 2013

Age Group	Total Chronic Conditions	CHC (95% CI)	PPP (95% CI)	P
All ages	≥ 1 chronic conditions	51.6 (48.4-54.8)	54.1 (51.7-56.5)	.227
	≥ 2 chronic conditions	27.8 (25.3-30.4)	30.5 (28.2-32.7)	.131
	≥ 3 chronic conditions	13.9 (12.3-15.5)	16.9 (15.2-18.6)	.012
Ages 65+ y	≥ 1 chronic conditions	90.3 (88.2-92.4)	89.4 (87.9-91)	.522
	≥ 2 chronic conditions	71.5 (68.4-74.5)	68.2 (65.1-71.4)	.144
	≥ 3 chronic conditions	40.8 (36.9-44.7)	43.8 (40.4-47.2)	.261
Ages 18-64 y	≥ 1 chronic conditions	63 (60.1-65.9)	56.4 (53.9-58.9)	<.001 ^a
	≥ 2 chronic conditions	34.6 (32.4-36.8)	27.7 (25.5-29.9)	<.001 ^a
	≥ 3 chronic conditions	16.9 (15.4-18.5)	13.2 (11.6-14.9)	.002 ^a
<18 y	≥ 1 chronic conditions	19.7 (16.5-22.9)	15.5 (13.2-17.9)	.034
	≥ 2 chronic conditions	2.3 (1.4-3.3)	1.4 (1-1.8)	.029
	≥ 3 chronic conditions	n/a ^b	n/a ^b	n/a ^b

Abbreviations: CHC, Community Health Centers; CI, confidence interval; n/a, not applicable; PPP, private practice physicians.

^aSignificance under Bonferroni correction at 0.005, *m* = 11.

^bEstimates were considered unreliable because they were based on fewer than 30 observations and had a relative standard error greater than 30%.

Table 3 shows the estimated rate of specific chronic conditions by age group. We also provide a summary of chronic conditions with higher prevalence in CHCs or PPPs in Table 4. Among all ages, CHCs had higher rates of obesity and asthma, while PPPs had higher rates of arthritis, cancer, cerebrovascular disease, hyperlipidemia, ischemic heart disease, and osteoporosis. Among elderly patient visits, CHCs had higher rates of diabetes, while PPPs had higher rates of cancer. Visits from working age patients to CHCs had higher rates of diabetes, hypertension, and obesity; there were no chronic conditions with significantly higher prevalence for these patients visiting PPPs. Children visiting CHCs had higher rates of obesity at CHCs, and no chronic conditions were more prevalent at PPP visits from children.

In our multivariable analyses using logistic regression (Table 5) to control for data collection methods, expected source of payment, and a limited number of patient characteristics, CHCs had higher odds of having any chronic condition (odds ratio [OR] = 1.35) and 2 or more chronic conditions (OR =

1.306) but no difference for 3 or more chronic conditions. Medicaid-covered and uninsured patient visits were also significant predictors. Medicaid was associated with increased odds of having 2 or more chronic conditions (OR = 1.36) and 3 or more chronic conditions (OR = 1.57). Uninsured patient visits were less likely to have 1 or more (OR = 0.562), 2 or more (OR = 0.617), and 3 or more (OR = 0.557) chronic conditions. Age (in years) was also a significant predictor in all 3 logistic regression models with ORs ranging from 1.055 to 1.061 in each model.

We conducted sensitivity analyses for the logistic regression models by adding race/ethnicity as a control variable and again using a recoded age variable with 5 distinct age groups. Most coefficients were similar in size and direction. Notably, Medicare as the expected source of payment became a significant and slightly more powerful predictor in each model when we used the recoded age variable as a predictor. We also performed a quasi-Poisson regression using the total count of chronic conditions as the outcome variable, finding again that all coefficients were roughly

Table 3. Prevalence of Selected Chronic Conditions at Visits to Primary Care Physicians and Psychiatrists in Community Health Centers Versus Private Practice by Age, United States, 2013

Age Group	Chronic Condition	CHC (95% CI)	PPP (95% CI)	P	
All ages	Arthritis	6.4 (5.6-7.2)	9.7 (8.6-10.7)	<.001 ^a	
	Asthma	8.5 (7.5-9.5)	6.7 (6.1-7.3)	.001 ^a	
	Cancer	1.4 (1.1-1.7)	3.8 (3.1-4.6)	<.001 ^a	
	CEBVD	0.9 (0.7-1.1)	1.5 (1.2-1.8)	<.001 ^a	
	Chronic renal failure	1.1 (0.8-1.4)	1.4 (1-1.9)	.225	
	Congestive heart failure	0.9 (0.7-1.1)	1.4 (1.1-1.7)	.002	
	COPD	3.1 (2.7-3.6)	4.2 (3.7-4.8)	.002	
	Depression	11.5 (9.3-13.8)	13.2 (11.8-14.5)	.242	
	Diabetes	13.5 (11.8-15.1)	11.8 (10.7-12.8)	.087	
	Hyperlipidemia	14.6 (12.7-16.4)	19.9 (18-21.8)	<.001 ^a	
	Hypertension	23.8 (21.4-26.1)	26.8 (24.8-28.8)	.054	
	Ischemic heart disease	1.3 (1.1-1.6)	2.5 (2.2-9)	<.001 ^a	
	Obesity	13.5 (11.7-15.2)	8.1 (7.2-8.9)	<.001 ^a	
	Osteoporosis	1.1 (0.8-1.4)	3 (2.5-3.5)	<.001 ^a	
	Ages 65+ y	Arthritis	16.1 (13.9-18.4)	20.5 (18.5-22.5)	.005
		Asthma	5.1 (3.6-6.6)	5.4 (4.2-6.5)	.788
Cancer		5.1 (3.7-6.6)	10.4 (8.4-12.4)	<.001 ^a	
CEBVD		3.5 (2.6-4.4)	4.4 (3.5-5.2)	.174	
Chronic renal failure		5.4 (3.3-7.6)	4.8 (3.4-6.3)	.648	
Congestive heart failure		4.4 (3.2-5.6)	4.9 (3.8-5.9)	.581	
COPD		9.2 (6.8-11.6)	9.5 (8.2-10.8)	.813	
Depression		11.6 (9.2-14)	15 (12.8-17.3)	.049	
Diabetes		37.4 (33.6-41.2)	26.5 (24.3-28.7)	<.001 ^a	
Hyperlipidemia		39.4 (34.2-44.5)	44.1 (40.6-47.7)	.137	
Hypertension		67.1 (64.4-69.8)	63.9 (61-66.8)	.111	
Ischemic heart disease		6.5 (4.5-8.4)	8.1 (6.6-9.6)	.216	
Obesity		11.1 (8.9-13.2)	9.2 (7.5-10.9)	.168	
Osteoporosis		6.8 (4.5-9.2)	10.7 (9.1-12.3)	.016	
Ages 18-64 y		Arthritis	8 (7.1-8.9)	9.1 (7.8-10.4)	.156
		Asthma	7.5 (6.6-8.4)	6.7 (6-7.4)	.148
	Cancer	1.5 (1.1-2)	2.8 (2.1-3.4)	.002	
	CEBVD	1 (0.7-1.2)	0.9 (0.6-1.2)	.868	
	Chronic renal failure	0.9 (0.6-1.1)	0.7 (0.4-0.9)	.293	
	Congestive heart failure	0.7 (0.5-1)	0.6 (0.4-0.8)	.292	
	COPD	3.4 (2.9-4)	3.3 (2.7-3.8)	.662	
	Depression	17.4 (14.1-20.8)	16.6 (15-18.3)	.659	
	Diabetes	16.8 (15.5-18.1)	10.7 (9.5-11.9)	<.001 ^a	
	Hyperlipidemia	18.3 (16.1-20.4)	18.5 (16.4-20.5)	.9	
	Hypertension	29.5 (27.5-31.5)	23.2 (21.4-25)	<.001 ^a	
	Ischemic heart disease	1.2 (0.9-1.5)	1.3 (1-1.5)	.687	
	Obesity	17.4 (15-19.8)	10.1 (9-11.3)	<.001 ^a	
	Osteoporosis	0.7 (0.4-0.9)	1.1 (0.8-1.4)	.026	
	<18 y	Arthritis	0.5 (0.3-0.7)	0.7 (0.4-0.9)	.393
		Asthma	11.2 (9.4-13.1)	7.9 (6.8-9)	.002
Cancer		n/a ^b	n/a ^b	n/a ^b	
CEBVD		n/a ^b	n/a ^b	n/a ^b	
Chronic renal failure		n/a ^b	n/a ^b	n/a ^b	
Congestive heart failure		n/a ^b	n/a ^b	n/a ^b	
COPD		n/a ^b	n/a ^b	n/a ^b	
Depression		n/a ^b	n/a ^b	n/a ^b	
Diabetes		n/a ^b	n/a ^b	n/a ^b	
Hyperlipidemia		n/a ^b	n/a ^b	n/a ^b	
Hypertension		n/a ^b	n/a ^b	n/a ^b	
Ischemic heart disease		n/a ^b	n/a ^b	n/a ^b	
Obesity		7.4 (5.3-9.5)	2.3 (1.7-2.9)	<.001 ^a	
Osteoporosis		n/a ^b	n/a ^b	n/a ^b	

Abbreviations: CI, confidence interval; CEBVD, cerebrovascular disease; CHC, Community Health Centers; COPD, chronic obstructive pulmonary disease; n/a, not applicable.

^aSignificance under Bonferroni correction at 0.001, *m* = 45.

^bEstimates for either CHCs or private practice providers were considered unreliable because they were based on fewer than 30 observations or had a relative standard error greater than 30%.

Table 4. Chronic Conditions With a Higher Prevalence at Visits to Community Health Centers Versus Private Practice Physicians, United States, 2013^a

Age Group	Community Health Centers (CHC)	Private Practice Physicians (PPP)
All ages	Obesity	Arthritis
	Asthma	Cancer
	...	Hyperlipidemia
	...	Ischemic heart disease
	...	Osteoporosis
Ages 65 y and above	...	CEBVD
	Diabetes	Cancer
Working age (18-65 y)	Diabetes	...
	Hypertension	...
	Obesity	...
Children (<18 y)	Obesity	...

Abbreviation: CEBVD, cerebrovascular disease.

^aInclusion of a chronic condition in the center column indicates that prevalence of this condition was higher among CHC patient visits; inclusion in the right column indicates higher prevalence among PPP patient visits.

similar in direction and significance compared with the logistic regression models.

DISCUSSION

This is the first study to provide a comprehensive description of the rates of MCC at patient visits to the nation’s largest network of safety primary care providers. The results of this study indicate that CHCs provide a high volume of care for patients with chronic conditions, particularly MCCs, and that visits to CHCs have a higher rate of MCCs compared with PPPs. In particular, visits among the bulk of health center patients—those ages 18 to 64 years—are more likely to be for patients with 1 or more, 2 or more, and 3 or more chronic conditions compared with the same group at PPPs. After controlling for data collection methods, expected source of payment, and a limited number of patient characteristics, the average visit to CHCs has a 31% higher odds of having 2 or more chronic conditions and 35% higher odds of having any chronic condition compared with PPP patient visits.

Multiple regression models indicate that Medicaid coverage, by far the dominant insurer across CHC patients nationally, was strongly associated with having 2 or more and 3 or more chronic conditions. These findings show that Medicaid is clearly a critical insurer for those patients experiencing MCC, even

after adjusting for age and other covariates, and helps make it possible for patients to access care. The reverse is true for lack of insurance, where we see that visits for those without coverage are less likely to have been diagnosed with MCCs, possibly because individuals seek out coverage (whether from private insurance, Medicaid, or elsewhere) if they receive a diagnosis.

Age is also a significant, leading, and positive predictor of having higher counts of chronic conditions. Our analysis of prevalence for specific chronic conditions between age groups illustrates this point. When all ages are included, the prevalence of obesity and asthma is greater at CHCs, whereas conditions such as arthritis, cancer, cerebrovascular disease, hyperlipidemia, ischemic heart disease, and osteoporosis are greater at PPPs. However, when looking at patients younger than 65 years, visits to CHCs showed a higher rate of costly diseases that disproportionately affect low-income and minority communities such as diabetes, hypertension (Leng et al., 2015), and obesity (Ogden et al., 2017). Community Health Centers serve far more children, who tend to experience few of the studied chronic conditions overall, and far fewer elderly patients, who tend to have far more. Proportionately, both CHCs and PPPs serve roughly the same amount of working-age patients.

Table 5. Estimated Odds Ratios for 1+, 2+, and 3+ Chronic Conditions at Visits to Primary Care Physicians and Psychiatrists in Community Health Centers Versus Private Practices, United States, 2013

Variable	Outcome: Any Chronic Condition		Outcome: ≥ 2 Chronic Conditions		Outcome: ≥ 3 Chronic Conditions	
	OR (95% CI)	P	OR (95% CI)	P	OR (95% CI)	P
Setting of care (reference: private practice physician)						
Community health center	1.35 (1.18-1.545)	<.01 ^a	1.306 (1.102-1.548)	<.01 ^a	1.11 (0.906-1.36)	.31
Data collection methods						
Provider type (reference: general and family practice)						
Psychiatrist	2.041 (1.382-3.014)	<.01 ^a	0.324 (0.19-0.555)	<.01 ^a	0.292 (0.157-0.541)	<.01
Internal medicine	1.403 (1.171-1.68)	<.01 ^a	1.356 (1.104-1.665)	<.01 ^a	1.26 (0.98-1.62)	.07
Pediatrician	0.701 (0.562-0.875)	<.01 ^a	0.366 (0.259-0.516)	<.01 ^a	0.241 (0.125-0.465)	<.01 ^a
OB/GYN	0.275 (0.223-0.339)	<.01 ^a	0.241 (0.186-0.311)	<.01 ^a	0.228 (0.165-0.315)	<.01 ^a
Patient type (reference: established patient)						
New patient	0.653 (0.541-0.787)	<.01 ^a	0.607 (0.494-0.747)	<.01 ^a	0.626 (0.51-0.769)	<.01 ^a
Expected source of payment						
Private insurance	0.871 (0.714-1.063)	.17	0.83 (0.668-1.031)	.09	0.793 (0.631-0.995)	.05
Medicare	1.157 (0.936-1.429)	.18	1.03 (0.826-1.285)	.79	0.947 (0.762-1.178)	.63
Medicaid	1.138 (0.92-1.407)	.23	1.361 (1.085-1.707)	<.01 ^a	1.567 (1.237-1.983)	<.01 ^a
Uninsured	0.562 (0.416-0.76)	<.01 ^a	0.617 (0.446-0.854)	<.01 ^a	0.557 (0.385-0.805)	<.01 ^a
Patient characteristics						
Age (Years)	1.055 (1.051-1.06)	<.01 ^a	1.061 (1.056-1.066)	<.01 ^a	1.06 (1.055-1.065)	<.01 ^a
Sex (reference: Female)						
Male	0.96 (0.872-1.057)	.4	1.066 (0.955-1.189)	.26	1.015 (0.89-1.157)	.83
Rurality (reference: Urban)						
Rural	0.967 (0.756-1.235)	.79	1.138 (0.891-1.454)	.3	0.869 (0.682-1.107)	.26

Abbreviations: CI, confidence interval; OR, odds ratio.

^aSignificance under Bonferroni correction at 0.017, *m* = 3.

This study demonstrates that CHCs improve access to care for medically underserved populations and patients with extensive and costly health care needs. Previous research shows that health centers also excel in quality standards and controlling the costs of care. For example, a previous study (Goldman et al., 2012) compared 18 quality measures at CHCs and PPPs, finding that, after controlling for patient characteristics, CHCs performed better on 6 measures and no differently than private practices on 12 measures. Other studies have found cost savings for children (Bruen & Ku, 2019) and Medicaid (Nocon et al., 2016) and Medicare (Mukamel et al., 2016) beneficiaries utilizing CHCs for primary care compared with other providers. By serving a generally younger patient population than PPPs, health centers also play an important role in screening, treating, and managing common chronic conditions before they progress into more acute stages—or lead to new chronic conditions—especially as patients age into Medicare.

As health centers treat more patients with costly, complex, and concurrent chronic conditions, they will play a larger role in bending the cost curve and improving health outcomes for the nation's medically underserved. Community Health Centers are rapidly growing to serve more underserved patients and communities, and the growth in the number of health center patients with chronic illnesses such as diabetes, depression, human immunodeficiency virus, substance use disorder, chronic obstructive pulmonary disease, and obesity has outpaced patient growth overall (National Association of Community Health Centers, 2019), and many of these conditions often co-occur.

Effectively managing patients with chronic conditions—especially MCC—requires ongoing care coordination, patient support, and care integration. In many cases, patients with 1 or more chronic conditions may require access to specialty care to manage their conditions. Community health center patients have greater challenges accessing needed specialty care, especially those covered by Medicaid or who are uninsured (Cook et al., 2007;

Ezeonwu, 2018; Holgash & Heberlein, 2019). Federal statute governing the Health Center Program requires that CHCs offer a comprehensive set of services beyond primary care, such as behavioral, oral, pharmacy, and “enabling” services that facilitate access to and better use of health care services (examples of these “enabling” services often include transportation, case management, health education, and translation). Recent research demonstrates that enabling services help patients navigate the health care system and achieve greater access to needed care (Yue et al., 2019) and may even lead to improved health outcomes, although more research is needed on specific patient outcomes.

Sustaining CHC financing is necessary to ensure that CHCs can continue to provide comprehensive, high-quality, and integrated primary care to treat patients with or at risk of chronic conditions. This is particularly important for patients with MCC whose complex health needs generally require a higher volume of health care services, including nonclinical enabling services that address nonclinically derived causes of poor health and higher costs. Health center financing is also important for delivering effective preventive care so that patients can be at lower risk of developing additional chronic illnesses.

Nationally, the largest sources of CHC financing are Medicaid reimbursement and federal grants through Section 330 of the Public Health Services Act. Although Section 330 federal funding makes up the bulk of grant revenues, Medicaid makes up CHCs' largest source of revenue overall (44%) (BPHC, 2019). Health centers depend on 330 grants and adequate Medicaid reimbursement to remain viable and provide both insured and uninsured patients the full range of services necessary to prevent and treat chronic conditions, some of which, like enabling services, are often not reimbursable by third-party payers. Moreover, as Medicaid and other payers increasingly move toward value-based care, the cost of providing the full range of clinical and nonclinical services necessary for managing patients with MCC must be accounted for

within new payment models, including the cost of needed face-to-face encounters.

Future research is needed to explore the impact of recent CHC growth, particularly since implementation of the Affordable Care Act, which made possible rapid CHC expansion. Medicare is a growing source of coverage for CHC patients and CHC revenue, with many Medicare CHC patients dually enrolled in Medicaid, given their low incomes. As patients age at CHCs, we expect the volume of MCC to increase, especially as patients age into Medicare. Further research is also needed to guide how risk adjustment models can better account for the extent to which providers—particularly safety net providers—are successfully managing high-need, high-risk patients.

This study has important limitations. The checkbox data for 2013 NAMCS are limited to 14 chronic conditions and exclude some important conditions, such as substance use disorder. National Ambulatory Medical Care Survey also captures only diagnosed chronic conditions and may undercount the true rate

of MCC, especially among the uninsured. In addition, the most recent CHC NAMCS data were collected in 2013, prior to many states implementing Medicaid expansion, which increased access to health insurance and primary care for millions of Americans (Medicaid and CHIP Payment and Access Commission, n.d.)—many of which utilized CHCs.

CONCLUSION

This study documents the different rates of MCC and mixes of chronic conditions at primary care and mental health visits to CHCs and PPPs. Well-coordinated, integrated, comprehensive, and continuous primary care is essential for managing MCC as well as the social determinants that exacerbate them, especially for vulnerable populations utilizing the health care safety net. Community Health Centers are well positioned to serve complex patients, given their unique model of care and mission to serve clinically and socially complex populations.

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