

COORDINATING CARE FOR PATIENTS WITH ALCOHOL OR DRUG USE DISORDERS: EFFECTIVE PRACTICES AND COMMON BARRIERS IN THREE CENTERS

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EXECUTIVE SUMMARY

Integrating treatment for mental health and substance use disorders (SUD) with primary care has been the subject of extensive research in recent years, testing a number of different integration models and specific interventions. While many of these approaches have shown promise in demonstrations or clinical trials, the true test of value is in real-world settings where there are competing demands on scarce resources, strict fidelity to intervention protocols is difficult, and patients have multiple urgent needs. This study attempts to describe the process of providing integrated care for patients with SUD and other health problems at three centers in central Massachusetts: Edward M. Kennedy Community Health Center (EMK), Family Health Center of Worcester (FHC), and Community Healthlink (CHL). The goal is not to compare outcomes at these centers but rather to identify common practices that appear to facilitate good care as well as challenges that remain to be addressed.

METHODS

We used mixed methods to describe care at the centers. Quantitative analyses used MassHealth (the Medicaid program in Massachusetts) enrollment records and medical claims for 18,041 adult patients served at one or more of the centers during 2013. These analyses focused on service utilization, expenditures, and quality indicators for common health conditions. Qualitative methods included interviews with staff and patients at each center to gather data on processes for identifying SUD patient service needs, securing and coordinating services, and engaging patients in care.

KEY FINDINGS FROM THE CLAIMS ANALYSIS

- **Co-occurring conditions:** Patients with SUD had higher rates of many mental and physical illness diagnoses than patients without SUD. Among the three centers, individuals with SUD who were served at CHL had the highest rates of most co-occurring diagnoses.
- **Service use:** Patients with SUD at all centers had higher rates of hospital admissions, emergency department use, and ambulatory care visits than patients without SUD. Most hospitalizations were for a mental or physical illness, not SUD treatment. Fewer than 10 percent of admissions were classified as potentially avoidable.
- **MassHealth expenditures:** Higher health care utilization led to higher expenditures for patients with SUD than for patients without SUD. This was true across all three centers.
- **Quality of care:** Patients with SUD generally had lower scores on quality indicators, but there were specific areas in which SUD patients had higher scores; these included cervical cancer screening and treatment for depression.
- **SUD treatment:** Rates of SUD treatment initiation were similar across the three centers and lower than national averages, but once patients began treatment, they were somewhat more likely to follow through with treatment than national averages.

KEY FINDINGS FROM STAFF AND PATIENT INTERVIEWS

- **Flexibility and responsiveness:** Sporadic health care use among patients with SUD demands flexible and responsive service strategies. Across centers, these strategies included working with patients to identify and minimize barriers to care (e.g., transportation); offering same-day appointments, urgent care, and walk-in clinics; and adopting a nonjudgmental approach to missed appointments and relapses.
- **Support services:** Patients with SUD often have many needs beyond health care, including housing, employment, and legal issues, to name a few. All centers provided or assisted patients with SUD in securing a range of nonclinical support services, and all understood these services as critical ingredients to effective care delivery for this population.
- **Leadership:** Care integration at all centers benefited from one or more staff leaders who showed particular dedication to serving patients with SUD. These staff members often contacted patients between appointments to see how they were doing and to encourage healthy behaviors. Staff leaders also demonstrated a deep understanding of addiction.
- **Service co-location:** All centers adopted some form of a co-located service model. In most cases, co-location was part of a targeted program such as an Office-Based Opioid Treatment (OBOT) program or a primary care clinic located within a methadone maintenance program. Co-location reportedly improved care coordination and likely contributed to improved quality of care but did not completely eliminate barriers to care integration.
- **Coordinating care:** Each center invested a significant amount of effort in coordinating care within the center and with external providers. These activities were often paid for with funds dedicated to a specific population, such as patients with HIV. Funds for coordinating care for patients who did not meet criteria for inclusion in such a group were limited.

CONCLUSIONS

An expanded role for primary care teams in treating patients with SUD could help to improve quality and manage costs. Primary care teams with a focus on serving patients with addiction, such as OBOT teams, appeared to contribute to higher-quality care for a range of conditions and to reduce rates of potentially avoidable hospitalization.

Quick and flexible responses to patients, coupled with payment systems to support them, are essential. Providers and patients underlined the importance of being flexible with scheduling visits and responding to patients with SUD when the patient was ready to engage in treatment. Typical fee-for-service payments do not offer adequate support for flexible scheduling, drop-in clinics, or other services that providers felt were essential for patients with SUD.

Care integration is improved but not solved by service co-location. Co-location helps to reduce the cost and effort of integrating care but is not feasible for all patients. Given the complexity of patients' situations, there will always be a need to invest in resources to ensure treatment integration when patients are receiving services from multiple health care or social service providers.

Patients with SUD need more than medical care. A key observation from patient interviews was the wide range of social needs for patients with SUD. Challenges such as unstable housing impose significant barriers to effective care for physical and behavioral illness. Patients are unlikely to see significant health improvements if these problems are not addressed.

INTRODUCTION

Massachusetts health care providers have demonstrated their ability to deliver care that exceeds national averages on key quality indicators.¹ Despite this, quality and access remain uneven, with some populations remaining particularly difficult to reach. Among these are individuals with alcohol or drug use disorders, who have above-average health care costs and more hospital admissions and who usually fare more poorly on cancer screenings, chronic disease management, prenatal care, and other indicators of health care quality.^{2,3} Several practice models have been proposed to improve care for individuals with behavioral health disorders. A patient-centered medical home (PCMH) is designed to better integrate behavioral health into primary care.⁴ Health Homes bring primary care to specialty settings for individuals with behavioral health disorders.⁵ These approaches and variations on them have been adopted in Massachusetts, providing a unique opportunity to learn more about how best to serve hard-to-engage, high-cost patients. This study aims to understand how care integration is working in real-world settings and to identify and disseminate best practices for providing better care to individuals with substance use disorders (SUD).⁶

To address our study aim, we conducted case studies of three sites that represent different approaches to integrating care, using a two-pronged mixed-methods design. Two of the sites were community health centers (CHCs), each representing a variation on the PCMH model of care integration. The third site followed a Health Home model: a behavioral health agency with some primary care services on-site. We used claims from MassHealth, the Massachusetts Medicaid program, to examine how the utilization, cost, and quality of care varied among patients with and without SUD at each center and across the three centers. We conducted key informant interviews with center representatives to determine how each center assessed need, engaged patients, and managed their ongoing care, as well as to determine what they saw as the most promising and most challenging aspects of successful treatment. We also interviewed patients at each site to document needs from their perspectives and to understand their impressions of what care practices worked well and what improvements might be needed. (See Appendix A for a complete description of the methodology.)

This paper begins with an overview of the three sites studied — type of health center, services provided, and patient mix — followed by a summary of the MassHealth claims analysis and then by a summary of findings from the interviews with providers and patients. The paper concludes with overarching key findings from the study.

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- 1 Agency for Healthcare Research and Quality. "National Healthcare Quality and Disparities Reports." Available online at https://nhqrnet.ahrq.gov/inhqrdr/Massachusetts/snapshot/summary/All_Measures/All_Topics.
 - 2 Clark RE, Weir S, Ouellette RA, Zhang J, Baxter JD. Beyond health plans: Behavioral health disorders and quality of diabetes and asthma care for Medicaid beneficiaries. *Medical Care*, 47(5): 545-552, 2009.
 - 3 Weir S, Posner HA, Zhang J, Willis G, Baxter JD, Clark RE. Predictors of prenatal and postpartum care adequacy in a Medicaid managed care population. *Women's Health Issues*, 21(4), 277-285, 2011.
 - 4 The Agency for Healthcare Research and Quality's definition of a PCMH and its attributes and functions is available online at <https://pcmh.ahrq.gov/page/defining-pcmh>.
 - 5 The Substance Abuse and Mental Health Services Administration's definition of a Health Home is available online at www.integration.samhsa.gov/integrated-care-models/health-homes.
 - 6 Agency for Healthcare Research and Quality. "National Healthcare Quality and Disparities Reports." Available online at https://nhqrnet.ahrq.gov/inhqrdr/Massachusetts/snapshot/summary/All_Measures/All_Topics.

SITE AND PROGRAM DESCRIPTIONS

Edward M. Kennedy Community Health Center (EMK) is recognized by the National Committee on Quality Assurance (NCQA) as a Level 2 PCMH.⁷ In 2014, EMK served an estimated 28,000 patients. Approximately 49 percent of these patients were MassHealth members, 7 percent were covered by Medicare, 29 percent were uninsured or covered by the Health Safety Net (HSN), and 15 percent were covered by commercial or other insurance. EMK provides a range of medical services including preventive care and chronic disease management as well as dental and vision care and a 340B pharmacy program.⁸ EMK also offers social and behavioral health services such as individual and family counseling, psychiatric evaluations, and psychosocial assessments. In addition to its main facility, the center operates a primary care clinic that is co-located with Spectrum Health Services' methadone maintenance program in Worcester. Otherwise, EMK relies primarily on referrals to off-site providers for addiction treatment, though its behavioral health department provides limited counseling and psychiatric services for patients with SUD.

Family Health Center of Worcester (FHC) is also a NCQA Level 2 PCMH. In 2014, FHC served approximately 33,000 patients, of whom 61 percent were MassHealth members, 11 percent were covered by Medicare, 20 percent were uninsured or covered by HSN, and 8 percent had commercial or other insurance. FHC offers comprehensive primary care services, such as health screenings, preventive health care, and treatment of acute and chronic diseases. FHC operates a dental clinic, a 340B pharmacy program, and a vision center as well as various school-based clinics. A behavioral health department offers services such as mental health counseling, case management, HIV/AIDS counseling, and a homeless families program. FHC participates in MassHealth's Primary Care Payment Reform Initiative (PCPRI)⁹ and has elected to be at risk for behavioral health expenditures. On-site addiction treatment services at FHC include an Office-Based Opioid Treatment (OBOT) program (an opioid agonist treatment program combining case management and buprenorphine maintenance) and associated buprenorphine support groups.¹⁰

The third site, Community Healthlink (CHL), is a community mental health center. Of the 19,000 patients it serves annually, approximately 80 percent are covered by MassHealth, 10 percent are covered by Medicare, and 9 percent have commercial insurance. CHL is not eligible for payments from the HSN.¹¹ CHL provides a range of outpatient and inpatient behavioral health services. These include an outpatient mental health clinic that provides ongoing psychotherapy and psychiatry, residential and day treatment programs, and psychiatric emergency services, including crisis stabilization. CHL also provides inpatient detoxification, acute inpatient SUD treatment services, a post-detox program, and a step-down program that provides inpatient SUD treatment and transitional support. Some CHL physicians prescribe buprenorphine and support groups for patients with opioid dependence, which are offered on-site. CHL also offers primary care services at two on-site locations: one is an embedded primary clinic

7 The NCQA has a program that recognizes sites that serve as patient-centered medical homes if they meet certain standards and contain certain elements. More information is available online at www.ncqa.org/Programs/Recognition/Practices/PatientCenteredMedicalHomePCMH.aspx.

8 The 340B Drug Pricing Program is administered by the federal Health Resources and Services Administration. It allows certain hospitals and other health care providers to obtain discounted prices on prescription drugs and biologics other than vaccines from drug manufacturers.

9 The PCPRI is an alternative payment model implemented by MassHealth aimed at supporting the delivery of primary care consistent with a patient-centered medical home that has integrated behavioral health services. More information is available online at www.mass.gov/eohhs/gov/newsroom/masshealth/providers/primary-care-payment-reform-initiative.html.

10 Labelle CT, Han SC, Bergeron A, Samet JH. Office-based opioid treatment with buprenorphine (OBOT-B): Statewide implementation of the Massachusetts collaborative care model in community health centers. *Journal of Substance Abuse Treatment*, in press. DOI: <http://dx.doi.org/10.1016/j.jsat.2015.06.010>.

11 The Health Safety Net reimburses hospitals and community health centers for care provided to uninsured and underinsured residents of Massachusetts. More information available online at www.mass.gov/eohhs/consumer/insurance/more-programs/health-safety-net/.

within CHL's outpatient mental health department, and the other is part of CHL's Homeless Outreach and Advocacy Project (HOAP), which primarily serves individuals who are homeless. Wellness services are offered to primary care patients who need help incorporating healthy practices into their daily lives or who have chronic or serious medical conditions.

All three sites are located in Worcester, Massachusetts, the second-largest city in New England, with a population of 181,045 according to the 2010 census, a median family income of \$57,704, and 21 percent of its citizens with incomes below the poverty level.¹² City residents have access to health care services at the two CHCs, one private general hospital, and a large academic medical center. The city has experienced an accelerating opioid addiction problem beginning in 2011. Massachusetts Department of Public Health records show that Worcester had one of the state's highest rates of opioid overdoses during 2012; overdose deaths increased from 24 in 2012 to 57 in 2015.¹³ Sixty-nine percent of city residents treated in Department of Public Health SUD treatment facilities reported using heroin during 2014, and 47 percent reported alcohol abuse during the same period.^{14,15} Recently, the city has taken a number of steps to address addiction, particularly opioid abuse.¹⁶

ACCESS TO MEDICATION-ASSISTED TREATMENT FOR SUBSTANCE USE DISORDERS

Patients at all three centers could access methadone or buprenorphine, the leading evidence-based treatments for opioid dependence, either on- or off-site. These two types of opioid agonist medications are dispensed in different ways. Methadone maintenance for addiction treatment must be administered by a licensed specialty program where staff members observe patients taking their daily dose. None of the centers operated a methadone maintenance program, but EMK co-located a primary care clinic in the same building with a methadone program operated by Spectrum Health Services. Primary care physicians can complete a training program and receive approval to prescribe buprenorphine, another form of medication-assisted treatment. This approval is called a DATA waiver, after the act that authorized use of buprenorphine for addiction treatment.¹⁷ Patients can take buprenorphine, often known by the leading brand name Suboxone, at home without observation. Long-acting injectable naltrexone (Vivitrol), another effective treatment for opioid addiction, which blocks the effects of opioids, was not offered at any of the three sites and was used by only two patients in the population.

Physicians can prescribe naltrexone and other medications for addiction treatment without obtaining special approval, but despite substantial numbers of patients with alcohol use disorders, no patient at any site filled a prescription for an alcohol treatment medication, such as disulfiram, acamprosate, or oral naltrexone. National

12 United States Census Bureau. American FactFinder. Available online at Factfinder.census.gov.

13 Massachusetts Department of Public Health. Number of confirmed unintentional opioid overdose deaths by city/town, MA residents January 2012–December 2015. Available online at <http://www.mass.gov/eohhs/docs/dph/quality/drugcontrol/county-level-pmp/town-by-town-listings-may-2016.pdf>.

14 Massachusetts Department of Public Health. "Opioid overdose response strategies in Massachusetts, April 2014." Available online at www.mass.gov/eohhs/docs/dph/substance-abuse/opioid/overdoseresponsestrategies.pdf.

15 Bureau of Substance Abuse Services, Massachusetts Department of Public Health. Description of admissions to BSAS contracted/licensed programs in 2014.

16 Worcester Department of Public Health. "Substance abuse prevention." Available online at www.worcesterma.gov/ocm/public-health/community-health/substance-abuse.

17 Substance Abuse and Mental Health Services Administration. "The Drug Addiction Treatment Act of 2000." Available online at http://buprenorphine.samhsa.gov/waiver_qualifications.html.

studies show that these medications are effective but underutilized.¹⁸ In our interviews, some providers suggested that physicians are unfamiliar with medication-assisted treatment for alcohol dependence.

TABLE 1. OVERVIEW OF STUDY SITES

	EMK	FHC	CHL
TYPE OF HEALTH CENTER	FQHC*	FQHC*	CMHC**
PRACTICE MODEL	PCMH	PCMH	Health Home
SERVICES PROVIDED (examples)	<ul style="list-style-type: none"> • Primary and preventive care • Dental, vision, pharmacy • Mental health counseling • Co-located primary care clinic at nearby methadone program 	<ul style="list-style-type: none"> • Primary and preventive care • Dental, vision, pharmacy • Mental health counseling • OBOT program 	<ul style="list-style-type: none"> • Outpatient and inpatient mental health and substance use treatment services • Detoxification and post-detox program • Buprenorphine prescribing and support groups • Two on-site primary care clinics
PATIENTS SERVED	28,000	33,000	19,000
CASE MIX	<ul style="list-style-type: none"> • 49% MassHealth • 29% uninsured or HSN • 7% Medicare • 15% commercial or other insurance 	<ul style="list-style-type: none"> • 61% MassHealth • 20% uninsured or HSN • 11% Medicare • 8% commercial or other insurance 	<ul style="list-style-type: none"> • 80% MassHealth • 10% Medicare • 9% commercial or other insurance

* Federally Qualified Health Center.
 ** Community Mental Health Center.

FINDINGS FROM CLAIMS ANALYSIS

We analyzed MassHealth claims and encounter data for patients treated at each of the centers to better understand similarities and differences in the characteristics of patients served. Claims were also used to describe utilization of key health services, such as hospital admissions and emergency department (ED) visits, and to describe total MassHealth expenditures for patients at each center. Finally, we used claims to construct 17 commonly used quality indicators to compare providers. We compared measures for patients with SUD to those without a diagnosed SUD within each center and across all three study sites. (See further information about claims analysis methods in Appendix A.)

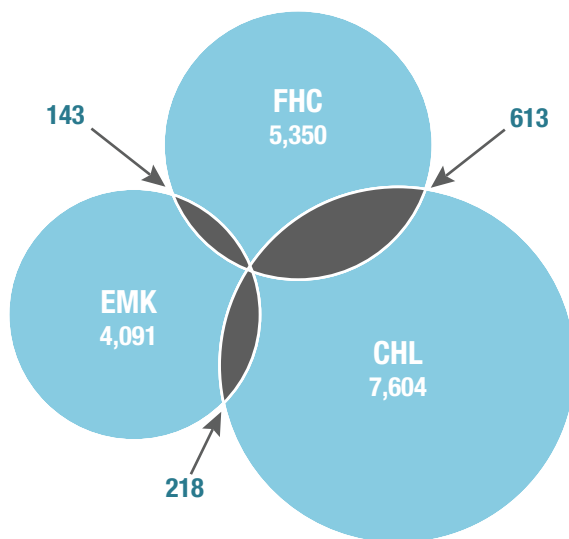
18 Jonas DE, Amick HR, Feltner C, Bobashev G, Thomas K, Wines R, Kim MM, Shanahan E, Gass E, Rowe CJ, Garbutt JC. Pharmacotherapy for adults with alcohol use disorders in outpatient settings. *JAMA*, 311(18), 1889-1900, 2014.

PATIENT CHARACTERISTICS

MassHealth claims for 18,041 members age 18 and older who were served by the three organizations during 2013 show that the majority received services from only one of the centers. Overlap in patients served (Figure 1) ranged from 8 percent at EMK to 12 percent at FHC. That is, 8 percent of patients at EMK also received services at one or both of the other centers, and 12 percent of patients at FHC also received services at EMK and/or CHL. Many members also received specialty services from other providers in the area.

Members served by the two CHCs, EMK and FHC, were slightly older (median age 39 versus 36), more likely to be women (55 percent versus 45 percent), more diverse in reported race and ethnicity, and less likely to be classified as disabled (8 percent versus 18 percent) than those served by the community mental health center, CHL. (See Table 2.)

FIGURE 1. MASSHEALTH MEMBERS SERVED AT EACH CENTER, 2013



Note: There were 22 members served by all three sites.

TABLE 2. PATIENT CHARACTERISTICS

	EMK	FHC	CHL
MEDIAN AGE	39	39	36
GENDER	55% female/ 45% male	55% female/ 45% male	45% female/ 55% male
DIVERSITY*	58% minority	54% minority	24% minority
PATIENTS WITH DISABILITY	8%	8%	18%

*Percentage of those reporting who were identified as a racial or ethnic minority. Race/ethnicity was not known for 47 percent of EMK patients, 44 percent of FHC patients, and 28 percent of CHL patients.

HEALTH STATUS

Patients with SUD had higher rates of many mental or physical illness diagnoses than patients without SUD across all sites. Individuals with SUD who were served at CHL had the highest rates of most co-occurring diagnoses, particularly severe mental illness, and were more likely to have had a drug overdose or a suicide attempt than patients served by EMK or FHC.

Across all three sites, many physical diagnoses were more prevalent among patients with SUD than those without. Diagnostic groups with particularly high differences in prevalence between patients with SUD and those without SUD in a given site included respiratory conditions, neurological disorders, arthritis, back pain, injuries, hepatitis C, and other infections.

Patients served by CHL had higher rates of behavioral health disorders, a category that includes both mental health disorders and SUD, than those served by the CHCs. Diagnosed prevalence of SUD, which includes use of

alcohol and drugs, ranged from 13 percent to 15 percent in the CHCs to 58 percent at CHL. Alcohol disorders, which were diagnosed in 4 percent of EMK patients and 6 percent of those at FHC, affected 30 percent of CHL patients. Eight percent of EMK patients had a drug use diagnosis, compared with 9 percent at FHC and 43 percent at CHL. More than half of all patients with an identified drug problem (excluding alcohol) were diagnosed with opioid dependence, ranging from 53 percent at FHC to 63 percent at CHL. Severe mental illness was also more prevalent at CHL (26 percent schizophrenia and other psychoses, 48 percent bipolar disorder) than at the CHCs, (3 to 5 percent schizophrenia and other psychoses, 8 to 10 percent bipolar disorder). Almost two-thirds (64 to 65 percent) of members with either of these disorders also had a SUD.

CHL patients had slightly higher rates of many other medical conditions, but in most cases, patients with SUD were roughly similar in physical co-morbidities across all three sites. Exceptions to the pattern of similarity included substantially more patients with drug overdoses at CHL than at EMK and FHC (19 percent versus 7 percent and 10 percent, respectively), more suicide and self-injury attempts (31 percent versus 8 percent and 13 percent), more cardiac dysrhythmias (20 percent versus 10 percent and 11 percent), and more brain or neurological injuries (13 percent versus 7 percent). Taken together, these findings suggest greater severity of SUD at CHL. Given the focus on caring for people with mental illness at CHL and the focus on primary care at the two CHCs, these differences are to be expected. See Appendix B for a detailed comparison of diagnosis rates using the Agency for Healthcare Research and Quality's (AHRQ) Clinical Classification System.¹⁹

SERVICE UTILIZATION AND EXPENDITURES

Patients with SUD at all centers were admitted to the hospital more often, visited the ED more frequently, and saw an ambulatory care provider more times per year than patients without SUD. Most hospitalizations were for a mental or physical illness; only a small percentage were primarily for SUD treatment. Overall, fewer than 10 percent of admissions were classified as potentially avoidable, but the percentage varied across centers: the highest was at EMK and the lowest at CHL. Potentially avoidable ED visits for physical disorders were frequent for all patients but represented a smaller portion of visits for patients with SUD than for those without. Higher utilization led to higher expenditures for patients with SUD at all centers. Median expenditures were substantially higher at CHL, likely due to higher rates of co-occurring severe mental illness there. See Table 3 on page 12 for a summary.

Hospitalization for any reason — mental illness, SUD, or physical conditions — was substantially higher among individuals with SUD than others: 22 percent of SUD patients at EMK, 27 percent at FHC, and 32 percent at CHL were hospitalized one or more times during 2013 (Figure 2). Patients with SUD were four times more likely than those without SUD to be hospitalized at EMK and FHC, and twice as likely to be hospitalized at CHL. Most hospitalizations for patients with SUD were for mental illness or other medical conditions; substance use was the primary diagnosis in only 10 percent of EMK admissions, 9 percent of FHC admissions, and 12 percent of CHL admissions (Figure 3).

¹⁹ Healthcare Cost and Utilization Project (HCUP). "Clinical Classifications Software (CCS) for ICD-9-CM." Available online at www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp.

FIGURE 2. HOSPITAL ADMISSIONS PER MEMBER, 2013

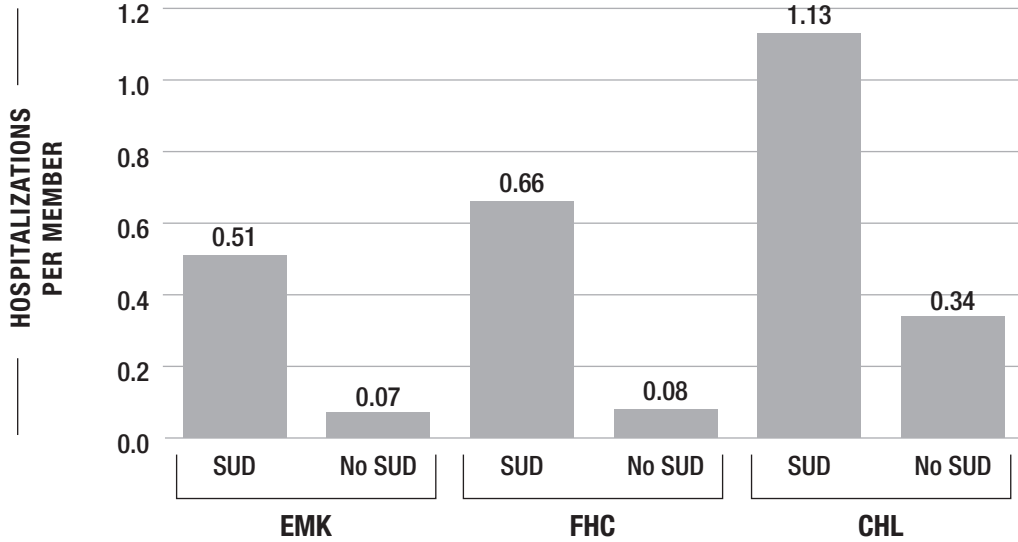
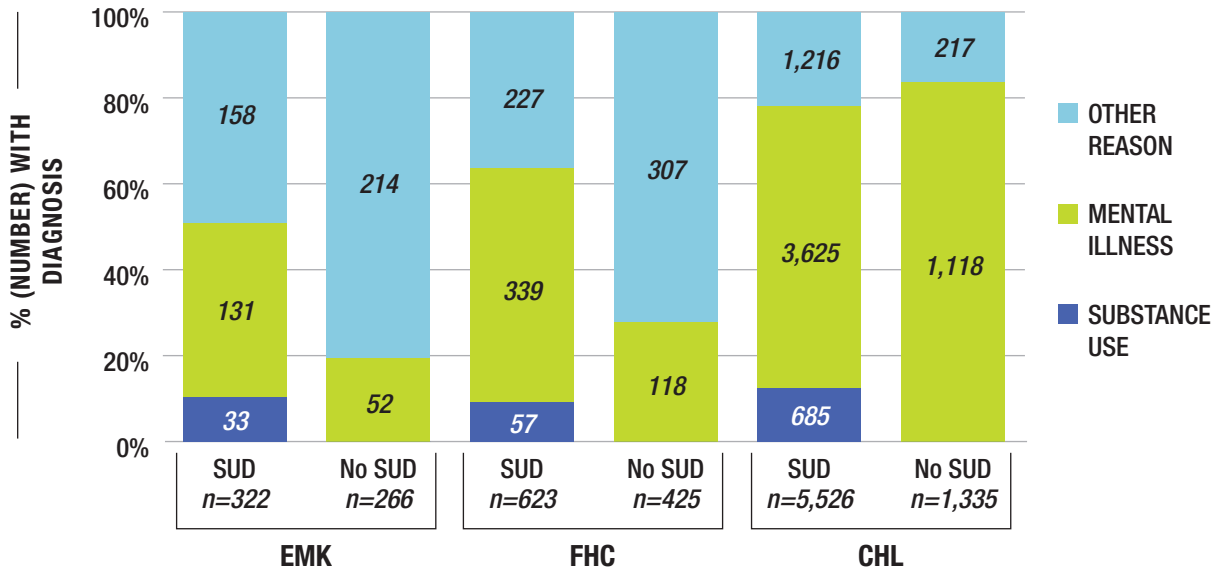


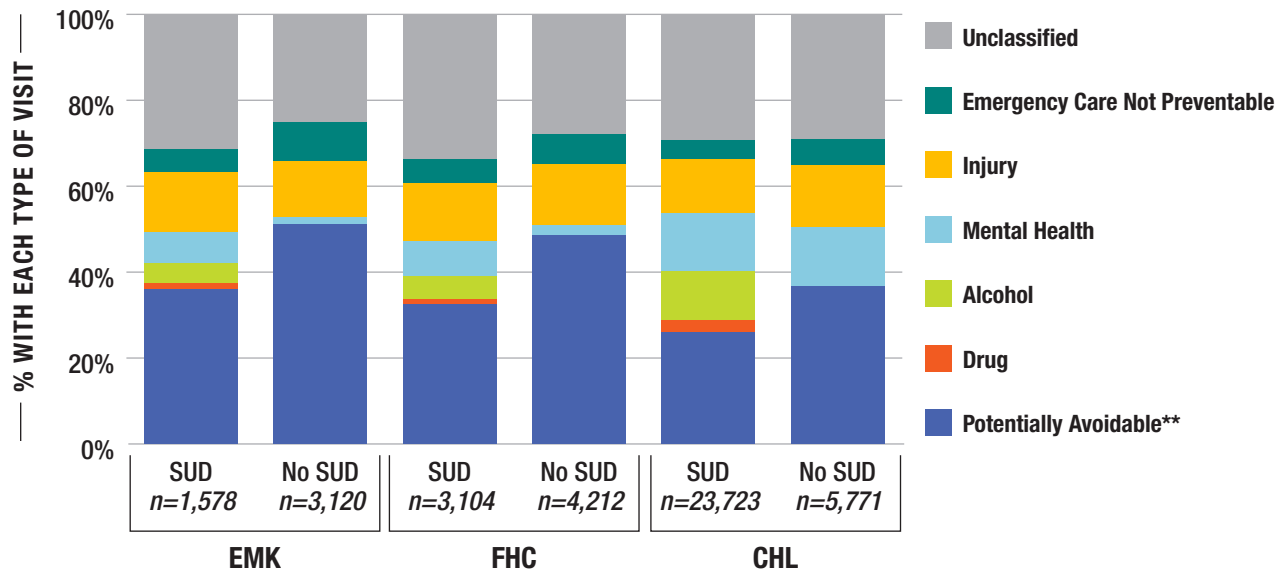
FIGURE 3. HOSPITAL ADMISSIONS: PRIMARY DIAGNOSIS, 2013



Potentially avoidable hospitalizations involve a set of acute or worsening chronic physical conditions for which better primary care might have prevented admission. The AHRQ includes this measure in their set of Prevention Quality Indicators.²⁰ Although these measures are often used as provider quality indicators, it is important to note that they reflect both provider and patient behaviors. Providers may recommend treatments, but patients must choose to act on those recommendations. Potentially avoidable hospitalization rates at all centers were above the

²⁰ Agency for Healthcare Research and Quality. "Prevention Quality Indicators Technical Specifications - Version 5.0, March 2015." Available online at http://www.qualityindicators.ahrq.gov/Modules/PQI_TechSpec.aspx.

FIGURE 4. TYPE OF EMERGENCY DEPARTMENT VISITS, 2013*



Note: NYU Classification System.

* 29% of visits could not be classified.

** "Potentially avoidable" includes three categories of ED visits: emergency ED care preventable, emergency primary care preventable, and non-emergency care.

published 2012 national rate of about 1.5 percent.²¹ Patients with SUD had the highest rate at EMK (8.4 percent versus 3.5 percent at FHC and 2.9 percent at CHL). Rates for patients with SUD were higher than those without SUD at EMK and CHL (8.4 percent versus 6.4 percent and 2.9 percent versus 2.4 percent, respectively) but lower than those for patients without SUD at FHC (3.5 percent versus 6.1 percent). Lower rates for patients with SUD at FHC may reflect greater involvement of primary care clinicians in addiction treatment, a practice that we identified in provider and patient interviews.

ED use was higher for SUD patients than for patients without a SUD at all centers. ED visits were particularly high at CHL. Most patients with SUD visited an ED at least once in 2013. The proportion of patients with one or more ED visits ranged from 69 percent with SUD and 39 percent without SUD at EMK to 71 percent and 38 percent at FHC and to 85 percent and 56 percent at CHL. However, substance use was the primary diagnosis for less than one in 10 ED visits overall. About one-third (32.4 percent) of ED visits across all sites were classified as non-emergent care or conditions that could have been prevented or treated in a primary care setting.²² Diagnoses associated with these conditions varied widely, with no single diagnosis constituting a large proportion of potentially preventable care. Non-emergent and preventable care represented a lower *proportion* of ED visits among patients with SUD than among others (Figure 4). However, given the substantially higher rates of ED visits among SUD patients, the total *number* of potentially preventable visits was greater for patients with SUD.

Approximately eight in ten patients with SUD had one or more ambulatory care visits for any reason. Ambulatory visit rates were higher for patients with SUD at all centers than for patients without SUD, but the differential varied

21 Fingar KR, Barrett ML, Elixhauser A, Stocks C, Steiner CA. Trends in potentially preventable inpatient hospital admissions and emergency department visits. HCUP Statistical Brief #195, November 2015.

22 The methodology developed by New York University's Center for Health and Public Service Research was used to define emergency department visits that were for non-emergent conditions or conditions that could have been prevented or treated in primary care. A description of that methodology is available online at <http://wagner.nyu.edu/faculty/billings/nyued-background>.

from 81 percent of patients with a SUD versus 80 percent of patients without a SUD at EMK to 89 percent of patients with a SUD versus 79 percent of patients without a SUD at FHC and to 85 percent of patients with a SUD versus 59 percent of patients without a SUD at CHL. Although these medical visits were more frequent for SUD patients at all centers, average annual visit rates varied from 6.5 per person with SUD and 5.7 per person without SUD at EMK to 7.9 with SUD and 7.5 without SUD at CHL and to 9.3 with SUD and 5.4 without SUD at FHC. The difference within each center was statistically significant ($p < .05$).

Higher service utilization led to substantially higher expenditures for SUD patients at all three organizations. For patients with and without SUD at each center, Figure 5a shows expenditures unadjusted for differences in co-morbid conditions and Figure 5b shows expenditures after case-mix adjustment using mean DxCG scores.²³ Higher expenditures for CHL patients after DxCG adjustment suggest that DxCG may not have captured the full severity of illness or the effects of nonclinical factors, such as housing instability, on expenditures. The substantially higher expenditures at CHL are consistent with expenditures for patients with co-occurring severe mental illness and SUD served at other sites in the state.²⁴ Thus it does not appear that CHL practice patterns cost more than other programs that treat similar patients.

FIGURE 5a. MEDIAN ANNUAL EXPENDITURES, 2013

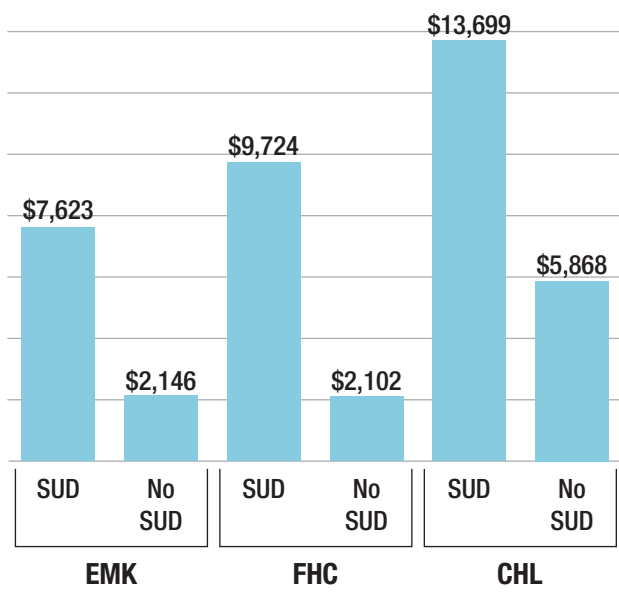
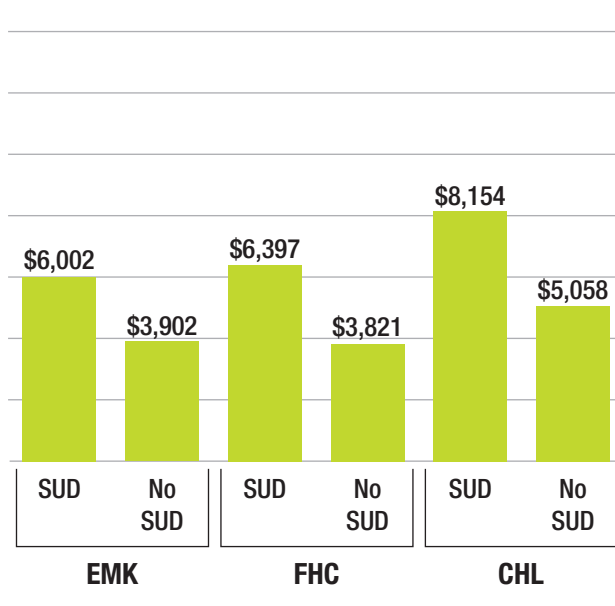


FIGURE 5b. ADJUSTED MEDIAN ANNUAL EXPENDITURES, 2013



²³ DxCG is a proprietary risk adjustment tool used by MassHealth for paying providers.

²⁴ Clark RE, Lin W, Aweh G, Posner H. "Super utilizers with substance use disorders" presentation at the Addiction Health Services Research Annual Meeting, Boston, MA, October 17, 2014.

TABLE 3. HEALTHCARE UTILIZATION AND EXPENDITURES FOR PATIENTS WITH AND WITHOUT SUD

MEASURE	EMK		FHC		CHL	
	SUD	NO SUD	SUD	NO SUD	SUD	NO SUD
HOSPITAL ADMISSIONS PER 100 MEMBERS	51	7	66	8	113	34
HOSPITAL ADMISSIONS POTENTIALLY AVOIDABLE	8.4%	6.4%	3.5%	6.1%	2.9%	2.4%
ED VISITS PER 100 MEMBERS	251	81	331	81	483	163
ED VISITS POTENTIALLY AVOIDABLE	36.0%	51.1%	32.4%	49.7%	25.9%	36.6%
AMBULATORY CARE VISITS PER 100 MEMBERS	649	568	931	541	791	749
MEDIAN ANNUAL EXPENDITURES PER MEMBER	\$ 7,623	\$ 2,146	\$ 9,724	\$ 2,102	\$13,699	\$ 5,868
ADJUSTED MEDIAN ANNUAL EXPENDITURES PER MEMBER	\$ 6,002	\$ 3,902	\$ 6,397	\$ 3,821	\$ 8,154	\$ 5,058

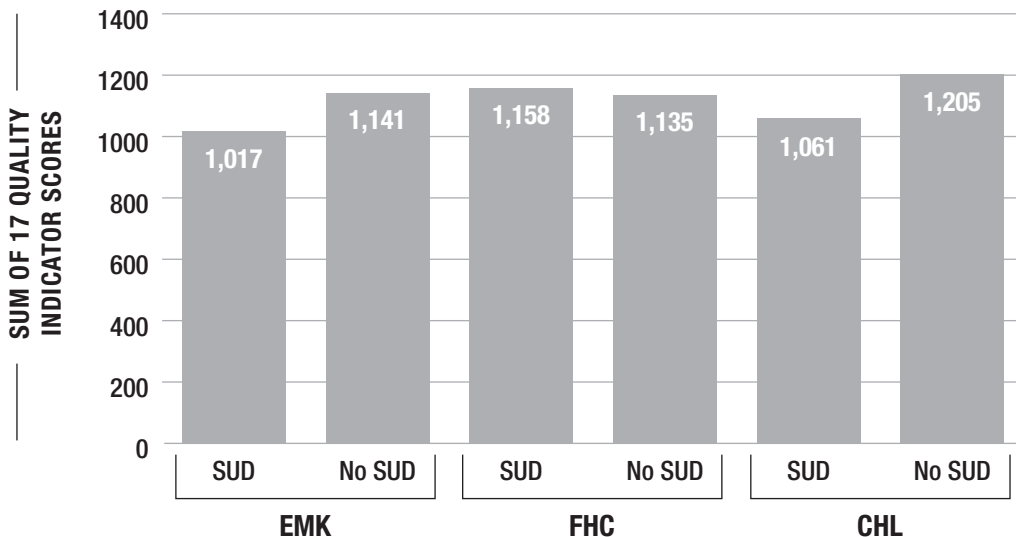
QUALITY INDICATORS

SUD was generally associated with lower quality scores, but there were specific areas in which SUD patients had higher quality scores. These included cervical cancer screening and treatment for depression. Patients with SUD scored lower than those without SUD on 11 of 17 quality indicators and the same or higher on the remaining measures. For some indicators, resources such as on-site mammography at FHC and targeted screening efforts at EMK led to significant differences in scores among centers. Rates of SUD treatment initiation were similar across the three centers and lower than national averages, but once patients began treatment, they were somewhat more likely to follow through with treatment than national averages.

This study analyzed 17 different quality indicators, designed to assess adherence to clinical guidelines or treatment protocols for patients with particular conditions or diagnoses. (See Appendix C for a full list of measures used in the analysis.) Combined quality indicator scores varied across centers. As shown in Figure 6 (page 13), patients with SUD had lower overall quality scores at EMK and CHL but slightly higher scores at FHC. Comparisons of individual indicators confirm this observation. At EMK, six individual quality indicators were significantly lower for patients with SUD than for patients without SUD ($p < .05$). At CHL, individual measures were significantly lower for patients with SUD in nine comparisons. At FHC, the quality scores for patients with SUD were lower for only two measures.

While patients with SUD generally had lower scores on asthma, chronic obstructive pulmonary disorder, and diabetes measures, they had higher scores on cervical cancer screening. Acute- and continuing-phase antidepressant measures were equal or slightly better for patients with SUD than for patients without SUD at all centers. In two cases, differences in individual measures either across centers or between patients with a SUD and those without were particularly remarkable. Breast cancer screening rates were substantially higher at FHC, which has a breast

FIGURE 6. COMBINED QUALITY INDICATOR SCORES



Note: See Appendix C for a full listing of the 17 quality measures used in the analysis.

cancer program offering on-site mammograms. Chlamydia screening was consistently higher for women with SUD at all centers, but the gap between women with and without SUD was greater at EMK (92 percent versus 55 percent), where cervical cancer screening is a routine part of exams at the EMK clinic co-located with Spectrum’s methadone maintenance program.

Using the Healthcare Effectiveness Data and Information Set (HEDIS) measures for initiation and engagement in alcohol or other drug treatment, which focus only on patients with SUD and were not included in the SUD/no SUD comparisons described above, we found lower rates of treatment initiation and slightly higher rates of engagement for study sites relative to published 2013 national rates for Medicaid managed care programs, which reported rates of 38 percent for initiation and 11 percent for engagement.²⁵ At CHL 22 percent of patients initiated treatment within 14 days of a substance use diagnosis, at EMK 24 percent did, and at FHC 26 percent did. At EMK 13 percent of patients had two or more treatment events during the first 30 days following initiation, as did 15 percent of FHC and CHL patients.

We found a similar pattern of relatively lower initiation but higher engagement rates in a prior three-state study of the quality of substance use treatment among Medicaid beneficiaries served by CHCs.²⁶ One possible explanation for this pattern may relate to the characteristic patient mix at CHCs, which includes disproportionate numbers of patients who are low-income, members of immigrant and minority groups, and challenged by linguistic and cultural barriers.²⁷ Patients served by CHCs are also more likely to have serious and chronic conditions, including diabetes, HIV, cardiovascular disease, emphysema, and mental and substance use illnesses.²⁸ Evidence shows that

25 National Committee for Quality Assurance. “Initiation and Engagement of Alcohol and Other Drug Dependence Treatment.” Available online at <http://www.ncqa.org/report-cards/health-plans/state-of-health-care-quality/2015-table-of-contents/alcohol-treatment>.

26 Gurewich D, Sirkin J, Prottas J, Shepard D. On site provision of substance abuse treatment services in community health centers. *Journal of Substance Abuse Treatment*, 42(4): 339-345, 2012.

27 Adashi EY, Geiger HJ, Fine MD. Health care reform and primary care — The growing importance of the community health center. *New England Journal of Medicine*, 362(22): 2047-2050, 2010.

28 Rosenbaum S, Finnegan B, Shin P. Community health centers in an era of health system reform and economic downturn: Prospects and challenges. Kaiser Commission on Medicaid and the Uninsured. Washington DC, 2009.

medically complex, high-risk patients tend to have lower initiation rates, which might account for lower initiation among CHC patients.²⁹ At the same time, among patients who do initiate treatment, CHCs may more effectively engage them in ongoing SUD treatment through a comprehensive set of support services such as care management, translation services, and health education — services more often associated with CHCs than with other primary care settings.^{30,31} It is possible that these support services kick in more intensely following a patient's initiation in treatment. An alternate explanation is that capacity constraints in the supply of available substance use treatment services and medication-assisted treatment (either on site or via off-site providers) limit the ability of CHCs to routinely schedule treatment initiation visits within the 14-day window specified by the performance measure.

FINDINGS FROM STAFF AND PATIENT INTERVIEWS

Staff members at each site were interviewed, including senior administrators, clinical leads, and heads of support services, as well as direct care providers such as physicians, nurses, care managers, and community health workers. We interviewed 29 provider staff across the three study sites. We also interviewed 25 patients with SUD from the three sites. Patients shared a number of characteristics; nearly all were MassHealth beneficiaries. Many also qualified for Medicare because of a disability. Half reported being treated for opioid dependence. See Appendix A for a more detailed description of staff and patient interviews.

Patient interviewees resembled the broader population of MassHealth members with SUD: one-third were women, and ages ranged from the early 20s to 60 years of age.³² Most had multiple medical conditions, including co-occurring mental illness; HIV and hepatitis C infection; and chronic pain resulting from injuries, arthritis, or infections. Minority representation among our interviewees was similar to that typically reported for MassHealth members, with 44 percent of patients representing a racial or ethnic minority.³³

Individuals with SUD have multiple problems that can impede effective health care. Patients and providers interviewed for this study described significant challenges for patients in meeting day-to-day needs, such as housing, nutrition, employment, and transportation. While many of these problems are related to poverty and unemployment, some were specifically driven by addiction or other chronic illness. In addition, cultural and language barriers hinder efforts to address some patients' needs.

In the following sections, we describe strategies and practices that our study sites adopted for responding to these challenges, some variation across sites in how these practices were operationalized, and in some cases the barriers sites experienced in sustaining these practices.

29 Zivin K, Pfeiffe PN, McCammon RJ, Kavanagh JS, Walters H, Welsh DE, et al. "No shows": Who fails to follow up with initial behavioral health treatment? *American Journal of Managed Care*, 15(2): 105-112, 2009.

30 Politzer RM, Yoon J, Shi L, Hughes RG, Regan J, Gaston MH. Inequality in America: The contribution of health centers in reducing and eliminating disparities in access to care. *Medical Care Research and Review*, 58 (2): 234-248, 2001.

31 Shi L, Stevens GD, Politzer RM. Access to care for U.S. health center patients and patients nationally: How do the most vulnerable populations fare? *Medical Care*, 45(3): 206-213, 2007.

32 Clark RE, Lin W, Aweh G, Posner H. "Super utilizers with substance use disorders" presentation at the Addiction Health Services Research Annual Meeting, Boston, MA, October 17, 2014.

33 Kaiser Family Foundation estimates based on the Census Bureau's March 2015 Current Population Survey (CPS: Annual Social and Economic Supplements). Available online at <http://kff.org/medicaid/state-indicator/distribution-by-raceethnicity-4/>.

FLEXIBILITY AND RESPONSIVENESS

Providers and patients emphasized timing and flexibility of appointments or opportunities for care as critical elements for engaging and retaining patients. Often a precipitating event, such as an arrest or a medical crisis, is the catalyst for seeking treatment for a SUD, but circumstances can change rapidly. Patients may be incarcerated or may succumb to drug or alcohol cravings between a detoxification and their first outpatient appointment. These intervening events interrupt care for medical conditions as well as for addiction treatment. Patients also cited transportation problems and other intervening circumstances, such as work opportunities, relapses, or simply inattention, as reasons for missed appointments.

For all three study sites, flexibility and responsiveness often meant adopting specific practices to facilitate care access and manage missed appointments. All three sites offered urgent medical care services; two (CHL and FHC) reported that same-day appointments were available; and two (EMK and FHC) operated walk-in clinics for patients who missed a scheduled appointment and for new patients seeking treatment for an urgent problem. Two sites (CHL and FHC) described having proactive strategies for patients with SUD who missed their appointments, following up with patients to rapidly reschedule. All sites stressed the importance of adopting relatively lenient policies and attitudes toward patients with SUD who do not show up for their appointments. This included not judging patients who repeatedly miss appointments (noted by all three sites); not setting thresholds for how many appointments are missed before a patient's case is closed (noted by CHL); and at a site that did have a no-show limit (EMK), working with patients who exceeded the missed appointment limit to identify obstacles to treatment and develop a plan that addresses the obstacles.

SUPPORT SERVICES

Flexibility and responsiveness at the study sites also meant offering extensive support services to help minimize barriers to patient engagement. All three sites helped patients to secure housing and goods and services in the community including food, transportation, and legal and domestic violence services. In addition to helping patients connect with needed services in the community, CHL provided some support services on-site including housing, food, and showers. Provider respondents reported that first offering patients the services the *patients* want and need (such as food and shelter) as opposed to the services *providers* think they need (such as detoxification or primary care) helped to build trust and relationships with patients, which in turn helped with patient engagement and retention.

At all three sites, support services were typically offered as part of a case management function embedded in a specialty program. For example, an OBOT program at FHC was staffed with nurse case managers and medical assistants responsible for following up with patients who missed appointments. Two sites (FHC and EMK) had HIV programs that funded case managers (and in one situation community health workers as well) to work closely with patients to assess need, to facilitate entry to addiction treatment and other clinical care, and to secure housing, transportation, and other needed services. Other programs that used case managers to help patients engage in medical and specialty care included a Chronic Care Program at FHC, a Corrections-to-Community Program at EMK, and a clinic for homeless patients at CHL. All these programs served patient populations with high rates of SUD. In most cases, sites relied on funding from outside the traditional fee-for-service payment system to offer both flexibility and added supports.

Despite all three sites' providing support services, the need for these services remained great. For example, many patients identified transportation to appointments and other services as a significant problem. Some complained that the transportation was not reliable or accessible when needed; others made alternative arrangements with family, friends, or personal care attendants.

Patients at all sites also had trouble finding and maintaining safe, affordable housing. Past criminal convictions related to SUD — approximately three-quarters of MassHealth members with opioid addiction have been charged with a criminal offense³⁴ — disqualify them for some housing options. Drug use, intoxication, and related behaviors make patients with addiction relatively undesirable tenants. And once patients are housed, poverty, relapses, and legal problems continue to play a role in their ability to maintain a home.

Access to adequate food was less frequently cited as a problem, but it was an important concern for a few patients. All three sites offered some assistance to patients in applying for Supplemental Nutritional Assistance Program (SNAP) benefits, but SNAP amounts were typically small and did not cover all of a patient's food needs. Patients identified a variety of privately run soup kitchens or food pantries that they used.

LEADERSHIP: DEDICATED PROVIDERS AND PROGRAM LEADS

Each site had one or more exceptionally dedicated program leaders or staff members who formed particularly strong bonds with patients and went out of their way to help those who needed extra attention. Patients often mentioned strong and continuing relationships with their physicians, nurses, or care managers among the things that they liked most about their care. Some interviewees identified staff turnover as a reason for dissatisfaction or for leaving a previous provider. Similarly, regular contact with providers, including check-ins between scheduled appointments, was often cited as a practice that patients appreciated or, when it did not occur, an area for improvement. Several patients offered examples of nurses and community health workers who contacted them between appointments to check on their health and to encourage them to continue recommended health practices, such as taking medications regularly, maintaining a healthy diet, and keeping specialty appointments.

Closely related to having exceptionally dedicated program leads was having staff who understood addiction and were able to develop trusting, nonjudgmental relationships with the population they serve. Patients and providers both noted the critical importance of a nonjudgmental response to relapse, missed appointments, or other instances in which patients did not adhere to provider recommendations. Patients appreciated providers who did not judge them for failing to comply with recommended care and typically did not find confrontational approaches helpful.

SERVICE CO-LOCATION

The definition of co-location differed across study sites in terms of the specific services offered. For CHL, co-location meant operating two on-site primary care clinics to serve at least some of the patients receiving substance use treatment services. At FHC, co-location meant operating an OBOT program on-site and aiming to have most, if not all, of its physicians certified to prescribe buprenorphine. At EMK, co-location meant staffing an embedded primary care clinic at a nearby methadone maintenance program (Spectrum). Patients served by the on-site clinic are eventually referred to EMK's main campus for ongoing medical care. Both EMK and FHC also operate a behavioral health department that offers limited counseling and psychiatry services for patients.

Across all three sites and co-location models, both patients and providers generally saw co-location of primary care and specialty services, including addiction treatment, as convenient and an important contributor to higher-quality, continuous care. Patients felt that co-location reduced the impact of transportation problems by allowing them to schedule multiple appointments during a single visit. In addition to facilitating scheduling, providers felt

³⁴ Fisher WH, Clark RE, Baxter JD, Barton BA, O'Connell E, Awch G. Co-occurring risk factors for arrest among persons with opioid abuse and dependence: Implications for developing interventions to limit criminal justice involvement. *Journal of Substance Abuse Treatment*, 47(3), 197-201, 2014.

that co-location promoted warm hand-offs and, by extension, increased patient access to needed specialty and primary care. Providers felt that it improved communication among staff serving the same patient.

COORDINATING CARE

Within these co-location models, sites also differed in the practices they adopted to help facilitate coordinated care. At CHL, where the primary care and behavioral health service departments were not linked by an interoperable electronic health record (EHR), much information sharing and coordination was managed by nurse case managers and medical assistants on the primary care teams. At EMK, an integrated EHR helped to facilitate the sharing of patient information among providers serving the same patient; providers at this site also communicated via email, phone and in-person meetings, which many considered the quickest and most effective means of information sharing. In-person meetings were also the means used for communicating with Spectrum staff about shared patients. In this regard, physical proximity of co-located provider staff from different centers serving the same patient helped to facilitate both formal and informal communication. Finally, at FHC, care coordination within the OBOT program was facilitated primarily by aiming to have the same medical provider manage a patient's medical and substance use treatment services. For this reason, most medical doctors at this site were waived to prescribe buprenorphine,³⁵ and in cases where a nurse practitioner had a patient who could benefit from the OBOT program, the prescribing physician copied all patient notes to the nurse practitioner. FHC also had an integrated EHR for its physical and behavioral health departments.

Although all three sites offered some co-located medical and SUD treatment services, all inevitably relied on off-site services for at least some patients. The need for off-site referrals arose for several reasons, including that patient demand for on-site services exceeded the supply and scope of services available. For example, at EMK, which offered limited counseling and psychiatry services for patients with SUD, providers reported a three- to four-month waiting list for these services and up to a six- month waiting list for patients seeking Spanish-speaking providers. At FHC, which offered relatively extensive OBOT services, respondents indicated that still more prescribers were needed. At CHL, on-site primary care services had the capacity to serve only a small fraction of the patients coming for substance use treatment services. Other factors that necessitated off-site referrals were that some on-site services are restricted to a particular population (e.g., homeless patients or those with HIV) and some patients preferred an off-site provider.

For these collective reasons, all three sites relied in part on off-site referrals, and all reported challenges including an insufficient supply of behavioral health services (especially noted with respect to psychiatry and detoxification services). CHL reported an insufficient supply of primary care providers. Additionally, most addiction treatment facilities require that patients contact them directly to schedule a service appointment (mainly as an indicator of a patient's readiness to engage in treatment), which limited provider staff's ability to help patients secure needed off-site services. A final challenge reported by all three sites about off-site referrals was difficulty in getting information from off-site providers (both behavioral and physical health providers) about whether a patient followed through with the appointment and about ongoing treatment plans and progress.

³⁵ Substance Abuse and Mental Health Services Administration. "Buprenorphine Waiver Management." Available online at http://buprenorphine.samhsa.gov/waiver_qualifications.html.

KEY FINDINGS

1.

AN EXPANDED ROLE FOR PRIMARY CARE TEAMS AND INCREASED TRAINING IN MEDICATION-ASSISTED TREATMENT COULD HELP TO IMPROVE QUALITY AND MANAGE COSTS.

Patients with SUD use more of virtually every type of health care and have substantially higher health care costs than other patients. They are admitted to hospitals more often, visit EDs with greater frequency, and use more ambulatory care. SUD treatment directly accounts for only a small portion of this additional utilization, most of which is due to higher rates of treatment for mental illness and physical disease. Rates of most chronic, and some acute, conditions were highest in the Health Home, CHL, suggesting an even greater need for primary care in that setting.

Higher utilization among the population of patients that we studied cannot be completely attributed to a lack of access to treatment or to lower-quality care. No more than 8 percent of hospitalizations were classified as potentially preventable at the three sites, and preventable admission rates were higher for patients *without* SUD at one site. Although they have lower scores on quality of care for several indicators, patients with SUD were slightly more likely to remain engaged in depression treatment and to be screened for cervical cancer than those without SUD.

A Massachusetts Health Policy Commission analysis reported that the percentages of ED visits in all hospitals in the Commonwealth that were potentially avoidable ranged from 46 percent to 52 percent. This range is slightly higher than the rate observed for patients with SUD in our analysis and slightly lower than the rate we observed for patients without SUD.³⁶ These similarities notwithstanding, there appears to be substantial room for reducing ED visits among all patients served by the three study centers. However, the percentage of visits classified as potentially avoidable was actually lower for patients with SUD than for others, suggesting that this population has a greater need for urgent care, including help with mental health crises. Potential solutions include targeting patients with specific conditions that may lead to emergency care, expanding access to after-hours urgent care, improving housing access, and increasing the intensity of care management for patients who use the ED often.^{37,38} CHL currently offers MyLink, a service that works with local hospitals to identify frequent ED users and offer them assistance with transportation to medical appointments and care management. This program's cost-effectiveness is currently being evaluated.

The combination of fewer preventable hospitalizations and generally higher scores on quality indicators for patients with SUD at FHC suggests that there may be a connection between those outcomes and practice differences that we identified in provider interviews. Factors that distinguish FHC from the other centers include a larger number of primary care physicians who treat their primary care patients with buprenorphine. Treatment with buprenorphine likely increases patient motivation for appointments and leads to more frequent contact between doctor and patient, providing more opportunities for the physician to recommend or administer preventive treatment, which may in turn reduce avoidable hospitalizations. FHC's OBOT team helps physicians manage more patients with opioid addiction and likely improves scheduling and coordination of care. While we cannot be sure that these factors

³⁶ Technical appendix B5: Wasteful spending: Readmissions and emergency department use. Addendum to the 2014 Cost Trends Report, Commonwealth of Massachusetts, Health Policy Commission. Available online at www.mass.gov/anf/budget-taxes-and-procurement/oversight-agencies/health-policy-commission/b5-waste-jan-20-2015.pdf.

³⁷ Centers for Medicare & Medicaid Services Informational Bulletin. "Reducing Nonurgent Use of Emergency Departments and Improving Appropriate Care in Appropriate Settings." Available online at www.medicare.gov/Federal-Policy-Guidance/Downloads/CIB-01-16-14.pdf.

³⁸ O'Malley AS. After-hours access to primary care practices linked to lower emergency department use and less unmet need. *Health Affairs*, 32(1): 1-9, 2013.

explain differences in quality and utilization, the potential benefits of primary care teams providing addiction treatment are clearly worthy of further exploration.

These utilization patterns, coupled with diagnostic prevalence data and previous research, show that patients with SUD are more prone to injury, severe mental illness, and acute exacerbations of disease than other groups. Although the picture is far from clear, our interviews with patients and providers suggest that social and environmental problems contribute significantly to higher rates of crisis. Further study is needed to determine the most effective and efficient ways to address social and environmental needs, as well as the optimal mix of clinical and social services.

Another opportunity for improving both the effectiveness and efficiency of care is to expand the use of medications for treating alcohol and opioid disorders. The Drug Addiction Treatment Act of 2000 (DATA) encourages integration of primary care and opioid addiction treatment by allowing primary care physicians with special training to treat up to 100 patients with buprenorphine, which patients can take at home.³⁹ The patient cap may soon be raised to 200 patients.⁴⁰ Due to methadone's higher risk profile, patients must typically travel to a clinic for methadone administration. Methadone and buprenorphine were used extensively by patients with opioid addiction, but staff told us that more prescribers are needed. Evidence shows that medication-assisted treatment for opioid addictions can improve outcomes and lower total health care costs.^{41,42} Medications such as disulfiram, acamprosate, and naltrexone have been shown to be effective for alcohol treatment but were virtually unused among the population served by the three sites. Our provider interviews suggest that potential prescribers of these medications may need additional training to feel comfortable using them to manage patients' addictions.

Although there is evidence that treating SUD can reduce health care costs,⁴³ addressing high service utilization and costs will require a multimodal approach, with careful evaluation of outcomes at each step. Given the diversity of patient needs, no single approach is likely to lower costs for this population.

2.

QUICK AND FLEXIBLE RESPONSES AND PAYMENT SYSTEMS TO SUPPORT THEM ARE ESSENTIAL.

Patients and providers repeatedly emphasized the importance of responding to patients when they are ready to begin treatment. All three sites adopted at least some policies and programs designed to adapt to each patient's individual needs and readiness to engage in treatment. Walk-in clinics, outreach support, and community health workers helped to address patients' needs quickly at a time when patients were ready for and wanting services. Flexible policies for scheduling and rescheduling appointments were also essential for engaging and retaining patients. Policies such as discharging patients who frequently miss appointments may be appropriate or necessary for some groups but should be used sparingly for patients with SUD.

39 Substance Abuse and Mental Health Services Administration. "Drug Addiction Treatment Act of 2000." Available online at <http://buprenorphine.samhsa.gov/titlexxxv.html>.

40 Federal Register. Medication assisted treatment for opioid use disorders, a proposed rule by the Health and Human Services Department on 3/30/2016. Available online at www.federalregister.gov/articles/2016/03/30/2016-07128/medication-assisted-treatment-for-opioid-use-disorders.

41 Mattick RP, Kimber J, Breen C, Davoli M. *Buprenorphine maintenance versus placebo or methadone maintenance for opioid dependence*. (Systematic Review No. CD002207.) Cochrane Database of Systematic Reviews, pub 4, 2014.

42 Clark RE, Samnaliev M, Baxter JD, Leung GY. The evidence doesn't justify steps by state Medicaid programs to restrict opioid addiction treatment with buprenorphine. *Health Affairs*, 30(8), 1425-1433, 2011.

43 Parthasarathy S, Weisner C, Hu TW, Moore C. Association of outpatient alcohol and drug treatment with health care utilization and cost: Revisiting the offset hypothesis. *Journal of Studies on Alcohol*, 62(1), 89-97, 2001.

Rapid access and the flexibility to engage patients who have difficulty maintaining a regular schedule or getting to and from appointments come at a cost to providers. Missed visits represent lost revenue for providers who are typically paid on a fee-for-service basis. Rapid response capacity may require additional staff. The current practice of relying on time-limited grants to support these services is perhaps necessary, but not efficient or sustainable. More flexible payment to providers is likely the best solution to this problem. Although insurers are increasingly using per capita or similar bundled rates to pay health care systems, many providers continue to be paid with fees tied to the volume of services they render.

3.

CARE INTEGRATION IS IMPROVED BUT NOT COMPLETELY SOLVED BY SERVICE CO-LOCATION.

The challenges of coordinating physical health, mental health, and substance use treatment services are significant. Our findings highlight some of the barriers to seamless care for patients with SUD. All three sites sought to minimize care fragmentation in part by adopting some form of a co-located service model: FHC limited fragmentation by having a single medical team manage a patient's primary care and SUD treatment services (for patients with opioid addiction); EMK co-located a primary care provider at Spectrum, a methadone treatment provider that serves EMK patients; and CHL brought primary care services on-site to operate alongside its specialty treatment services. Patients and providers reported that co-location made scheduling multiple appointments easier and reduced transportation problems. Communication among providers was also generally improved when multiple providers serving the same patient were located at the same site.

At the same time, and importantly, co-location did not completely eliminate the transaction costs associated with linking services. Across all three sites, resources were still required to coordinate care *within* their respective co-location models. For example, EMK relied on a combination of shared EHRs among its physical and behavioral health providers who serve the same patient and informal communication with Spectrum staff; CHL relied on boundary-spanning staff to coordinate care across its medical and SUD treatment departments. Of note, the site that limited transaction costs the most by integrating medical and SUD treatment within a single medical provider (FHC) was also associated with higher overall quality, although other sites excelled on specific quality indicators. While we cannot attribute causation, this finding merits further study.

Co-location also did not eliminate the need for off-site referrals, where the cost of information sharing is steeper. Although there are many advantages to locating behavioral health and primary care at the same site, it may not be possible or practical to also integrate other, less frequently needed specialty care. At our study sites, communication and care coordination required significantly more work when care for a patient was spread across multiple sites, and it was not always effective. Some providers used medical assistants or community health workers to facilitate the demanding process of requesting, sharing, and following up on information about a patient's care. Dedicating staff to the task of information sharing appeared to be an adequate solution for managing care across multiple locations but was not available for all patients and, in terms of replicability, may be an additional expense that many programs could not afford. Staff resources for information sharing are scarce and the return on investment in boundary-spanning staff likely varies depending on patients' needs. Determining which patients will benefit most from these investments, and when, is a decision that must be weighed carefully.

4.

PATIENTS WITH SUBSTANCE USE DISORDERS NEED MORE THAN MEDICAL CARE.

Many patients with SUD need help to solve logistical problems, like unreliable transportation or getting health insurance. Others face social challenges, such as finding adequate housing and nutrition, or addressing legal problems. Although these needs are typically considered to be beyond the purview of health care providers, they can be significant barriers to care. Patients and providers mentioned these concerns so often that it is difficult to imagine effective treatment and recovery without addressing them. Social problems are likely among the most important contributors to increased cost and service utilization by patients with SUD. In recognition of this, all three sites provided a range of services designed to help patients secure needed social services in the community, and at least one site (CHL) provided some basic services on site, such as showers and food. It is beyond the qualitative scope of this study to assess the degree to which study sites varied in the overall scope of social services they provided, but we speculate (as do others) that the degree to which a provider site is able to address social determinants of health will have significant consequences for health care quality and outcomes. It will be up to future studies to quantify the provision of such services for patients with SUD and assess how these services affect health care delivery performance as well as patient experience and satisfaction.

The specific role that health care providers play in addressing the social determinants of health will vary depending on funding, staff capabilities and training, and available community resources. At a minimum, providers who treat patients with SUD need to have effective working relationships with the criminal justice, housing, employment, disability evaluation, and social welfare systems. Our findings also suggest that bundled payments and related payment reforms that enable more flexibility are also a key to promoting a service model that can accommodate the full range of health and social services that any given patient might need.

CONCLUSIONS

Organizational models such as the PCMH or Health Home are good starting points for addressing the practical challenges of integrating SUD treatment and primary care. But care within these models can vary widely. All of the sites we studied had pockets of well-integrated, high-quality care and other areas where integration was less apparent.

Effective care for patients with SUD demands a special measure of flexibility, creativity, and commitment from primary care providers as well as specialists. We have identified a number of practices that support better care, most of which could be adopted by providers in other parts of Massachusetts or in other states that offer relatively good access to health coverage. In particular, expanding the role of primary care providers in SUD treatment — in both PCMHs and Health Homes — appears to be a promising strategy for improving the quality and effectiveness of care. Reimbursement, too, must allow providers room to adapt care to the needs of a diverse population, while still offering incentives for reducing use of expensive and ineffective services.

Our interviews with patients uncovered a broad set of social needs that appear to have a profound effect on their health and quality of life as well as the cost of their care. In several cases, providers were able to help patients solve these problems, either directly or through referral. Unfortunately, these social needs outstrip resources for addressing them, particularly in the areas of housing and employment. Nevertheless, our analyses suggest that social and health needs are inseparable.

Ultimately, improving care for patients with SUD may require a broader definition of integration — one that encompasses social as well as health care needs. PCMHs and Health Homes can lay the foundation for this type of integration, but services not typically deemed to be health care are also an essential part of the solution. How to develop these resources and effectively combine them with treatment remains a significant challenge, though our case studies suggest providers are aware of their importance to the health and well-being of their patients and are committed to developing practices and programs that support a more holistic approach to care.

APPENDICES

APPENDIX A. METHODS

We conducted case studies of three centers using a two-pronged mixed-methods study design. With permission from MassHealth, we used a subset of MassHealth claims and enrollment in the Patient-Centered Medical Home Initiative (PCMHI) evaluation, for which the University of Massachusetts Medical School was the selected evaluator. All three centers were included in the larger evaluation, either as intervention or as comparison practices. These claims represent all services provided to patients assigned to each center. Key informant interviews, with center representatives and patients, and qualitative data analysis was used to identify the operational practices that the centers adopted to manage the care of patients with substance use disorders (SUD), to describe the process of linking patients seen in primary care with SUD treatment services, and to identify operational approaches for effectively coordinating care. The study was submitted to the University of Massachusetts Committee on Human Subjects in Research and determined to be exempt from further review.

For the **Claims Analysis**, we used MassHealth Primary Care Clinician Plan claims and Managed Care Organization encounter data from calendar years 2012 and 2013 to compare the cost and quality of care across study centers for individuals with similar characteristics. Use of these data was authorized by MassHealth as an extension of the PCMHI evaluation. Utilization and cost data were analyzed for 2013, and 2012 data were used for the purposes of calculating denominators for some quality measures. Because patients were likely to be served by more than one provider, we used an attribution method that linked patients to the sites if there was evidence that they had received any health care services from the site. This resulted in a small percentage of patients being attributed to more than one site. The overlap is described in Figure 1 (page 7).

Given the small number of centers and the focus on specific practices, we took a qualitative approach to describing cost, utilization, and quality differences. Utilization and quality for patients with and without SUD were described at each site. Utilization and quality achievement was reported for each site, but because some patients were assigned to multiple sites, statistical tests were not systematically conducted to compare sites. Thus, claims analysis results describe the patient population served by each center but do not attempt to quantitatively assign full responsibility for utilization or quality outcomes to a specific center. In some cases, we identified practices through interviews that seemed to offer a qualitative explanation for differences in reported rates, such as the impact of on-site mammography on breast cancer screening rates.

Primary diagnoses from all claims were classified using the Clinical Classification System developed by the Agency for Healthcare Research and Quality (AHRQ),⁴⁴ aggregated first at the person level and then by site to describe the number and percentage of patients with various conditions at each center. Diagnosed prevalence rates are reported separately for patients with and without SUD at each center. Cells with fewer than 11 members were not reported, to protect patient privacy.

We measured rates of hospital utilization, potentially avoidable hospitalizations, emergency department (ED) visits (defined as visits that did not result in a hospital admission), ambulatory care visits, and utilization of medications for treating SUD at each center. Utilization was aggregated for each center, and rates for patients with SUD were compared with those for patients without SUD.

⁴⁴ Healthcare Cost and Utilization Project (HCUP). "Clinical Classifications Software (CCS) for ICD-9-CM." Available online at www.hcup-us.ahrq.gov/toolssoftware/ccs/ccs.jsp.

We used algorithms developed by New York University to measure potentially avoidable ED visits⁴⁵ and AHRQ measures for potentially avoidable hospital admissions from the Prevention Quality Indicators measure set.⁴⁶ In Figure 4 (page 10) we collapsed three categories of ED visits—emergency ED care preventable, emergency primary care preventable, and non-emergency care—into a single category that we labeled “potentially avoidable.”

Quality measures were derived from the 2014 Healthcare Effectiveness Data and Information Set (HEDIS) measures for Medicaid managed care plans.⁴⁷ These measures addressed physical and behavioral health conditions common among people with SUD (as determined from our claims analysis), such as asthma, diabetes, chronic obstructive pulmonary disease, and depression, as well as screening for breast and cervical cancer. A list of specific quality measures, with a brief description of each, is included in Appendix C.

For the **Qualitative Portion** of the study, we conducted site visits and key informant interviews to assess patient and staff views about the components of each care model that facilitate and impede effective care. At each center, interviews were conducted with staff representing senior administrators, physical and behavioral health clinical leads, and support services. In total, we interviewed 29 provider staff across the three study centers. To guide the investigation and ensure data comparability within and across sites, we created semi-structured interview guides for each category of respondents. Core domains of inquiry focused on the operational practices adopted by sites to identify patient need for SUD services, to refer patients for services, and to manage ongoing care, including coordinating care and engaging patients. Two members of the research team attended each interview, with one member leading the interview and the other taking notes. Additionally, each interview was audio-recorded and transcribed into Word files following the site visit. We conducted some interviews by phone, in cases when the respondent was not available at the time of the site visit. We used content analysis to determine major themes present in the interviews. The semi-structured interview guides determined our preliminary coding scheme, which were further refined as the data were analyzed. We then developed initial concepts and categories that reflected salient and recurring themes in the data. After the coding of each individual interview, transcripts were clustered by center, and center-specific memos were generated to help facilitate cross-center comparisons.

In addition to staff interviews, we interviewed a sample of patients with SUD at each center to understand how they experienced care delivery and what they perceived as effective and less effective. As with the staff interviews, we created a semi-structured protocol. Here, core domains of inquiry focused on service use, experience receiving services, barriers to care, and unmet needs. We worked with a lead at each center who was responsible for recruiting and consenting patient respondents. In total, we interviewed 25 patients across the three centers: 10 at EMK, six at FHC, and nine at CHL. All patients gave their written informed consent to participate and consented to have their interview audio-recorded. Interviews typically lasted 45 minutes to one hour. Patients were paid a \$40 honorarium for their participation. Two interviewers participated in each interview. Each took detailed notes, which were then consolidated, and checked against audiotapes prior to coding. Each interview was coded separately by interviewers. Coded interviews were then compared, discrepancies were again checked against audiotapes, and a summary was prepared for each center. Summaries were then compared across sites and used to identify common themes as well as findings that were unique to a particular site.

45 The methodology developed by New York University’s Center for Health and Public Service Research was used to define emergency department visits that were for non-emergent conditions or conditions that could have been prevented or treated in primary care. A description of that methodology is available online at <http://wagner.nyu.edu/faculty/billings/nyued-background>.

46 Agency for Healthcare Quality and Research. “Prevention Quality Indicators Technical Specifications - Version 5.0, March 2015.” Available online at www.qualityindicators.ahrq.gov/Modules/PQI_TechSpec.aspx.

47 National Committee for Quality Assurance. “HEDIS 2014.” Available online at www.ncqa.org/HEDISQualityMeasurement/HEDISMeasures/HEDIS2014.aspx.

APPENDIX B. CLINICAL CLASSIFICATION SYSTEM GROUPS BY SUBSTANCE USE DISORDER STATUS AMONG MASSHEALTH RECIPIENTS AT THREE STUDY SITES, 2013

DESCRIPTION	EMK				FHC				CHL			
	SUD N=621		NO SUD N=3,853		SUD N=927		NO SUD N=5,201		SUD N=4,905		NO SUD N=3,552	
Septicemia (except in labor)	29	4.7%	25	0.6%	40	4.3%	29	0.6%	207	4.2%	32	0.9%
Bacterial infection; unspecified site	25	4.0%	73	1.9%	43	4.6%	88	1.7%	246	5.0%	75	2.1%
Mycoses	40	6.4%	317	8.2%	74	8.0%	342	6.6%	353	7.2%	304	8.6%
HIV infection	34	5.5%	38	1.0%	41	4.4%	61	1.2%	122	2.5%	27	0.8%
Hepatitis	49	7.9%	34	0.9%	47	5.1%	52	1.0%	455	9.3%	39	1.1%
Viral infection	37	6.0%	189	4.9%	53	5.7%	263	5.1%	340	6.9%	222	6.3%
Other infections; including parasitic	60	9.7%	78	2.0%	105	11.3%	94	1.8%	642	13.1%	130	3.7%
Sexually transmitted infections (not HIV or hepatitis)	*	*	*	*	12	1.3%	49	0.9%	76	1.5%	51	1.4%
Immunizations and screening for infectious disease	242	39.0%	1,692	43.9%	475	51.2%	2,379	45.7%	1,735	35.4%	1,295	36.5%
Cancer of breast	*	*	*	*	*	*	*	*	20	0.4%	29	0.8%
Cancer of cervix	13	2.1%	83	2.2%	18	1.9%	66	1.3%	93	1.9%	73	2.1%
Neoplasms of unspecified nature or uncertain behavior	*	*	*	*	*	*	*	1.1%	75	1.5%	76	2.1%
Maintenance chemotherapy; radiotherapy	*	*	*	*	*	*	*	*	20	0.4%	13	0.4%
Benign neoplasm of uterus	*	*	*	*	*	*	*	*	20	0.4%	34	1.0%
Other and unspecified benign neoplasm	23	3.7%	197	5.1%	42	4.5%	260	5.0%	174	3.5%	207	5.8%
Thyroid disorders	27	4.3%	273	7.1%	40	4.3%	309	5.9%	257	5.2%	322	9.1%
Diabetes mellitus without complication	64	10.3%	726	18.8%	122	13.2%	821	15.8%	502	10.2%	511	14.4%
Diabetes mellitus with complications	18	2.9%	207	5.4%	60	6.5%	415	8.0%	197	4.0%	240	6.8%
Other endocrine disorders	17	2.7%	64	1.7%	20	2.2%	83	1.6%	165	3.4%	113	3.2%
Nutritional deficiencies	33	5.3%	155	4.0%	79	8.5%	458	8.8%	344	7.0%	284	8.0%
Disorders of lipid metabolism	77	12.4%	664	17.2%	140	15.1%	882	17.0%	588	12.0%	604	17.0%
Gout and other crystal arthropathies	*	*	*	*	*	*	*	*	47	1.0%	24	0.7%
Fluid and electrolyte disorders	73	11.8%	126	3.3%	142	15.3%	209	4.0%	866	17.7%	230	6.5%
Other nutritional, endocrine, and metabolic disorders	82	13.2%	731	19.0%	159	17.2%	709	13.6%	902	18.4%	742	20.9%
Deficiency and other anemia	45	7.2%	273	7.1%	83	9.0%	343	6.6%	449	9.2%	267	7.5%
Coagulation and hemorrhagic disorders	12	1.9%	39	1.0%	29	3.1%	51	1.0%	228	4.6%	61	1.7%
Diseases of white blood cells	26	4.2%	42	1.1%	42	4.5%	52	1.0%	291	5.9%	82	2.3%
Other hematologic conditions	*	*	*	*	*	*	*	*	40	0.8%	19	0.5%
Multiple sclerosis	*	*	*	*	*	*	*	*	16	0.3%	15	0.4%
Other hereditary and degenerative nervous system conditions	*	*	*	1.0%	24	2.6%	70	1.3%	143	2.9%	93	2.6%
Epilepsy; convulsions	34	5.5%	56	1.5%	73	7.9%	105	2.0%	497	10.1%	178	5.0%

* When a cell contains fewer than 11 patients, the number has not been recorded to protect patient privacy.

continued

DESCRIPTION	EMK				FHC				CHL			
	SUD N=621		NO SUD N=3,853		SUD N=927		NO SUD N=5,201		SUD N=4,905		NO SUD N=3,552	
Headache; including migraine	108	17.4%	581	15.1%	192	20.7%	713	13.7%	1,196	24.4%	687	19.3%
Coma; stupor; and brain damage	44	7.1%	21	0.5%	69	7.4%	39	0.7%	657	13.4%	109	3.1%
Cataract	*	*	*	*	24	2.6%	211	4.1%	77	1.6%	106	3.0%
Retinal detachments, defects, vascular occlusions, and retinopathy	*	*	*	*	17	1.8%	142	2.7%	66	1.3%	101	2.8%
Glaucoma	12	1.9%	155	4.0%	21	2.3%	176	3.4%	70	1.4%	119	3.4%
Blindness and vision defects	116	18.7%	932	24.2%	177	19.1%	1,020	19.6%	902	18.4%	903	25.4%
Inflammation, infection of eye (except that caused by tuberculosis or sexually transmitted disease)	17	2.7%	167	4.3%	26	2.8%	184	3.5%	187	3.8%	165	4.6%
Other eye disorders	17	2.7%	259	6.7%	25	2.7%	239	4.6%	168	3.4%	206	5.8%
Otitis media and related conditions	*	*	*	*	24	2.6%	123	2.4%	158	3.2%	138	3.9%
Conditions associated with dizziness or vertigo	44	7.1%	301	7.8%	78	8.4%	359	6.9%	475	9.7%	300	8.4%
Other ear and sense organ disorders	28	4.5%	234	6.1%	57	6.1%	325	6.2%	346	7.1%	315	8.9%
Other nervous system disorders	146	23.5%	581	15.1%	296	31.9%	742	14.3%	1,761	35.9%	834	23.5%
Heart valve disorders	18	2.9%	53	1.4%	16	1.7%	65	1.2%	152	3.1%	64	1.8%
Peri-, endo-, and myocarditis; cardiomyopathy (except that caused by tuberculosis or sexually transmitted disease)	*	*	*	*	17	1.8%	33	0.6%	102	2.1%	29	0.8%
Essential hypertension	132	21.3%	919	23.9%	256	27.6%	1,245	23.9%	1,134	23.1%	734	20.7%
Hypertension with complications and secondary hypertension	*	*	*	*	22	2.4%	79	1.5%	81	1.7%	46	1.3%
Acute myocardial infarction	*	*	*	*	*	*	*	*	46	0.9%	11	0.3%
Coronary atherosclerosis and other heart disease	26	4.2%	119	3.1%	58	6.3%	158	3.0%	253	5.2%	113	3.2%
Nonspecific chest pain	136	21.9%	464	12.0%	256	27.6%	658	12.7%	1,412	28.8%	548	15.4%
Pulmonary heart disease	*	*	*	*	15	1.6%	27	0.5%	54	1.1%	30	0.8%
Other and ill-defined heart disease	*	*	*	*	14	1.5%	36	0.7%	72	1.5%	26	0.7%
Conduction disorders	*	*	*	*	*	*	*	*	89	1.8%	26	0.7%
Cardiac dysrhythmias	74	11.9%	185	4.8%	91	9.8%	253	4.9%	970	19.8%	281	7.9%
Cardiac arrest and ventricular fibrillation	*	*	*	*	*	*	*	*	45	0.9%	11	0.3%
Acute cerebrovascular disease	*	*	*	*	23	2.5%	42	0.8%	97	2.0%	41	1.2%
Occlusion or stenosis of precerebral arteries	*	*	*	*	*	*	*	*	30	0.6%	18	0.5%
Other and ill-defined cerebrovascular disease	11	1.8%	21	0.5%	11	1.2%	19	0.4%	36	0.7%	25	0.7%
Late effects of cerebrovascular disease	*	*	*	*	21	2.3%	125	2.4%	39	0.8%	29	0.8%
Peripheral and visceral atherosclerosis	13	2.1%	41	1.1%	26	2.8%	60	1.2%	69	1.4%	65	1.8%

* When a cell contains fewer than 11 patients, the number has not been recorded to protect patient privacy.

continued

DESCRIPTION	EMK				FHC				CHL			
	SUD N=621		NO SUD N=3,853		SUD N=927		NO SUD N=5,201		SUD N=4,905		NO SUD N=3,552	
Phlebitis; thrombophlebitis and thromboembolism	*	*	*	*	23	2.5%	34	0.7%	129	2.6%	46	1.3%
Varicose veins of lower extremity	*	*	*	*	11	1.2%	41	0.8%	26	0.5%	24	0.7%
Hemorrhoids	11	1.8%	113	2.9%	26	2.8%	137	2.6%	114	2.3%	100	2.8%
Other diseases of veins and lymphatics	*	*	*	*	17	1.8%	30	0.6%	57	1.2%	28	0.8%
Pneumonia (except that caused by tuberculosis or sexually transmitted disease)	39	6.3%	72	1.9%	54	5.8%	107	2.1%	334	6.8%	85	2.4%
Influenza	*	*	*	*	20	2.2%	45	0.9%	87	1.8%	30	0.8%
Acute and chronic tonsillitis	*	*	*	*	*	*	*	*	52	1.1%	51	1.4%
Acute bronchitis	16	2.6%	54	1.4%	43	4.6%	141	2.7%	232	4.7%	136	3.8%
Other upper respiratory infections	73	11.8%	569	14.8%	129	13.9%	758	14.6%	868	17.7%	670	18.9%
Chronic obstructive pulmonary disease and bronchiectasis	46	7.4%	105	2.7%	81	8.7%	147	2.8%	507	10.3%	218	6.1%
Asthma	101	16.3%	382	9.9%	170	18.3%	555	10.7%	928	18.9%	580	16.3%
Pleurisy, pneumothorax, pulmonary collapse	37	6.0%	89	2.3%	74	8.0%	110	2.1%	342	7.0%	103	2.9%
Respiratory failure; insufficiency; arrest (adult)	24	3.9%	20	0.5%	35	3.8%	41	0.8%	244	5.0%	46	1.3%
Other lower respiratory disease	194	31.2%	762	19.8%	368	39.7%	1,077	20.7%	1,897	38.7%	880	24.8%
Other upper respiratory disease	38	6.1%	408	10.6%	90	9.7%	454	8.7%	529	10.8%	457	12.9%
Intestinal infection	*	*	*	*	19	2.0%	46	0.9%	98	2.0%	37	1.0%
Disorders of teeth and jaw	63	10.1%	144	3.7%	105	11.3%	232	4.5%	540	11.0%	173	4.9%
Diseases of mouth; excluding dental	*	*	*	*	24	2.6%	63	1.2%	141	2.9%	55	1.5%
Esophageal disorders	57	9.2%	308	8.0%	153	16.5%	432	8.3%	693	14.1%	429	12.1%
Gastroduodenal ulcer (except hemorrhage)	*	*	*	*	11	1.2%	26	0.5%	68	1.4%	26	0.7%
Gastritis and duodenitis	24	3.9%	95	2.5%	44	4.7%	140	2.7%	274	5.6%	123	3.5%
Other disorders of stomach and duodenum	12	1.9%	64	1.7%	20	2.2%	67	1.3%	128	2.6%	76	2.1%
Abdominal hernia	19	3.1%	72	1.9%	23	2.5%	95	1.8%	140	2.9%	63	1.8%
Regional enteritis and ulcerative colitis	*	*	*	*	11	1.2%	16	0.3%	44	0.9%	18	0.5%
Diverticulosis and diverticulitis	14	2.3%	56	1.5%	25	2.7%	69	1.3%	98	2.0%	55	1.5%
Anal and rectal conditions	11	1.8%	27	0.7%	19	2.0%	41	0.8%	76	1.5%	39	1.1%
Biliary tract disease	24	3.9%	60	1.6%	32	3.5%	63	1.2%	157	3.2%	74	2.1%
Other liver diseases	52	8.4%	140	3.6%	116	12.5%	173	3.3%	569	11.6%	153	4.3%
Pancreatic disorders (not diabetes)	18	2.9%	13	0.3%	30	3.2%	20	0.4%	158	3.2%	34	1.0%
Gastrointestinal hemorrhage	33	5.3%	67	1.7%	50	5.4%	91	1.7%	279	5.7%	108	3.0%
Other gastrointestinal disorders	101	16.3%	536	13.9%	183	19.7%	608	11.7%	1,101	22.4%	647	18.2%
Nephritis; nephrosis; renal sclerosis	*	*	*	*	*	*	*	*	17	0.3%	12	0.3%

* When a cell contains fewer than 11 patients, the number has not been recorded to protect patient privacy.

continued

DESCRIPTION	EMK				FHC				CHL			
	SUD N=621		NO SUD N=3,853		SUD N=927		NO SUD N=5,201		SUD N=4,905		NO SUD N=3,552	
Acute and unspecified renal failure	13	2.1%	36	0.9%	44	4.7%	42	0.8%	213	4.3%	39	1.1%
Urinary tract infections	46	7.4%	245	6.4%	86	9.3%	328	6.3%	526	10.7%	373	10.5%
Calculus of urinary tract	20	3.2%	98	2.5%	39	4.2%	105	2.0%	191	3.9%	98	2.8%
Other diseases of kidney and ureters	19	3.1%	94	2.4%	39	4.2%	118	2.3%	159	3.2%	96	2.7%
Other diseases of bladder and urethra	*	*	*	*	*	*	*	*	57	1.2%	67	1.9%
Genitourinary symptoms and ill-defined conditions	79	12.7%	500	13.0%	138	14.9%	633	12.2%	742	15.1%	557	15.7%
Hyperplasia of prostate	*	*	*	*	19	2.0%	57	1.1%	54	1.1%	30	0.8%
Inflammatory conditions of male genital organs	*	*	*	*	19	2.0%	22	0.4%	70	1.4%	22	0.6%
Other male genital disorders	24	3.9%	90	2.3%	37	4.0%	109	2.1%	181	3.7%	57	1.6%
Nonmalignant breast conditions	25	4.0%	257	6.7%	26	2.8%	266	5.1%	137	2.8%	190	5.3%
Inflammatory diseases of female pelvic organs	21	3.4%	234	6.1%	53	5.7%	336	6.5%	282	5.7%	223	6.3%
Endometriosis	*	*	*	*	*	*	*	*	21	0.4%	20	0.6%
Menstrual disorders	99	15.9%	682	17.7%	174	18.8%	856	16.5%	995	20.3%	576	16.2%
Ovarian cyst	*	*	*	*	*	*	*	*	86	1.8%	76	2.1%
Menopausal disorders	*	*	*	*	*	*	*	*	36	0.7%	62	1.7%
Other female genital disorders	45	7.2%	357	9.3%	82	8.8%	462	8.9%	396	8.1%	368	10.4%
Contraceptive and procreative management	45	7.2%	400	10.4%	62	6.7%	579	11.1%	319	6.5%	311	8.8%
Spontaneous abortion	*	*	*	*	*	*	*	*	16	0.3%	13	0.4%
Induced abortion	13	2.1%	35	0.9%	13	1.4%	62	1.2%	65	1.3%	29	0.8%
Other complications of pregnancy	34	5.5%	204	5.3%	59	6.4%	290	5.6%	156	3.2%	130	3.7%
Hemorrhage during pregnancy; abruptio placenta; placenta previa	11	1.8%	66	1.7%	19	2.0%	100	1.9%	57	1.2%	46	1.3%
Early or threatened labor	*	*	*	*	32	3.5%	122	2.3%	48	1.0%	48	1.4%
Prolonged pregnancy	*	*	*	*	*	*	*	*	12	0.2%	17	0.5%
Diabetes or abnormal glucose tolerance complicating pregnancy	*	*	*	*	*	*	*	*	14	0.3%	16	0.5%
Previous C-section	*	*	*	*	*	*	*	*	14	0.3%	18	0.5%
Polyhydramnios and other problems of amniotic cavity	*	*	*	*	13	1.4%	67	1.3%	22	0.4%	19	0.5%
Umbilical cord complication	*	*	*	*	*	*	*	*	23	0.5%	22	0.6%
Obstetric-related trauma to perineum and vulva	*	*	*	*	15	1.6%	97	1.9%	17	0.3%	33	0.9%
Other complications of birth; puerperium affecting management of mother	27	4.3%	186	4.8%	48	5.2%	296	5.7%	122	2.5%	117	3.3%
Normal pregnancy and/or delivery	36	5.8%	264	6.9%	63	6.8%	394	7.6%	174	3.5%	165	4.6%
Skin and subcutaneous tissue infections	97	15.6%	202	5.2%	167	18.0%	291	5.6%	962	19.6%	325	9.1%

* When a cell contains fewer than 11 patients, the number has not been recorded to protect patient privacy.

continued

DESCRIPTION	EMK				FHC				CHL			
	SUD N=621		NO SUD N=3,853		SUD N=927		NO SUD N=5,201		SUD N=4,905		NO SUD N=3,552	
Other inflammatory condition of skin	54	8.7%	166	4.3%	83	9.0%	199	3.8%	418	8.5%	188	5.3%
Chronic ulcer of skin	*	*	*	*	16	1.7%	20	0.4%	74	1.5%	37	1.0%
Other skin disorders	99	15.9%	666	17.3%	158	17.0%	742	14.3%	925	18.9%	670	18.9%
Infective arthritis and osteomyelitis (except that caused by tuberculosis or sexually transmitted disease)	43	6.9%	64	1.7%	64	6.9%	111	2.1%	284	5.8%	91	2.6%
Rheumatoid arthritis and related disease	*	*	*	*	*	*	*	0.7%	42	0.9%	39	1.1%
Osteoarthritis	44	7.1%	256	6.6%	87	9.4%	330	6.3%	321	6.5%	213	6.0%
Other non-traumatic joint disorders	167	26.9%	765	19.9%	312	33.7%	1,120	21.5%	1,603	32.7%	881	24.8%
Spondylosis; intervertebral disc disorders; other back problems	203	32.7%	878	22.8%	346	37.3%	1,221	23.5%	1,789	36.5%	931	26.2%
Osteoporosis	*	*	*	*	*	*	*	*	21	0.4%	42	1.2%
Acquired foot deformities	*	*	*	*	25	2.7%	77	1.5%	77	1.6%	66	1.9%
Other connective tissue disease	203	32.7%	999	25.9%	371	40.0%	1,189	22.9%	1,991	40.6%	1,087	30.6%
Other bone disease and musculoskeletal deformities	35	5.6%	224	5.8%	64	6.9%	218	4.2%	305	6.2%	245	6.9%
Cardiac and circulatory congenital anomalies	*	*	*	*	*	*	*	*	31	0.6%	28	0.8%
Genitourinary congenital anomalies	*	*	*	*	12	1.3%	31	0.6%	32	0.7%	29	0.8%
Other congenital anomalies	13	2.1%	98	2.5%	27	2.9%	122	2.3%	90	1.8%	95	2.7%
Liveborn	*	*	*	*	12	1.3%	46	0.9%	26	0.5%	29	0.8%
Other perinatal conditions	*	*	*	*	*	*	*	0.8%	29	0.6%	25	0.7%
Joint disorders and dislocations (trauma-related)	21	3.4%	69	1.8%	52	5.6%	122	2.3%	206	4.2%	103	2.9%
Fracture of neck or femur (hip)	*	*	*	*	*	*	*	*	11	0.2%	13	0.4%
Skull and face fractures	*	*	*	*	25	2.7%	23	0.4%	148	3.0%	25	0.7%
Fracture of upper limb	29	4.7%	39	1.0%	35	3.8%	58	1.1%	189	3.9%	55	1.5%
Fracture of lower limb	15	2.4%	44	1.1%	31	3.3%	60	1.2%	150	3.1%	61	1.7%
Sprains and strains	87	14.0%	338	8.8%	149	16.1%	474	9.1%	879	17.9%	444	12.5%
Intracranial injury	16	2.6%	19	0.5%	40	4.3%	40	0.8%	225	4.6%	64	1.8%
Crushing injury or internal injury	22	3.5%	15	0.4%	23	2.5%	23	0.4%	106	2.2%	18	0.5%
Open wounds of head, neck, and trunk	36	5.8%	58	1.5%	84	9.1%	112	2.2%	464	9.5%	122	3.4%
Complication of device; implant or graft	14	2.3%	41	1.1%	16	1.7%	67	1.3%	76	1.5%	53	1.5%
Superficial injury; contusion	88	14.2%	207	5.4%	172	18.6%	316	6.1%	1,239	25.3%	480	13.5%
Burns	*	*	*	*	*	*	*	*	64	1.3%	27	0.8%
Poisoning by other medications and drugs	43	6.9%	34	0.9%	91	9.8%	28	0.5%	925	18.9%	127	3.6%
Poisoning by nonmedicinal substances	*	*	*	*	*	*	*	*	113	2.3%	23	0.6%

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continued

DESCRIPTION	EMK				FHC				CHL			
	SUD N=621		NO SUD N=3,853		SUD N=927		NO SUD N=5,201		SUD N=4,905		NO SUD N=3,552	
Other injuries and conditions due to external causes	146	23.5%	287	7.4%	250	27.0%	458	8.8%	1,741	35.5%	578	16.3%
Syncope	30	4.8%	84	2.2%	44	4.7%	105	2.0%	321	6.5%	123	3.5%
Fever of unknown origin	48	7.7%	164	4.3%	90	9.7%	185	3.6%	602	12.3%	205	5.8%
Lymphadenitis	17	2.7%	40	1.0%	21	2.3%	59	1.1%	125	2.5%	68	1.9%
Nausea and vomiting	126	20.3%	418	10.8%	199	21.5%	543	10.4%	1,375	28.0%	524	14.8%
Abdominal pain	152	24.5%	748	19.4%	285	30.7%	1,005	19.3%	1,578	32.2%	783	22.0%
Malaise and fatigue	72	11.6%	250	6.5%	150	16.2%	417	8.0%	1,146	23.4%	530	14.9%
Allergic reactions	61	9.8%	282	7.3%	89	9.6%	284	5.5%	507	10.3%	293	8.2%
Rehabilitation care; fitting of prostheses; and adjustment of devices	23	3.7%	87	2.3%	50	5.4%	102	2.0%	285	5.8%	188	5.3%
Administrative/social admission	111	17.9%	498	12.9%	275	29.7%	602	11.6%	1,383	28.2%	507	14.3%
Medical examination/evaluation	254	40.9%	1,415	36.7%	416	44.9%	1,717	33.0%	2,332	47.5%	1,653	46.5%
Other aftercare	218	35.1%	556	14.4%	406	43.8%	829	15.9%	2,188	44.6%	970	27.3%
Other screening for suspected conditions (not mental disorders or infectious disease)	127	20.5%	1,026	26.6%	284	30.6%	1,643	31.6%	1,090	22.2%	1,022	28.8%
Residual codes; unclassified	287	46.2%	1,399	36.3%	523	56.4%	1,716	33.0%	3,223	65.7%	1,497	42.1%
Adjustment disorders	30	4.8%	124	3.2%	91	9.8%	248	4.8%	531	10.8%	515	14.5%
Anxiety disorders	286	46.1%	660	17.1%	455	49.1%	849	16.3%	3,374	68.8%	1,738	48.9%
Attention-deficit, conduct, and disruptive behavior disorders	48	7.7%	75	1.9%	87	9.4%	85	1.6%	925	18.9%	468	13.2%
Delirium, dementia, and amnesic and other cognitive disorders	14	2.3%	54	1.4%	46	5.0%	68	1.3%	366	7.5%	116	3.3%
Developmental disorders	16	2.6%	52	1.3%	31	3.3%	60	1.2%	349	7.1%	298	8.4%
Disorders usually diagnosed in infancy, childhood, or adolescence	*	*	*	*	*	*	*	*	66	1.3%	141	4.0%
Impulse control disorders, Not elsewhere classified	13	2.1%	20	0.5%	32	3.5%	24	0.5%	196	4.0%	96	2.7%
Personality disorders	23	3.7%	25	0.6%	45	4.9%	24	0.5%	459	9.4%	150	4.2%
Schizophrenia and other psychotic disorders	86	13.8%	128	3.3%	168	18.1%	26	0.5%	1,397	28.5%	783	22.0%
Alcohol-related disorders	197	31.7%	0	0.0%	376	40.6%	0	0.0%	2,533	51.6%	0	0.0%
Substance-related disorders	353	56.8%	0	0.0%	567	61.2%	0	0.0%	3,601	73.4%	0	0.0%
Suicide and intentional self-inflicted injury	52	8.4%	20	0.5%	124	13.4%	39	0.7%	1,534	31.3%	327	9.2%
Screening and history of mental health and substance abuse codes	323	52.0%	420	10.9%	558	60.2%	784	15.1%	3,128	63.8%	1,027	28.9%
Miscellaneous disorders	42	6.8%	128	3.3%	77	8.3%	187	3.6%	368	7.5%	220	6.2%
E Codes: Cut/pierced	*	*	*	*	*	*	*	*	67	1.4%	24	0.7%
E Codes: Fall	11	1.8%	20	0.5%	21	2.3%	28	0.5%	236	4.8%	76	2.1%
E Codes: Motor vehicle traffic (MVT)	17	2.7%	30	0.8%	20	2.2%	31	0.6%	192	3.9%	60	1.7%

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continued

DESCRIPTION	EMK				FHC				CHL			
	SUD N=621		NO SUD N=3,853		SUD N=927		NO SUD N=5,201		SUD N=4,905		NO SUD N=3,552	
E Codes: Natural/environment	*	*	*	*	*	*	*	*	28	0.6%	16	0.5%
E Codes: Overexertion	*	*	*	*	*	*	*	*	74	1.5%	12	0.3%
E Codes: Poisoning	*	*	*	*	*	*	*	*	163	3.3%	17	0.5%
E Codes: Other specified and classifiable	*	*	*	*	*	*	*	*	38	0.8%	15	0.4%
E Codes: Other specified; Not elsewhere classified	*	*	*	*	*	*	*	*	84	1.7%	27	0.8%
E Codes: Place of occurrence	40	6.4%	56	1.5%	22	2.4%	21	0.4%	369	7.5%	126	3.5%
Bipolar split of mood disorders	180	29.0%	190	4.9%	321	34.6%	269	5.2%	2,743	55.9%	1,311	36.9%
Depression split of mood disorders	300	48.3%	853	22.1%	542	58.5%	1,072	20.6%	3,530	72.0%	1,893	53.3%
Opioid Dx disorders	367	59.1%	0	0.0%	490	52.9%	0	0.0%	3,096	63.1%	0	0.0%
Hepatitis C	118	19.0%	36	0.9%	206	22.2%	55	1.1%	1,165	23.8%	64	1.8%

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APPENDIX C. QUALITY MEASURE DESCRIPTIONS

<p>Comprehensive diabetes care Ages 18–75 years</p>	<p>Yearly screening of the following:</p> <ul style="list-style-type: none"> • HbA1c testing • LDL-C testing • Retinal eye exam • Nephropathy screening test or evidence of nephropathy
<p>Antidepressant medication management Ages 18 years and older</p>	<p>Adults <i>newly</i> diagnosed with depression and treated with an antidepressant who received the following:</p> <ul style="list-style-type: none"> • Effective acute phase: Filled sufficient number of prescriptions to allow for 84 days of continuous therapy. • Effective continuation phase: Filled sufficient number of prescriptions to allow for 180 days of continuous therapy. <p>To qualify as a <i>new</i> diagnosis, two criteria must be met:</p> <ul style="list-style-type: none"> • A 120-day (4-month) negative diagnosis history on or before the start date • A 90-day (3-month) negative medication history on or before the start date
<p>Use of spirometry testing in the assessment and diagnosis of chronic obstructive pulmonary disease Ages 40 years and older</p>	<p>Adults with a <i>new</i> (within the measurement year) diagnosis or <i>newly</i> active chronic obstructive pulmonary disease who received spirometry testing to confirm the diagnosis.</p> <ul style="list-style-type: none"> • Spirometry testing must occur 730 days prior to or 180 days after the diagnosing event.
<p>Pharmacotherapy management of chronic obstructive pulmonary disease exacerbation Ages 40 years and older</p>	<p>Adults aged 40 or older who had an acute inpatient discharge or an emergency department encounter with a principal diagnosis of chronic obstructive pulmonary disease who were dispensed <i>both</i>:</p> <ul style="list-style-type: none"> • A systemic corticosteroid within 14 days of discharge • Bronchodilator within 30 days of discharge <p>Note: The eligible population for this measure is based on the discharges and visits, <i>not</i> the patient. It is possible for the denominator for this measure to include multiple events for the same patient.</p>
<p>Use of appropriate medications for people with asthma Ages 19–64 years Age stratifications: 19–50 years 51–64 years Total</p>	<p>Children and adults identified with asthma who received a prescription for long-term control of asthma (inhaled corticosteroids, cromolyn sodium, nedocromil, leukotriene modifiers, methylxanthines).</p> <p>Exclusions:</p> <ul style="list-style-type: none"> • Patients with diagnosis of emphysema, chronic obstructive pulmonary disease, cystic fibrosis, or acute respiratory failure <p>Note: Long-acting beta-2 agonists do not count by themselves. They are considered add-on therapy.</p>
<p>Medication management for people with asthma Ages 19–64 years Age stratifications: 19–50 years 51–64 years Total</p>	<p>The percentage of members 19-64 years of age during the measurement year who were identified as having persistent asthma and were dispensed appropriate medications that they remained on during the treatment period. Two rates are reported:</p> <ul style="list-style-type: none"> • The percentage of members who remained on an asthma controller medication for at least 50 percent of their treatment period • The percentage of members who remained on an asthma controller medication for at least 75 percent of their treatment period <p>Exclusions:</p> <ul style="list-style-type: none"> • Emphysema, chronic obstructive pulmonary disease, cystic fibrosis, acute respiratory failure, or no dispensed medications

continued

Initiation and engagement of alcohol and other drug dependence treatment

Ages 13 years and older

Age stratifications: 13–17 years

18+ years

Total

Patients diagnosed with alcohol and other drug dependence who:

- Initiate treatment within 14 days of diagnosis
- Receive two additional alcohol or drug dependence services within 30 days of initiation

Chlamydia screening

Ages 16–24 years
and sexually active

Women identified as presumed sexually active by pharmacy prescription data or claims data indicating potential sexual activity.

- Screening test for chlamydia yearly

Exclusions:

- Women who had a pregnancy test followed within 7 days by either a prescription for Accutane (isotretinoin) or an X-ray.

Cervical cancer screening

Ages 21–64 years

PAP test within the measurement year or prior year.

Note: The typical measure includes tests in the prior two years.

Exclusions:

- Women who have had a complete hysterectomy with no residual cervix.

Breast cancer screening

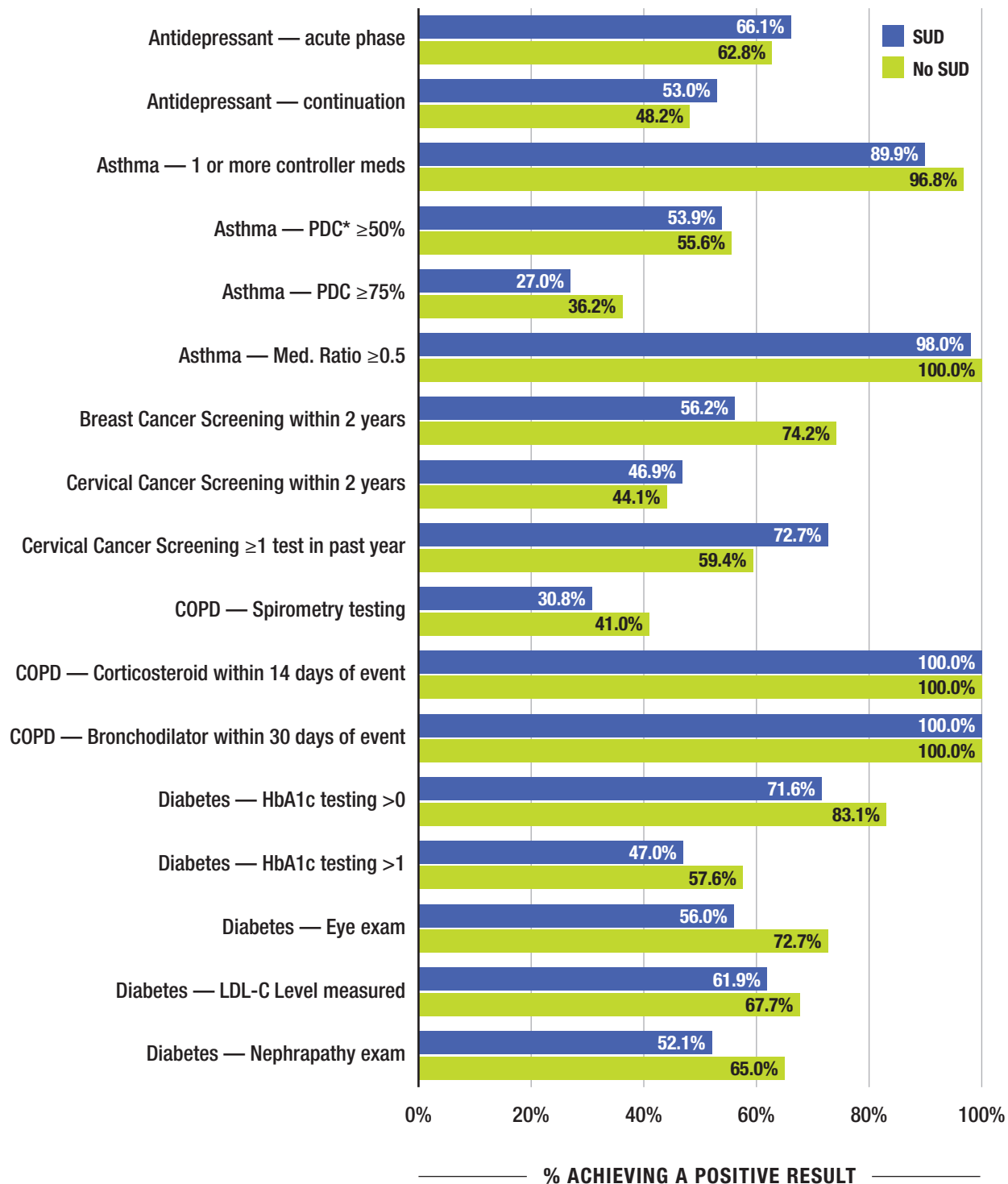
Ages 50–74 years

Mammogram in the measurement year or one year prior.

Exclusions:

- Women who have had bilateral mastectomy or two unilateral mastectomies.

APPENDIX FIGURE 1. QUALITY INDICATOR ACHIEVEMENT FOR PATIENTS WITH AND WITHOUT SUBSTANCE USE DISORDER



*PDC means proportion of days covered.

15
years



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