

# Research & Policy Highlights

Penn Center for Mental Health

Department of Behavioral Health and Intellectual Disability Services (DBHIDS)

Community Behavioral Health (CBH)

July 18, 2022

## Treatment for Opioid Use Disorder following Emergency Departments for Medicaid Eligible Individuals in Philadelphia: The Role of Warm Handoffs

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### The Policy Issue/Introduction

Philadelphia, Pennsylvania has one of the highest opioid overdose rates of any metropolitan area in the U.S.<sup>1,2</sup> Opioid-related mortality occurs despite the existence of effective, evidence-based treatments for opioid use disorder (OUD). FDA-approved medications for opioid use disorder (MOUD), including methadone, buprenorphine, and naltrexone, are associated with fewer overdoses and lower rates of opioid-related and all-cause mortality.<sup>3,4,5</sup>

Despite the efficacy, most individuals with OUD do not utilize MOUD.<sup>8</sup> However, individuals with OUD frequently utilize emergency departments (ED), which have therefore been identified as a promising point of care for initiating treatment for OUD.<sup>9,10</sup> The process of directly connecting patients with OUD to MOUD and other psychosocial services in EDs can be facilitated by social workers, peer support, and/or certified recovery specialists, which is sometimes referred to as a *warm handoff* and can help improve engagement in MOUD and other treatments for OUD.<sup>6,7</sup>

In recent years, hospitals in Philadelphia have launched various initiatives leveraging EDs to increase uptake of MOUD and psychosocial services. For example, Emergency Engagement for Opioid Use Disorder (ENGAGE), which was introduced at Penn Medicine in July 2018, aims to increase treatment initiation and retention among individuals with OUD patients who visit a Penn Medicine ED using a warm handoff. A concurrent effort was the Center for Opioid Recovery and Engagement (CORE), which involved screening individuals presenting at Penn Medicine EDs, allowing them to better identify individuals with OUD who could benefit from a warm handoff.

Initially, the goal of the present study was to examine the impact of ENGAGE, CORE, and the use of warm handoffs and improved screening for OUD on engagement into OUD treatment, primarily buprenorphine. We intended to compare Medicaid-eligible individuals (who are henceforth referred to as CBH members) with a diagnosis of OUD and who had at least one ED visit at a Penn

Medicine hospital (i.e., Hospital of the University of Pennsylvania, Presbyterian Hospital, and Pennsylvania Hospital) to CBH members with OUD who had at least one ED visit outside of Penn Medicine.

Upon discussions with CBH/DBHIDS, the study team learned of similar warm handoff initiatives happening in EDs throughout Philadelphia, which invalidated the planned comparison group. Therefore, the goal of the study was reframed to examine the impact of warm handoffs for CBH members with OUD who had at least one ED visit at any hospital in Philadelphia in 2017, 2018, and 2019. We also examined general trends in ED visits among Medicaid-eligible individuals with OUD between 2016 and 2020, measuring differences in characteristics for those with and without an ED visit.

### Methods

**Study Sample.** To be included in the general trends, CBH members had to have at least one behavioral health claim indicating an OUD diagnosis, which was identified using the ICD-10 code F11\*. To be included in the warm handoff analyses, CBH members had to have at least one ED visit in 2017, 2018, or 2019. To increase the likelihood that CBH members would be offered a warm handoff in the ED, we required the OUD diagnosis to occur within one calendar year of the ED visit (either before or after).

**Study period.** Trends in ED visits among CBH members with OUD were tracked from 2016 through 2020. For the warm handoff analyses, we focused on ED visits that occurred in 2017, 2018, and 2019.

**Data.** ED visits were available in the physical health claims and were identified using the place of service code. OUD diagnoses were available in the behavioral health claims and were identified using primary, secondary, or tertiary diagnostic codes. Methadone maintenance and psychosocial services were based on level of care codes in the behavioral health claims. Buprenorphine prescription

fills were identified using generic drug names in the pharmacy claims. This included buprenorphine and buprenorphine-naloxone products.

**Variables.** The primary outcomes were the use of medication assisted therapy, which we measured by (1) buprenorphine prescription fills and (2) the receipt of any methadone maintenance. Secondary outcomes measured the utilization of psychosocial services, including (3) outpatient mental health care, (4) case management, (5) inpatient psychiatric hospitalizations, and (6) the crisis continuum. We also considered an exploratory outcome, which measured whether the CBH member had (7) any Z code indicating that they were screened for social determinants of health.

**Analyses.** First, we counted the unique number of CBH members with at least one ED visit by year as well as the total number of ED visits among CBH members with OUD. Next, we compared demographic characteristics (age, gender, race/ethnicity) for CBH members with OUD, stratifying by whether they had at least one ED visit. We also examined differences in mental health diagnoses, including severe mental illness (schizophrenia, bipolar disorder, major depression, or borderline personality disorder) and related suicidal ideation. We determined whether differences in the ED and non-ED group were statistically significant using pairwise t-tests.

Next, we analyzed the impact of warm handoffs for CBH members with OUD who had at least one ED visit at any hospital in Philadelphia in 2017, 2018, and 2019. Because we cannot directly observe whether a warm handoff occurred due to the lack of procedural code and the missing OUD diagnosis in physical health claims, this amounted to an “intention to treat” analysis. We plotted point estimates and 95% confidence intervals of the share of CBH members with any medication for OUD and other psychosocial services in the year prior to and the year following the first ED visit that occurred in the calendar year; differences were deemed statistically significance if 95% confidence intervals did not overlap.

Finally, we conducted the originally planned analyses, comparing outcomes for CBH members with OUD who had an ED visit in a Penn Medicine zip code to CBH members with OUD who had an ED visit elsewhere (and who did not have any ED visit in a Penn Medicine zip code). Because Pennsylvania Hospital and Thomas Jefferson share a zip code (19107), we excluded any CBH members who had an ED visit in that zip code from both groups.

To demonstrate the impact of restricting the pre-period and post-period to a shorter time window, we measured these outcomes in the 90 days prior to and the 90 days following the ED visit as well.

## Summary of Results

Between 2016 and 2020, the number of CBH members with OUD and at least one ED visit exceeded 15,000 per year (Figure 1a). The number of CBH members declined in 2019 and again in 2020, although the number of ED visits among these CBH members rose in 2020—indicating more repeat ED visits among a smaller number of CBH members with OUD (Figure 1b).

CBH members with OUD and at least one ED visit were more likely to be female, were more likely to be African-American, and were less likely to be white (Table 1). Of note, they were also more likely to have a severe mental illness diagnosis (defined as schizophrenia, bipolar disorder, major depression or borderline personality disorder). And the largest difference was in the share who reported suicidal ideation: nearly 7% of CBH members with an ED visit and OUD had reported suicidal ideation compared to 1% of CBH members with OUD and without an ED visit ( $p < 0.001$ ).

In the warm handoff analyses, we found that many CBH members with an ED visit were already using MOUD in the year prior to the ED visit—for example, for 2017 ED visits, 17.1% of CBH members with OUD had a buprenorphine prescription fill in the year leading up to the ED visit, while 23.5% had at least one methadone maintenance visit (Figure 2). However, in the year following the ED visits, the share of CBH members with OUD and at least one buprenorphine prescription increased by nearly 10 percentage points in 2017 and 2018, and by nearly 7 percentage points in 2019; all changes were statistically significant. By comparison, the share of CBH members with methadone maintenance remained relatively steady in the year following an ED visit.

In terms of other behavioral health care utilization, we also saw statistically significant increases in outpatient mental health visits, psychiatric hospitalizations, case management, use of the crisis continuum, and screening for social determinants of health, as measured by the share of CBH members with at least one Z code in their diagnoses (Figure 2). In fact, the share of CBH members with OUD and at least one Z code more than quadrupled for the ED visits in 2018—although it remains low relative to other psychosocial services.

When we disaggregated ED visits based on whether they occurred at Penn Medicine, we found that the increase in buprenorphine prescriptions and psychosocial services were consistent outside of Penn Medicine (Table 2). Of note, the results were also consistent when we limited the pre- and post-period to 90 days, although the changes in utilization were smaller in magnitude.

## Discussion

CBH members with OUD were more likely to have buprenorphine prescription fills in the year following an ED

visit. Conversely, there was little change in their likelihood of having a methadone maintenance visit. This suggests that following ED visits, individuals with OUD are more likely to begin buprenorphine therapy. This finding supports use of warm handoffs as a strategy to link individuals in ED to buprenorphine services. Additionally, this finding may reflect barriers and challenges with methadone maintenance, which is more strictly regulated and has historical stigma. —<sup>11</sup>

There were increases in the utilization of other types of behavioral health care following the ED visit, including psychiatric hospitalizations and the crisis continuum. This suggests that increased engagement may be coupled with more intensive care utilization, at least in the year following an ED visit. This aligns with prior evidence that points to an increase in self-reported depression that coincided with engagement in treatment for OUD following a warm handoff. This finding has numerous potential explanations. Initiating and engaging in treatment for OUD may reveal or exacerbate coexisting mental health issues (such as depression, anxiety, unaddressed trauma or grief). Contact with ED and substance use disorder health care providers can facilitate timely connection to additional appropriate mental health services. Of note, these individuals were also more likely to receive outpatient mental health care and case management, which translated into a larger share who were screened for social determinants of health.

There are various barriers to delivering MOUD and other psychosocial services in the ED, including physician hesitancy, patient interest, licensing regulations, and limited time and resources.<sup>12</sup> There is also difficulty in implementing screeners that reliably detect OUD, not to mention patients' willingness to enroll in programs related to MOUD.<sup>13,14</sup> In order to address these barriers, health systems have created programs with a warm handoff to better connect individuals with outpatient care with MOUD after discharge from the ED.<sup>6,7,11</sup> Our results suggest that their efforts, at least in Philadelphia, have been successful at increasing engagement in MOUD and other psychosocial services within this hard-to-reach population.

These results, despite the limitations described below, raise important questions. First, are there concurrent initiatives that could be driving these findings? For example, warm handoffs at Penn Medicine were coupled with efforts to increase the number of providers with waivers to prescribe buprenorphine. A second question is: what are the key mechanisms helping CBH members access care? We noted that some CBH members were already connected to OUD treatment—the type of services they were using, and the length of time they used those services, may increase their willingness to try new treatments. It could also be that other characteristics, including whether they are a caregiver, where they live, and where they are receiving care, influences outcomes. More research is needed to understand how, why, and for whom warm handoffs are effective.

## Limitations

Administrative claims data are rarely used in evaluations of OUD interventions that begin in the EDs, such as ones that study warm handoffs, given limitations of the data. In our data, for example, we cannot directly ascertain whether CBH members received a warm handoff, or even if the ED visit was related to their OUD diagnosis. Because warm handoffs were available in most EDs in Philadelphia by 2018, and many of these warm handoffs were made available to interested individuals who had an historic diagnosis of OUD or were screened as potentially having an OUD (even if they were not in an ED for OUD withdrawal or overdose symptoms), our evaluation is an intention to treat analysis. In this case, the estimated findings are likely attenuated. The time period studied overlapped with other initiatives to address the Opioid Epidemic, including increasing use of MOUD, increasing waived buprenorphine prescribers, public health campaigns, etc. Use of specific coding to indicate warm-handoff in the ED would improve data quality.

Other limitations of our data and analytical approach include the difficulty in capturing key measures in administrative claims data, such as ongoing opioid use and quality of life. For a smaller cohort of individuals with OUD who received a warm handoff at Penn Medicine, we previously described the results of a qualitative survey, which found reduced opioid use and an increase in self-reported quality of life following the warm handoff.

## Conclusion and Next Steps

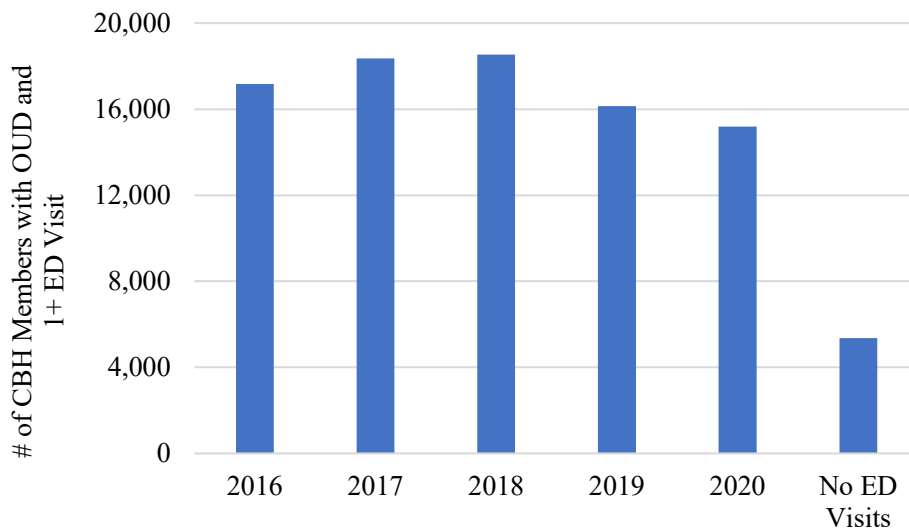
Our results suggest that ED visits and the increased use of warm handoffs are increasing the likelihood that CBH members with OUD are engaging in treatment for OUD. Specifically, a larger share of CBH members with OUD had buprenorphine prescription fills, outpatient mental health visits, and social determinants of screening in the year following an ED visit compared to the year before. However, we also found increases in inpatient psychiatric stays and use of the crisis continuum.

## References

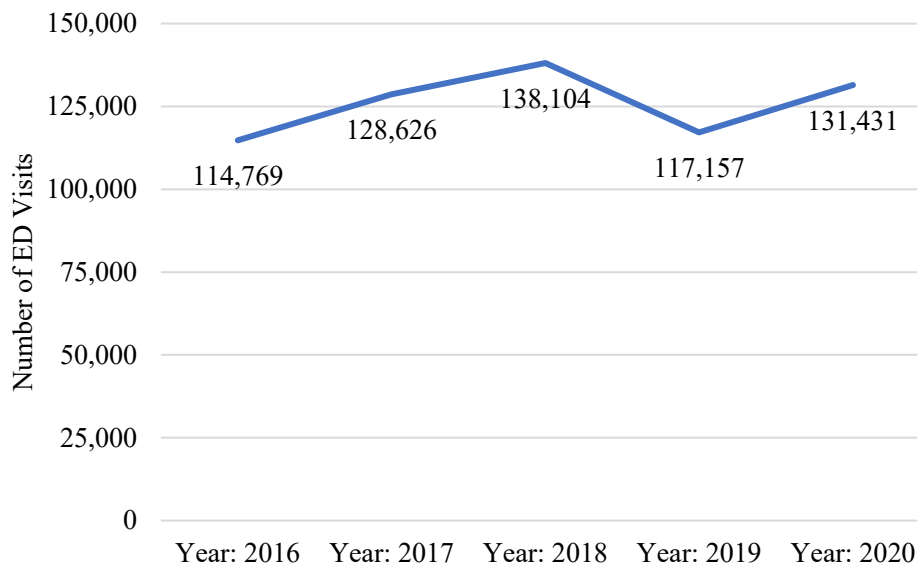
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**Appendix I.**

**Figure 1a.** Number of CBH Members with Opioid Use Disorder and an Emergency Department Visit, 2016-2020



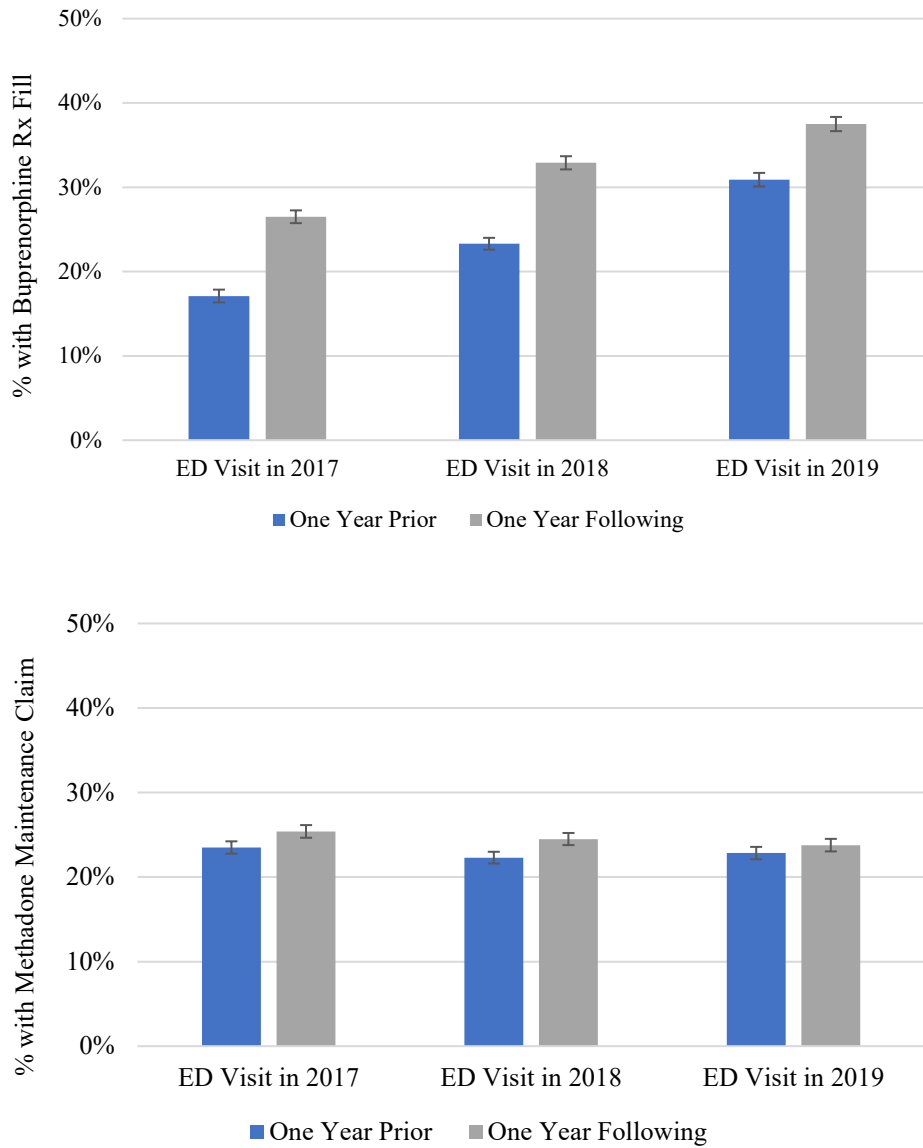
**Figure 1b.** Number of Emergency Department Visits among CBH Members with Opioid Use Disorder, 2016-2020



**Table 1.** Characteristics of CBH Members with Opioid Use Disorder who Did and Did Not Have an Emergency Department Visit, 2016-2020

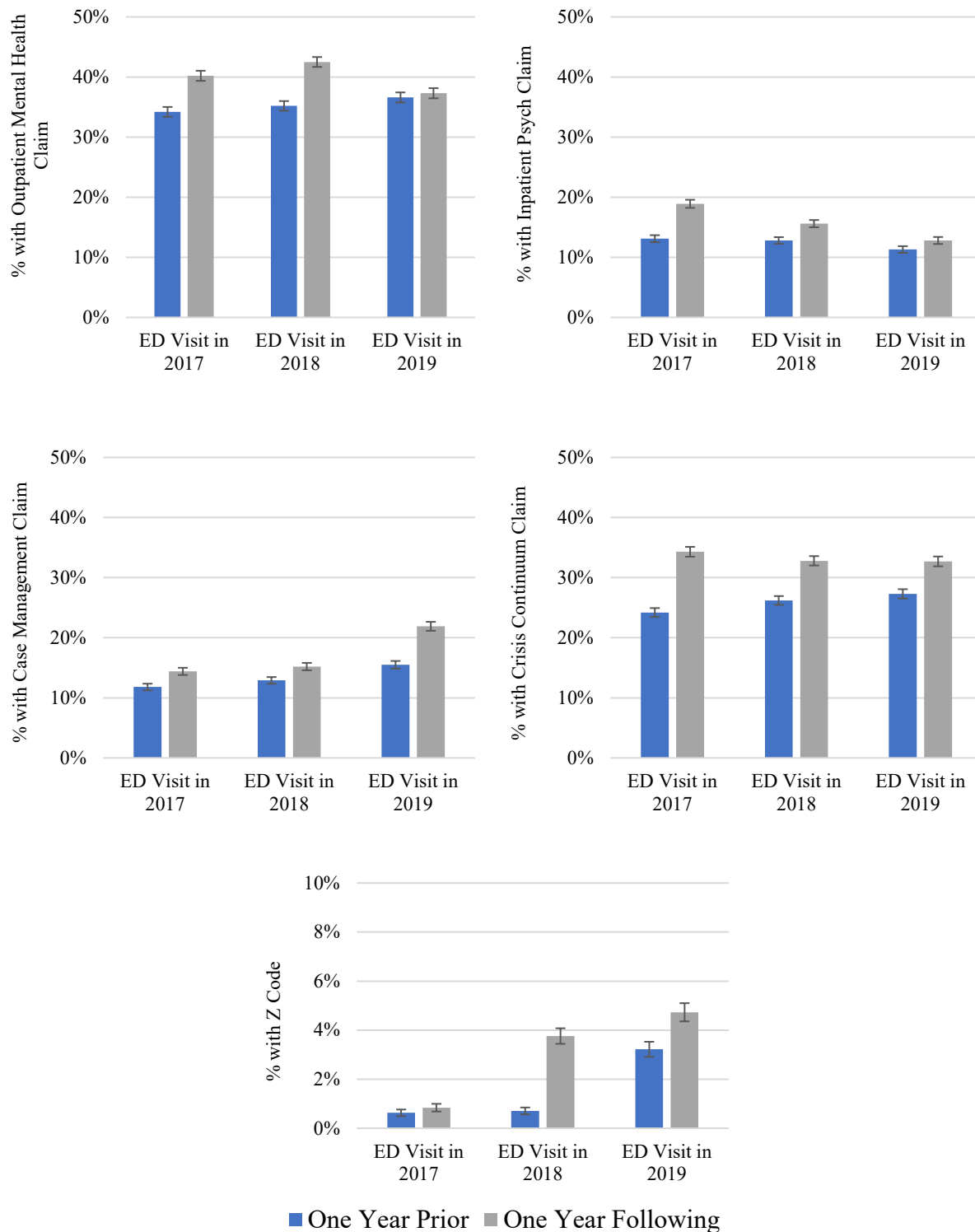
	<b>Had 1+ ED Visit</b>	<b>Had 0 ED Visits</b>	<b>p-value</b>
Age in years	38.9	39.4	0.014
Male	63.7%	74.2%	<0.001
Female	36.3%	25.8%	<0.001
Black/African American	45.4%	34.6%	<0.001
Hispanic	12.8%	13.1%	0.493
Other race	2.9%	5.7%	<0.001
White	38.9%	46.5%	<0.001
Any severe mental illness	52.4%	25.5%	<0.001
Any mood disorder	49.1%	23.3%	<0.001
Any schizophrenia	10.8%	3.5%	<0.001
Any suicidal ideation	6.8%	1.0%	<0.001

**Figure 2.** Buprenorphine and Methadone Maintenance in Year Before and After an Emergency Department Visit among CBH Members with Opioid Use Disorder, 2017-2019



Note. Based on first ED visit in calendar year by CBH members with an OUD diagnosis (F11\*) within one year of the ED visit.

**Figure 3. Psychosocial Services in Year Before and After an Emergency Department Visit among CBH Members with Opioid Use Disorder, 2017-2019**



Note. Based on first ED visit in calendar year by CBH members with an OUD diagnosis (F11\*) within one year of the ED visit. Z codes refer to social determinant of health screenings.



**Table 2.** Medication Assisted Treatment and Other Psychosocial Services in Year Prior to and Following an Index Emergency Department Visit by Zip Code, 2018

	<b>ED Visits in 19104 in 2018</b> (i.e., Hospital of the University of Pennsylvania & Presbyterian Hospital)		<b>ED Visits Not in 19104 in 2018</b>	
	90 Days Prior	90 Days Following	90 Days Prior	90 Days Following
<b>Medications for OUD</b>				
Buprenorphine Rx	20.2%	27.9%	23.8%	33.1%
Methadone maintenance	23.2%	25.3%	19.0%	20.2%
<b>Other Psychosocial services</b>				
Outpatient mental health care	42.1%	46.2%	31.9%	37.8%
Case management	15.9%	20.6%	10.5%	12.7%
Inpatient psychiatric stays	20.3%	21.4%	9.5%	11.2%
Crisis continuum	32.4%	37.5%	22.2%	27.9%
Any Z code	1.4%	4.7%	0.6%	3.5%
Number of CBH Members	2,318		6,282	

Note. Both categories of ED visits exclude CBH members that had any ED visit in 19107 to avoid contamination, as it includes Pennsylvania Hospital and Thomas Jefferson. Z codes refer to social determinant of health screenings.