Drug Arrest Diversion*

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Only one in five individuals with a substance use disorder in the U.S. are able to access treatment services. Substance use disorders are 17% higher among Black Americans than white Americans. This paper shows that linkage to treatment can occur effectively, beneficially, and at sizable scale in a potentially unexpected setting—police stations. Law enforcement officers continue to serve as first responders to most health crises in the U.S., allowing them to connect many more individuals to treatment services than other government actors, a fact that has come into increasing focus due to the opioid epidemic. In response, police departments across the country have begun to divert individuals who possess drugs away from arrest and towards treatment and recovery. This paper evaluates the potential of this approach by studying the country's largest drug arrest diversion program in Chicago using a triple-difference strategy that exploits arrest-level variation in diversion eligibility. Drug arrest diversion primarily serves Black Chicagoans, and benefits individuals with medically diagnosed substance use disorders, increases connections with substance use treatment, and reduces subsequent arrests. We conclude that this approach can simultaneously reduce the reach of the criminal legal system, expand the number of individuals with substance use disorders connected with treatment, and improve public safety.

Keywords: opioids, diversion, criminal justice, recidivism, substance use

JEL classifications: I18, I38, K32, K42

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1 Introduction

Drug overdose deaths in the U.S. reached a record high of 107,573 in 2021, 75% of which involved opioids (CDC, 2023). In a sharp contract to the mid-2010s, by 2020, Black men have become the most likely demographic group to die from an overdose, while substance use treatment remains rare in this demographic group (Gramlich, 2022; Centers for Disease Control and Prevention, 2022). Overdoses are now responsible for more American deaths than homicides or traffic crashes, even in cities with high rates of violent crime. In response to this crisis, federal, state, and local governments have invested substantial resources in de-addiction services (Maclean *et al.*, 2020). In Illinois, for instance, federal funding for substance use treatment increased to $84 million by 2018, more than double the amount it received in 2014.

A natural question is *how* governments should connect individuals with de-addiction services and treatment. In this paper, we study the impact of linkage to treatment in a potentially unexpected setting—police stations. As the possession of most controlled substances is illegal in the U.S., police officers continue to interface with individuals who seek out the sale of these substances in illegal markets. At the same time, there is growing consensus that criminalization and heavy penalties for drug use do not discourage long-term use (Hayhurst *et al.*, 2015). In this paper, we study an approach that leverages the scale at which police officers reach individuals who may benefit from substance use treatment *and* removes all penalties associated with that arrest.

Drug arrest diversion is currently being deployed by hundreds of police departments across the U.S., but causal evidence on its benefits and costs is limited.[1] To address this gap, we study the country's largest drug arrest diversion effort to date. Since 2018, the Chicago Police Department has been connecting individuals arrested for low-level drug possession charges with substance use treatment counselors, releasing the individuals without criminal charges.

[1] See the Police Assisted Addiction and Recovery Initiative and LEAD National Support Bureau for examples of jurisdictions implementing this approach. Drug arrest diversion has also received federal encouragement—in May 2022, the White House Office of National Drug Control Policy released the Model Law Enforcement and Other First Responders Deflection Act, which encourages the establishment of deflection programs at the state level.

We estimate the causal impact of this approach on downstream criminal justice involvement by exploiting the staggered expansion of drug arrest diversion across the city combined with individual-level eligibility for diversion in a triple difference framework.

Using arrest-level data for 2010-2020, we find that connections with substance use counselors sharply increase among those eligible for diversion, as does the probability of being released without criminal charges. Re-arrest rates fall, including a 15% reduction in the probability of being re-arrested for drug charges, indicating that the program may be chipping away at the demand for drugs. Additionally, the probability of being re-arrested for violent charges decreases by 17%, indicating that the program also improved public safety. We implement several tests to show that this reduction is not driven by shifts in officer behavior in response to the program, discussed at length in Section 6.5. Our results are also robust to specifications that explicitly account for biases that emerge in three-way fixed effects designs with variable treatment timing (Borusyak *et al.*, 2021). The program is already cost beneficial at a 5:1 ratio on direct costs to the criminal justice system versus due to treatment, even before considering the benefits of a reduction in crimes.

To understand the mechanisms driving these results, we examine *who* is served by the program, and *how* they engage with treatment services. Data collected by substance use counselors indicates that the program is well-targeted—among diverted individuals that consented to sharing their health data with the research team, 69% reported using heroin daily, and 34% reported overdosing in the past. 61% of the individuals are Black. Treatment engagement rates are also high—79% start treatment, and 43% remain engaged 60 days out.[2] Finally, survey evidence also indicates that police officers are supportive of the program—a 2019 survey of 115 beat officers found that 86% believed arrest did not discourage future drug

[2]NADP also allowed "walk-ins"—i.e. individuals who were not being arrested could walk in to the district station, and ask to be connected with treatment and counseling. While not the focus of the empirical analysis, treatment engagement rates among this group are helpful in understanding whether engagement rates for diverted individuals—who do not self-select into treatment, and are instead referred by the Chicago Police Department (CPD)—are high. 100% of walk-in individuals start treatment, and 50% remain engaged 60 days out—these are (as expected) higher but very similar to those for the diverted group. Walk-ins account for 5% of connections with counselors, while referrals via diversion by CPD account for 95%.

use, and 40% had shared information about CPD's alternatives to arrest with the public.

This paper contributes to the growing economic literature on mental health and substance use, and their treatment. One in five Americans suffer from a mental illness in any given year, but less than half of them receive any mental health service, including inpatient treatment, outpatient treatment, or simply a prescription (National Institute of Mental Health, 2022). Even for serious mental health disorders services only reached 65% of those suffering. Within mental health services, prescription medication is twice as common as counseling or therapy (Terlizzi, 2020), suggesting that regular contact with a mental health professional is rare among individuals with disorders overall. Treatment patterns are even bleaker for substance use. 7.4% of Americans suffer from a substance use disorder in a given year, however, only 1.5% receive any substance use treatment (Lipari, 2019). When treatment can improve health outcomes and social functioning, the presence of treatment centers can improve local communities (Bondurant *et al.*, 2018), and when treatment is shown to be economically net-beneficial based on meta-evidence (Belenko *et al.*, 2005), this is a significant concern and a missed opportunity. Our paper explores how linkage to treatment can occur effectively, persistently, and beneficially for both the individual and the community in a potentially unexpected setting—at police stations.

Broadly, our paper advances work in the area of the impacts of healthcare access. Increased care has a range of health as well as beyond-health benefits. Increased healthcare improves schooling and employment outcomes and has a range of crime-reducing benefits (Hefei *et al.* 2017, Vogler 2020, Jacome 2021). Substance use treatment specifically carries similar benefits. Then, why only one in ten individuals with the disorder are in treatment? While evidence is mixed on the highest barrier to access, but practical barriers—transportation to and from treatment, length of wait lists—ranks highly across studies.[3]

[3]For example, Rapp *et al.* (2006) find that among the top five concerns people name for not being in treatment, three relate to discomfort revealing information about one's personal life to others, while two relate to wait-lists and getting to treatment. Matsuzaki *et al.* (2018) found that financial concerns and logistics play a leading role, as well as having been treated poorly in a health care setting before. Notably, the vast majority of those with a substance use disorder do not perceive to need help (Lipari *et al.*, 2013).

This work also ties in to recent work on the impact of diverting individuals from further processing within the criminal justice system, where recent evidence shows that non-prosecution of misdemeanor offenses and deferred prosecution for certain felony offenses both led to reductions in recidivism (Mueller-Smith & Schnepel 2020, Agan *et al.* 2021). However, in the context of drug arrest diversion, the few existing studies, which are based on a pilot or small-scale programs use a propensity score matching design and evalaute programs that had all participants subjectively selected by police officers (Collins *et al.* 2015a, Collins *et al.* 2015b). In contrast, diversion eligibility in Chicago was predetermined, allowing us to produce estimates that are not biased by selection issues. Further, drug arrest diversion in Chicago expanded citywide by 2021; this allows us to produce causal estimates based on the implementation of drug arrest diversion at scale, which are more likely to be externally valid.

This paper makes several contributions: (1) it studies the impact of a large-scale criminal justice-based approach to connecting individuals with substance use treatment; (2) it quantifies the positive impact of treatment and non-prosecution on subsequent criminal justice involvement using a triple difference framework that accounts for selection on unobservables; (3) it presents novel evidence on which individuals are served by drug arrest diversion, not just in terms of demographic characteristics, but in terms of their history of substance use and engagement with post-diversion treatment; (4) it leverages additional data sources to rule out explanations other than substance use treatment as the main mechanism, including police officer behavior change and voluntary incapacitation (i.e., in-patient treatment for the diversion-eligible); (5) it is the first paper to estimate the impact of drug arrest diversion – an approach being deployed by hundreds of police departments across the U.S. in response to the opioid crisis – on the risk of fatal overdose.

The remainder of this paper is organized into six sections. Section 2 describes the institutional setting, and Section 3 describes the datasets used. Section 4 outlines the empirical strategy and Section 5 discusses descriptive evidence. Section 6 presents causal evidence of the impact of drug arrest diversion, including a cost-benefit analysis. Section 7 concludes.

2 Setting

2.1 Opioid Use and Access to Treatment in the U.S.

Opioid use is widespread in the U.S., and is associated with a range of adverse health outcomes, increased health care costs, worse labor market outcomes, and costs to families including in-utero exposure to opioids (Maclean *et al.*, 2020). Opioids also account for over two thirds of drug overdoses, which have skyrocketed in recent years (Centers for Disease Control and Prevention, 2021).

Opioid dependence often begins with the use of legally prescribed opioids, which has led to the development of several approaches to regulate the legal opioid market. These approaches vary in their effectiveness, but cannot prevent the diversion of some drugs onto the illegal market (Neumark & Savych, 2022; Powell *et al.*, 2020). As a result, identifying ways to connect individuals to substance use treatment at scale remains crucial.

Prior research shows that the opening of additional treatment facilities can reduce substance use related mortality and crime (Swensen, 2015; Bondurant *et al.*, 2018). Improving insurance coverage of substance use treatment services has also been shown to be effective in some instances (Wen *et al.*, 2017; Maclean *et al.*, 2018; Dafny *et al.*, 2022; Maclean *et al.*, 2022). However, access to treatment is still stymied, regardless of coverage (Ali *et al.*, 2017). Therefore, identifying robust ways to connect individuals to treatment at scale is necessary to bridge the current treatment gap.

2.2 Criminal Justice System Responses to the Opioid Epidemic

The opioid crisis and an increasing shift of viewing drug use as as much of a public health problem as a legal one (Volkow *et al.*, 2017; Caulkins *et al.*, 2021) have been present in America for nearly a decade. As a result, initiatives within the U.S. criminal justice system that aim at broadening the possible courses of action beyond criminal conviction for certain crimes have become increasingly prevalent in recent years. These are often also cost effective compares to

criminal justice system processing (Anglin *et al.*, 2013).

These alternative and less punitive approaches chiefly include drug courts and diversion programs. While both of these are necessary to support a multifaceted approach to the problem, drug courts only reach a very small share of users.[4] Meanwhile, over 50% of prison and jail inmates meet the criteria for drug dependence or abuse (Bronson, 2017), but less than 15% receive treatment while incarcerated (Substance Abuse and Mental Health Services Administration, 2000), suggesting that in-prison treatment is rarely a viable alternative.[5] Drug diversion, which aims at disengaging the individual from the criminal justice system as early as possible (such as before they are ever charged with a crime) can therefore be especially valuable.[6]

Diversion programs related to narcotics have proliferated incredibly fast in recent years. As of early 2023, there were 617 police departments (up from 153 in 2017 (ICJIA, 2017)) across 40 states that run some form of non-arrest treatment linkage program (though participation numbers are unknown), and over 45 full-fledged post-arrest programs exist across the country (Beckett, 2014; LEAD Bureau, 2020), making diversion one of the most popular current policy levers to curbing drug use and increasing treatment access. Yet, causal evidence on the efficiency of non-arrest and non-charge diversion programs is currently lacking. The existing literature is largely correlational due to a number of policy characteristics that limit many programs' assessment potential.[7]

[4]For example, Chicago's drug court requires a guilty plea and a two-year probation period, making it a very resource-intensive and criminal justice system-involved approach (Evans, 2022). Additionally, it is only able to reach a few dozen people per year (Main, 2022).

[5]Additionally, pre-trial diversion programs may go a long way in addressing this larger systemic shortfall as well, since they are able to intervene much earlier than prison officials, and potentially decrease the demand for in-prison services, thereby increasing the odds of treatment access for those incarcerated on other charges.

[6]Other charges that often have a diversion program attached to them are those related to sex work (where diversion often takes the form of physical health care and housing and legal employment support) and charges for individuals with mental health disorders (who usually receive mental health care) (Anglin *et al.*, 2013; Collins *et al.*, 2017; Bird & Shemilt, 2019).

[7]Such policy characteristics include that most cities allow complete officer discretion in which arrestee has the opportunity to receive diversion (Beckett, 2014), which evidence in turns suggests will lead to diversions that depend on the officer's view of alternatives to prosecution (Worden & McLean, 2018; Schaible *et al.*, 2020), making those in the treatment and control group not identical; small sample sizes; and the use of propensity score weighting, which does not account for selection on unobservables.

Where small sample or correlational evidence is available on drug diversion programs, it is largely positive. In Seattle (Washington) and Fayetteville (North Carolina), diversion program participants were less likely to be re-arrested and in Seattle publicly funded legal costs went down (Collins *et al.*, 2017, 2019); in Contra Costa County (California), over half attended some treatment after being diverted; in San Francisco (California), misdemeanor arrests decreased, but citations increased (Collins *et al.*, 2017; Perry, 2018; Bastomski *et al.*, 2019; Malm *et al.*, 2020). Reaching a large population, and meeting sufficient levels of officer buy-in have been challenges in some diversion programs—Albany reported only 43 diversions in its first year, noting that officers believed the program was implemented too quickly, leading to low officer buy-in (Worden & McLean, 2018).

2.3 Drug Arrest Diversion in Chicago

Chicago experiences rates of opioid overdose (predominantly from illicit opioids—heroin and its derivatives) that are higher than both the state and national average (IDPH, 2017), and opioid-related deaths in Chicago well over doubled between 2013 and 2018 (IDHS 2017, CDPH 2019).[8] The U.S. Department of Justice's Drug Enforcement Agency has assessed that Chicago serves as the primary distribution hub for opioids and other illegal drugs in the Illinois, Indiana, and Wisconsin region, with the West Side of Chicago being the region's most significant opioid market, easily accessed via Interstate 290, also called the *heroin highway* (DEA, 2017).[9] This fact is reflected in the geographic concentration of calls for service and deaths related to opioid overdoses within Chicago, as shown in Figure A2.

The Narcotics Arrest Diversion Program (NADP) emerged as a direct response to the spread of the opioid epidemic within Chicago. The program focuses on averting negative

[8]The age-adjusted death rate in 2016 was 21.7 per 100,000 in Chicago and 14.7 in Illinois. Figure A4 shows trends in annual age-adjusted opioid overdose death rates for Illinois and the U.S. between 2000 and 2018. As of 2018, Chicago accounts for 37% of all opioid overdoses in the state of Illinois (NIDA 2020, CDPH 2019). Preliminary data analysis suggests that both the overall counts in the city and state, as well as the proportion accounted for by Chicago have increased in 2020 (Sanchez & Eldeib, 2020).

[9]The West Side is also home to a large open-air drug market. For more details about open-air drug markets in the country see Harocopos & Hough (2012). See Chicago High Intensity Drug Trafficking Area (2009) for more details about drug dealing and trafficking in Chicago specifically.

downstream consequences by addressing the causes of substance use through supportive, rather than punitive, interventions. District 11, home to three of five neighborhoods most impacted by the epidemic, was selected to be the first site, which in mid-2018 began to connect eligible individuals arrested for drug possession to a Chicago Police Department-approved substance use counselor in lieu of criminal charges. By the end of 2020, NADP had expanded to three neighboring districts, District 10, 15, and 25; and then to the rest of the city by the end of 2021. Figures A5 and A6 outline the expansion of the NADP in detail.[10] Today, NADP is the largest criminal justice system-led drug arrest diversion effort across America.[11]

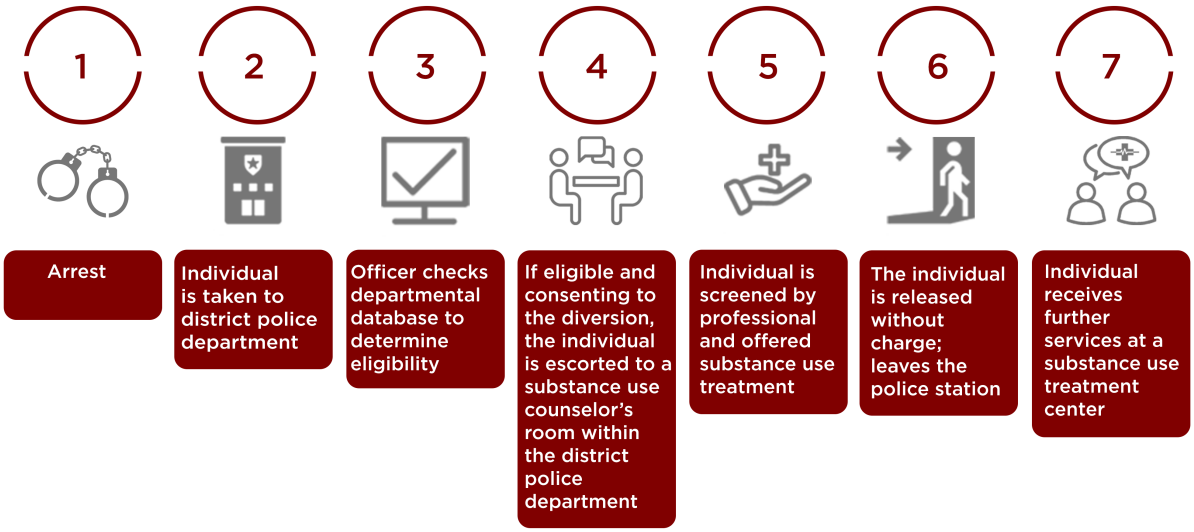
The program is implemented in participating districts as follows. When an individual is arrested for the possession of narcotics or cocaine, they are taken in to the police station for processing, and placed in lockup. Then, the arresting officer evaluates whether the individual qualifies for the diversion program. The complete list of qualifying and disqualifying characteristics are listed in Figure A1. These include that they must be at least 18 years of age, be arrested with one gram or less of the drug in question, and have a valid form of legal identification. For comparison, 1 gram of heroin is about 1.3 to 2 days worth of substance for someone with a severe substance use disorder (Addiction Center, 2021). Individuals are ineligible if they are charged with a violent crime in association with the narcotics charge, are being charged with another felony, are being charged with a misdemeanor involving a victim, or have a conviction for a violent felony, illegal possession of a firearm, or a sex offense.

Next, if the individual qualifies for diversion, they are asked if they are interested in receiving substance use treatment. If they consent, they are connected with the treatment provider—crucially, located inside the police station. If they do not consent, they are processed as they otherwise would be without the program's presence. During this introductory meeting with the substance use counselor, the individual is assessed for service eligibility, which consists of assessing whether they have a substance use disorder. In the rare case where they do not,

[10]Figure A7 provides additional information on violent crime across CPD districts.

[11]To the best of our knowledge, the only other large (population>1,000,000) cities with narcotics arrest diversion programs are Los Angeles, Philadelphia, and Phoenix, and each of them have served fewer individuals than NADP has in Chicago.

Figure 1: The Diversion Process



Source: Chicago Police Department. Department Notice D18-03.

they are processed as they would otherwise be. The conversation, which lasts about one hour, opens with the provider going through some basic questions to ask the individual how they are doing in that moment, about their housing and other circumstances, their drug use currently and in the past, and their potential experiences with overdose and Naloxone. Then, once the provider has a clear understanding of the individuals circumstances and needs, the provider and the individual have an active exchange about what kind of services the individual might be most interested in. This could involve medication assisted treatment, inpatient treatment, outpatient treatment, and additional potential wraparound services, such as housing or employment assistance. Lastly, the provider offers to connect the individual with the most appropriate substance use treatment service. This usually involves one of two outcomes: the individual is offered substance use treatment by the main treatment provider, Thresholds; or is referred out to another treatment provider—in the latter case the provider is chosen based on the individual's potential prior engagement with an alternative agency, proximity to their home address, or other considerations. Once the provider is identified, the individual is offered to be taken to a treatment center directly from the police station, or

they can opt to go home and attend an appointment scheduled for the following days. Both Thresholds and the alternative agencies provide drug-assisted de-addiction services, but also attempt to connect individuals with services such as housing and insurance enrollment.

Finally, the diverted individual is officially removed from lockup, and is released without charge. Those who are not diverted are transported to court for further processing at the Cook County courthouse. The diversion process from a qualifying individual's perspective is summarized in Figure 1.[12] Importantly, the two parts of the diversion process—having a conversation with a substance use counselor and being released without charge—always and exclusively occur together; one cannot take place without the other.

Figure 2: The Criminal Justice System Process



Source: District of Columbia Statistical Analysis Center (2017).

NADP is innovative compared to preexisting diversion programs in three ways. First, it places substance use treatment providers directly in police stations, offering the opportunity for warm hand-off, a broadly recommended behavioral health approach (Pace *et al.*, 2018). Second, it does not include the threat of deferred prosecution—in Chicago, diverted individuals are released without charge, and without the threat of future prosecution.[13] Figure 2 captures at what moment within criminal justice system processing does NADP offer a route out of the criminal justice system for the individual. Third and final, eligibility for diversion is determined at the program's onset, rather than officers making a case-by-case determination.

[12] See Figure A5 for district-specific expansion details.

[13] Deferred prosecution—where officers still file charges with the prosecutor's office, but charges are deferred as long as individuals fulfill city-specific treatment-related criteria—exists in most drug diversion programs, such as in Seattle, Santa Fe, San Francisco, and Albany, among other cities (Collins *et al.*, 2017; New Mexico Sentencing Commission, 2018; Worden & McLean, 2018; Malm *et al.*, 2020).

Overall, NADP changes how we think about alternatives to prosecution. It allows understanding whether long-term, active, and costly criminal justice monitoring (often in some form of deferred prosecution) is a necessary component of non-conviction and non-incarceration for certain types of crimes and for certain populations. At the same time, it also allows testing how crucial the immediate offer of alternatives is in advancing the well-being of arrestees and of their communities.

Our empirical strategy compares outcomes for individuals arrested for narcotics possession in districts with and without the NADP, pre- and post-program implementation. We also exploit additional layers of variation that result from individual-level variation in eligibility. Our treatment is defined as to whether someone meets the eligibility criteria—that is, Step 3 of Figure 1, meaning we measure the intent-to-treat estimate. We consider the following outcomes. At the individual level, we consider the direct impact of the program—whether an individual is connected with an on-site counselor and released without charge—and the impact of the program for eligible individuals on downstream criminal justice involvement, including future arrests for drug crime, property crime, and violent crime.

3 Data

We rely on three data sources, described in detail below.

Chicago Police Department Data. To measure eligibility for diversion, whether an individual is released without charge, as well as arrests following diversion, we rely on data from the Chicago Police Department (CPD). These data include descriptive information about both the offense and the individuals involved in criminal arrests within the city of Chicago.

Thresholds Data. To track whether individuals are connected with counselors following diversion, we rely on the service provider Thresholds' data. This data is restricted to individuals that consent to having their health information included in the study, and includes participant

demographics, substance use history, and length of engagement with Thresholds' counselors.

Cook County Sheriff's Office Data. We use this dataset to measure pre-trial incarceration (including electronic monitoring) as well as misdemeanor sentences served in Cook County jails. These records are merged with CPD data using Identification Record (IR) numbers, a fingerprint-based method of identifying arrestees.

Cook County Medical Examiner Data. To track the impact of drug arrest diversion on fatal overdoses, we obtained death records from the Cook County Medical Examiner's Office via a Freedom of Information Act (FOIA) request. This dataset includes case level information about deaths between 2010 and 2022 within Cook County, including name, date of birth, demographic information, cause of death, date, and location of the incident. These records are merged with CPD data using name and date of birth.

CPD Beat Officer Survey Data. To assess opinions about the NADP among CPD officers, an in-person survey was conducted in District 11 in June 2019. At this point, the program had been operational for one year. Respondents comprised of 115 beat officers—those who patrol and make arrests—and responses were anonymized. Opinions gathered through the survey are used to assess how officers implementing the diversion program perceive its benefits and drawbacks, and how many were implementing it with fidelity.

4 Empirical Strategy

This section describes the difference-in-difference-in-differences (DDD) framework used to identify the impact of arrest diversion on subsequent criminal justice involvement and health outcomes. This technique compares drug arrests eligible for diversion with those that were ineligible, before and after the expansion of the diversion program into each CPD district. The DDD estimate relies on the assumption that in the absence of the NADP, the difference in outcomes between eligible and ineligible individuals in treatment districts would have evolved

similarly to that in control districts.

Central Specification

Figure A5 specifies when police officers were trained in how to implement the NADP in their respective CPD districts. This information is used to estimate the following equation:

$$Y_{i,d,t} = \beta_0 + \beta_1 Elig_i * Treat_d * After_{dt} + \gamma_{ed} + \gamma_{dt} + \gamma_{et} + \varepsilon_{i,d,t}$$

$Y_{i,d,t}$ is a criminal justice or health outcome for individual i in district d in year t. Eligibility-district interactions γ_{ed} allow for permanent differences between eligible and ineligible individuals in different districts. Eligibility-time interactions γ_{et} control flexibly for trends that may affect eligible individuals more or less than those ineligible for diversion in Chicago. District-time interactions γ_{dt} control flexibly for factors changing at the district-time level that could affect the outcome of interest. Since treatment varies at the individual level, standard errors are clustered at the individual level to account for serial correlation in the outcome variable.

β_1 captures the impact of having NADP-trained patrol officers on our outcomes of interest. $Elig_i$ is an indicator variable that equals one for individuals eligible for diversion under the NADP. $Treat_d$ is an indicator variable that equals one if district d trained its patrol officers on how to implement the NADP within its boundaries during the study period 2010-2020. $After_{dt}$ is an indicator variable that equals one if NADP-trained officers were patrolling within district d's boundaries in period t.

Event Study Specification

In order to examine the year-by-year impact of the NADP expansion, we use the following event study specification:

$$Y_{i,d,t} = \textstyle\sum_{\tau \geq -n} \beta_\tau Elig_i * Treat_d * After^{\tau}_{dt} + \gamma_{ed} + \gamma_{dt} + \gamma_{et} + \varepsilon_{i,d,t}$$

$Y_{i,d,t}, \gamma_{ed}, \gamma_{dt}$ and γ_{et} are defined exactly as above. $After^{\tau}_{dt}$ are indicator variables that equal one if the NADP training was implemented in district d exactly τ years before period t. For

instance, District 11 trained its officers in how to implement the NADP in June 2018, so $After^1$ indicator equals one for District 11 during June 2018 - May 2019, the $After^2$ indicator equals one for District 11 during June 2019 - May 2020, and so on. τ can take on negative values, which allows us to test for (and rule out) differences prior to the policy's implementation.

5 Descriptive Evidence

In this section, we present descriptive evidence about individuals connected with substance use treatment by the NADP, and CPD officers' impressions of the diversion program. Overall, we find that the program is able to reach those with medically diagnosed substance use disorders and enjoys the support of CPD officers.

5.1 Individuals Connected With Treatment by NADP

To understand who is connected with substance use treatment by the NADP, and how long they continue to engage with counselors, we rely on data collected by Thresholds, the service provider embedded with the District 11 station. We are only able to observe this information for individuals that consented to sharing their health data with the research team until the end of 2019. In total, we are able to analyze data on 263 individuals that were diverted by CPD and 38 individuals that walked in for treatment. The latter group is not the main focus of the analysis, but provides a useful benchmark against which to compare treatment take-up and engagement rates among those who are diverted by CPD—i.e. those who did not seek out substance use treatment themselves.[14]

Column (1) of Table 1 summarizes descriptive statistics of program participants—78% of diverted individuals are men, 61% Black, and on, average, 48 years old. 34% report being employed and 12% report living in a shelter or on the street. 87% reported using heroin in the year prior to their screening interview, and among those who did, 79% used it daily. When

[14]Our analysis does not include individuals who needed to be taken to the hospital because of the severity of their withdrawal symptoms, as those individuals were not eligible for diversion under NADP.

Table 1: Individuals Connected With Treatment

	Diverted (1)	Walk-in (2)
Served by Any Treatment Provider		
Male	0.78	0.71
Average age	47.51	48.53
Employed	0.34	0.16
Black	0.61	0.76
Lives in shelter or on the street	0.12	0.37
Currently experiencing withdrawal symptoms	0.39	0.31
Used heroin in the past year	0.87	0.79
Heroin use frequency: Daily	0.79	0.93
Age when first used heroin	26.73	25.17
Ever overdosed	0.34	0.43
Overdosed in the past year	0.14	0.24
Ever had Naloxone administered to them	0.29	0.38
Observations	263	38
Served by the Main Treatment Provider (Thresholds)		
Medically diagnosed substance use disorder	0.89	0.90
Medically diagnosed mental health disorder	0.21	0.40
Starts treatment	0.79	1.00
In treatment for 30 days or longer	0.52	0.83
In treatment for 60 days or longer	0.43	0.50
In treatment for 90 days or longer	0.31	0.50
Average days in treatment	122.31	115.17
Attends therapy	0.57	0.90
Observations	47	20

Note: Total observations between July 2018 - December 2019 are reported; some variables have missing values. Variables "Heroin use frequency: Daily" and "Age when first used heroin" are only available for those who reported heroin use in the past year. Variables under the "Served by Thresholds" section are available only for those who were offered services by Thresholds, rather than having been referred out to other providers. Variable "Medically diagnosed mental health disorder" refers to additional disorders outside of substance use disorder. Variable "Attends therapy" refers to an individual taking part in at least one one-on-one therapy session, group therapy session, or a meeting with a psychiatrist. Data Source: Thresholds.

assessed, 89% of respondents were classified as meeting the medical criteria for a substance use disorder, most often for heroin. Notably, 21% also met the criteria for at least one mental health disorder beyond the substance use disorder, with the two leading disorders being depression and bipolar disorder.

After completing the screening, the counselor, who is associated with the main substance use treatment organization, Thresholds, refers individuals for treatment to counselors within

their own organization or to other organizations working in the substance use treatment field in Chicago. 18% of consenting individuals are referred to Thresholds during the study period. The substance use treatment offered by Thresholds is similar to what treatment provision usually looks like. Thresholds offers outpatient services only, occasionally offers medication assisted treatment (using buprenorphine, brand name Suboxone), if warranted, and has a strong focus on providing wraparound services related to housing, along with substance use treatment. They also put large emphasis on follow up, regularly reaching out to individuals to ensure sustained support. Overall, these characteristics make Thresholds a broadly typical provider—rather than, for example, an exceptionally service-intensive one—, suggesting that the type of treatment access discussed in this paper is scale-able to other cities. In terms of treatment costs, individuals on Medicare, Medicaid, or private insurance pay their own way, while the uninsured's costs during the study period are covered by a federal grant. On the long term, cities would need to expect to cover treatment costs for the uninsured—as shown before, resulting in a much lower public cost then criminal justice processing.

For individuals referred to Thresholds, there is additional information available on their subsequent engagement with treatment. 79% enroll in the treatment program, with 52% being actively enrolled (attending therapy sessions and meetings with counsellors) for at least 30 days.[15] The retention rate at 30 days—a measure often used to assess substance use program success—places the program into a similar success range as substance use treatment programs in general, where engagement rates vary between 53-83%, depending on the context (Condelli *et al.*, 2000; Petry & Bickel, 2000; Arfken *et al.*, 2001; Dakof *et al.*, 2001). This is especially encouraging given that the program connects individuals who are not actively seeking treatment with de-addiction services, without any threat of legal ramifications for non-compliance.

[15]We base the treatment engagement end date on the last date the individual attended a service. This is a stringent definition, as it excludes days when counselors conducted repeated attempts to get in contact with the diverted individual, before the person was officially deemed closed to services. We calculate average days of engagement based on the subset of individuals who are already closed to services.

5.2 CPD Beat Officer Survey

In June 2019, after the program had been active in District 11 for a year, 115 beat officers from District 11 were surveyed to understand if and how they valued the program. 86% of officers reported that did not believe that arrest discouraged future use.[16] The majority of officers were clear on which arrestees were eligible for the NADP. When asked about the benefits of the NADP, the most popular answers were that it could support community relationship development, redirect officer time to other public safety matters, and reduce substance use in the community. As a suggestion for program improvement, officers mentioned the expansion of the program to the rest of the city, which is now underway.

One year into the implementation of the program, 18% had detained someone who was referred to treatment via the program. 40% had shared information about CPD's alternatives to arrest with the public, with the vast majority of the 40% doing so while on duty.

6 Results

In this section, we present intent-to-treat estimates of the causal impact of the NADP on individuals eligible for diversion.[17] We find that the program increases connections with substance use counselors and the probability of being released without criminal charges. Re-arrest rates fall, including a 15% reduction in the probability of being re-arrested for drug

[16]This finding is not unique to the Chicago context. Survey evidence from Baltimore, for instance, shows that officers do not believe that arrest is an effective way to discourage drug use (Rouhani *et al.*, 2019).

[17]Figure A1 summarizes the eligibility criteria for diversion under NADP. There are at least three reasons why take-up might not be perfect, creating a wedge between the intent-to-treat and treatment-on-treated estimates. First, individuals were diverted only if the counselor assessing them determined that they would benefit from a substance use program. This is not a large concern because the implementation agency (Thresholds) reported that this never occurred. They found that every person was engaging enough with substances to benefit from the program. This is in line with a finding described below in Table 1—89% of consenting participants met the medical criteria for a substance use disorder. Second, when an individual was offered diversion, they could potentially opt to not participate, and elect to be charged with the crime of possession, and be taken to bond court the following morning. It was exceedingly rare for a person to decline participation; in the first 1.5 years of implementation, there were only 2 such individuals. Third, some individuals that were eligible did not get diverted because some police officers may not have known about the program, or on-site counselors were not available between the time of arrest and the arrival of the county bus that transports individuals to bond court every morning.

charges, indicating that the program may be chipping away at the demand for drugs, and a 17% reduction in the probability of being re-arrested for violent charges, indicating that the program also improved public safety.

6.1 Direct Impact

In this section, we discuss the impact of the program on the probability that an eligible individual was screened and diverted by a Thresholds counselor following a narcotics arrest. Our estimation sample includes all arrests that include drug charges in Chicago between 2010-20. To minimize issues with conventional DDD estimators with staggered treatment dates, we first focus on District 11 and eighteen control districts. These estimates are informative about the program's impact in its initial implementation site.

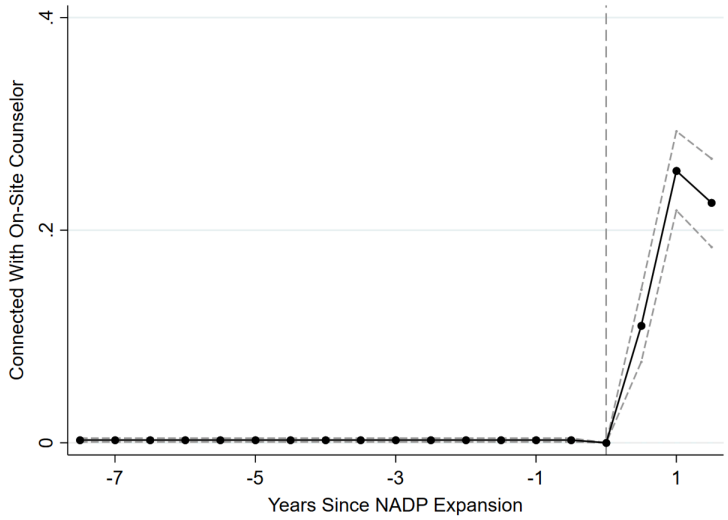
Panel A of Figure 3 shows that when we compare eligible drug arrests with ineligible drug arrests, we observe a sharp, pronounced increase in the probability of being connected with the treatment provider (Thresholds) after the start of the program. The probability of meeting with the treatment provider significantly increases for all observed periods. Column (1) of Table 2 shows a precisely estimated increase of 18 percentage points in the probability of being connected with a counselor in District 11. Table A4 shows that these results are robust to addressing methodological concerns around three-way fixed effects designs, by showing that the Borusyak *et al.* (2021) estimator produces near-identical point estimates.

Parallel with treatment linkage, Column (2) shows a sharp increase in being released without charge, with a 25 percentage point increase for eligible arrests compared to ineligible ones. Panel B of Figure 3 shows that by the end of the study period, the probability of being released without charges was near 40%.[18] These estimates are higher than those observed in column (1) as we are only able to observe health data for individuals that were diverted *and* consented to sharing their health data, and the data used in column (1) cease at the end of 2019.

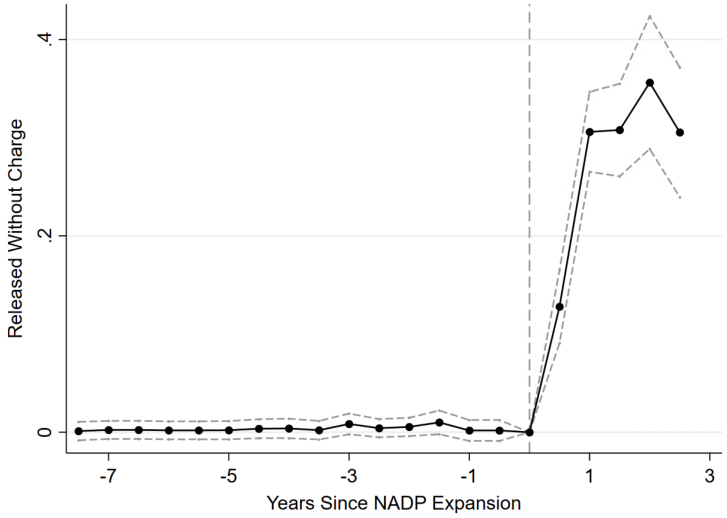
[18]Outside of the NADP, being released without charge following a drug arrest is exceedingly rare. Prior to 2018, 0.07% of drug arrests were released without charge in District 11, and 0.09% citywide. See the parallel trends in Figure A8.

Figure 3: Direct Impact of Drug Arrest Diversion

Panel A: Connection with a Counselor + Consent to Share Health Data



Panel B: Release Without Criminal Charge



Notes: These figures display DDD point estimates and 90% confidence intervals of the impact of the NADP using drug arrests between 2010-2020 in District 11 and eighteen control districts. Regressions include district-year, year-eligibility, and eligibility-district fixed effects, and standard errors are clustered at the individual level. Data Sources: Chicago Police Department, Thresholds.

Table 2: Direct Impact of Drug Arrest Diversion

	(1)	(2)
	Dependent Variable:	*Dependent Variable:*
	Connected with On-Site Counselor	*Released Without Charge*
Estimate	0.177***	0.251***
	(0.012)	(0.013)
Mean	0.002	0.005
Untreated Eligible Mean	0.000	0.002
N	123,194	127,815
Districts Excluded	10, 15, 25	10, 15, 25

Notes: This table displays the estimated impact of drug arrest diversion using drug arrests between 2010-2020 in District 11 and eighteen control districts. Regressions include district-year, year-eligibility, and eligibility-district fixed effects. Standard errors are clustered at the individual level, and reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Source: Chicago Police Department, Thresholds.

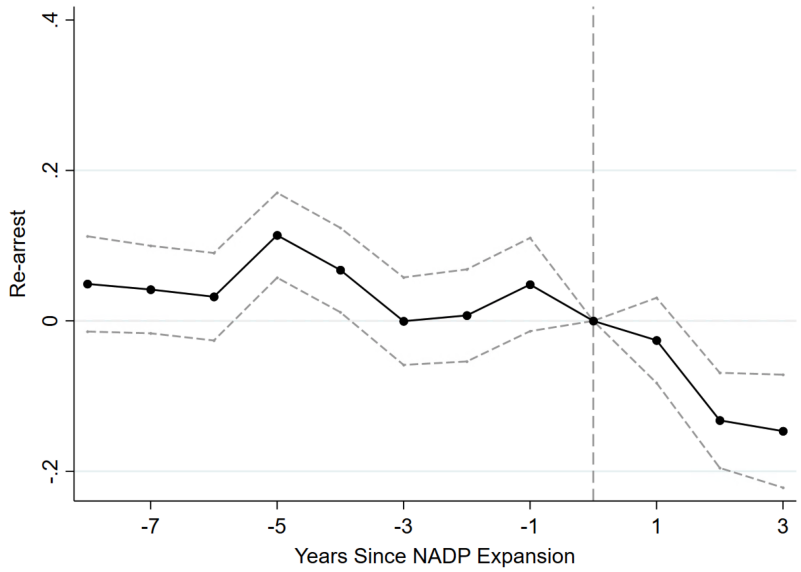
6.2 Recidivism

In this section, we discuss the impact of the NADP on the probability that an eligible individual was re-arrested following the initial drug arrest. We find that compared to the treatment group, those eligible for diversion were significantly less likely to be rearrested in the subsequent years, as seen in Figure 4. Table 3 shows that this effect is present for arrests for drug charges, for violent charges, and for other charges. Overall, eligible individuals are 6.4 percentage points less likely to be arrested for a drug offense, 3.4 percentage point less likely for violent offenses, and 8.8 percentage point less likely for other offenses; these amount to reductions of 15, 17, and 19% of their respective means. Column (2) shows that these results are robust to addressing methodological concerns around three-way fixed effects designs, by showing that the Borusyak *et al.* (2021) estimator produces near-identical point estimates.

6.3 Program Expansion

After the NADP had been active in District 11 for eighteen months, it was gradually expanded to District 10 in December 2019, and to Districts 15 and 25 in 2020. Using all four treatment

Figure 4: Impact of Drug Arrest Diversion on Recidivism



Notes: This figure displays DDD point estimates and 90% confidence intervals of the impact of drug arrest diversion using drug arrests between 2010-2020 in District 11 and eighteen control districts. Regressions include district-year, year-eligibility, and eligibility-district fixed effects, and standard errors are clustered at the individual level. Data Source: Chicago Police Department.

districts does not change our main findings—Columns (1) and (2) of Table 4 show that the increase in the probabilities of being connected with a counselor and being released without charge are positive, statistically significant, and very similar to those reported in Table 2. We also find similar negative and statistically significant impacts on subsequent arrests, shown in Table 5. To address concerns about DDD regressions with staggered treatment dates, we follow Borusyak *et al.* (2021), to our knowledge the only empirical correction offered to date for a triple difference design. Implementing this robust estimator, we find very similar point estimates and standard errors in columns (1) and (3) of Table A4, and in Panel B of Table 5.

Table 3: Impact of Drug Arrest Diversion on Recidivism

	(1)	(2)	(3)	(4)	(5)
Re-arrest charges:	*All*	*Drug*	*Violent*	*Property*	*Other*
			Panel A: DDD		
Estimate	-0.110***	-0.064***	-0.034**	-0.010	-0.088***
	(0.021)	(0.019)	(0.011)	(0.012)	(0.019)
Mean	0.624	0.425	0.198	0.120	0.466
Untreated Eligible Mean	0.607	0.423	0.127	0.150	0.423
			Panel B: Borusyak et al. *(2021) Imputation DDD*		
Estimate	-0.103**	-0.078***	-0.034**	-0.000	-0.085***
	(0.022)	(0.019)	(0.012)	(0.013)	(0.020)
Mean	0.624	0.425	0.198	0.120	0.466
Untreated Eligible Mean	0.719	0.536	0.278	0.154	0.558
N	127,815	127,815	127,815	127,815	127,815
Districts Excluded	10, 15, 25	10, 15, 25	10, 15, 25	10, 15, 25	10, 15, 25

Notes: This table displays the estimated impact of drug arrest diversion using drug arrests between 2010-2020 in District 11 and eighteen control districts. Regressions include district-year, year-eligibility, and eligibility-district fixed effects. Standard errors are clustered at the individual level, and reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Source: Chicago Police Department

Table 4: Direct Impact of Drug Arrest Diversion — Expansion

	(1)	(2)
	Dependent Variable:	*Dependent Variable:*
	Connected with On-Site Counselor	*Released Without Charge*
Estimate	0.176***	0.232***
	(0.012)	(0.012)
Mean	0.002	0.004
Untreated Eligible Mean	0.000	0.002
N	162,640	168,465
Districts Excluded	None	None

Notes: This table displays the estimated impact of drug arrest diversion using drug arrests between 2010-2020 in Chicago. Regressions include district-year, year-eligibility, and eligibility-district fixed effects. Standard errors are clustered at the individual level, and reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Source: Chicago Police Department, Thresholds.

Table 5: Impact of Drug Arrest Diversion on Recidivism — Expansion

	(1)	(2)	(3)	(4)	(5)
Re-arrest charges:	*All*	*Drug*	*Violent*	*Property*	*Other*
			Panel A: DDD		
Estimate	-0.089***	-0.055***	-0.026***	-0.001	-0.074***
	(0.018)	(0.016)	(0.009)	(0.011)	(0.017)
Mean	0.630	0.436	0.194	0.118	0.471
Untreated Eligible Mean	0.612	0.439	0.123	0.146	0.419
			Panel B: Borusyak et al. *(2021) Imputation DDD*		
Estimate	-0.085***	-0.068***	-0.028***	-0.008	-0.070***
	(0.018)	(0.016)	(0.009)	(0.010)	(0.017)
Mean	0.630	0.436	0.194	0.118	0.471
Untreated Eligible Mean	0.726	0.547	0.273	0.151	0.565
N	168,465	168,465	168,465	168,465	168,465
Districts Excluded	None	None	None	None	None

Notes: This table displays the estimated impact of drug arrest diversion using drug arrests between 2010-2020 in Chicago. Regressions include district-year, year-eligibility, and eligibility-district fixed effects. Standard errors are clustered at the individual level, and reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Source: Chicago Police Department.

6.4 Mechanisms

In this section, we discuss several mechanisms that may explain the findings. We present evidence that changes in police officer behavior, incapacitation, and being released without criminal charges are unlikely to explain the patterns we document. We argue that the results are most consistent with the increase in access to substance use treatment, both because of how well this approach identifies individuals who could benefit from treatment as well as prior literature that documents the crime-reducing benefits of expanded healthcare in a variety of contexts.

Changes in Policing. A potential explanation for the observed reduction in recidivism is that police officers are less likely to re-arrest someone that they know will end up being diverted. We argue that this explanation is unlikely to hold in our setting for four reasons.

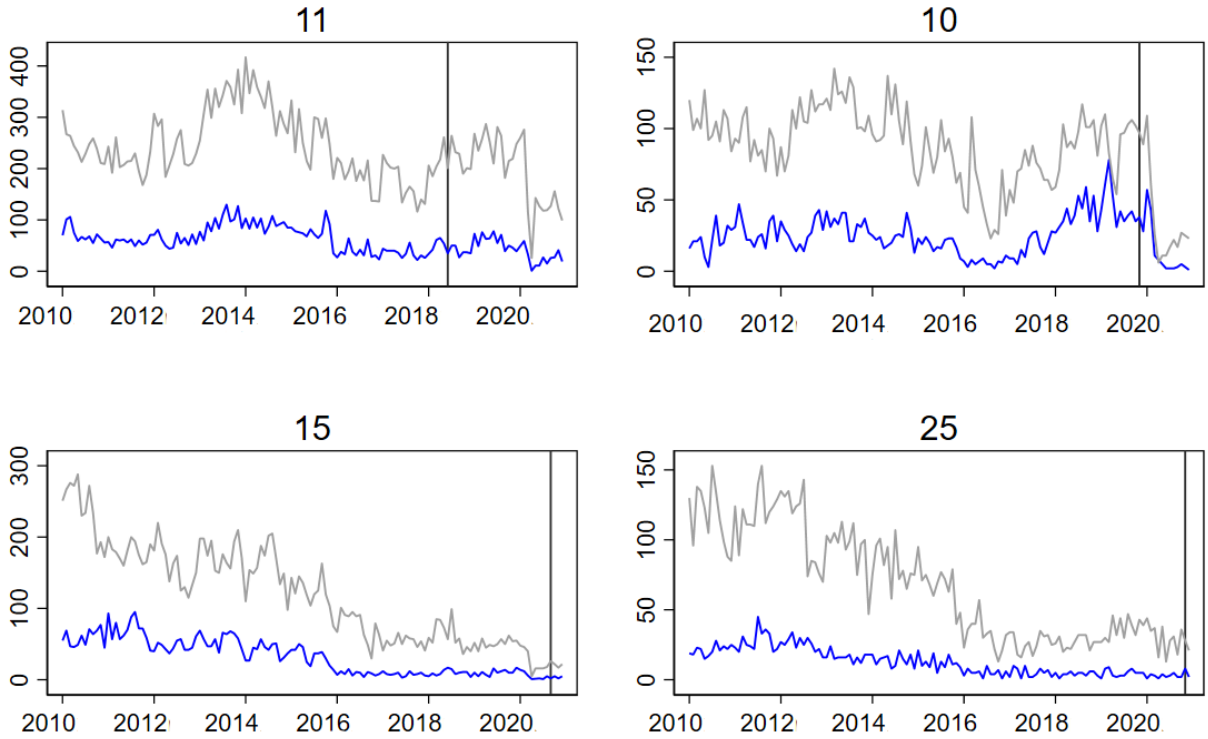
First, it is actually not possible for an officer to assess an individual's eligibility status prior to making an arrest. For instance, prior violent convictions render arrestees ineligible for diversion, but each individual's criminal history can only be determined via the departmental database which is located in police stations.[19]

Second, as Figure 5 shows, officers were no less likely to make eligible drug arrests relative to ineligible drug arrests after the program rolled out in each district. We also verify this using statistical tests – in District 11, for instance, the ratio of eligible to ineligible arrests was 0.228 in the year prior to the introduction of the program, and 0.225 in the year after. A t-test is unable to reject the hypothesis of equality of these two coefficients (p-value = 0.89).

Third, any degree of de-policing of all drug arrests would bias our estimates towards zero. This is because the vast majority (four-fifths) of drug arrests are *not* eligible for diversion, and

[19] One could also argue that police officers remember specific individuals that are eligible for diversion and have been diverted in the past, and are less likely to re-arrest them. However, for this to be the mechanism driving the results, the same officer would have to be the only officer that had the chance to interface with and re-arrest the individual over a period of 2.5 years (i.e. the length of our follow-up period). Additionally, this would require a substantial share of the diverted individuals having recurring eligible arrests, of which we see few in the data.

Figure 5: Eligible and Ineligible Arrests



Note: These graphs shows that the monthly count of eligible (blue) and ineligible (gray) arrests did not change discontinuously following the start of drug arrest diversion in each district (demarcated by the vertical line in each graph). The reduction in both eligible and ineligible drug arrests in early 2020 is explained by the COVID-19 pandemic. Source: Chicago Police Department.

de-policing would result in a reduction in recidivism for the comparison group as well in our regressions.

Fourth, arrest-avoidance behavior is not consistent with an officer survey conducted with 115 officers in District 11 in 2019, a year after the start of drug arrest diversion. The survey found that 86% of officers did not believe arrest discouraged drug use, and 72% agreed that diversion had at least one benefit (including the potential to reduce addiction, free up police time for other public safety matters, and improve community relations).

Incapacitation. Another channel that may drive the observed reduction in recidivism is incapacitation – i.e., diverted individuals are enrolled in inpatient services and cannot be re-

arrested, leading to a mechanical decrease in recidivism. This argument is inconsistent with how the program was implemented—the vast majority of diverted individuals were referred to outpatient services. Additionally, the recidivism reduction lasts well beyond treatment engagement (which averages 122 days); we show this explicitly by estimating very similar reductions in recidivism for three separate follow-up periods – ever, first 6 months post-arrest, and ever excluding the first 30 days – in Figure A9.

Criminogenic Impact of Jail Time. A third explanation for the estimated reduction in recidivism is not that diverted individuals are less likely to be re-arrested, but that comparison group individuals (i.e., the diversion-ineligible) are more likely to be re-arrested due to the criminogenic impact of jail time. This channel is unlikely to play a major role in our setting—as Table 6 and Figure A10 show, drug arrest diversion reduces the probability of jail time for those who are eligible for diversion, but this reduction is entirely driven by jail time of less than one day.[20] This is because the local prosecutor's office (the Cook County State's Attorney's Office) has deprioritized the prosecution of low-level drug offenses since the mid-2010s.[21] As a result, most low-level drug offenses end in non-prosecution at bond court the day following the arrest.

Release Without Criminal Charge. Prior research also shows that diversion alone (i.e., without an accompanying referral to or connection with services) can produce sizeable reductions in recidivism (Mueller-Smith & Schnepel 2020, Agan *et al.* 2021). These studies show that reductions in recidivism are driven by young, first-time defendants for whom diversion means no criminal record.

This mechanism may explain part of our findings but is unlikely to provide a full explana-

[20] Prior studies that document the crimonogenic impact of pre-trial jail incarceration include Gupta *et al.* (2016) and Dobbie *et al.* (2018), but the median length of incarceration is 200 days in the former, and pre-trial incarceration is defined as greater than 3 days by the latter.

[21] For more details, see https://www.themarshallproject.org/2019/10/24/the-kim-foxx-effect-how-prosecutions-have-changed-in-cook-county.

Table 6: Impact of Drug Arrest Diversion on Jail Time

	Any Jail Time	< 1 Day	≥ 1 Day
Estimate	-0.234***	-0.238***	0.003
	(0.018)	(0.023)	(0.017)
Mean	0.789	0.455	0.280
Unt. Elig. Mean	0.810	0.549	0.195
N	51,066	51,066	51,066

Notes: This table displays DDD estimates of the impact of drug arrest diversion on jail outcomes using drug arrests between 2015-2019 in Chicago. Regressions include district-year, year-eligibility, and eligibility-district fixed effects. Standard errors are clustered at the individual level, and reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Source: Chicago Police Department, Cook County Sheriff's Office.

tion for a few reasons. First, we document *larger* reductions for those with prior drug arrests (see Table 7 for point estimates). Second, as discussed above, the local prosecutor's office has deprioritized the prosecution of low-level drug offenses since the mid-2010s, which means that non-eligible arrests are also unlikely to end in prosecution. Third, the median age among diverted individuals is 48, indicating that our results are unlikely to be driven by young individuals who avoid a criminal record if they are diverted.

Table 7: Heterogenous Impacts of Drug Arrest Diversion

	Prior Drug Arrest	Prior Non-Drug Arrest	No Prior Arrest
Estimate	-0.120***	-0.086	-0.070
	(0.025)	(0.060)	(0.057)
Share of Arrests	0.696	0.134	0.170
DDD Estimate / Mean	-14.9%	-11.5%	-11.3%

Notes: This table displays DDD estimates of the impact of drug arrest diversion on three subsets of the data: individuals with prior drug arrests, individuals with prior arrests that do not include drug charges, and individuals with no prior arrests. The lookback period to compute prior arrests begins in 1999. Regressions include district-year, year-eligibility, and eligibility-district fixed effects. Standard errors are clustered at the individual level, and reported in parentheses. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Data source: Chicago Police Department.

Substance Use Treatment. In this subsection, we argue that connections with sub-

stance use treatment providers are likely to explain a lion-share of the reduction in recidivism. This is both because of who the program reaches, as well as prior work on the crime-reducing benefits of healthcare access.

Table 1 summarizes descriptive characteristics of individuals diverted between 2018 and 2019. 89% of diverted individuals met the medical criteria for a substance use disorder, and 68% reported using heroin daily. The age at first drug use was 27 while the age at diversion was 48, indicating that the program is not reaching casual, infrequent drug users, but those who could stand to substantially benefit from treatment. Additionally, diverted individuals face no sanctions if they do not return to start treatment. Despite this, 79% of individuals start treatment, and 43% remain engaged 60 days out. These numbers are comparable to those who self-select into (i.e., walk in for) treatment, displayed in the last column of Table 1. In sum, substance use treatment providers make efforts to continue to engage individuals well after the initial intake process.

Relatedly, a large literature consistently documents the recidivism-reducing impact of healthcare access. Batistich *et al.* (2021), Jacome (2021), and Deza *et al.* (2022) show that access to mental healthcare reduces crime; this is relevant to the present study because of the meaningful overlap of substance use disorder and mental illness, both nationally (Center for Behavioral Health Statistics and Quality, 2019) and in our sample (see Table 1). Wen *et al.* (2017), Bondurant *et al.* (2018), and Aslim *et al.* (2022) show that access to substance use treatment reduces crime. Wilson *et al.* (2006) review 55 experimental and quasi-experimental studies and conclude that court-mandated treatment programs ("drug courts") also reduce recidivism. Given that Kelly *et al.* (2017) find using a nationally representative sample that those who ever went through drug courts—other alternative pathways, such as diversion, were not asked on the survey—are more likely to continue seeking out and using support services during their recovery journey, diversion might be an especially promising path; marrying direct linkage with support with a substantially lower degree of criminal justice contact.

6.5 Robustness Checks

In this section, we discuss a number of robustness checks to rule out alternative explanations for the patterns documented above.

Drug Weight Distribution. To ensure that reported drug quantities are not manipulated up or down, we follow Tuttle (2019) and plot the distribution of drug weights in the 12 months prior to implementation and the first 12 months post-implementation in District 11 in Figure A11. We find no evidence of bunching around the 1 gram weight limit—the maximum limit for diversion eligibility—for individuals arrested with narcotics once NADP is active in District 11.

Smaller Samples of Drug Arrests. Next, we show that our results are robust to re-defining the study sample in two ways. Panel A of Table A5 shows our estimates using all drug arrests that include at least one *narcotics* charge. Panel B shows our estimates when we further restrict the sample to only include narcotics arrests that were eligible for diversion or ineligible for exactly one reason. This way, we create treatment and control samples that are as similar to each other as possible. We find that the point estimates do not change meaningfully, though statistical power falls because of the significantly smaller sample sizes.

Arrest by Charge Severity. To show that NADP is not just impacting low-level arrests, we also estimate the impact of the program on re-arrest for felony and misdemeanor charges. Table A6 shows that NADP reduces the probability of any felony re-arrest by 5.4-6.8 percentage points and the probability of any misdemeanor re-arrest by 7.8-9.3 percentage points. Estimates are negative and statistically distinguishable from zero irrespective of the sample (including/excluding Districts 10, 15, and 25) and estimator (conventional DDD / Borusyak *et al.* 2021 DDD) used.

6.6 Cost Benefit Analysis

How does diversion and treatment in lieu of prosecution fare when it comes to the necessary public funds to offer these services? We consider this question by assessing (or approximating, where exact numbers are not available) the costs of each approach.

We start with Mueller-Smith (2015)'s social cost estimate of $2,926 of processing drug possession offenses through the criminal justice system.[22] This estimate includes the cost of drug consumption, legal system costs, and productivity losses while individuals are incarcerated. We compare this with the cost of providing treatment based on the grant that funded the substance use counselors embedded in police stations between 2018 and 2022. During this time, 1,131 individuals were diverted by CPD into substance use treatment, and Thresholds received $662,578 for substance use counselors, administrative assistance, data collection, equipment, supplies, travel, and indirect costs. This amounts to an average cost of $586 per diverted individual, which easily outweighs the $2,926 cost of processing low-level drug offenses through the criminal justice system, making the program cost beneficial at a 5:1 ratio on direct costs alone. Adding in the benefits of reduced recidivism would tilt the scale even more in favor of expanding drug arrest diversion.

An alternative way to conduct the cost-benefit analysis is to estimate how much the public would be willing to pay for treatment that successfully addresses substance use disorders. Zarkin *et al.* (2000) find that the typical household in 2000 would be willing to pay between $15 and $37 per year, which amounts to $48,720-$120,930 per individual in 2018 USD. Assuming even 2% of diversions lead to successful treatment of substance use, this willingness-to-pay easily exceeds the cost of connecting individuals with substance use counselors within police stations ($\frac{\$586}{0.02} = \$29,300$).

[22] Specifically, we scale Mueller-Smith (2015)'s estimate of charged drug offenses of $2,544 in 2010 USD by 1.15 to reflect 2018 USD.

7 Conclusion

In 2016, as the outcome of a General Assembly Special Session, the United Nations recognized "drug dependence as a complex, multifactorial health disorder characterized by a chronic and relapsing nature with social causes and consequences that can be prevented and treated" (United Nations Office on Drugs and Crime, 2016). This is a starkly different language than the previous such special session used in 1998, which concluded that "drugs destroy lives [...] and generate crime" (Sischy & Blaustein, 2018). Facing a drug use challenge like few other nations, America has began ramping up non-punitive approaches to illicit drug purchase and use in the wake of the current opioid crisis. These included a reclassification of certain drugs' possession from felony to misdemeanor, decriminalization, or full legalization of some drugs (such as marijuana), and a more extensive control over access to legal opioids (such as through Prescription Drug Monitoring Programs). However, these approaches were not able to tackle a persistent and fundamental challenge—that only one in ten drug users receive treatment services, without which recovery is exceptionally challenging. Treatment is severely under-supplied and under-accessed inside criminal justice institutions, as well (Bronson, 2017; Substance Abuse and Mental Health Services Administration, 2000). Drug diversion, which at once removes criminal justice consequences and adds a direct linkage to treatment, is therefore especially promising as an avenue in tackling the epidemic.

Chicago's Narcotics Arrest Diversion Program is currently the largest opioid diversion program in the U.S. Operated by the nation's second largest police department, the program has been diverting eligible individuals on the Westside of Chicago since mid-2018. While the program started in District 11, home to the highest number of drug arrests in Chicago and one of the nation's few remaining open air drug markets, support from the Chicago Police Department and the Mayor's Office has led to the city-wide expansion of the program by the end of 2021.

As a result of the ongoing public agency collaboration and the academic evidence offered by an earlier version of this working paper (from November 2021), the Mayor's Office of Chicago

substantially expanded eligibility for the diversion program in May 2022. The expansion—not the subject of this study due to the program already being city-wide at the time—nearly doubled the number of eligible individuals through making almost all other drug types (such as methamphetamine, PCP, and Ecstasy) eligible, increasing drug weight from one to two grams, and making only violent and adjacent convictions within the past ten years, rather than ever, a disqualifying characteristic.

Descriptive evidence indicates that the program is well-targeted. It serves individuals with very high rates of medically diagnosed substance use disorders, who could substantially benefit from participation in substance use treatment and counseling. Despite the fact that the program connects individuals who are not actively seeking treatment with counselors, we observe treatment engagement length similar to that documented in contexts where treatment is actively sought out by individuals themselves. The substance use treatment provided to participants is similar to what providers across the country supply, suggesting that a treatment-centric drug diversion approach can be successfully implemented elsewhere as well. Further, survey evidence indicates that the program enjoys favorable opinions among CPD beat officers; 4 out of 5 officers do not consider arrest to be helpful in discouraging future drug use, and a large majority consider the NADP to have several benefits, including the potential to reduce substance use and demand for drugs, and improve police-community relations.

In this study, we use a difference-in-difference-in-differences framework to assess the impact of diversion on eligible individuals, using the staggered rollout of the program across Chicago districts as well as the individual-level eligibility criteria for diversion. We find that counselor connections increase following the start of the program, and so do the number of individuals who are released without criminal charges. Subsequent re-arrest rates drop substantively, driven by a drop in arrests for drug, violent, and other non-property charges. Overall, these findings indicate that it is possible to proactively connect those with opioid use disorders, particularly those with severe substance use disorders, with de-addiction treatment, reduce the reach of the criminal justice system, and simultaneously increase public safety. Drug

diversion appears to hold immense promise as a policy solution to address the ongoing opioid epidemic and its associated costs.

References

Addiction Center. 2021. *How Much Do Drugs Cost: The Steep Price of Addiction*. https://www.addictioncenter.com/drugs/how-much-do-drugs-cost/.

Agan, Amanda Y., Doleac, Jennifer L., & Harvey, Anna. 2021. *Misdemeanor Prosecution*. Tech. rept. National Bureau of Economic Research.

Ali, Mir M., Teich, Judith L., & Mutter, Ryan. 2017. Reasons for Not Seeking Substance Use Disorder Treatment: Variations by Health Insurance Coverage. *The Journal of Behavioral Health Services & Research*, **44**(1), 63–74.

Anglin, M. Douglas, Nosyk, Bohdan, Jaffe, Adi, Urada, Darren, & Evans, Elizabeth. 2013. Offender Diversion Into Substance Use Disorder Treatment: The Economic Impact of California's Proposition 36. *American Journal of Public Health*, **103**(6), 1096–1102.

Arfken, Cynthia L., Klein, Chris, di Menza, Salvatore, & Schuster, Charles R. 2001. Gender Differences in Problem Severity at Assessment and Treatment Retention. *Journal of substance abuse treatment*, **20**(1), 53–57.

Aslim, Erkmen, Mungan, Murat C., Navarro, Carlos I., & Yu, Han. 2022. The Effect of Public Health Insurance on Criminal Recidivism. *Journal of Policy Analysis and Management*.

Bastomski, Sara, Cramer, Lindsey, & Reimal, Emily. 2019. Evaluation of the Contra Costa County Law Enforcement Assisted Diversion Plus Program. 74.

Batistich, Mary Kate, Evans, William N., & Phillips, David C. 2021. Reducing Re-arrests through Light Touch Mental Health Outreach. *Working Paper*.

Beckett, Katherine. 2014. Seattle's Law Enforcement Assisted Diversion Program: Lessons from the First Two Years. 52.

Belenko, Steven, Patapis, Nicholas, & French, Michael. 2005. Economic Benefits of Drug Treatment: A Critical Review of the Evidence for Policy Makers | Office of Justice Programs. *U.S. Department of Justice Office of Justice Programs*, Feb.

Bird, Karen Schucan, & Shemilt, Ian. 2019. The Crime, Mental Health, and Economic Impacts of Prearrest Diversion of People with Mental Health Problems: A Systematic Review. *Criminal Behaviour and Mental Health*, **29**(3), 142–156.

Bondurant, Samuel R., Lindo, Jason M., & Swensen, Isaac D. 2018. Substance Abuse Treatment Centers and Local Crime. *Journal of Urban Economics*.

Borusyak, Kirill, Jaravel, Xavier, & Spiess, Jann. 2021. Revisiting Event Study Designs: Robust and Efficient Estimation.

Bronson, Jennifer. 2017. Drug Use, Dependence, and Abuse Among State Prisoners and Jail Inmates, 2007-2009. 27.

Caulkins, Jonathan P., Gould, Anne, Pardo, Bryce, Reuter, Peter, & Stein, Bradley D. 2021. Opioids and the Criminal Justice System: New Challenges Posed by the Modern Opioid Epidemic. *Annual Review of Criminology*, **4**(1), null.

CDC, National Center for Health Statistics. 2023. Provisional Drug Overdose Death Counts. *Vital Statistics Rapid Release*.

CDPH. 2019. 2018 Chicago Opioid Overdose Data Brief. *Chicago Department of Public Health Office of Epidemiology*.

Centers for Disease Control and Prevention. 2021. *Drug Overdose Deaths*. https://www.cdc.gov/drugoverdose/deaths/index.html.

Centers for Disease Control and Prevention. 2022 (July). *Overdose death rates increased significantly for Black, American Indian/Alaska Native people in 2020*. Tech. rept.

Chicago High Intensity Drug Trafficking Area. 2009. *Chicago High Intensity Drug Trafficking Area: Drug Market Analysis 2009*.

Collins, S.E., Lonczak, H. S., & Clifasefi, S. L. 2015a. LEAD program evaluation: Criminal justice and legal system utilization and associated costs. *University of Washington LEAD Evaluation Team, Harm Reduction Research and Treatment Lab*.

Collins, S.E., Lonczak, H. S., & Clifasefi, S. L. 2015b. LEAD program evaluation: Recidivism report. *University of Washington LEAD Evaluation Team, Harm Reduction Research and Treatment Lab.*

Collins, Susan E., Lonczak, Heather S., & Clifasefi, Seema L. 2017. Seattle's Law Enforcement Assisted Diversion (LEAD): Program Effects on Recidivism Outcomes. *Evaluation and Program Planning*, **64**(Oct.), 49–56.

Collins, Susan E., Lonczak, Heather S., & Clifasefi, Seema L. 2019. Seattle's Law Enforcement Assisted Diversion (LEAD): Program Effects on Criminal Justice and Legal System Utilization and Costs. *Journal of Experimental Criminology*, **15**(2), 201–211.

Condelli, Ward S., Koch, Matthew A., & Fletcher, Bennett. 2000. Treatment Refusal/Attrition among Adults Randomly Assigned to Programs at a Drug Treatment Campus The New Jersey Substance Abuse Treatment Campus, Seacaucus, NJ. *Journal of Substance Abuse Treatment*, **18**(4), 395–407.

Dafny, Leemore S., Barrette, Eric, & Shen, Karen. 2022. Do Policies to Increase Access to Treatment for Opioid Use Disorder Work?

Dakof, Gayle A., Tejeda, Manuel, & Liddle, Howard A. 2001. Predictors of Engagement in Adolescent Drug Abuse Treatment. *Journal of the American Academy of Child & Adolescent Psychiatry*, **40**(3), 274–281.

DEA. 2017. The Opioid Threat in the Chicago Field Division. *Drug Enforcement Authority Intelligence Report DEA-CHI-DIR-023-17.*

Deza, Monica, Maclean, Johanna Catherine, & Solomon, Keisha. 2022. Local Access to Mental Healthcare and Crime. *Journal of Urban Economics.*

District of Columbia Statistical Analysis Center. 2017. Brief: Diversion and Deflection in the District of Columbia. **2**(1).

Dobbie, Will, Goldin, Jacob, & Yang, Crystal S. 2018. The Effects of Pretrial Detention on Conviction, Future Crime, and Employment: Evidence from Randomly Assigned Judges. *American Economic Review.*

Evans, Timothy C. 2022. *Rehabilitation Alternative Probation/ Women's Rehabilitation Alternative Probation (W)RAP Drug Treatment Program Participant Handbook.*

Gramlich, John. 2022 (Jan.). *Recent surge in U.S. drug overdose deaths has hit Black men the hardest.*

Gupta, Arpit, Hansman, Christopher, & Frenchman, Ethan. 2016. The Heavy Costs of High Bail: Evidence from Judge Randomization. *The Journal of Legal Studies.*

Harocopos, Alex, & Hough, Mike. 2012. Drug Dealing in Open-Air Markets. *Center for Problem-Oriented Policing*, **No. 31**, 64.

Hayhurst, Karen P., Leitner, Maria, Davies, Linda, Flentje, Rachel, Millar, Tim, Jones, Andrew, King, Carlene, Donmall, Michael, Farrell, Michael, Fazel, Seena, Harris, Rochelle, Hickman, Matthew, Lennox, Charlotte, Mayet, Soraya, Senior, Jane, & Shaw, Jennifer. 2015. The Effectiveness and Cost-Effectiveness of Diversion and Aftercare Programmes for Offenders Using Class A Drugs: A Systematic Review and Economic Evaluation. *Health Technology Assessment (Winchester, England)*, **19**(6), 1–168, vii–viii.

Hefei, Wen, Hockenberry, Jason M., & Cummings, Janet R. 2017. The effect of Medicaid expansion on crime reduction: Evidence from HIFA-waiver expansions. *Journal of Public Economics.*

ICJIA. 2017. Rethinking Law Enforcement's Role on Drugs: Community Drug Intervention and Diversion Efforts. *Illinois Criminal Justice Information Authority Research and Analysis Publications.*

IDHS. 2017. The Opioid Crisis in Illinois: Data and the State's Response. *Illinois Department of Health Services, DHS 4489 (N-05-17).*

IDPH. 2017. 2017 State of Illinois Comprehensive Opioid Data Report. *Illinois Department of Public Health.*

Jacome, Elisa. 2021. Mental Health and Criminal Involvement: Evidence from Losing Medicaid Eligibility. *Working Paper.*

Kelly, John F., Bergman, Brandon, Hoeppner, Bettina B., Vilsaint, Corrie, & White, William L. 2017. Prevalence and Pathways of Recovery from Drug and Alcohol Problems in

the United States Population: Implications for Practice, Research, and Policy. *Drug and Alcohol Dependence*, **181**(Dec.), 162–169.

LEAD Bureau. 2020. *LEAD Programs | LEAD National Support Bureau | United States.* https://www.leadbureau.org.

Lipari, Rachel N. 2019. Key Substance Use and Mental Health Indicators in the United States: Results from the 2019 National Survey on Drug Use and Health.

Lipari, Rachel N., Park-Lee, Eunice, & Van Horn, Struther. 2013. America's Need for and Receipt of Substance Use Treatment in 2015. *In: The CBHSQ Report.* Rockville (MD): Substance Abuse and Mental Health Services Administration (US).

Maclean, Johanna Catherine, Popovici, Ioana, & Stern, Elisheva R. 2018. Health Insurance Expansions and Providers' Behavior: Evidence from Substance-Use- Disorder Treatment Providers. *The Journal of Law and Economics*, **61**(2), 279–310.

Maclean, Johanna Catherine, Mallatt, Justine, Ruhm, Christopher J., & Simon, Kosali. 2020 (Nov.). *Economic Studies on the Opioid Crisis: A Review.* Tech. rept. w28067. National Bureau of Economic Research.

Maclean, Johanna Catherine, Mallatt, Justine, Ruhm, Christopher J., & Simon, Kosali. 2022. The Opioid Crisis, Health, Healthcare, and Crime: A Review of Quasi-Experimental Economic Studies. *The ANNALS of the American Academy of Political and Social Science*, **703**(1), 15–49.

Main, Frank. 2022. This Cook County Judge Gives Convicts His Cell Number — If They Complete Addiction Program. *Chicago Sun-Times*, Jan.

Malm, Aili, Perrone, Dina, & Magana, Erica. 2020. Law Enforcement Assisted Diversion (LEAD) External Evaluation. *School of Criminology, Criminal Justice and Emergency Management California State University Long Beach.*

Matsuzaki, Mika, Vu, Quan M., Gwadz, Marya, Delaney, Joseph A. C., Kuo, Irene, Trejo, Maria Esther Perez, Cunningham, William E., Cunningham, Chinazo O., & Christopoulos, Katerina. 2018. Perceived Access and Barriers to Care among Illicit Drug Users

and Hazardous Drinkers: Findings from the Seek, Test, Treat, and Retain Data Harmonization Initiative (STTR). *BMC Public Health*, **18**(1), 366.

Mueller-Smith, M., & Schnepel, Kevin. 2020. Diversion in the Criminal Justice System. *The Review of Economic Studies*.

Mueller-Smith, Michael. 2015. The Criminal and Labor Market Impacts of Incarceration. *Working Paper*.

National Institute of Mental Health. 2022. *Mental Illness*.

Neumark, David, & Savych, Bogdan. 2022. Effects of Opioid-Related Policies on Opioid Utilization, Nature of Medical Care, and Duration of Disability. *American Journal of Health Economics*, Oct.

New Mexico Sentencing Commission. 2018. Santa Fe Law Enforcement Assisted Diversion (LEAD). An Analysis of the Pilot Phase Outcomes.

NIDA. 2020. Illinois: Opioid-Involved Deaths and Related Harms. *National Institute on Drug Abuse*.

Pace, Christine A., Gergen-Barnett, Katherine, Veidis, Alysa, D'Afflitti, Joanna, Worcester, Jason, Fernandez, Pedro, & Lasser, Karen E. 2018. Warm Handoffs and Attendance at Initial Integrated Behavioral Health Appointments. *Annals of Family Medicine*, **16**(4), 346–348.

Perry, Claire. 2018. Leading the Way. *East Carolina University*.

Petry, Nancy M., & Bickel, Warren K. 2000. Gender Differences in Hostility of Opioid-Dependent Outpatients: Role in Early Treatment Termination. *Drug and Alcohol Dependence*, **58**(1-2), 27–33.

Powell, David, Pacula, Rosalie Liccardo, & Taylor, Erin. 2020. How Increasing Medical Access to Opioids Contributes to the Opioid Epidemic: Evidence from Medicare Part D. *Journal of health economics*, **71**, 102286.

Rapp, Richard C., Xu, Jiangmin, Carr, Carey A., Lane, D. Tim, Wang, Jichuan, & Carlson, Robert. 2006. Treatment Barriers Identified by Substance Abusers Assessed at a Centralized Intake Unit. *Journal of substance abuse treatment*, **30**(3), 227–235.

Rouhani, S., Gudlavalleti, R., Atzmon, D., Park, J. N., Olson, S. P., & Sherman, S. G. 2019. Police attitudes towards pre-booking diversion in Baltimore, Maryland. *International Journal of Drug Policy*.

Sanchez, Melissa, & Eldeib, Duaa. 2020. Overdose Deaths Have Skyrocketed in Chicago, and the Coronavirus Pandemic May Be Making It Worse. *ProPublica*.

Schaible, Lonnie, Gant, Lauren, & Ames, Stephanie. 2020. The Impact of Police Attitudes Towards Offenders on Law-Enforcement Assisted Diversion Decisions. *Police Quarterly*, Sept., 1098611120960714.

Sischy, Jessica, & Blaustein, Jarrett. 2018. Global Drug Policy at an Impasse: Examining the Politics of the 2016 United Nations General Assembly Special Session. *International Journal of Drug Policy*, **60**(Oct.), 74–81.

Substance Abuse and Mental Health Services Administration. 2000. *Substance Abuse Treatment: For Adults in The Criminal Justice System: (715702007-001)*.

Swensen, Isaac D. 2015. Substance-Abuse Treatment and Mortality. *Journal of Public Economics*, **122**(Feb.), 13–30.

Terlizzi, Emily P. 2020. Mental Health Treatment Among Adults: United States, 2019.

Tuttle, Cody. 2019. Racial Disparities in Federal Sentencing: Evidence from Drug Mandatory Minimums. *Available at SSRN 3080463*.

United Nations Office on Drugs and Crime. 2016. *Outcome Document of the 2016 United Nations General Assembly Special Session on the World Drug Problem*.

Vogler, Jacob. 2020. Access to Healthcare and Criminal Behavior: Evidence from the ACA Medicaid Expansions. *Journal of Policy Analysis and Management*, **39**(4), 1166–1213.

Volkow, Nora D., Poznyak, Vladimir, Saxena, Shekhar, & Gerra, Gilberto. 2017. Drug Use Disorders: Impact of a Public Health Rather than a Criminal Justice Approach. *World Psychiatry*, **16**(2), 213–214.

Wen, Hefei, Hockenberry, Jason M., & Cummings, Janet R. 2017. The Effect of Medicaid Expansion on Crime Reduction: Evidence from HIFA-Waiver Expansions. *Journal of Public Economics*.

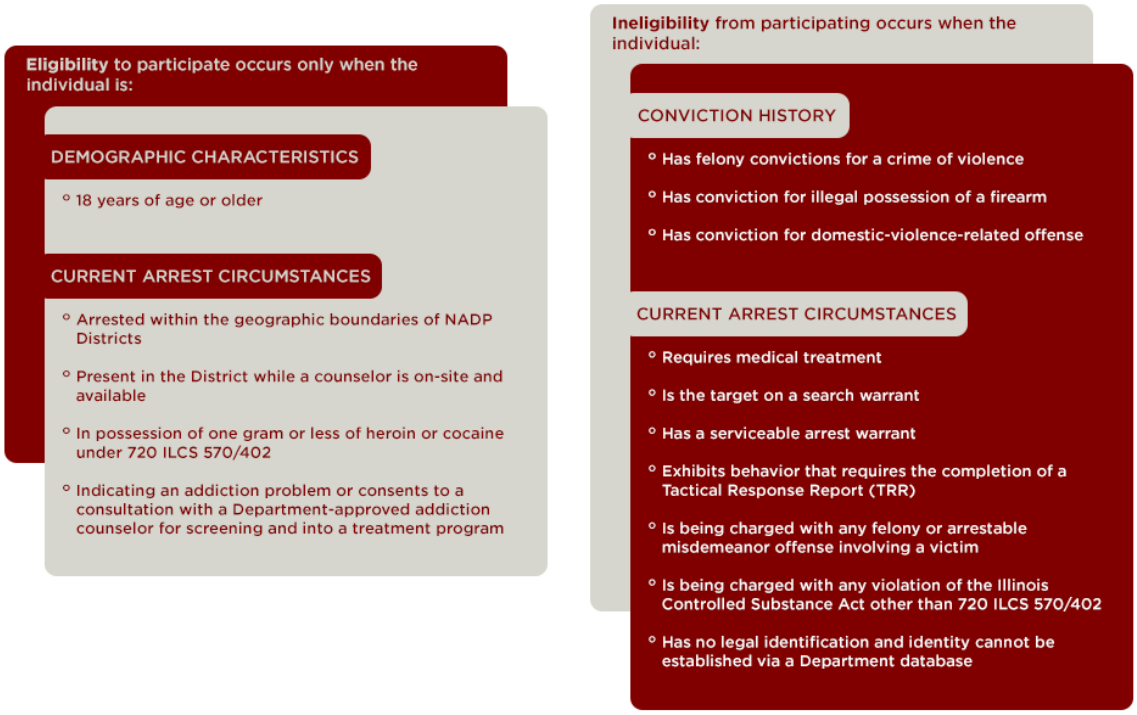
Wilson, D. B., Mitchell, O., & Mackenzie, D. L. 2006. A Systematic Review of Drug Court Effects on Recidivism. *Journal of Experimental Criminology*.

Worden, Robert E., & McLean, Sarah J. 2018. Discretion and Diversion in Albany's LEAD Program. *Criminal justice policy review*, **29**(6-7), 584–610.

Zarkin, G A, Cates, S C, & Bala, M V. 2000. Estimating the Willingness to Pay for Drug Abuse Treatment: a Pilot Study. *Journal of Substance Abuse Treatment*.

Appendix

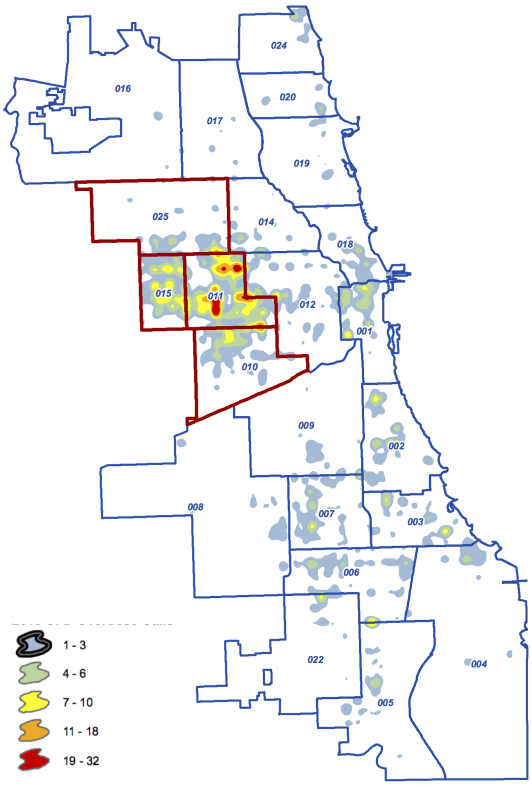
Figure A1: Eligibility Criteria for Drug Arrest Diversion



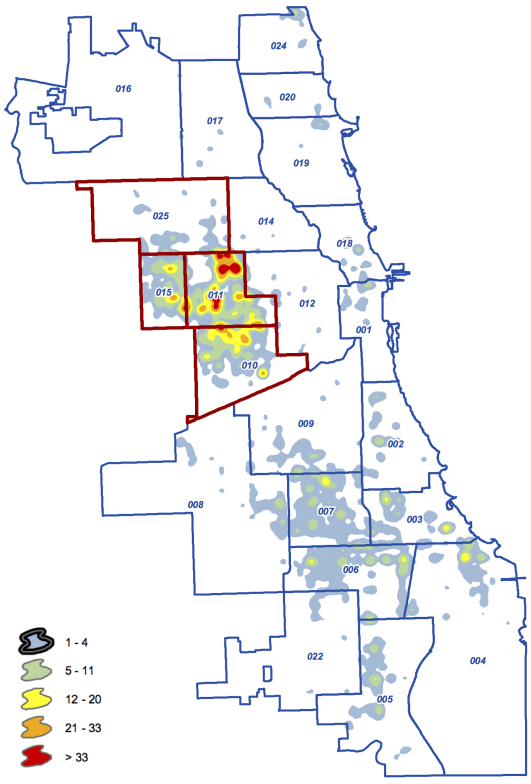
Source: Chicago Police Department. Department Notice D18-03.

Figure A2: Overdose Calls for Service and Arrests in Chicago in 2018

Panel A: Overdose Calls For Service

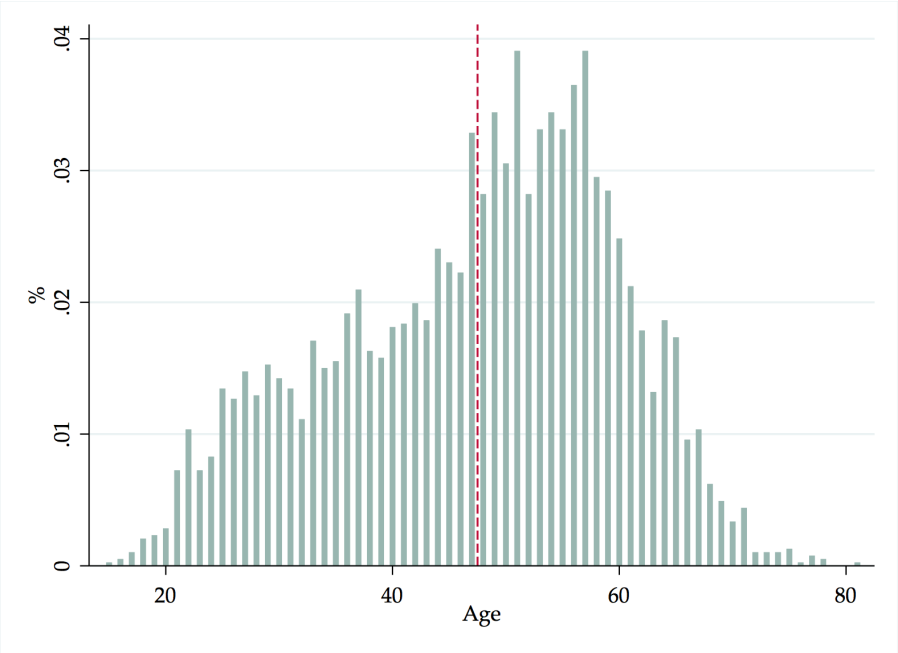


Panel B: Narcotics Arrests



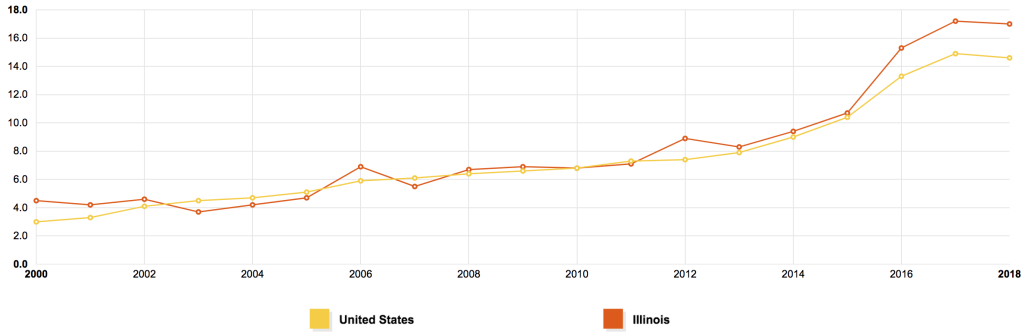
Source: Chicago Police Department CLEAR Data Warehouse, Office of Emergency Management and Communications Bureau of Technical Services PSIT GIS Print Date: 04-JUN-2019. Westside districts in red.

Figure A3: Age Distribution of Opioid Deaths Chicago 2015-19



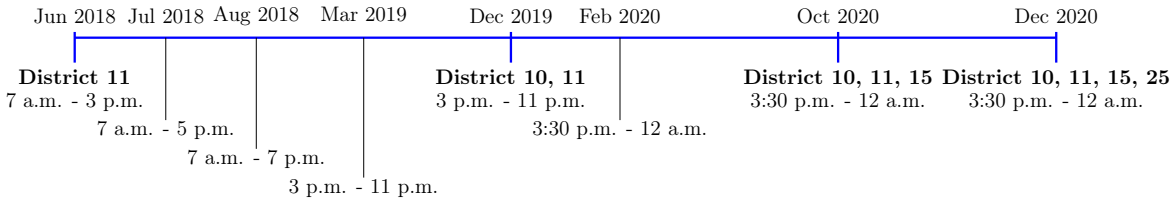
Source: Cook County Medical Examiner Case Archives. Dashed line marks the average age (47.3).

Figure A4: Opioid Overdose (Age-Adjusted) Death Rates: Illinois and the United States



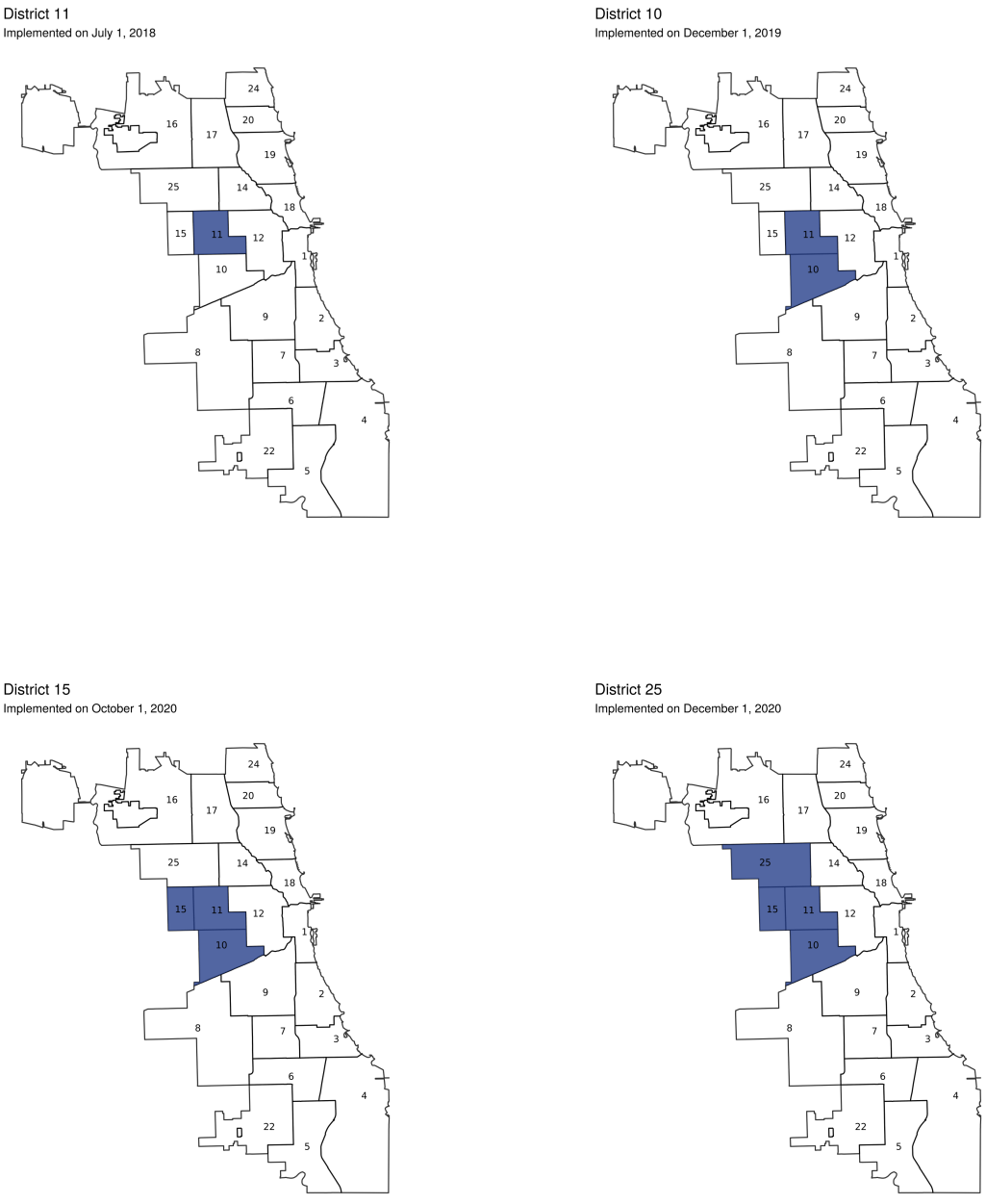
Source: Opioid Overdose Death Rates, State Health Facts, Kaiser Family Foundation.

Figure A5: Implementation



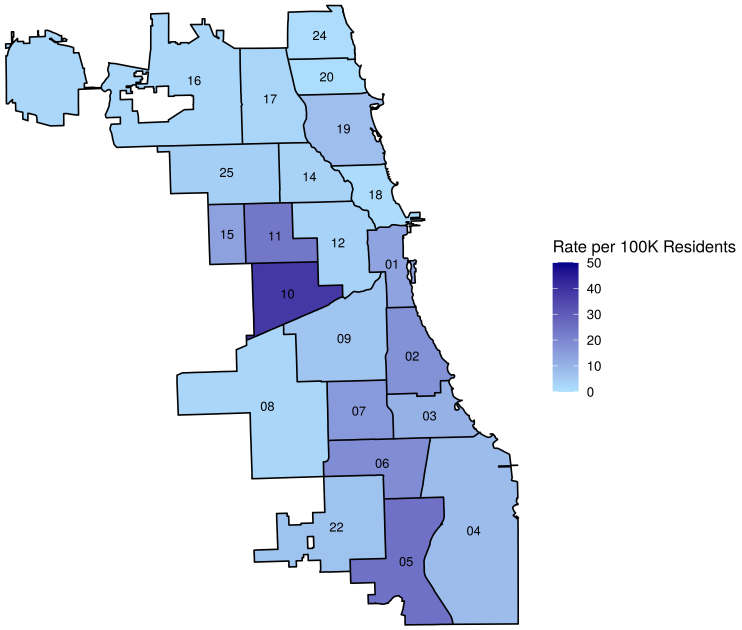
Notes: This figure depicts the expansion of the Narcotics Arrest Diversion Program across Chicago Police Department (CPD) districts between 2018 and 2020. CPD officers were trained on how to identify arrestees eligible for diversion in District 11, 10 and 15 during June 2018, December 2019, and October 2020 respectively. This figure also reflects changes in on-site counselor hours during the expansion; the change from 7 a.m. - 3 p.m in 2018 to 3:30 p.m. - 12 a.m. in 2020 was made in order for Thresholds (the addiction recovery agency providing on-site counseling services) to be able to screen and offer treatment to more individuals each day. However, we find that (a) counselors actively encouraged all officers during the program's roll out training to call them off hours as well if they have an eligible individual in custody, and (b), eligible individuals are indeed very often diverted outside of official hours too. Therefore, we do not differentiate treatment based on hours, but consider all times eligible.

Figure A6: The Spatial Expansion of NADP



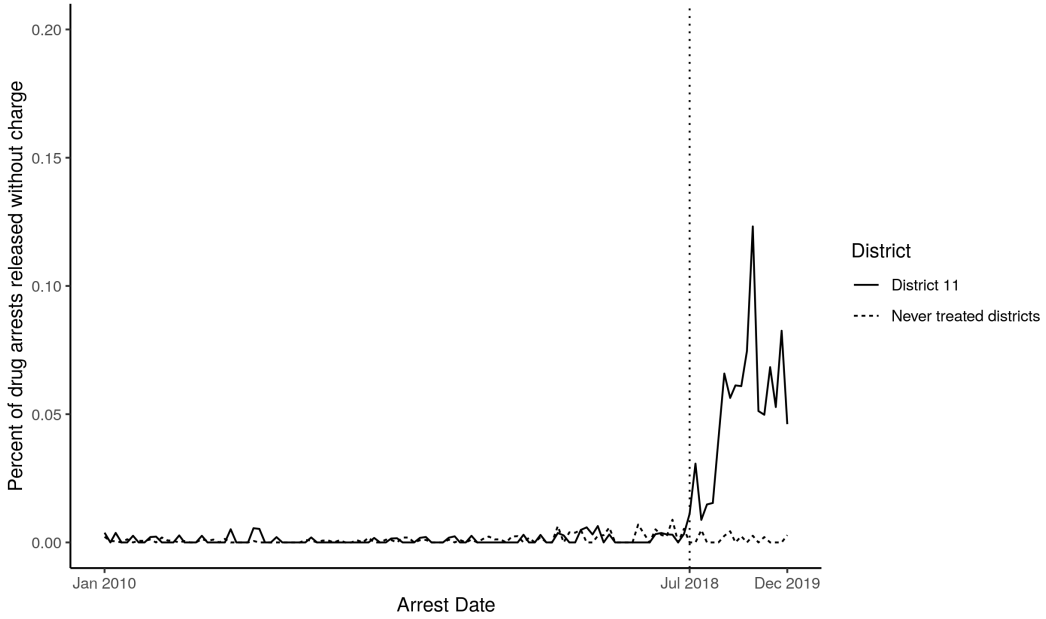
Source: Chicago Police Department.

Figure A7: Homicide Rate in Chicago in 2018



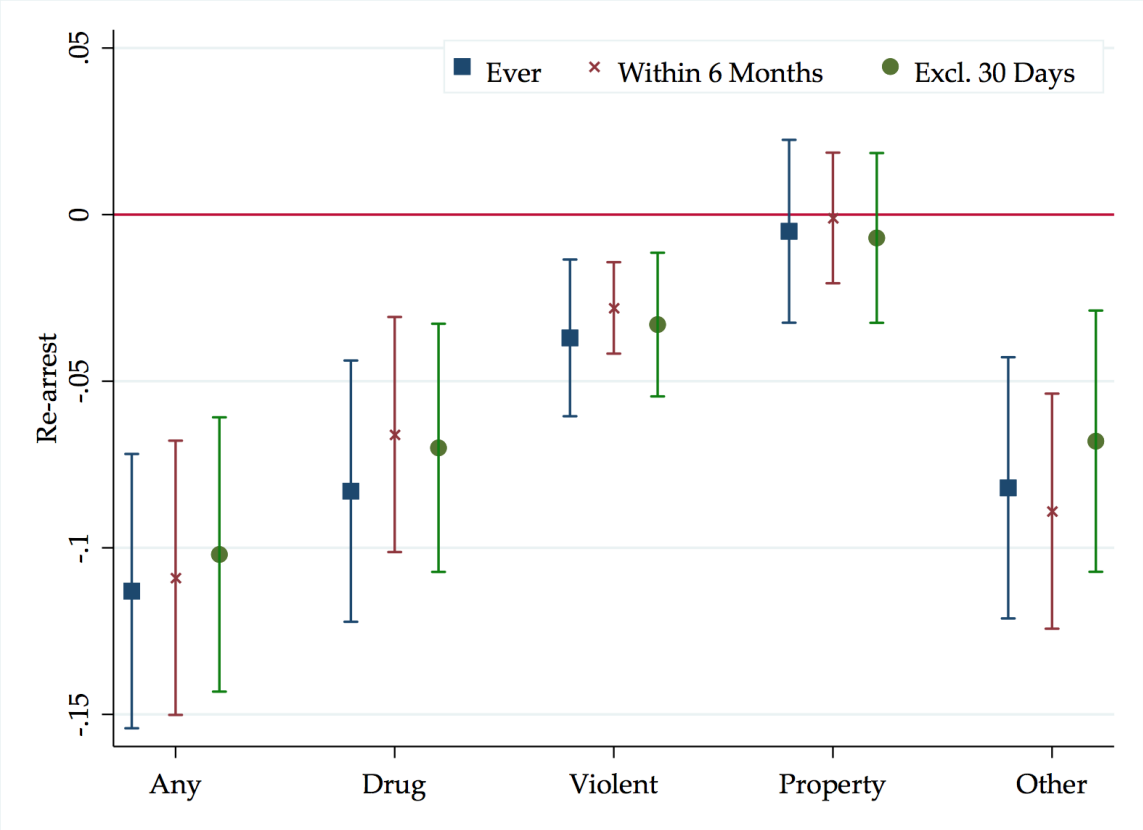
Source: Chicago Police Department.

Figure A8: Drug arrests released without charge



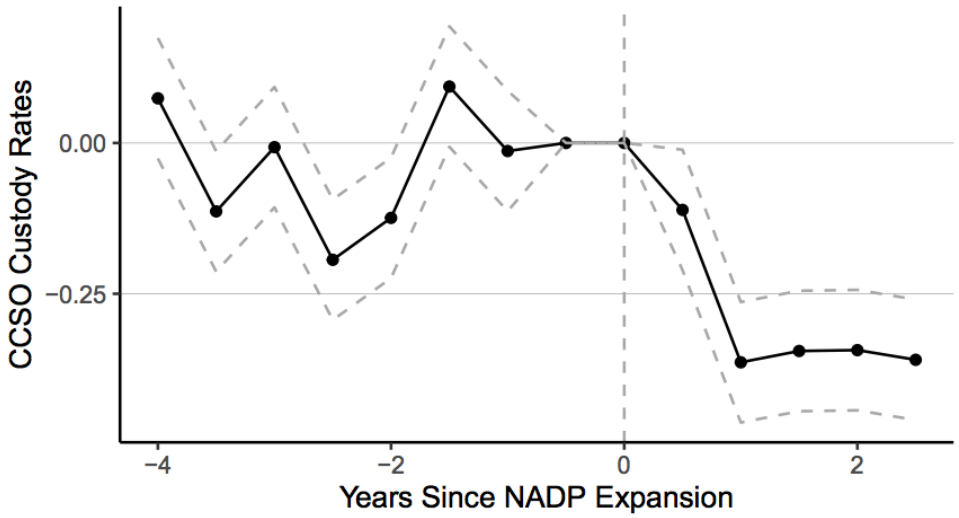
Note: Vertical line at District 11's implementation date. Source: Chicago Police Department.

Figure A9: Recidivism Estimates



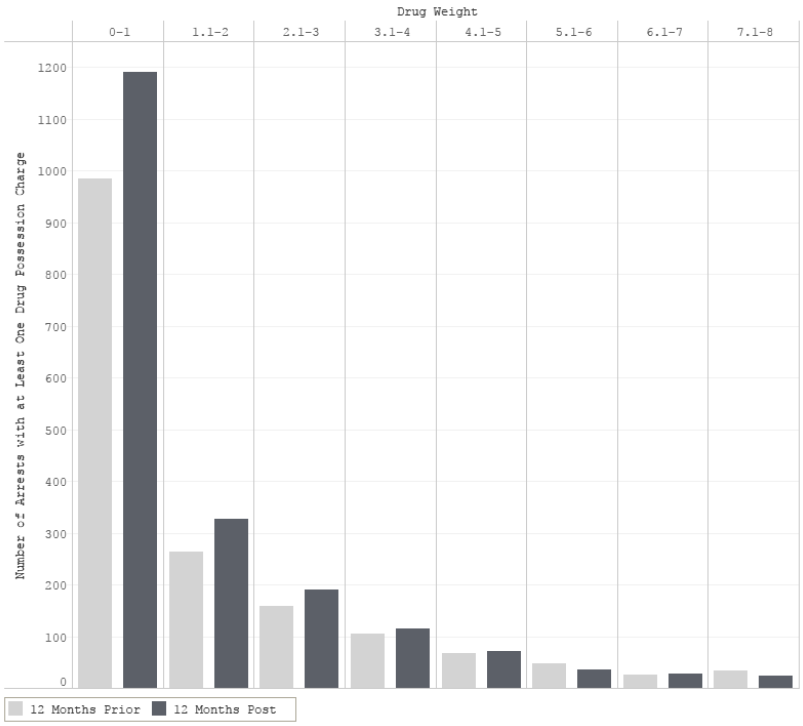
Notes: This graph displays DDD estimates of the impact of drug arrest diversion on recidivism in District 11 using three distinct follow-up periods (ever, within 6 months, ever excluding the first 30 days post-arrest). Data Source: Chicago Police Department.

Figure A10: Jail Time



Notes: This graph displays DDD estimates of the impact of drug arrest diversion in District 11 on any jail time. Data Sources: Chicago Police Department, Cook County Sheriff's Office.

Figure A11: Distribution of the Weight of Narcotics for Arrests in District 11



Notes: Arrests with 1 gram or below (first two columns) were NADP-eligible, while arrests with over 1 gram were ineligible. The histograms are truncated at 8 grams for displaying. Source: Chicago Police Department.

Table A1: Top 15 Service Providers where Thresholds Sent Individuals

Service Provider	N	%
Thresholds Treatment	130	26%
Family Guidance	55	17%
Haymarket Center	23	7%
Pilsen Wellness Center	17	5%
Gateway Foundaton	14	4%
Lawndale Christian Health Center	12	4%
Chicago TX Counseling Center	11	3%
Women's Treatment Center	11	3%
El Rincon	10	3%
Healthcare Alternative Systems	10	3%
Loretto	10	3%
St Anthony	10	3%
Garfield Counseling	9	3%
New Age	9	3%
New Vision	8	3%
Southwood Interventions	6	2%
Total for Top 15 Service Providers	215	43%

[1] 504 individuals were diverted to Thresholds from July 2018 to February 2022.
[2] 315 individuals were sent to 70 different treatment providers by Thresholds.
[3] 16 individuals were sent to "Other" service provider and were excluded from the table.

Table A2: Services Offered by Top 15 Service Providers

Service Provider	Inpatient	Residential	Outpatient	MAT	MH Services	MMD	Toxicology
Thresholds Treatment			X		X		
Family Guidance	X	X	X	X	X	X	X
Haymarket Center	X	X	X			X	
Pilsen Wellness Center				X	X	X	
Gateway Foundaton	X	X	X	X	X		
Lawndale Christian Health Center				X	X		
Chicago TX Counseling Center				X		X	
Women's Treatment Center	X	X	X	X		X	
El Rincon			X	X	X	X	X
Healthcare Alternative Systems	X	X	X	X	X		
Loretto					X		
St Anthony					X		
Garfield Counseling			X		X		
New Age			X	X	X		
New Vision	X					X	
Southwood Interventions	X	X	X			X	
% of Top 15 Service Providers Offering Service	47%	40%	60%	60%	67%	53%	13%

[1] Family Guidance and New Vision also offer hospital handoff services.
[2] Information on services offered by each provider was determined by Crime Lab through reviewing each provider's website.

Table A3: Maximum Number of Individuals Receiving Services from Top 15 Service Providers

Services Offered	N	%
Inpatient	127	40%
Residential	119	38%
Outpatient	147	47%
MAT	149	47%
MH Services	156	50%
MMD	141	45%
Toxicology	65	21%

[1] 315 individuals were sent to 70 different treatment providers by Thresholds.
[2] Counts for each service are not mutually exclusive.

Table A4: Direct Impact of the Narcotics Arrest Diversion Program — Imputation

	(1)	(2)	(3)	(4)
	Dependent Variable:		*Dependent Variable:*	
	Connected with On-Site Counselor		*Released Without Charge*	
Estimate	0.109***	0.157***	0.162***	0.223***
	(0.007)	(0.010)	(0.008)	(0.011)
Mean	0.002	0.002	0.004	0.005
Untreated Eligible Mean	0.000	0.000	0.001	0.001
N	162,640	123,194	168,465	127,815
Districts Excluded	None	10, 15, 25	None	10, 15, 25

Notes: This table displays the estimated impact of drug arrest diversion using (Borusyak *et al.*, 2021)'s robust DDD estimator. Columns (2) and (4) use drug arrests between 2010-2020 in District 11 and eighteen control districts; columns (1) and (3) use drug arrests between 2010-2020 in all twenty-two districts. Regressions include district-year, year-eligibility, and eligibility-district fixed effects, and standard errors are clustered at the individual level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Source: Chicago Police Department, Thresholds.

Table A5: Impact of the Narcotics Arrest Diversion Program on Re-arrest Rates — Subsamples

	(1)	(2)	(3)	(4)	(5)
Re-arrest charges:	*All*	*Drug*	*Violent*	*Property*	*Other*
Panel A	*Drug arrests for narcotics possession*				
Estimate	-0.087***	-0.054**	-0.009	-0.003	-0.060***
	(0.022)	(0.020)	(0.011)	(0.013)	(0.021)
Mean	0.584	0.393	0.149	0.131	0.418
Untreated Eligible Mean	0.60	0.423	0.127	0.149	0.423
N	56,427	56,427	56,427	56,427	56,427
Districts Excluded	10, 15, 25	10, 15, 25	10, 15, 25	10, 15, 25	10, 15, 25
Panel B	*Drug arrests for narcotics possession where those ineligible were ineligible for exactly one reason*				
Estimate	-0.077***	-0.052**	-0.002	-0.010	-0.045**
	(0.025)	(0.022)	(0.012)	(0.015)	(0.023)
Mean	0.587	0.403	0.136	0.141	0.414
Untreated Eligible Mean	0.606	0.423	0.127	0.149	0.423
N	38,707	38,707	38,707	38,707	38,707
Districts Excluded	10, 15, 25	10, 15, 25	10, 15, 25	10, 15, 25	10, 15, 25

Notes: This table displays the estimated impact of drug arrest diversion using drug arrests between 2010-2020 in District 11 and eighteen control districts. Regressions include district-year, year-eligibility, and eligibility-district fixed effects, and standard errors are clustered at the individual level. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$. Source: Chicago Police Department, Thresholds.

Table A6: Impact of the Narcotics Arrest Diversion Program on Re-arrest Rates

Outcome	DDD		DDD Imputation	
	(1)	(2)	(3)	(4)
	Dependent Variable: Re-arrest Incl. Felony Charges			
Estimate	-0.054***	-0.066***	-0.059***	-0.068***
	(0.017)	(0.019)	(0.016)	(0.020)
Mean	0.433	0.421	0.433	0.421
Untreated Eligible Mean	0.473	0.461	0.490	0.477
	Dependent Variable: Re-arrest Incl. Misdemeanor Charges			
Estimate	-0.078***	-0.093***	-0.080***	-0.091***
	(0.017)	(0.020)	(0.017)	(0.021)
Mean	0.522	0.519	0.522	0.519
Untreated Eligible Mean	0.465	0.469	0.640	0.635
N	168,465	127,815	168,465	127,815
Districts Excluded	None	10, 15, 25	None	10, 15, 25

Notes: This table displays the estimated impact of drug arrest diversion using the full sample of arrests in columns (1) and (3); columns (2) and (4) only use drug arrests in District 11 and eighteen control districts. Regressions include district-year, year-eligibility, and eligibility-district fixed effects, and standard errors are clustered at the individual level. ***$p < 0.01$, **$p < 0.05$, *$p < 0.1$. Data Source: Chicago Police Department.