In-Kind Welfare Benefits and Recidivism Risk: Evidence from Medicaid[1]

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ABSTRACT: Of the 600,000 persons returning to the community from state and federal prisons each year in the US, more than 44% are re-arrested within one year. Most adults who serve prison sentences carry substantial debt, have low income and relatively low education, and limited formal employment experience prior to entering prison. Reentry into the community is characterized by a high incidence of adverse outcomes for individuals and their communities - financial hardship, morbidity and mortality, and re-offense. Medicaid coverage, as a means-tested transfer program providing subsidized health insurance, may influence recidivism through both financial and health channels. In this paper, we provide a comprehensive look at the effects of public health insurance coverage on the post-release behavior of formerly incarcerated adults. We study a natural experiment in which two separate policy changes resulted in a 60 percentage point increase in Medicaid enrollment at the time of release. Using a series of individual level linked administrative datasets, we estimate the effects of this huge change in Medicaid enrollment on recidivism. We find declines in recidivism at 6 and 12 months associated with the increase in Medicaid enrollment. We test for Medicaid enrollment effects on employment and treatment for substance use disorders as potential explanatory mechanisms by which Medicaid coverage may influence recidivism, and show that employment increases as a result of Medicaid enrollment, while similar effects regardless of substance use disorder risk suggest a limited role for a treatment mechanism.

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1. INTRODUCTION

Over 600,000 persons return to the community from state and federal prisons each year in the US.(Carson, 2020). More than 44% are re-arrested at least once within one year and more than 80% by 9 years later. Most adults who serve prison sentences carry substantial debt, have low income and relatively low education, and limited formal employment experience prior to entering prison. Circumstances do not typically improve during incarceration, and economic disadvantage is associated with increased risk of recidivism. A majority of state prison inmates have a history of substance use,(S. Belenko and Peugh, 2005) an additional risk factor for recidivism (Winter et al., 2019). Reentry into the community is characterized by a high incidence of adverse outcomes for individuals and their communities - financial hardship (Harding et al., 2014), morbidity (Mallik-Kane and Visher, 2008) and mortality (Binswanger et al., 2013), and re-offense (Alper and Markman, 2018).

Many interventions have been tested or proposed that affect the re-entry period for formerly incarcerated adults (Berghuis, 2018; Moore et al., 2020). These include policies like inmate education, cognitive behavioral therapy, and substance use treatment disorder programs during or immediately following incarceration as well as policies like “ban the box” and changes in eligibility to the Supplemental Nutritional Assistance Program (SNAP) and Temporary Aid for Needy Families (TANF) that might affect a more general post-release population. In general, evidence supports the hypothesis that financial support and strong labor market conditions post-release may ease the transition to the community and encourage desistance from crime.

Recent efforts have begun to recognize that access to health care could play an important role during the critical reentry period. While incarcerated, prisoners have access to at least some medical care, but this disappears for most upon release. Historically, 80% of former inmates were uninsured post-release. Unlike SNAP and TANF, Medicaid has not legally excluded the formerly incarcerated from coverage, but most were unlikely to be eligible prior to the Affordable Care Act because of family status eligibility requirements. Policies to increase Medicaid coverage for eligible individuals upon release from jails and prisons have since been proposed as part of Medicaid waivers and some states have moved toward helping inmates transition through enrollment assistance programs as part of the discharge planning process (Jannetta et al., 2018).

Medicaid coverage, as a means-tested transfer program providing subsidized health insurance, may influence recidivism through both a financial and a health channel. As a transfer program, Medicaid has the potential to increase the opportunity cost of recidivism and reduce the financial incentives to pursue criminal activity. This could decrease returns to prison and increase formal employment, although the potential for disincentives to work may limit the reach of any effects. Of course, the nature of the benefits means that Medicaid coverage is not a direct substitute for income, and its value to an individual likely depends on their need for health care. Medicaid coverage may also influence recidivism directly by facilitating treatment of conditions associated with elevated risk of recidivism including substance use disorders (SUDs). Efficacious outpatient treatment exists for substance use disorders (Dolan et al., 2003; Lee et al., 2016); however, financial access to treatment is limited for low-income adults without health insurance (Ali et al., 2017). The symptoms that untreated SUDs can impose (e.g., impulsivity, impaired judgment, aggression) may directly increase the risk of committing crime. Additionally, the nature of addiction, combined with limited material resources, creates an incentive to commit crime to purchase or otherwise obtain the addictive substance (Chandler et al., 2009; Goldstein, 1985). By reducing the out-of-pocket price for treatment, acquiring Medicaid coverage may facilitate SUD treatment use and reduce symptoms, thereby reducing the risk and incentive to commit crime.

A growing collection of studies estimate the impact of Medicaid eligibility expansions and enrollment policy on recidivism defined alternately as aggregate crime rates (He and Barkowski, 2020; Vogler, 2020; Wen et al., 2017b), the likelihood of rearrest (Fry et al., 2020), and the likelihood of reincarceration (Aslim, 2019; Gollu and Zapryanova, 2020). The findings are generally consistent; the increased *availability* of Medicaid is associated with reduced recidivism. This research provides important insights into the social welfare benefits of the Medicaid program. However, in most cases these are intention-to-treat analyses which are not well-suited to estimating the effect of coverage per se or the pathways by which Medicaid coverage may impact recidivism. The mechanism matters because it affects how we think about targeted policies to reduce repeat offending. If for example, Medicaid operates primarily through a health channel, desistance from crime policies that further support access and adherence to the relevant treatment may be appropriate. Alternatively, if an income effect prevails, further attention to the appropriate income eligibility threshold may be important to secure the income benefits while minimizing work disincentives.

In this paper, we provide a comprehensive look at the effects of public health insurance coverage on the post-release behavior of formerly incarcerated adults. We study a natural experiment in which two separate policy changes resulted in a major shift in Medicaid enrollment for formerly incarcerated adults. Together, these policy changes resulted in a nearly 60 percentage point increase in the likelihood of having Medicaid coverage in the month of release for formerly incarcerated adults (Burns et al., 2021). Using a series of individual level linked administrative datasets, we use the individual timing of release relative to the Medicaid coverage policy in place as an instrument for Medicaid enrollment to estimate the effects of this huge change in Medicaid enrollment on recidivism. Additionally, we examine the Medicaid enrollment effects and employment and consider whether effects differ for a subgroup of inmates at high risk for substance use disorder as potential explanatory mechanisms by which Medicaid coverage may influence recidivism.

The current study makes several contributions to understanding the role of in-kind welfare benefits on desistance from crime. First, the unique dataset and empirical context enables us to examine directly the channels through which Medicaid has been theoretically suggested to affect recidivism by observing Medicaid enrollment, employment, and substance use treatment for individuals released from state prison. Scholars have offered alternative theories about how substance use influences crime perpetration and recidivism that suggest different hypotheses about the types of crimes that are likely to decline when individuals receive treatment (Evans et al., 2019; Goldstein, 1985; Hakansson and Jesionowska, 2018). We are able to study these ideas empirically because we observe individual measures of risk of substance use disorder. Second, each of these potential mediators is of potential policy interest in and of themselves, independent of their potential role relative to recidivism. Yet, to date, there has been no empirical research on the impact of Medicaid coverage upon release from a correctional setting on employment or substance use treatment. Third, observation of individual-level releases and employment outcomes is a substantial contribution relative to prior work that almost exclusively relies on aggregate analyses of cross state variation in Medicaid policy.

In a preview of our findings, we find declines in recidivism at 6 and 12 months associated with the increase in Medicaid enrollment. We test for Medicaid enrollment effects on employment and treatment for substance use disorders as potential explanatory mechanisms by which Medicaid coverage may influence recidivism, and show that employment increases as a result of Medicaid enrollment, while similar effects regardless of substance use disorder risk suggest a limited role for a treatment mechanism.

The rest of paper proceeds as follows. We discuss the theoretical framework for the study in Section 2 and review the background literature in Section 3. The empirical plan for the paper is discussed in Section 4 followed by our results and conclusions in Sections 5 and 6 respectively.

2. THEORY / FRAMEWORK

Our expectations of the effects of Medicaid coverage on recidivism derive from an expansion of Becker's model (Becker, 1968) that incorporates the decision to reoffend as explicated by Doleac (2019). At its foundation, the model asserts that individuals will commit crime if the expected utility from doing so exceeds the expected utility from not doing so, and that this calculation of costs and benefit is likely to differ for first-time offenders relative to individuals who have already committed a crime.

(1) $(1\text{-}p)U_{c1} + pU_{c2} > U_{nc}$

In this framework, p is the perceived probability of punishment, U_{c1} is the benefit from committing crime if the person is not punished, and U_{c2} is the payoff if punished. The benefit to non-criminal activity, or the opportunity cost of crime, is represented by U_{nc}. The utility derived from criminal and non-criminal activity includes both financial and psychic costs and benefits. Following Doleac, multiple factors determine each of these payoffs.

(2) $U_{ci} = f(a, b, m, n)$

The payoff from committing crime without punishment, U_{ci}, is a function of the financial benefit, *a;* the psychic benefit or enjoyment from the criminal activity, *b*; the material costs of committing the crime, *m*; and the psychic costs of committing the offense, *n*. *f*( ) is decreasing in m and n, and increasing in a and b.

(3) $U_{c2} = f(a, b, m, n, s, t)$

In addition to the same costs and benefits as U_{c2}, the payoff includes *s,* any perceived direct penalties from committing the offense (e.g., incarceration) and *t*, any perceived indirect penalties (e.g., stigma, ineligibility for public benefits). *f*( ) is decreasing in both *s* and *t*.

(4) $U_{nc} = f(v, w, x, z)$

Finally, "U_{nc} is a function of *v*, material costs to engage in non-criminal activity (e.g., transportation to get to work, job training, etc.); *w*, non-criminal wages; *x*, the disutilty of work required to earn those wages; and z any psychic benefits from non-criminal activity. *f*( ) is increasing in w and z, and decreasing in v and x."

To reduce reoffending, a given policy or intervention must then increase *p or* U_{nc}, or reduce U_{c1} or U_{c2}. Individuals with a history of committing a crime may have a higher, U_{c1} than before the first offense because they have invested in activity, persons, or skills that support criminal behavior thereby increasing *a* and/or *b*, while decreasing *m* and/or *n*. U_{c2} may be higher or lower for individuals who have already committed an offense relative to first-time offenders depending on the direct and indirect penalties they faced after their prior offense and the consequences of those penalties.

The perceived likelihood of getting caught, *p*, may be lower or higher than before the first offense. It may be lower if the individual has learned how to avoid apprehension. It may be higher, if individuals perceive that routine contact with law enforcement through parole or probation obligations increases the risk of being caught.

The utility derived from non-criminal activity, $U_{nc,}$ may be lower for individuals who have already committed an offense than those who have not done so because the opportunity and ability to obtain legal employment may be reduced (e.g., due to absence from the labor force, employment required background checks, etc.). In other words, the opportunity cost of continuing to commit crime is lower relative to individuals who have not yet committed an offense.

Finally, the individual's future discount rate will influence how each of these factors affects the expected utility from criminal activity. Individuals with higher discount rates, for whom the immediate benefits of crime are more highly valued than the more distant costs, will be more likely to commit crime, all other things equal.

Medicaid coverage has the potential to influence recidivism by acting upon each utility function within model. As an income transfer, Medicaid coverage increases the opportunity cost of continued criminal activity, *w,* thereby increasing U_{nc}; it is a financial benefit that can only be enjoyed while living in the community and is suspended or lost when an individual is admitted to a jail or prison. Practically, individuals may experience the financial benefit as a reduction in financial risk, a freeing up of resources that they might otherwise spend on health care. As a health care payer, Medicaid coverage may influence U_{c1} *and* U_{c2} to the extent that coverage increases treatment for conditions that influence the individual's perceived financial, *a*, or psychic benefits, *b*, from criminal activity, their capacity to identify and perceive direct, *s*, or indirect*, t*, penalties from getting caught, their earning capacity and thus non-criminal wages, *w,* and/or their future discount rate.

A complicating factor in understanding the influence of Medicaid coverage on recidivism is the role that such coverage may play in former inmates' employment status. Employment is an important component of a sustained return to the community (Raphael, 2010) because it generates income and reduces the time available for criminal activity (Becker, 1968; Ehrlich, 1973; Grogger, 1998). Whether Medicaid coverage is likely to increase or decrease employment among recently incarcerated adults is uncertain. Economic theory predicts, and empirical research in the general population largely demonstrates, that receipt of means-tested, in-kind welfare benefits reduces employment (Dague et al., 2017; Garthwaite et al., 2014; Hoynes and Schanzenbach, 2012). The risk of losing benefits as earnings increase creates a disincentive to work. This prediction may hold for adults with recent criminal justice involvement who already face greater barriers to employment than their peers without such a history (Pager, 2007). Alternatively, if the benefits mitigate impediments to work that are especially salient for this population (e.g., untreated substance use disorders, mental health) employment outcomes may improve.

On net, our expectation is that Medicaid coverage is likely to decrease recidivism, but that employment could increase or decrease. We also expect that these effects are likely to be larger for those with high risk of substance use disorder for whom a treatment mechanism is more likely to be salient.

3. BACKGROUND

As hypothesized above, Medicaid coverage may reduce the likelihood of recidivism to the degree that it improves either economic well-being or increases the use of treatment for substance use disorders. In

this section, we discuss the availability of Medicaid for justice-involved adults and review the empirical literature addressing each component of these theoretical linkages.

3.1 Medicaid Availability and Justice Involved Adults

In the years preceding the implementation of the Affordable Care Act (ACA), 80% of adults who were recently incarcerated lacked health insurance in the 2-3 months following release(Mallik-Kane and Visher, 2008). However, the implementation of the ACA Medicaid expansions, now operating in 37 states, increased the proportion of recently incarcerated adults who are eligible for Medicaid largely by extending eligibility to adults without dependent children. Initial projections estimated that 21-34% of adults released from prison were likely to gain Medicaid coverage because of ACA Medicaid expansions (Cuellar and Cheema, 2014). Two studies, while not exclusively focused on Medicaid expansions, used the National Survey on Drug Use and Health to assess the one-year impact of the ACA overall on insurance coverage for individuals with some justice-involvement in the past year; they report a 5 to 8 percentage point increase in Medicaid coverage for that population (Saloner et al., 2016; Winkelman et al., 2016).

There have been no national estimates of the effect of Medicaid expansions on insurance coverage for adults reentering the community from correctional facilities. However, two recently published single state studies have evaluated the impact on Medicaid coverage of state-level policy changes related to eligibiliy and facilitated enrollment. Blackburn and colleagues (2020) assessed the impact of 3 policies in Indiana on the likelihood of Medicaid enrollment within 7 and within 120 days of release from state prison: a Medicaid eligibility expansion; a policy enabling corrections personnel to submit Medicaid applications on behalf of incarcerated individuals; and a policy to suspend rather than terminate Medicaid coverage upon incarceration. Each policy change was associated with increased Medicaid enrollment within 120 days of release, a 9 ppt increase following eligibility expansion, a 17% increase after the application policy went into effect, and a 12% increase in suspension. In Wisconsin, Burns and colleagues (2021) evaluated the association between a Medicaid eligibility expansion and pre-release enrollment assistance on Medicaid coverage within the month of release. Medicaid enrollment in the month of release from state prison grew from 8 percent of adults at baseline to 36 percent after a Medicaid eligibility expansion, and up to 61 percent after the introduction of pre-release enrollment assistance. The latter paper describes the first stage for the current study.

3.2 Medicaid and Recidivism

As referenced earlier, a small but growing literature exploits variation over time and across states to examine the impact of Medicaid eligibility expansions and enrollment policy. Three studies evaluate the impact of Medicaid expansions on aggregate crime rates from the FBI's Uniform Crime Report program using difference-in-difference strategies with state- or contiguous border-county samples. Wen, Hockenberry and Cummings (2017) examined the impact of pre-ACA Medicaid expansions and found a decrease in total crime rates driven by reductions in three categories, robbery (-2%), aggravated assault (-1%) and larceny theft (-0.6%). ACA Medicaid expansions were the focus of the remaining studies on eligibility expansions. Over a study period of 2010-2016, He and Barkowski (2020) assessed the impact of Medicaid expansions on the rates of specific types of crime. Across modeling strategies and specifications, they most consistently found reductions in the rate of motor vehicle theft and of robbery. With a somewhat longer observation period, 2009-2018, Vogler (2020) found no impact of Medicaid expansions on overall rates of crime but a robust 5% decline in the rate of violent crime. This reduction was largely explained by a reduction in aggravated assaults.

Using individual level data for persons released from state prison between 2010-2016, and a difference-in-differences approach, Aslim and colleagues (2019) estimated the likelihood of reincarceration by type of crime within 1- and 2-years of release. They observed negative, statistically insignificant effects for first-time reoffenders and a relative decrease in reincarceration for violent crime at 1- and 2-years for multi-time reoffenders. Fry, McGuire and Frank (2020) used a comparative interrupted time series (ITS) design to examine the change in the likelihood of rearrest among adults booked into county jails in six counties that were paired according to demographic, geographic, and policy comparability, and their differences in state Medicaid expansion status. Rearrests decreased within 2 of the 3 expansion counties relative to their matched pairs ranging from 5 to 13 percent over the 2-year post-expansion observation period. Within the third pair of counties, the likelihood of rearrest increased by 10.1 percent. Gollu and Zapryanova (2020) take up a related question and examine whether reducing the transaction costs of Medicaid enrollment by suspending rather than terminating Medicaid coverage, reduces the likelihood of a return to prison. Specifically, for individuals who are enrolled in Medicaid at the time of incarceration, suspending rather than terminating Medicaid aims to simplify the process of regaining coverage upon release. They find suspension is associated with a relative decline in the likelihood of recidivism within 3-years. Lastly, Jacome (2020) exploits age-based eligibility criteria for Medicaid to estimate the effect of losing Medicaid eligibility at age 19 on the likelihood of reincarceration among low-income young men in South Carolina. Using matched difference-in-differences as the primary analytic strategy, she finds that young men who lose access to Medicaid eligibility on their 19th birthday are 15% more likely to be incarcerated in the following two years than similar men who were not likely to be enrolled in Medicaid immediately before their 19th birthday. The findings were particularly pronounced for men with a history of mental illness.

Three of the above studies also examined the potential mediating effects of SUD treatment. Aslim and colleagues (2020) analyzed the impact of Medicaid eligibility expansions on the state count of admissions to SUD treatment facilities. Expanded Medicaid eligibility was associated with increased admissions for which Medicaid was the payer. Among referrals from criminal justice settings, the magnitude of this association increased with age consistent with their finding that Medicaid expansion effects on recidivism generally increased with age. Wen, Hockenberry and Cummings (2017) examined the explanatory role of SUD treatment in the reduction in crime rates that followed implementation of pre-ACA expansion expansions. After finding that the expansions were associated with a relative increase in county-level SUD treatment rates, they conducted pathway analyses to explore the effect of SUD treatment rates on crime rates. Using 2SLS in which the Medicaid expansion and the presence of a state mandate for SUD treatment insurance parity served as instruments, they found that an increase in SUD treatment rates was associated with a reduction in the rate of select types of crime (e.g., robbery, aggravated assault, larceny theft). Lacking data that directly links individual interactions with corrections, Medicaid, and SUD treatment, these studies offer suggestive but inconclusive evidence that SUD treatment mediates the relationship between Medicaid coverage and recidivism. Finally, Vogler (2020) explored the potential role of SUD treatment in explaining his observed association between Medicaid expansion and a reduction in aggravated assaults. Within his DD analyses, he interacted state expansion status with a measure of the state Medicaid program's generosity of coverage for SUD services, specifically an indicator that the state's benchmark plan for essential health benefits excluded SUD services. If for example, receipt of SUD treatment mediated the observed association, one would expect to see that effect amplified in states with greater coverage generosity. There was no consistent difference in the association between Medicaid expansion and rates of crime according to the generosity of the state's benchmark plan.

We conclude from this literature, that although findings are not uniform, there is consistent evidence of an association between expanded Medicaid eligibility and a reduction in recidivism. However, the intention-to-treat design of these studies makes it challenging to identify the mechanism(s) by which Medicaid may achieve reductions in criminal activity.

3.3 Economic Well-Being and Recidivism

Most adults who serve prison sentences carry substantial debt (Harper et al., 2020) have low income and relatively low levels of education (Harlow, 2003), and limited employment experience before they enter prison (Looney and Turner 2018). These circumstances do not typically improve during incarceration such that they face significant barriers to meeting basic needs and achieving economic security when they return to the community (Berk et al., 1980; Harding et al., 2014; Western 2002). In turn, economic disadvantage is associated with increased risk of recidivism (Link et al., 2019; Yukhnenko et al., 2020). This dynamic has motivated intervention and research to determine if reducing financial hardship during the post-incarceration period reduces the likelihood of recidivism, including income support, access to income transfer programs (e.g., SNAP) and opportunities for employment.

In an early experimental study, Berk and colleagues compared the likelihood of employment and arrests during the 12-months following release from prison among adults who were randomly assigned to eligibility for unemployment benefits or the control condition of job counseling (Berk et al, 1980). The treatment conditions varied in duration and the level of tax imposed on earnings, from 25% to 100%. Using an intention to treat analysis, they found no difference in arrests across the treatment and control conditions, and a relative decrease in employment among adults assigned to the unemployment benefits condition. In supplementary structural equation modeling, the employment effects were similar; however, unemployment benefits were associated with a relative reduction in arrests for both property and non-property crime. More recently, Yang (2017b) evaluated the impact of local labor market conditions at the time of release on risk of recidivism within 3 years of prison release by exploiting variation in the average low-skilled wages for men across counties and time within 43 states. Higher wages for low-skilled employment at the time of release is associated with a reduction in the risk of recidivism.

A separate literature considers the impact of access to income transfer programs on recidivism. Most recently three studies separately test whether improved access to public welfare benefits including Supplemental Nutrition Assistance Program and Temporary Assistance for Needy Families following release from prison reduces the risk of recidivism. They exploit changes over time in an eligibility exclusion for the programs that applies to individuals with felony drug convictions. Variation in state responses to this ban provide the basis for Yang's identification strategy, a triple difference-in-differences design comparing individuals released from prison for drug and non-drug related offenses across states and over time (Yang, 2017a). The risk of recidivism falls by roughly 10 percent following states' partial or full elimination of this exclusion. Tuttle (2019) uses a regression discontinuity design, and finds a robust though imprecisely estimated, increase in the likelihood of recidivism among adults convicted of drug trafficking following imposition of the exclusion that is driven by financially motivated crime. Luallen and colleagues (2018) used an RD design that incorporates difference-in-differences estimation to compare the risk of recidivism for individuals who were admitted to prison before and after the initial adoption of the exclusion within six states. The treatment group included individuals with a conviction for a drug offense; the comparison group include individuals convicted of a non-drug offense. They found no evidence of a change in risk of recidivism for the affected group of individuals following the eligibility exclusion although there was suggestive evidence of heterogeneous effects according to time at risk.

3.4 Medicaid and Economic Well-Being

A growing literature demonstrates the positive effects of Medicaid on measures of financial security suggesting the plausibility of the income effect channel. Finkelstein et al., (2012), Baicker et al., (2013), Hu et al., (2016), and Gruber and Yelowitz (1999) study financial outcomes and find improvements in one or more of the following outcomes, medical debt, financial strain, credit scores, and out-of-pocket medical spending. Gross and Notowidigdo (2011) examine bankruptcies using the expansions of SCHIP and Medicaid from 1992 to 2004; they find that a 10-percentage point increase in insurance eligibility decreases bankruptcies by 8%. Two additional papers find decreases in out of pocket spending in the context of the early Medicaid expansions (Golberstein and Gonzales, 2015; McMorrow et al., 2016).

The literature generally presumes that financial outcomes are a proxy for the consumption-smoothing benefits of health insurance, although it is unclear to what degree the changes in finances reported result from decreased prices, reduced risk, increased effective income, or some combination. Medicaid coverage has the potential to affect financial security through each of these mechanisms. It changes the risk of large unexpected expenses and the out of pocket price of health care services. It is also unclear to what degree the incidence of the financial benefits falls on the beneficiaries as opposed to providers of health care services (Finkelstein et al., 2018).

As a transfer program, Medicaid may also influence financial well-being more broadly through income effects in which resources previously allocated to health care are newly available for other purposes that may alter the incentives to recidivate. Most salient in this case is likely labor supply incentives, which have been studied in Medicaid but not previously in the justice-involved population. Pre-ACA work has found somewhat mixed effects. For example, there was no evidence of employment effects in the Oregon Health Insurance Experiment population (Baicker et al., 2014) but Wisconsin adults who were able to access an earlier limited Medicaid waiver program returned to the work force more slowly than those who were waitlisted for the program, with net employment declines of 3-5 percentage points (Dague et al., 2017). Some work finds evidence of large increases in employment in Tennessee following the TennCare disenrollment event, suggesting strong work disincentives, although other work on the change using panel data has not replicated this finding (Garthwaite et al., 2014). Recent cross-sectional work focused on the ACA Medicaid expansions does not typically find any declines in employment, which could be due in part to policy uncertainty, different affected income groups, labor market conditions, or to the availability of phased out Marketplace subsidies in non-expansion states (Gooptu et al., 2016; Kaestner et al., 2017; Leung and Mas, 2018). We do not rule out the possibility, which has theoretical support and strong empirical support in the context of other transfer programs.

3.4 Treatment for substance use disorder and recidivism

Observational studies consistently find that treatment for substance use is associated with reduced criminal activity including recidivism (Bondurant et al., 2018, Bukten et al., 2012; Campbell et al., 2007; Deck et al., 2009; Durbeej et al., 2015; Gossop et al., 2005). Relatively few experimental studies have investigated the effects of SUD treatment relative to no treatment on criminal activity. Among them, participation in higher intensity interventions such as residential therapeutic communities decreased risk of reincarceration relative to the control residential condition (Sacks et al., 2012). However, receipt of a lighter touch intervention, screening, brief intervention and referral to treatment, did not alter the likelihood of rearrest (Prendergast et al., 2017). We conclude that the empirical literature suggests that receipt of SUD treatment is a plausible mechanism for reducing recidivism but may depend on the type and scope of treatment. Whether Medicaid coverage can trigger this mechanism, depends on how coverage influences treatment use.

3.5 Medicaid and the use of substance use disorder treatment

While the effect of Medicaid *enrollment* on use of SUD treatment has not been well-studied, a growing evidence base examines the impact of Medicaid eligibility expansions on SUD service use. This research has generally evaluated three types of outcomes, the share of patients or services for which Medicaid is the payer, the population rate of SUD services provided overall and paid by Medicaid specifically, and the number of individuals or share of a given population that received any SUD services (M. Olfson et al., 2018). There is strong evidence that the share of services for which Medicaid is the payer increased in states that expanded Medicaid eligibility under the ACA relative to non-expansion states including admissions to specialty treatment facilities (Maclean and Saloner, 2019; Saloner and Maclean, 2020), outpatient SUD programs (Andrews et al., 2019), and emergency department visits and hospitalizations (Wen et al., 2020). The increasing role of Medicaid as payor is typically offset by a reduction in self-pay or uninsured as the payer source. Similarly consistent evidence shows that the rate of Medicaid-reimbursed prescription medications to treat opioid use disorder (OUD) and alcohol use disorder increased in expansion states compared to non-expansions states (Maclean and Saloner, 2019; Meinhofer and Witman, 2018; B. Saloner et al., 2018; Sharp et al., 2018; Wen et al., 2017a).

The impact of Medicaid expansions on population rates of SUD services provided is somewhat more mixed across outcomes and duration of follow-up. Saloner and colleagues (2018) compared the rate of prescription medication claims for OUD across expansion and non-expansion counties using an all-payer pharmaceutical claims dataset in five states and a DD design. The rate of prescription medication fills increased in expansion counties relative to non-expansion counties with no observed difference in the mean number of days of treatment supplied (Saloner et al., 2018). A small group of studies has evaluated the change in admissions to specialty treatment facilities following ACA Medicaid expansions using difference-in-differences and event study designs. In the short-term, Meinhofer and Witman (2018) observed an increase in the rate of opioid-related admissions to specialty treatment facilities in expansion states relative to non-expansion states (Meinhofer and Witman, 2018). When all types of SUD admissions were included, Maclean and Saloner (2019) did not find strong evidence of a relative increase in expansion states. However, in a recent update to their work that extends the follow-up period to four years, the rate of SUD admissions specialty treatment facilities increased steadily post-expansion resulting in a cumulative increase of 35.5% relative to non-expansion states (Saloner and Maclean, 2020). Wen and colleagues (2020) evaluated the impact of early Medicaid expansions (2005-2013) and post-2014 expansions (2014-2017) on the population rate of opioid-related emergency department visits and hospitalizations. There was no notable change in the rate of opioid-related ED visits associated with either the pre- or post-2014 expansion; however, the post-2014 expansions were associated with a 10% reduction in the opioid-related hospitalization rate that they speculate may reflect improved access to outpatient treatment.

Two survey-based studies have assessed the impact of Medicaid expansions on the size, or share of a given, population that receives SUD treatment. Olfson et al., (2018) used the cross-sectional National Survey on Drug Use and Health to examine the impact of Medicaid expansions, 2012-2015, on the use of any SUD treatment among low-income adults with self-reported SUDs. There was no significant change in the percentage who reported receiving any treatment in the past year. Using data from a nationally representative longitudinal survey of SUD treatment programs, Andrews and colleagues (2019) found no evidence of change in the total number of patients served by outpatient treatment programs. Finally, Saloner and colleagues (2016) assessed the impact of the ACA's implementation as a whole, including Medicaid expansions, on use of treatment for SUDs among adults with SUDs who also had some justice-involvement in the prior year (i.e., arrested, booked, on probation or parole. Using the National Survey

on Drug Use and Health, they reported a significant decrease in the rate of uninsurance within the first year of the ACA within the study population but no changes in the likelihood of receiving SUD treatment.

We conclude from this literature review that Medicaid expansions are associated with a significant change in the payer composition for SUD services, and an increase in the population rate of some types of SUD treatment services across payers and paid by Medicaid specifically. Whether the expansions increased the likelihood of receiving treatment within selected populations of policy interest remains less clear.

4. EMPIRICAL METHODS

4.1 Natural Experiment

We exploit two policy changes in the State of Wisconsin that greatly expanded the availability of Medicaid benefits to released prisoners. First, on April 1, 2014 Wisconsin expanded Medicaid eligibility to all adults with income below 100% of the federal poverty level (FPL). The state did not participate in the full Medicaid expansion authorized by the Affordable Care Act; this eligibility expansion was done under waiver authority and at a higher state funding share. Parents with income below 100% FPL were already eligible for Medicaid at that time and have remained so. However, before April 2014, Medicaid in Wisconsin (called BadgerCare) was generally unavailable to non-disabled adults without dependent children in the home ("childless adults", which would include non-custodial parents). The income and family composition of the vast majority of adults released from state correctional facilities would allow them to qualify as childless adults after the 2014 policy change, but not previously (Western and Smith, 2018).

Second, beginning in January 2015 and through the first quarter of that year, the Wisconsin Department of Corrections (DOC) implemented pre-release Medicaid enrollment assistance. The pre-release enrollment assistance program is available to all adults under the supervision of the state's Division of Adult Institutions (DAI) incarcerated within state correctional facilities; these include state prisons, correctional centers, and DAI-contracted beds within county jails. Under the new enrollment assistance program, individuals may apply for Medicaid as early as the 20th day of the month prior to their month of release. In all facilities, DAI discharge planning staff provide guidance on how to apply for Medicaid, and individuals are given the opportunity to call an eligibility case worker from the correctional facility to do so. Additionally, five facilities share three paralegal staff who also assist inmates with the enrollment process. The DOC selected these five facilities for additional support based on the composition of their populations (e.g., relatively high prevalence of limited English proficiency, intellectual disabilities, mental illness, etc.) At all facilities, the eligibility decision is generally made at the conclusion of this single call. If deemed eligible, the Medicaid coverage is effective upon release from the correctional facility. Full implementation was complete at the end of March 2015.

4.2 Data

We use a person-level, longitudinal dataset for the years 2013-2017 which combines administrative data from the state of Wisconsin's Department of Corrections (DOC), the Medicaid program, and the Unemployment Insurance (UI) program as well as the Census Bureau's Quarterly Workforce Indicators (QWI) (U.S. Census Bureau, 2016). These records are matched within the Institute for Research on Poverty's Wisconsin Administrative Data Core (Brown and Thornton, 2020) using Social Security Numbers (last four digits), names, dates of birth, and other characteristics such as gender and race/ethnicity. Linkages are made using fuzzy matching methods to account for name variants, data entry errors, or other data quality issues.

We observe Medicaid enrollment status, which is defined at the month level, from the Medicaid program data. From the Department of Corrections' data, we observe individual demographic characteristics including age, sex, race (Black, White, American Indian/Alaskan Native, Asian or Pacific Islander, and unknown), level of education (>= high school degree), and marital status. Additionally, we observe the characteristics of each prison term including exact entry and release dates, the correctional facility, the Association of State Correctional Administrators' category of conviction offense(s) (i.e., violent, property, drug, and public order), and an indicator for having a history of substance use. The latter variable is derived from self-reported data collected through the DOC's risk and needs assessment tool, the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) (Northpoint, Inc. 2019; Northpointe Institute for Public Management, 2009). Additional information about this measure and the COMPAS tool is included in the Appendix. The QWI includes quarterly measures of average wages at the county-level stratified by age, sex, industry, and educational background which we use to adjust for local labor market demand.

The UI data includes quarterly wages for any individuals who are employed by an employer covered by Wisconsin UI law whose work could qualify them for UI benefits. These measures may be missing some forms of employment (such as independent contracting) that the formerly incarcerated may be engaged in; so long as this is not differential across time periods this is not an issue for bias in our estimates, only for interpretation.

4.3 Sample

From these data, we create a release-level analytic sample that includes the available demographic and term characteristics in addition to the outcome measures described below. The study population includes all adults ages 18-64 incarcerated by the state and under supervision of the Division of Adult Institutions who were released to the community between January 2013 – June 2017. We required a minimum incarceration period of 30 days to increase the likelihood that individuals had adequate time to complete the discharge planning process and thus have the opportunity to enroll in Medicaid. The full sample include 32,846 individuals for whom we observe 41,001 releases. Table 1 includes the full set of summary characteristics on the sample by individual (defined at the first release) and for all releases.

4.4 Outcome Measures

Medicaid enrollment is our outcome for the first stage of the analysis. Because everyone is eventually exposed to the Medicaid expansion policy, we focus on outcomes that are defined relative to or at the time of release. Thus, even if someone released in December 2013 enrolls in Medicaid in April 2014, they were not able to do so at the time of their release. We create a binary variable for Medicaid enrollment that is equal to one if the individual is enrolled in Medicaid in the month of release and zero otherwise based on our observation of Medicaid enrollment following the data linking process.

We define recidivism as a state prison admission at two time points, within 6 and 12 months of release from state prison consistent with other work in this area (Wisconsin Department of Corrections,2020; Hall et al., 2015; Kirk, 2009; Kuziemko, 2013; Luallen et al., 2018; Tuttle, 2019; Yang, 2017a). This measure of recidivism includes admissions for new sentences as well as violations of parole and probation.

Employment status and earnings are defined at the quarter-level using the QWI data. We define any employment as having non-zero earnings in a quarter. The quarter of release is set to be the one that contains the release date. We set earnings to zero if we do not observe any earnings in the data in that

quarter for an individual. To adjust for differences in time available to have earnings and employment, in the empirical specifications we control for the month of the quarter of release.

5. EMPIRICAL MODEL & IDENTIFICATION

In general, recidivism and employment are likely to be endogenous to characteristics correlated with Medicaid enrollment including, in particular, income. The changes in Medicaid eligibility that occurred during this time period are a plausibly exogenous determinant of Medicaid enrollment. We thus use the different policy regimes as instruments for Medicaid enrollment.

We define the regimes as follows:

- Regime 0 (control): released January 2013-March 2014;
- Regime 1 (pure expansion): released April 2014-December 2014
- Regime 2 (expansion + EA phase-in): released January 2015-March 2015
- Regime 3 (expansion + full EA): released April 2015-December 2015

The IV model is given by the following two equations:

(1) $Y_i = Medicaid_i + X_i\beta + \mu_i$
(2) $Medicaid_i = \sum_{n=1}^{3}(\lambda_n Regime_n) + X_i\delta + \upsilon_i$

In the model, *Y* is the outcome of interest for release *i*, *Medicaid* is an indicator for Medicaid enrollment, *Regime* is an indicator for whether release *i* was during a particular regime, and **X** is a vector of release characteristics that includes age, sex, race, level of education, marital status, months incarcerated, type of crime, and risk of substance use.

Because prisoners do not have control over their timing of release from a facility and are not able to delay their release until a more favorable policy regime is in place, we argue that release date is as good as randomly assigned. To support plausibility we include the results of a normalized difference as a balance test across regimes in Table 1. In large administrative samples such as ours, the t-statistic can be large in absolute value and even small differences are statistically significant even if they are economically small (Imbens, 2015). The normalized difference is the difference in means over regimes divided by the square root of half the sum of the group variances, so it is scale invariant. Large values for the normalized differences would suggest that the average covariate values in the two groups are substantially different and that we might be concerned for the plausibility of the as good as randomization assumption. A rule of thumb based on Imbens and Rubin (2015) is that differences of 1 or larger could be problematic and differences of .25 or smaller suggest good balance; all of the normalized differences in Table 1 are less than .2, with balance supporting the randomization assumption.

The exclusion restriction is that the timing of release (the regime) is unrelated to the outcome (recidivism, employment, and earnings) conditional on the other variables included in the model. The main threat to identification is changes over time in the outside environment (i.e. the economy), since there is no possible simultaneous control group. In order to address this we include controls from the QWI for the employment to population ratio for men with low education levels at the time of release. We also in some models include fixed effects for correctional facilities, as Medicaid take-up rates varied by facility.

Because we are overidentified, we estimate this model using GMM in Stata 16; specifically, we use the implementation in the ivreghdfe Stata package (Correia, 2018; StataCorp, 2019) which partials out controls and fixed effects. We cluster standard errors at the individual level in models that include multiple releases per individual.

The two policies are not exactly the same, and the second was phased in over several months. Here, we combine the variation from these phases, but we also provide the reduced form estimates of the direct effects of the policy on the outcomes. The equation for the reduced form is:

$$(3)\quad \mathrm{Y_i} = \sum_{n=1}^{3}(\gamma_n Regime_n) + X_i\theta + \epsilon_i$$

Some individuals have multiple releases in the data. In this version of the paper, our ability to observe releases prior to January 2013 among individuals in our sample is limited, although we are working to obtain additional information on prior justice involvement. This means there may be censoring related to the timing of release in what we consider to be the first release of an individual. The sample of all releases, however, includes multiple observations from repeat offenders who may be less likely to be affected by the policies. We therefore include results from both a subsample of first releases and the full set of releases to help contextualize the results.

6. RESULTS

6.1 First Stage Results

Figure 1 illustrates the fraction of releases that were enrolled in Medicaid over time. It provides clear evidence that the new Medicaid policies resulted in large increases in Medicaid enrollment at the time of release among former prisoners.

Table 2 summarizes the results of the first stage estimation (represented in the empirical model by equation (2)) for our preferred specification, which improves facility fixed effects (although the first stage is not specification sensitive). Among first releases, the availability of Medicaid to adults without dependent children with incomes below the policy line (Regime 1) resulted in a 29 percentage point increase in Medicaid enrollment in the month of release. During the implementation of enrollment assistance (Regime 2), this increased to 46 percentage points, and after full implementation of enrollment assistance it had increased to 58 percentage points (Regime 3). Among all releases, the increase was very similar, 1-2 percentage points larger across the board. Relative to average enrollment at release in the pre-period of 10 percent, this represents a roughly 200% increase during Regime 1 and a 500% increase by Regime 3.

Table 2 includes the first stage results for specific subjects of interest: SUD risk and type of crime. Those with SUD risk had a net increase that was 2-4 percentage points higher than first releases, and 1-2 percentage points larger than all releases. Among types of crime, the largest increase at Regime 1 was for those with a violent crime (32 percentage points). The largest net increase from the enrollment assistance relative to Medicaid expansion (Regime 3 – Regime 1) was for those with a drug crime (35 percentage points). The largest overall increase in enrollment across regimes was by those with public order crimes (63 percentage points). The major takeaway, however, is that the increases in enrollment were very similar across all groups.

In terms of instrument relevance, there is clearly not a weak instruments problem as indicated by the very large first stage F statistics reported in the table.

6.2 Recidivism

We can see the results of OLS estimation of the effect of Medicaid enrollment on recidivism along with the IV estimated with GMM and the reduced form effects of the regimes on reincarceration within 6 months in Table 3. Panel A provides results for the sample of first releases and Panel B shows results for all releases. All models include controls for age, race, education, marital status, duration of incarceration, type of crime, calendar month of release, and some models include additionally controls for the employment to population ratio of low-educated men, or fixed effects for facility of incarceration.

The OLS results do not consistently show a relationship between Medicaid and incarceration. However, the GMM results show that Medicaid enrollment is associated with a decline in the probability of recidivism for first releases of 5 percentage points, statistically significant at the 1% level across all specifications. For all releases, the effect size is approximately 2 percentage points. Statistically significant effects are also evident in the reduced forms across all regimes. Average 6 month recidivism in the data is 17% for all spells and 16% for the first spell, so the implied effect size is a reduction of 29% for first releases or 13% for all releases.

Table 4 shows the same results estimated for a longer post-release window, 12 months. Here there is some evidence of a positive correlation between Medicaid enrollment and recidivism in the OLS results, consistent with lower incomes as a confounding factor. In the IV results, for first releases the effect is even stronger, with Medicaid enrollment associated with a decline of 6.6 to 5.4 percentage points depending on the specification. In the sample of all releases, the effects at 12 months are slightly attenuated (as expected, if those with multiple spells are less likely to be sensitive to the policy). Again these effects are similarly evident in the reduced forms. Average 12 month recidivism is 31% of all spells and 30% of first spells, so the implied effect size is a reduction of 20% for first releases or 6% for all releases.

6.3 Employment and Earnings

Tables 5 and 6 show the results of estimation for the employment and earnings outcomes, respectively. Similar to above, all models include controls for age, race, education, marital status, duration of incarceration, type of crime, calendar month of release, and some models include additionally controls for the employment to population ratio of low-educated men, or fixed effects for facility of incarceration. An important difference is that because the employment and earnings data are quarterly, here we control for the month of the quarter in which the release occurred.

In Panel A of Table 5, we show the results for the sample of first releases. There is generally a positive correlation between Medicaid enrollment and employment in the OLS estimates. The IV results suggest an increase in employment in the quarter of release of 5 percentage points. Panel B includes the results for the sample of all releases which shows very similar increases of 5-6 percentage points. In the reduced form, these effects are most strongly evident in Regime 3.

Results for net earnings are in Table 6. Medicaid enrollment is generally negatively correlated with earnings in the OLS (likely since enrolling in Medicaid requires, mechanically, a lower income). The IV results, however, suggest an increase in net earnings consistent with the IV employment effects, of approximately $200 in the quarter of release. Again in the reduced form, the effects are most strongly evident in Regime 3.

6.4 Summary of Subgroup Analyses

Table 7 includes the main IV GMM coefficient from the specification including fixed effects for facilities for subsamples including those with an indicator for SUD risk, and the indicators for types of crime. Recall that the first stage was largely similar across groups (Table 2). For recidivism at 6 months, a reduction is most evident for those with a violent crime conviction (approximately 4 percentage points) and is least evident for those with SUD risk and/or public order crimes. For those with drug and property crimes, the effect size is similar to all releases (2 percentage points) but is not statistically different from zero at standard calculation levels. For recidivism at 12 months, the conclusion is very similar.

For employment, the largest employment effects are also among those with SUD risk and public order and violent crimes, while the smallest employment effects are among those with drug and property crimes. For net earnings, the largest effects are for those with drug crimes, followed by public order, and the smallest are for those with property crimes.

The purpose of the analysis of subgroups was to help us consider whether the hypothesis that the mechanism was increased treatment among those with substance use disorder. Our interpretation is that these results are largely not consistent with that mechanism – results for those with identified SUD risk were not substantially different and in many cases were actually smaller than average. Similarly, those whose crimes might be more consistent with a need for SUD treatment (typically defined as drug and property crimes) did not see larger effects on recidivism or employment. The only exception is net earnings for those with drug crimes, where we saw the largest coefficient.

7. CONCLUSION

Dedicated programs that seek to improve economic and criminogenic outcomes for adults returning to the community from prison often focus on specific populations (e.g., adults with serious mental illness). For these subpopulations, they provide a set of comprehensive services including supportive housing, vocational training, and access to health care. However, because these high-touch programs are expensive, their reach is limited. Public policies that encompass the broader population of adults leaving prison provide an alternative means of influencing post-incarceration outcomes. These range from policies that address discrimination which may prevent individuals from achieving financial security (e.g., employment and housing) to policies that provide direct financial assistance (e.g., SNAP, public housing vouchers, etc). Among the more recent examples of the latter is the expansion of Medicaid eligibility, in most states, to include low-income adults without dependent children.

In this paper, we assessed the consequences of Medicaid coverage upon release from prison on the likelihood of reincarceration. While the magnitude and precision of point estimates varied across model specifications and subgroups, Medicaid coverage generally reduced the likelihood of reincarceration at 6- and 12-months. We examined employment as a potential channel through which Medicaid coverage may reduce reincarceration by estimating the effect of coverage on employment. Medicaid coverage improved employment outcomes consistently; these effect sizes were substantial and robust to alternative specifications and subgroups.

Our findings suggest that the positive impact of Medicaid coverage on reincarceration operates, at least in part, through a financial channel. In next steps for this paper, we will further examine the health channel by estimating the effects of Medicaid coverage on treatment for substance use disorders post-incarceration.

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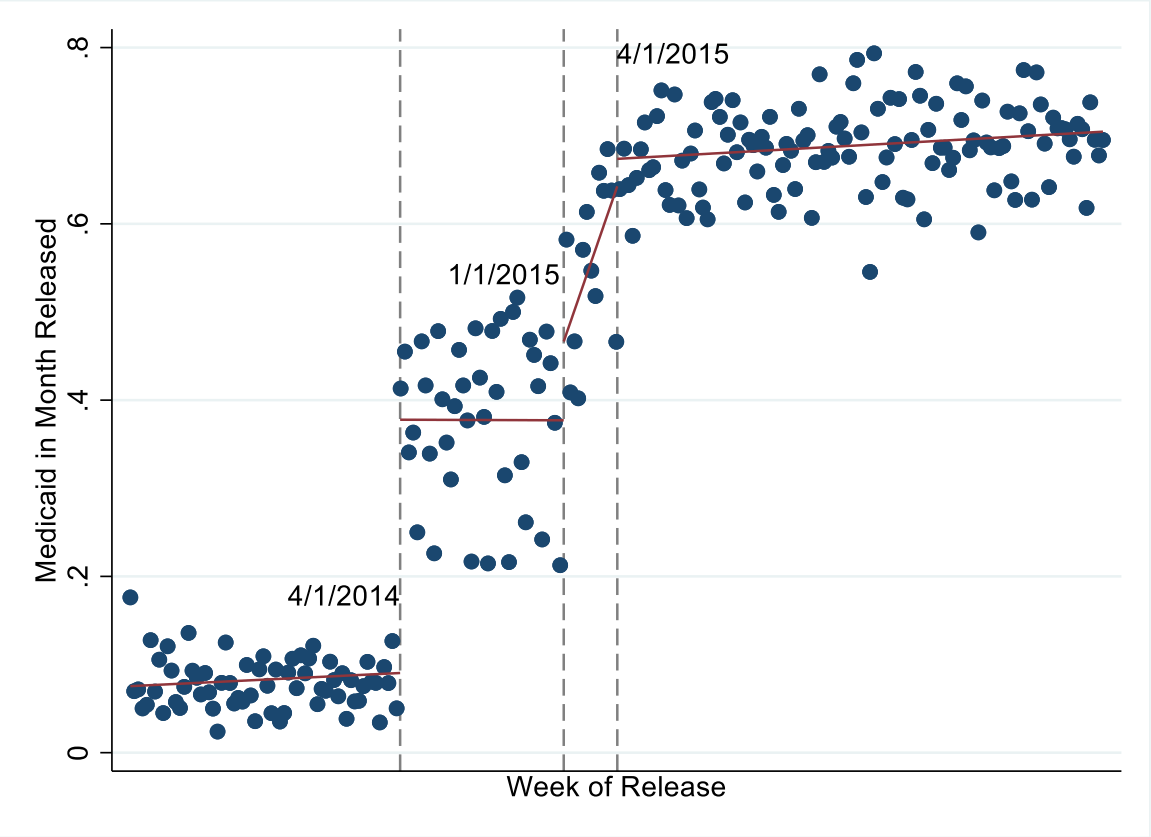
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TABLES AND FIGURES

Figure 1. Probability of Medicaid Enrollment at Release



Source: Authors' calculations from Wisconsin administrative data. Notes: Figure shows fraction of releases with Medicaid enrollment in the month of their release, binned by week of release. Bins do not cross regimes. Linear trend superimposed.

Table 1. Summary of Release Characteristics and Omnibus Balance Test

	First Releases					All Releases				
		Regime Average			Normalized		Regime Average			Normalized
Characteristic	Regime 0	Regime1	Regime2	Regime 3	Balance	Regime 0	Regime1	Regime2	Regime 3	Balance
Female	8.1%	8.2%	9.8%	11.1%	0.0714	7.9%	7.9%	9.3%	9.8%	0.0454
Age 18-23	7.1%	5.9%	5.2%	6.4%	-0.0473	7.4%	6.6%	6.2%	7.6%	-0.0117
Age 24-35	36.1%	35.8%	33.7%	34.0%	-0.0340	36.1%	36.7%	35.1%	36.6%	0.0095
Age 36-55	46.8%	47.0%	49.4%	46.9%	0.0113	46.6%	46.0%	47.8%	44.8%	-0.0226
Age 55+	10.0%	11.3%	11.7%	12.8%	0.0727	9.9%	10.7%	10.8%	11.0%	0.0324
American Indian	3.7%	4.4%	4.5%	4.3%	0.0239	3.8%	4.3%	4.4%	4.5%	0.0274
Asian or Pacific Islander	0.8%	0.9%	1.1%	1.0%	0.0235	0.8%	0.8%	0.9%	0.9%	0.0128
Black	42.0%	38.4%	38.2%	36.6%	-0.0935	42.6%	40.0%	39.3%	38.8%	-0.0633
White	53.4%	56.2%	56.1%	58.1%	0.0772	52.9%	54.8%	55.3%	55.8%	0.0486
Education Level	1.159	1.034	1.007	0.972	-0.0890	1.173	1.072	1.071	1.020	-0.0676
Married	9.6%	9.6%	10.1%	10.7%	0.0225	9.6%	9.4%	9.7%	9.6%	-0.0019
Months Incarcerated	24.84	28.80	31.00	32.93	0.1763	24.15	25.57	26.45	26.39	0.0490
Substance Use Risk Flag	57.7%	55.5%	55.6%	60.6%	-0.0199	57.7%	56.7%	57.0%	61.8%	-0.0086
Violent Crime	42.3%	41.4%	43.9%	41.5%	-0.0351	42.2%	41.6%	43.8%	42.0%	-0.0110
Property Crime	32.5%	32.8%	29.9%	30.6%	0.0633	32.7%	32.8%	31.6%	32.4%	0.0459
Public Order Crime	42.7%	44.1%	44.2%	46.9%	0.0370	42.1%	42.9%	42.8%	45.5%	0.0253
Drug Crime	26.5%	26.8%	25.8%	28.6%	0.0229	26.2%	26.3%	24.9%	27.6%	0.0528

Source: Authors' calculations from Wisconsin administrative data. Notes: Table shows average characteristics by regime and the results of a normalized balance test comparing Regime 0 to the other regimes.

Table 2. Medicaid Enrollment at Release (First Stage)

				Type of Crime			
	First Release	All Releases	SUD Risk	Drug	Public Order	Property	Violent
Regime 1	0.289***	0.300***	0.314***	0.247***	0.310***	0.317***	0.324***
	(0.00759)	(0.00660)	(0.00905)	(0.0131)	(0.0102)	(0.0117)	(0.0106)
Regime 2	0.457***	0.476***	0.491***	0.445***	0.478***	0.475***	0.527***
	(0.0130)	(0.0113)	(0.0150)	(0.0226)	(0.0174)	(0.0201)	(0.0170)
Regime 3	0.584***	0.611***	0.624***	0.602***	0.628***	0.634***	0.619***
	(0.00767)	(0.00428)	(0.00572)	(0.00867)	(0.00645)	(0.00765)	(0.00679)
Observations	31104	40721	23418	10585	17482	12901	16336
F-statistic	5021.2	7038.1	4076.1	1650.6	3235.4	2343.8	2901.1

Notes: Estimates from a model that includes controls for age, race, education, marital status, duration of incarceration, type of crime, calendar month of release, and fixed effects for facility

Table 3. IV Results, Reincarcerated Within 6 Months

Panel A.	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form
Sample: First Releases									
Medicaid	-0.00573	-0.0545***		-0.00585	-0.0542***		-0.000875	-0.0476***	
	(0.00383)	(0.00741)		(0.00385)	(0.00752)		(0.00416)	(0.00754)	
Regime 1			-0.0290***			-0.0282***			-0.0293***
			(0.00590)			(0.00594)			(0.00596)
Regime 2			-0.0303**			-0.0303**			-0.0326***
			(0.00925)			(0.00929)			(0.00930)
Regime 3			-0.0342***			-0.0339***			-0.0355***
			(0.00455)			(0.00462)			(0.00463)
Facility Fixed Effects							X	X	X
Employment/Population				X	X	X			
Observations		31408			31104			31097	
First Stage F-statistic		5268.9			5102.6			5021.2	
Panel B.									
Sample: All Releases									
Medicaid	0.00140	-0.0238***		0.00155	-0.0225**		0.000512	-0.0207**	
	(0.00366)	(0.00700)		(0.00369)	(0.00712)		(0.00397)	(0.00707)	
Regime 1			-0.0165**			-0.0154**			-0.0152**
			(0.00582)			(0.00586)			(0.00589)
Regime 2			-0.0176*			-0.0173			-0.0190*
			(0.00888)			(0.00892)			(0.00896)
Regime 3			-0.0158***			-0.0148***			-0.0138**
			(0.00442)			(0.00449)			(0.00453)
Facility Fixed Effects							X	X	X
Employment/Population				X	X	X			
Observations		39504			39186			39185	
First Stage F-statistic		6906.3			6692.4			6589.1	

Notes: Authors' calculations from Wisconsin administrative data. Controls for age, race, education, marital status, duration of incarceration, type of crime, calendar month of release.

Table 4. IV Results, Reincarcerated Within 12 Months

Panel A.	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form
Sample: First Releases									
Medicaid	0.00565	-0.0659***		0.00598	-0.0654***		0.0136*	-0.0542***	
	(0.00493)	(0.00943)		(0.00497)	(0.00956)		(0.00531)	(0.00958)	
Regime 1			-0.0372***			-0.0366***			-0.0380***
			(0.00750)			(0.00755)			(0.00756)
Regime 2			-0.0342**			-0.0350**			-0.0378**
			(0.0119)			(0.0120)			(0.0120)
Regime 3			-0.0414***			-0.0410***			-0.0429***
			(0.00577)			(0.00586)			(0.00588)
Facility Fixed Effects							X	X	X
Employment/Population				X	X	X			
Observations		31408			31104			31097	
First Stage F-statistic		5268.9			5102.6			5021.2	
Panel B.									
Sample: All Releases									
Medicaid	0.0152***	-0.0217*		0.0154***	-0.0208*		0.0136**	-0.0168	
	(0.00451)	(0.00859)		(0.00455)	(0.00873)		(0.00484)	(0.00868)	
Regime 1			-0.0210**			-0.0203**			-0.0200**
			(0.00712)			(0.00716)			(0.00718)
Regime 2			-0.0172			-0.0177			-0.0198
			(0.0111)			(0.0111)			(0.0112)
Regime 3			-0.0150**			-0.0144**			-0.0131*
			(0.00541)			(0.00549)			(0.00553)
Facility Fixed Effects							X	X	X
Employment/Population				X	X	X			
Observations		39504			39186			39185	
First Stage F-statistic		6906.3			6692.4			6589.1	

Notes: Authors' calculations from Wisconsin administrative data. Controls for conviction county, age, race, education, marital status, duration of incarceration, type of crime, calendar month of release.

Table 5. IV Results, Employment

Panel A.	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form
Sample: First Releases									
Medicaid	0.00512	0.0567***		0.00429	0.0522***		0.0281***	0.0497***	
	(0.00474)	(0.00887)		(0.00477)	(0.00898)		(0.00466)	(0.00874)	
Regime 1			0.0105			0.00939			0.0118
			(0.00715)			(0.00719)			(0.00695)
Regime 2			0.00941			0.00833			0.00758
			(0.0105)			(0.0106)			(0.0102)
Regime 3			0.0353***			0.0325***			0.0312***
			(0.00544)			(0.00552)			(0.00535)
Facility Fixed Effects							X	X	X
Employment/Population				X	X	X			
Observations		31408			31104			31097	
First Stage F-statistic		5257.6			5090.2			5010.2	
Panel B.									
Sample: All Releases									
Medicaid	0.0154***	0.0558***		0.0151***	0.0528***		0.0124**	0.0563***	
	(0.00413)	(0.00772)		(0.00415)	(0.00783)		(0.00416)	(0.00761)	
Regime 1			0.00554			0.00477			0.00477
			(0.00660)			(0.00663)			(0.00665)
Regime 2			0.0137			0.0129			0.0143
			(0.00936)			(0.00939)			(0.00939)
Regime 3			0.0339***			0.0320***			0.0314***
			(0.00487)			(0.00494)			(0.00495)
Facility Fixed Effects									
Employment/Population				X	X	X			
Observations		39504			39186			39185	
First Stage F-statistic		6908.2			6692.1			6588.5	

Notes: Authors' calculations from Wisconsin administrative data. Controls for conviction county, age, race, education, marital status, duration of incarceration, type of crime, calendar month of release, and month of quarter.

Table 6. IV Results, Net Earnings

Panel A.	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form	OLS	IV (GMM)	Reduced Form
Sample: First Releases									
Medicaid	-194.6***	208.3***		-196.7***	198.6***		-80.03***	204.3***	
	(14.83)	(28.23)		(14.96)	(28.72)		(13.12)	(27.05)	
Regime 1			9.698			7.333			17.72
			(21.92)			(21.91)			(20.70)
Regime 2			26.48			22.59			22.06
			(34.38)			(34.59)			(32.16)
Regime 3			133.4***			127.7***			130.7***
			(17.26)			(17.57)			(16.47)
Facility Fixed Effects							X	X	X
Employment/Population				X	X	X			
Observations		31408			31104			31097	
First Stage F-statistic		5268.9			5102.6			5021.2	
Panel B.									
Sample: All Releases									
Medicaid	-157.5***	184.0***		-158.8***	177.8***		-169.2***	198.4***	
	(12.70)	(23.59)		(12.76)	(23.98)		(12.90)	(22.54)	
Regime 1			0.558			-0.959			-0.958
			(19.66)			(19.66)			(19.75)
Regime 2			50.83			48.35			53.72
			(30.09)			(30.21)			(30.25)
Regime 3			112.1***			108.3***			105.8***
			(14.71)			(14.97)			(15.01)
Facility Fixed Effects							X	X	X
Employment/Population				X	X	X			
Observations		39504			39186			39185	
First Stage F-statistic		6906.3			6692.4			6589.1	

Notes: Authors' calculations from Wisconsin administrative data. Controls for conviction county, age, race, education, marital status, duration of incarceration, type of crime, calendar month of release, and month of quarter.

Table 7. IV Results for Selected SubSamples

	Type of Crime				
	SUD Risk	Drug	Public Order	Property	Violent
Reincarcerated within 6 months	-0.00622	-0.0201	-0.00490	-0.0244	-0.0380***
	(0.00894)	(0.0128)	(0.00955)	(0.0125)	(0.0110)
Reincarcerated within 12 months	-0.0114	-0.0193	-0.00674	-0.0182	-0.0383**
	(0.0111)	(0.0166)	(0.0124)	(0.0153)	(0.0134)
Employed in quarter of release	0.0618***	0.0469**	0.0609***	0.0483***	0.0644***
	(0.00974)	(0.0151)	(0.0113)	(0.0130)	(0.0116)
Earnings in quarter of release	213.1***	253.6***	233.6***	133.2***	206.7***
	(28.57)	(42.12)	(35.55)	(35.72)	(34.14)
Observations	23418	10585	17482	12901	16336
First stage F-statistic	4076.1	1650.6	3235.4	2343.8	2901.1

Source: Authors' estimates from Wisconsin administrative data. Notes: IV GMM estimates from a model that includes controls for age, race, education, marital status, duration of incarceration, type of crime, calendar month of release, and fixed effects for facility; employment and earnings models control for month of quarter.

APPENDIX

COMPAS Substance Use History Measures

The underlying function of the COMPAS instrument is to assess risk of recidivism including potentially modifiable correlates of recidivism including substance use.[1,2] Available assessments of the validity of the COMPAS substance use score concern the degree to which this score is associated with recidivism rather than a clinical diagnosis of substance use disorder.[1]

During our study period, the Wisconsin Department of Corrections (WI DOC) was adopting the COMPAS with the eventual goal of collecting two COMPAS assessments per person: one using the COMPAS Core instrument at intake; and one using the COMPAS Reentry instrument close to the time of release. During this implementation process, it was frequently the case that individuals completed just one assessment – either Core or Reentry – depending on the time of administration. Thus, for each subject we obtained from the WI DOC the most recently completed COMPAS assessment relative to the individual's release date, and no more than 120 days after their release. An assessment may have a date after the release if it was conducted through the community supervision program.

There are some differences in the Core and Reentry instruments with respect to the substance use history questions although the WI DOC generates the same 3-category score indicating a need for treatment from each instrument: highly probable, probable, and unlikely. The specific questions on which this score is based for each instrument are noted below. We do not have access to the proprietary algorithm used to generate the score. However, in our internal analysis the vast majority of individuals identified as "highly probable" using the Core instrument had three or more positive responses to the substance use history questions. Using the Reentry instrument, the vast majority of individuals identified as highly probable had five or more positive response to the substance use history questions. We use the determination of "highly probable" as our indicator for a history of substance use.

CORE Instrument Substance Use History Questions

1.Do you think your current/past legal problems are partly because of alcohol or drugs?
2.Were you using alcohol when arrested for your current offense?
3.Were you using drugs when arrested for your current offense?
4.Are you currently in formal treatment for alcohol or drugs such as counseling, outpatient, inpatient, residential?
5.Have you ever been in formal treatment for alcohol such as counseling, outpatient, inpatient, residential?
6.Have you ever been in formal treatment for drugs such as counseling, outpatient, inpatient, residential?
7.Do you think you would benefit from getting treatment for alcohol?
8.Do you think you would benefit from getting treatment for drugs?
9.Did you use heroin, cocaine, crack or methamphetamines as a juvenile?

COMPAS Reentry Instrument Substance Use History Questions

1.Committed Offenses while high/drunk?
2.Prior drug charges/convictions?
3.History of drug problems?
4.History of alcohol problems?
5.Prior treatments for drug/alcohol abuse?
6.Any history of failed drug/urine analysis test?
7. Is the inmate at risk for substance abuse problems?