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IN-KIND WELFARE BENEFITS AND REINCARCERATION RISK: EVIDENCE FROM MEDICAID

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ABSTRACT

Most of the 600,000 adults returning to the community from state and federal prisons annually in the U.S. carry substantial debt, have low income and low education, and limited formal employment prior to entering prison. Upon reentry, they face financial hardship, high rates of morbidity and mortality, and high incidence of re-offense. Medicaid coverage, as a means-tested transfer program providing subsidized health insurance, may influence reincarceration through both financial and health channels. In this paper, we provide a comprehensive look at the effects of public health insurance coverage on post-release behavior of formerly incarcerated adults. We study a natural experiment in which two separate state policy changes resulted in a 60 percentage point increase in Medicaid enrollment at release. Using a series of linked individual level administrative datasets, we estimate the effects of this change in Medicaid enrollment, finding declines in reincarceration, increased employment, and higher health care use. Leveraging data on financial concerns and need for mental health and substance use treatment to examine mechanisms, we find support for a financial channel and mixed support for health channels. Policies that enhance access to healthcare and provide financial security for this population may have significant benefits for individuals and society.

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1. INTRODUCTION

More than 600,000 people 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, 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 (i.e., rearrest, reincarceration, or a new conviction among individuals with prior convictions). The majority of individuals incarcerated in state prisons have a history of substance use (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 - financial hardship (Harding et al., 2014), morbidity (Mallik-Kane and Visher, 2008), mortality (Binswanger et al., 2013; Eisenberg et al., 2019; Norris et al. 2022), and re-offense (Alper and Markman, 2018).

Many strategies have been tested or proposed to support a successful transition from prison to community for formerly incarcerated adults (Berghuis, 2018; Moore et al., 2020). Direct reentry interventions vary along several dimensions (Jonson and Cullen, 2015). Content and intensity vary from programs with a singular focus such as work and vocational training (Jacobs 2012) to multi-modal programs that include a mix of social, housing, and health care supports (Duwe 2012; Grommon et al., 2013), and deterrent programs such as DNA registration (Anker, Doleac, and Landersø, 2017). Participation eligibility may be determined by demographic, health or criminogenic factors, and interventions may be administered by correctional agencies or community organizations. Against this variation, budget and capacity constraints are relatively common features which limit the reach of reentry interventions.

Public policy is an alternative strategy to influence reentry outcomes. Prominent examples include state laws and local ordinances that prohibit employers from asking about prior convictions on initial job applications, which have had mixed effects with unintended consequences (Agan and Starr, 2018; Doleac and Hansen 2020), and states' relaxation of a

federal ban on the provision of Temporary Aid for Needy Families (TANF) and Supplemental Nutrition Assistance (SNAP) to individuals convicted of drug felonies, which reduced recidivism (Yang 2017a, Tuttle 2019). Strong labor market conditions post-release may independently ease the transition to the community and encourage desistance from crime (Yang 2017b).

Upon release, access to health care among formerly incarcerated adults has been minimal; historically, 80% of recently released individuals were typically uninsured (Mallik-Kane and Visher, 2008.) Unlike SNAP and TANF, Medicaid has not legally excluded formerly incarcerated individuals from coverage, but most were unlikely to be eligible prior to the Affordable Care Act because of family status eligibility requirements (i.e., the need to be a parent of a dependent child). Policies to increase Medicaid coverage for eligible individuals upon release from carceral settings have since been proposed as part of Medicaid waivers (The SUPPORT Act of 2018; U.S. Department of Health and Human Services, 2023), and some states have moved toward helping individuals transition through enrollment assistance programs as part of the prison or jail discharge planning process (Jannetta et al., 2018; Blackburn et al., 2020; Burns et al., 2021).

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 Medicaid benefits means that coverage is not a direct substitute for income, and its value to an individual likely depends on their expected need for health care and risk tolerance. Medicaid coverage may also influence recidivism directly by facilitating treatment of conditions associated with elevated risk of recidivism including mental health and substance use disorders. Efficacious outpatient treatment exists for both mental health and substance use disorders (Cuijpers, Reynolds, Donker et al., 2012; Williams, Hattingh, Kariuki, et al., 2017; 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; Panchal, Rae, Saunders et al.,

2022). The symptoms that untreated mental health and substance use disorders can impose (e.g., impulsivity, impaired judgment, aggression) may increase the risk of committing crime (Volavka and Citrome, 2011). 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 mental health and substance use disorder treatment use and reduce symptoms, thereby reducing the risk and incentive to commit crime.

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 major shifts in Medicaid enrollment for formerly incarcerated adults. Together, these policy changes resulted in a nearly 60 percentage point increase in the probability of having Medicaid coverage in the month of release for formerly incarcerated adults (Burns et al., 2021). Using a series of administrative datasets that link individual-level incarceration, Medicaid coverage and claims, and employment outcomes over time for the universe of individuals released from a state prison system, we exploit the timing of the individual's release from prison relative to the Medicaid coverage policy in place to instrument for Medicaid enrollment. We estimate the effects of this change in Medicaid enrollment on the probability of reincarceration within 6 months of release. We find declines in reincarceration of 2.5 percentage points on a baseline of 16.3 percent at 6 months, a 16% decrease. We furthermore consider whether Medicaid enrollment affects employment and earnings in this population to estimate the degree to which the formerly incarcerated were increasingly (or decreasingly) attached to the labor market, and we find that they were 5.2 percentage points more likely to be employed on a baseline of 20.7%, for an increased probability of employment of 25%, and a net increase in quarterly earnings of almost $200. We show that access to health care use increases across service categories because of Medicaid enrollment.

We then test the potential explanatory mechanisms by which Medicaid coverage may influence reincarceration. The intuition behind our approach is to identify subgroups of the

population that are plausibly more and less likely to benefit from the financial effects of Medicaid and the health effects of Medicaid and to estimate the effects of Medicaid enrollment on reincarceration risk for each subgroup. If, for example, a financial channel explains the enrollment effect on reincarceration, we would expect to observe a larger reduction in reincarceration risk among individuals with relatively greater financial concerns. We define subgroups from data obtained during the individuals' incarceration episode including self-reported financial concerns, need for substance use treatment, and mental health care need. Those with financial worries were much more likely to return to prison than those with no financial worries; however, consistent with an important role for income effects, we show that reincarceration declines are larger among those who reported financial concerns. Medicaid coverage essentially closes the gap in reincarceration between the two groups. Evidence that the Medicaid enrollment effect on reincarceration operates through a health channel is weaker and varies by health condition. The probability of reincarceration decreased more for those with mental health care needs relative to those without mental health care needs when need was defined according to a correctional staff- and self-reported assessment; however, that finding does not hold when an alternate measure of mental health care need was used based on receipt of a mental health-related prescription drug before release. We find that Medicaid-induced declines in reincarceration are concentrated among those who were unlikely to need SUD treatment according to a case management assessment. This finding may be explained by low rates of substance use disorder (SUD) treatment post-incarceration even among the subgroup with highly probable SUD treatment needs.

The current study makes several contributions to understanding the role of in-kind welfare benefits on desistance from crime. First, to date, there has been no empirical research on the impact of having Medicaid coverage that comprehensively considers reincarceration, post-release individual employment status, and health care use within a general state prison population. A growing collection of studies estimates the impact of Medicaid eligibility policies on criminal activity, including incarceration among young men (Jacome, 2022), aggregate arrest rates (Simes and Jahn, 2022), and aggregate crime rates (Wagner, 2021; Vogler, 2022; He and Barkowski, 2020; Wen et al., 2017b). These findings are

generally consistent; the increased availability of Medicaid is associated with reduced criminal activity. Three additional studies have assessed the impact of Medicaid availability on recidivism specifically, measured as rearrest or reincarceration (Fry et al., 2020; Aslim et al., 2022; Gollu and Zapryanova, 2022), finding that increased Medicaid availability is associated with a reduced risk of recidivism. Overall, this body of research provides important insights into the social welfare benefits of the Medicaid program. However, the outcome measures and study designs used generally do not allow estimation of the effect of Medicaid coverage rather than eligibility, so the measured effects depend on both participant take-up and the impact of the policy on the outcome of interest. Furthermore, our examination of longitudinal, person-level data connecting correctional, labor market, and health care dimensions is a substantial contribution relative to prior work that almost exclusively relies on aggregate analyses of cross state variation in Medicaid policy, focuses on particular subgroups, or lacks person-level data across multiple sectors.

Second, this study's unique data and empirical context enable us to directly examine the channels through which Medicaid has been theoretically suggested to affect criminal activity and recidivism by observing Medicaid enrollment, employment, and substance use and mental health treatment for individuals released from state prison. Existing work has generally been unable to distinguish the pathways by which coverage may impact recidivism. The mechanism matters because it affects how we think about targeted policies to reduce reoffending. 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 benefits of increased financial security while minimizing potential work disincentives. Scholars have also 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 can study these ideas empirically because we observe individual history of substance use prior to release from prison, receipt of treatment post-incarceration, and type of conviction among those reincarcerated.

Together our results provide evidence that Medicaid coverage upon release from prison yields a meaningful reduction in the probability of reincarceration, improves employment outcomes, and increases access to health care. We find some support for the hypothesis that Medicaid's effect on reincarcerations operates through a health channel, particularly for persons with mental health needs. However, our findings more strongly indicate that Medicaid enrollment's effect on reincarceration likely operates through the provision of financial security, consistent with a growing body of evidence in the general population. Our results should not be interpreted as suggesting that treatment for SUD has no effect on risk of reincarceration. Rather, we find that Medicaid coverage *alone* is not sufficient to drive a level of increase in SUD treatment that can potentially support broad population-level declines in reincarceration.

The rest of paper proceeds as follows. We discuss the conceptual framework for the study in Section 2 and review the background literature in Section 3. Data and measures are discussed in Section 4. The policy changes forming the natural experiment and the empirical methods are discussed in Section 5, followed by results in Section 6 and conclusions in Section 7 respectively.

2. CONCEPTUAL FRAMEWORK

Our expectations of the effects of Medicaid coverage on reincarceration derive from an expansion of Becker's model (Becker, 1968) that incorporates the decision to reoffend as explicated by Doleac (2023). At its foundation, the model asserts that individuals will commit crime if the expected utility from doing so exceeds the utility from not doing so. Here, we present a slightly streamlined version of the model to fix ideas.

Let U_c be the individual's utility if a crime is committed, which is uncertain because it depends on whether or not they are punished. Defining p as the perceived probability of punishment, U_{c1} as the benefit from committing crime if the person is not punished, U_{c2} as the payoff if punished, and

representing the benefit to non-criminal activity, or the opportunity cost of crime, as U_{nc}, equation (1) describes the circumstances under which a crime will be committed:

(1) $E[U_c] = (1-p)U_{c1} + pU_{c2} > U_{nc}$

The utility derived from criminal and non-criminal activity includes both financial and psychic costs and benefits. Multiple factors determine each of these payoffs. The payoff from committing crime without punishment, U_{c1}, is a function of the financial and psychic benefit or enjoyment from the criminal activity, b; and the material and psychic costs of committing the offense, m; $U_{c1} = f_{c1}(b, m)$. The function $f_{c1}( )$ is decreasing in m, and increasing in b.

In addition to the same costs and benefits as U_{c1}, the payoff with punishment, U_{c2}, includes t, any perceived direct (e.g., incarceration) and indirect (e.g., stigma, future ineligibility for public benefits such as SNAP or housing assistance) penalties from committing the offense, $U_{c2} = f_{c2}(b, m, t)$, where $f_{c2}( )$ is decreasing in t and m, and increasing in b.

Finally, U_{nc} is a function of w, non-criminal resources, net of material costs to engage in non-criminal activity (e.g., transportation to get to work, job training, etc.): $U_{nc} = f_{nc}(w)$. The function $f_{nc}( )$ is increasing in w. Earnings as well as public benefits can be thought of as part of this payoff.

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

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 b, while decreasing m. 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 relatively 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. As reviewed by Doleac (2023), there is strong evidence that increasing *p* reduces recidivism; evidence is mixed on how incarceration itself affects future offending and employment, but increasing indirect penalties (part of *t*) can increase recidivism. Increasing U_{nc} generally reduces recidivism, particularly through public assistance. Note that public assistance is likely to be available regardless of committing the crime, conditional on not being punished (i.e., it may increase both U_{c1} and U_{nc}).

Medicaid coverage has the potential to influence reincarceration through multiple channels within this model. As an in-kind transfer, Medicaid coverage increases the opportunity cost of continued criminal activity, thereby on net increasing U_{nc}; it is a financial benefit that can only be enjoyed while living in the community and is suspended or terminated, depending on state law (Rosen, et al., 2014), while an individual is admitted to a jail or prison. Practically, individuals may experience the financial benefit as a reduction in financial risk or 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 or psychic benefits, *b*, from criminal activity, or their capacity to identify and perceive direct or indirect penalties from getting caught, *t*. Lastly as a health care payer, Medicaid coverage may also influence U_{nc} through their earning capacity (as individuals achieve or maintain health) and thus non-criminal wages, *w*, and/or their future discount rate.

A complicating factor in understanding the influence of Medicaid coverage on reincarceration is the role that such coverage may play in formerly incarcerated adults' 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 itself is likely to increase or decrease employment among recently incarcerated adults is uncertain. Economic theory predicts, and empirical research in the general population demonstrates, that receipt of means-tested, in-kind welfare benefits including Medicaid can reduce employment (Dague et al., 2017; Garthwaite et al., 2014; Hoynes and Schanzenbach, 2012), and conversely that loss of cash benefits can increase formal employment (Deshpande 2016; Deshpande and Mueller-Smith, 2022). This prediction may or may not 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 SUDs or mental illness) employment outcomes may improve.

On net, our expectation is that Medicaid coverage is likely to decrease reincarceration, but that employment could increase or decrease, and that use of health care will increase. We also expect that reincarceration effects are likely to be larger for those with a treatment need for substance use or mental health disorders for whom a treatment mechanism is more likely to be salient. To the extent that the treatment benefits are important, we would expect the impacts to be larger than for other transfer programs of equivalent income value that have been observed in the literature.

Certain types of crimes may be more tightly aligned with addiction disorders and a need for treatment than others in which case we might expect more pronounced effects on reincarceration for those individuals, if Medicaid operates through a health channel. While we do present results separately by type of conviction, we refrain from asserting hypotheses about differential effects of Medicaid coverage by type of conviction for two reasons. First, in our data we observe the conviction type (e.g., property, violent, public order, etc.,), not the crime. The type of conviction is a function of the actual crime and any potential plea bargain; further, it reflects only the most serious offense when an individual is convicted of multiple offenses (Sawyer 2020). Second, the percentage of state prisoners who report substance use at the time of the offense is highly prevalent across all major categories of conviction, 40% of violent, 50%

of property, 50% of drug, 28% of DUI/DWI and 30% of other public order convictions (Bronson 2020). Thus, there is some amount of unknown, likely non-random, measurement error in conviction type that obscures its potential usefulness as a signal for a need for substance use treatment.

3. LITERATURE

As hypothesized above, Medicaid coverage may reduce the probability of reincarceration to the degree that it improves either economic well-being or increases the use of treatment for health conditions that may increase risk of reincarceration including substance use and mental health 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.

a. 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. One-year after implementation of the ACA, Medicaid coverage was 5 to 8 percentage points higher among individuals with a recent history of justice-involvement, although the specific role of Medicaid expansions was not identified (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. Two single state studies evaluated the impact on Medicaid coverage of state-level policy changes related to eligibiliy and facilitated enrollment. In Indiana, each of three separate policies was associated with increased Medicaid enrollment within 120 days of release: a Medicaid eligibility expansion; submission of Medicaid applications on behalf of incarcerated individuals pre-release; and suspension rather than termination of Medicaid coverage upon incarceration (Blackburn et al., 2020.) In Wisconsin, 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 (Burns et al., 2021.) The latter paper describes the first stage for the current study.

b. Medicaid and Criminal Activity

A growing literature exploits variation over time and across states to examine the impact of Medicaid eligibility expansions and enrollment policy on criminal activity. Five studies evaluate the impact of Medicaid expansions on aggregate crime or arrest rates from the FBI's Uniform Crime Report program using event study and difference-in-difference strategies with state- or county-samples. Wen, Hockenberry and Cummings (2017) examine the impact of pre-ACA Medicaid expansions and find a decrease in total crime rates driven by reductions in three categories, robbery (-2%), aggravated assault (-1%) and larceny theft (-0.6%). Over a study period of 2010-2016, He and Barkowski (2020) assess the impact of Medicaid expansions on the rates of specific types of crime. Across modeling strategies and specifications, they most consistently find reductions in the rate of motor vehicle theft and robbery. With a somewhat longer observation period, 2009-2018, Vogler (2022) finds no impact of Medicaid expansions on overall rates of crime but a 5% decline in the rate of violent crime. Simes and Jahn (2022) evaluate changes in county-level arrest rates within expansion and non-expansion states from 2011-2016 using a difference-in-differences framework and find a relative decrease in the rate of arrests within expansion states. Wagner (2021) examines the influence of Medicaid eligibility expansions for individuals with disabilities from 1995-2010 on the population crime rate using an event study approach. The crime rate within states that implemented these expansions declined relative to those that did not; however, this decrease diminished over time relative to the expansion year.

Jacome (2022) exploits age-based eligibility criteria for Medicaid to estimate the effect of losing Medicaid eligibility at age 19 on the likelihood of incarceration among low-income young men in South Carolina. Using individual-level data that links incarceration outcomes to past Medicaid enrollment status and matched DD and DDD analyses, she compares the likelihood of incarceration before and after the 19^{th} birthday for men who were more and less likely to be enrolled in Medicaid just before that birthday.

Men who were likely to be enrolled in Medicaid prior to their 19th birthday, and thus more likely affected by the loss of eligibility, were 16% more likely to be incarcerated in the next two years than men who were not likely to be enrolled in Medicaid immediately before their 19th birthday.

A handful of studies have examined the association between Medicaid expansions and recidivism more specifically. Fry, McGuire, and Frank (2020) use a comparative interrupted time series (ITS) design to examine the change in the likelihood of rearrest among adults booked into county jails in three counties located in Medicaid expansion states relative to three matched counties in non-expansion states. Relative to their matched pair, rearrests decreased within 2 of the 3 expansion counties, and increased in the third, over the 2-year post-expansion period. Using individual level data for persons released from state prison from 2010-2016 and state-year variation in Medicaid expansion status, Aslim et al. (2022) estimated the likelihood of reincarceration according to the individual's type of crime for their first observed incarceration. The likelihood of reincarceration at 1- and 2-years declined in expansion states relative to non-expansion states among individuals with multiple re-incarcerations who were convicted of a violent crime; there was no change in reincarceration risk among individuals who had only a single reincarceration. Gollu and Zapryanova (2022) find that a state policy to suspend rather than terminate Medicaid coverage upon admission to prison is associated with a relative decline in the likelihood of reincarceration within 1- and 3-years of release. Finally, using a propensity score weighted comparison group, a series of papers evaluated the effects of a referral to expedited Medicaid enrollment for incarcerated adults with serious mental illness on recidivism in Washington State (Morrissey, Domino and Cuddeback, 2016; Grabert, Gertner, Domino, Cuddeback and Morrissey, 2019). There was no evidence that the referral was associated with a lower risk of recidivism at 12- or 36-months after release and some indication of an elevated risk for number of days in custody.

c. Economic Well-Being and Criminal Activity

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).[1] In turn, economic disadvantage is associated with increased risk of criminal activity (Link et al., 2019; Yukhnenko et al., 2020; Deshpande and Mueller-Smith, 2022).

This dynamic has motivated work that seeks 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 compare 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). In an intention to treat analysis, they find 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 are similar; however, unemployment benefits are associated with a relative reduction in arrests. More recently, Yang (2017b) evaluates the impact of local labor market conditions at the time of release on risk of reincarceration within 3 years of prison release by exploiting variation in the average low-skilled wages for men across counties and time. Higher wages for low-skilled employment at the time of release are associated with a reduction in the risk of reincarceration. Foley (2011) and Carr and Packham (2019) show that the timing of benefit availability is associated with declines in crime in a way that supports a causal role for income support programs. Palmer et al. (2019) show that granting temporary housing assistance reduces total arrests.

The Supplemental Security Income (SSI) program provides both cash income and Medicaid benefits, and for at least some beneficiaries, the monetary value of the Medicaid benefit that comes with it can exceed the amount of the cash transfer (Burns and Dague, 2017). Deshpande and Mueller-Smith

[1] At least some evidence from countries with a focus on rehabilitative prisons suggests it is possible to design a system that makes more effective use of this time with positive results for health, reincarceration, and employment (Bhuller et al. 2020; Hjalmarsson and Lindquist, 2022).

(2022) test the effects of reduced income through the loss of SSI benefits at age 18, on employment, criminal charges, and incarceration. Over the two decades following SSI removal, employment increased among those who lost benefits relative to those who did not; however, the employment effects are overshadowed by the magnitude of increased criminal activity: the annual likelihood of incarceration increased by 60% among those who lost SSI benefits compared to those who did not. They test for effects of standalone Medicaid but do not find an impact.

Several recent 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 reincarceration. Variation in state responses to this ban provide the basis for a triple differences design comparing individuals released from prison for drug and non-drug related offenses across states and over time (Yang, 2017a). The risk of reincarceration 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 reincarceration among adults convicted of drug trafficking following imposition of the exclusion that is driven by financially motivated crime. Luallen and colleagues (2018) use a regression discontinuity design that incorporates difference-in-differences to compare the risk of reincarceration for individuals who were admitted to prison before and after the initial adoption of an eligibility exclusion for the SNAP and TANF that applies to individuals with felony drug convictions. They find no evidence of a change in risk of reincarceration for individuals with a drug offense conviction relative to those with other conviction types after the eligibility exclusion although there is suggestive evidence of heterogeneous effects according to time at risk.

d. *Medicaid and financial security*

A growing literature demonstrates the positive effects of Medicaid on measures of financial security suggesting the plausibility of the income effect channel. Financial outcomes of these studies include medical debt, financial strain, credit scores, unpaid bills, and out-of-pocket medical spending, and have been established across a broad set of populations. For example, Miller et al. (2021), Brevoort et al.

(2020), and Hu et al. (2018), show improvements for ACA Medicaid expansions; and Baicker et al. (2013) and Finkelstein et al. (2012) for the Oregon Health Insurance Experiment population. Gruber and Yelowitz (1999) study early expansions to children prior to 1993, and show increases in consumption alongside declines in savings, and 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 health care 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 reduces the risk of large, unexpected expenses and the out-of-pocket price of health care services. The incidence of the financial benefits likely falls providers of health care services in addition to beneficiaries (Finkelstein et al., 2018).

As a transfer program, Medicaid may also influence financial well-being more broadly through effects that alter other dimensions of the incentives to recidivate. Most salient in this case are 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). One paper finds evidence of large increases in employment in Tennessee following the TennCare disenrollment event (Garthwaite et al., 2014), suggesting strong work disincentives, although other work has challenged that interpretation (DeLeire, 2019; Ham and Ueda, 2021). Recent cross-sectional studies of ACA Medicaid expansions do 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 of employment declines, which have theoretical and empirical support in the context of other transfer programs.

e. *Medicaid and health care use*

Medicaid coverage and expanded Medicaid availability are associated with increased general medical care use among adults (Buchmueller, Ham, and Shore-Sheppard, 2015; Mazurenko et al., 2017). This evidence derives from Medicaid expansions that preceded the ACA and those that followed. Among studies of non-ACA expansions, the Oregon Health Insurance Experiment demonstrated that having Medicaid coverage increased outpatient care use including visits and preventive services' testing (Finkelstein et al., 2012; Baicker et al., 2013), receipt of prescription medications (Baicker et al., 2013), and inpatient admissions (Finkelstein et al., 2012); the effect of coverage on emergency department use varied depending on the data source and look-back period (Finkelstein et al., 2012; Baicker et al., 2013; Taubman et al., 2014). Long and Dahlen (2014) found that the expansion in coverage to childless adults in Massachusetts resulting from its 2006 reform led to a substantial increase in access to care. Sommers and colleagues (2012) used national survey data to compare health care access across several states before and after pre-ACA expansions and found improved access to care. Two studies examined a 2009 expansion to adults without dependent children in Wisconsin first in an urban setting (Deleire et al., 2013) and subsequently in a rural setting (Burns et al., 2014). Across both studies, the expansion was associated with increased outpatient care use while the impact on hospital-based care differed by population. Following implementation of the ACA, a large literature has since grown showing increased use of general medical care associated with expanded Medicaid availability with the most consistent findings related to increased outpatient care use (Mazurenko et al., 2017; Guth, Garfield and Rudowitz, 2020).

Expanded Medicaid availability is also associated with increased use of care for mental health and substance use disorders specifically. Broadly, the Oregon Health Insurance Experiment shows that

the acquisition of Medicaid coverage, relative to no Medicaid coverage at all, reduces the likelihood of unmet need for mental health care (Baicker et al., 2018). The most consistent finding across study designs, populations, and expansions is that expanded Medicaid availability is associated with increased receipt of prescription medication treatment for mental health and substance use disorders (Baicker et al., 2017; Baicker et al., 2018; Ghosh, Simon, and Sommers, 2019; MacLean et al., 2017; Maclean and Saloner, 2019; Meinhofer and Witman, 2018; Saloner et al., 2018; Sharp et al., 2018; Wen et al., 2017a). The evidence related to other categories of service is mixed.

In a study of pre-ACA Medicaid expansions across the country, Golberstein and Gonzales (2015) find no evidence of a change in mental health care use including outpatient, emergency department, inpatient services and prescription medications. In Wisconsin specifically, a 2009 Medicaid expansion for adults without dependent children increased outpatient and emergency department mental health care use among urban beneficiaries (DeLeire et al., 2013) although there was no evidence of a similar change among rural beneficiaries (Burns et al., 2014). Wen and colleagues (2020) found no change in the rate of opioid-related emergency department visits associated with pre- or post-ACA Medicaid expansions; however, the post-2014 expansions were associated with a 10% reduction in the opioid-related hospitalization rate. Following the ACA expansions, the rate of SUD admissions to specialty treatment facilities did not initially differ across expansion and non-expansion states but increased steadily in subsequent years resulting in a cumulative increase of 35.5% relative to non-expansion states (Maclean and Saloner, 2019; Saloner and Maclean, 2020). Finally, two survey-based studies found no significant changes after the ACA Medicaid expansions in the size or share of the study populations that reported receiving any SUD treatment in the past year (Olfson et al., 2018; Olfson et al., 2021) or were served by outpatient SUD treatment programs (Andrews et al., 2019).

f. Treatment for mental health and substance use disorders and criminal activity

The plausibility of the health channel hypothesis described above depends on whether expanded Medicaid availability alters mental health and substance use disorder care use among justice-involved adults specifically and whether such treatment may reduce criminal activity.

Expanded Medicaid availability is associated with increased mental health and substance use disorder care use among adults recently released from prison. Referral to expedited Medicaid enrollment for incarcerated adults with serious mental illness is associated with a greater likelihood of receiving treatment for serious mental illness and for substance use treatment following release from prison (Gertner et al., 2019; Grabert et al., 2017; Wenzlow, et al., 2011; Morrissey, Domino, and Cuddeback, 2016). Consistent with this finding for a general incarcerated population, Burns and colleagues (2022) found prison-based Medicaid enrollment assistance was associated with an increased likelihood of SUD care use within 30-days after release, including an outpatient visit, receipt of medication for opioid use disorder, and an inpatient admission for drug overdose.

Research that examines receipt of treatment and criminal activity is less uniform in its findings. Experimental studies of the effect of SUD treatment on recidivism commonly examine interventions that begin during the incarceration period with or without an additional post-release component (de Andreade et al., 2018; Perry et al., 2015; Glanville et al., 2021; Moore et al., 2020.) While the findings are not uniform (e.g. Lee et al 2016), two categories of interventions indicate promising effects of treatment on recidivism: first, residential therapeutic communities which provide comprehensive SUD treatment, support the development of vocational and independent living skills, and provide housing when implemented in the community (Sacks et al., 2012; Olson and Lurigio 2014); and second, pharmacologic treatment for opioid use disorder with or without concomitant behavioral therapy (Schwartz et al., 2009; Gordon et al., 2008).

Wen, Hockenberry and Cummings (2017) examined the explanatory role of SUD treatment in the reduction in crime rates that followed implementation of pre-ACA expansions using 2SLS. An increase in population-level SUD treatment rates was associated with a reduction in the rate of select types of crime. Vogler (2022) interacted state Medicaid expansion status with the program's generosity of coverage for SUD to examine the potential role of SUD treatment in explaining an observed association between

Medicaid expansion and a reduction in aggravated assaults. The generosity of SUD coverage did not moderate this association.

Regarding treatment for mental illness, Domino and colleagues (2019) use an IV approach to estimate the impact of receiving mental health care within 90 days of prison release among adults with serious mental illness on recidivism; they found a relative increase in the likelihood of reincarceration associated with receipt of mental health care. Jacome (2022) finds evidence that access to mental health care is a mechanism by which Medicaid coverage reduces the risk of an initial incarceration by implementing a triple difference-in-differences to isolate the effect of losing Medicaid eligibility on risk of incarceration among young men with a past mental health diagnosis. Deshpande and Muller-Smith (2022) do not find that effects of SSI removal are larger among those with mental or intellectual disabilities.

g. Key findings and implications

We conclude from this review, that there is consistent evidence of an association between (1) expanded Medicaid availability and a reduction in criminal activity, (2) expanded Medicaid availability and increased health care use and financial security, (3) increased economic well-being and reduced criminal activity, and (4) mixed evidence that treatment for mental health and SUDs is associated with reduced criminal activity. Notably, common features of this rich literature limit the inferences we can draw about the extent to which Medicaid coverage itself drives reductions in criminal activity and by what pathways. Specifically, the current research on Medicaid and criminal activity is dominated by study designs that evaluate the consequences of exposure to a Medicaid policy change on crime. As such, any observed effects reflect the degree to which individuals take-up (or lose) Medicaid coverage under that specific policy and the impact of having Medicaid coverage itself. The advantage of these intent-to-treat designs is that they mitigate bias due to individual selection into Medicaid. However, it is difficult to isolate and estimate the effect of coverage because Medicaid take-up and disenrollment rates vary substantially by type of policy change. Additionally, with few exceptions (Morrissey, Domino, and Cuddeback, 2016; Grabert et al., 2017; Jacome, 2022), there is limited use of individual-level data

linkages across Medicaid and corrections which makes it difficult to identify the mechanism(s) by which Medicaid may achieve reductions in criminal activity.

4. EMPIRICAL METHODS

We exploit two policy changes in the State of Wisconsin that greatly expanded the availability of Medicaid benefits to individuals leaving prison. 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 most 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). Dague, Burns, and Friedsam (2022) provide a descriptive overview of the 2014 policies and show how insurance coverage changed in Wisconsin at the time, including that the vast majority of new childless adult enrollees were previously uninsured.

Second, beginning in January 2015, the Wisconsin Department of Corrections (DOC) introduced 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 any of the 37 state correctional facilities (i.e., state prisons and 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. This policy was phased in over several months in ways that are not observable to the researcher, with full implementation of the enrollment assistance program complete at the end of March 2015.

Figure 1, which illustrates the fraction of releases in our sample (described below) who enrolled in Medicaid during the month they were released from prison, makes it clear that a large net change in Medicaid enrollment occurred among the population of those released from prison. The net enrollment changes from these policies are also described in Burns et al. (2021).

No other major health care policy changes likely to affect this population occurred in the state during this time. One criminal justice policy did change. In 2014, the State of Wisconsin passed a law that did two things.[2] First, it harmonized the processes for determining short-term sanctions when individuals violate the terms of extended supervision, a deferred prosecution agreement, probation or parole which resulted in a change for individuals on probation or parole. The expected effect on the likelihood of reincarceration for this subgroup was ambiguous. For this reason, we considered robustness to this change by re-estimating our main models after excluding the 2,660 releases from prison to parole or to probation, 6.9% of the sample described below; findings (available on request) were robust to this exclusion. Second, the law increased the penalty for attempted possession of particular narcotic drugs to make it consistent with the penalty for actual possession. This change had the potential to increase the risk of reincarceration, which would bias (if anything) against finding a decline in reincarceration.

a. Data and Sample

In order to estimate the impacts of these major shifts in Medicaid policy, we combine administrative data from the state of Wisconsin's Department of Corrections (DOC), the Medicaid

[2] Wisconsin Act 196, https://docs.legis.wisconsin.gov/2013/related/acts/196

program, and the Unemployment Insurance (UI) program. 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.

In the DOC data, we observe the characteristics of each prison term including exact entry and release dates, type of release including whether the individual was under extended supervision, probation, or parole, county of conviction, correctional facility, and the Association of State Correctional Administrators' category of conviction offense(s) (i.e., violent, property, drug, and public order). We also observe individual demographic characteristics including age, sex, race, level of education, marital status, and the county of conviction.[3] We use DOC data from the incarceration period including prescription claims data and data collected through the DOC's risk and case management assessment tool, the Correctional Offender Management Profiling for Alternative Sanctions (COMPAS) (Northpoint, Inc. 2019; Northpointe Institute for Public Management, 2009) to construct measures of the potential causal mechanisms.

From the DOC administrative data, we create a release-level analytic sample that includes all adults ages 18-64 incarcerated by the state who were released to the community between January 2013 – June 2017. For inclusion in the sample of releases, we required a minimum incarceration period of 31 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, a total of 41,001 releases. We exclude 157 releases that were due to death or transfers to federal institutions or other states. We additionally exclude 350 releases where the conviction county is either missing or "other state," because for those releases we are unable to include geographic controls for economic conditions, resulting in 40,477 releases. We then

[3] Although Hispanic ethnicity is in the data, it is missing at a high frequency and we determined it insufficiently reliable to include.

selected the first observed release per person during each of the 4 policy regimes,[4] so each person's exposure to the treatment within regime was similar and repeat offenders were not overrepresented. The final analytic sample includes 38,508 releases representing 32,384 unique individuals. To obtain history of incarceration for each of these 38,508 releases in the analytic sample, we obtain DOC records of incarcerations looking back at least 5 years relative to the admission date associated with the release, and looking forward at least 12 months from the date of release. The post-release incarceration records are the source for our reincarceration outcome.

For the universe of releases, we observe Medicaid enrollment status, which is defined at the month level, from the Medicaid program data. Medicaid enrollment can be retroactively backdated up to three months, but only if the person would have been eligible during that time. Individuals are not eligible for Medicaid during periods of incarceration, so could not be backdated prior to release, and also could not have been backdated across the April 2014 statewide eligibility change. We are also able to observe Medicaid administrative claims and encounter data for the months the individual is enrolled in Medicaid.

The UI data are quarterly wage reports from the state of Wisconsin. These data include quarterly earnings for any individuals who are employed by an employer covered by Wisconsin UI law whose work could qualify them for UI benefits.[5] Some forms of income-earning activities that the formerly incarcerated adults may be engaged in are therefore not included in the data (such as informal sector work, non-covered employment, or independent contracting); so long as this is not differential across time periods this is not an issue for bias in our estimates and only relevant for interpretation of results.

To these administrative records, we match the Census Bureau's Quarterly Workforce Indicators (QWI) by county (U.S. Census Bureau, 2016). The QWI includes quarterly measures of average employment at the county level stratified by age, sex, industry, and educational background which we use to adjust for local labor markets.

[4] Results are robust to the full set of releases (all releases per individual per regime) as well as to excluding those with a release in the 12 months prior to the reference release and available upon request.
[5] Precise information on covered employment is available from the Wisconsin Department of Workforce Development at https://dwd.wisconsin.gov/ui201/t1201.htm

Table 1 includes summary characteristics on the sample of releases overall and by regime. Gender was reported as female or male, with 9.1% of releases recorded as female. We categorized age as 18-23 (7.1% of the sample), 24-35 (36.4% of the sample), 36-55 (46.1% of the sample), and 55-64 (10.5% of the sample). Race was categorized as American Indian/Alaskan Native (4.3%), Asian or Pacific Islander (.9%), Black (39.6%) and White (55.3%). For almost 66% of releases, the individual had at least a high school education or GED. In 9.7% of releases, the individual reported being married, and the average months of incarceration prior to the release was 25.5. A highly probable need for treatment of SUDs was indicated for 57.5% of the sample. Approximately 26% had mental health (MH) treatment needs, and 22% had a prescription for one of our indicated MH drugs during the last 3-months of their prison term. In terms of types of conviction, for which a release could be associated with multiple types, 41.9% were associated with a violent crime, 32.6% for a property crime, 44.5% with a public order crime, and 27.3% with a drug crime. The county of conviction was categorized as rural for 18% of releases. These statistics are generally similar to publicly available reports on the distribution of sentenced prisoners (Carsen, 2020), although the rates of Black and American Indian/Alaskan Native prisoners in Wisconsin are slightly higher than federal averages. Released prisoners are also much less likely to be associated with a violent crime than sentenced prisoners overall.

b. Outcome Measures

Medicaid enrollment is the outcome for the first stage of the analysis. Everyone is eventually exposed to the Medicaid expansion policy if they reside in the community at any point after April 2014. Because the period immediately following return to the community is particularly important to deter acute health care events (Binswanger et al., 2007; Binswanger et al., 2013), we focus on outcomes that are defined relative to or at the time of 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. 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 (because the expansion was not yet in place) and would have a zero for this outcome.

We define reincarceration as an admission to a state correctional facility, including prisons, detention centers, and state-contracted beds in county jails, within 6 months of release from state prison. This measure of reincarceration includes all types of admissions including for new sentences, revocations of parole and probation, and holds. In Wisconsin, holds may be imposed for any of the following reasons: for an investigation of an alleged violation of a rule or condition of supervision; after an alleged violation to determine whether to commence revocation proceedings; for disciplinary purposes; to prevent a possible violation by the offender; and pending placement in a program as an alternative to revocation.

Employment status and earnings are defined at the quarter-level using the UI data. The UI data is observed from the first quarter of 2007 through the last quarter of 2017 regardless of incarceration or Medicaid status. We define any employment as having non-zero earnings in a quarter. The quarter of release is the quarter 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 which may be due to lack of UI eligible wages or incarceration. To adjust for differences in time available to have earnings and employment, in the empirical specifications we control for whether the release occurred in the first, second, or third month of the quarter.

Using Medicaid claims data, we measure overall use of outpatient, emergency department, and inpatient care as well as health care use specific to treatment for substance use and mental health disorders. We construct four binary measures of health care use within the immediate 30-days after release: any outpatient visit, any outpatient visit with a SUD diagnosis (excluding tobacco dependence), and any outpatient visit with an opioid use disorder diagnosis. Extending the observation period to six-months after release, we assess the following additional binary measures: any outpatient visit, any outpatient visit with a SUD diagnosis, any outpatient visit with a mental illness diagnosis, receipt of any medication for opioid use disorder, any emergency department visit, and any hospital admission. Additional details about the definition of these measures are included in the appendix. Importantly, we only observe health care use with Medicaid as the payer. We therefore interpret these outcomes carefully,

as they only represent the net change to the extent that Medicaid-paid health care did not substitute for other payers; we discuss this further below.

c. Measures of mechanisms

We are interested in the degree to which Medicaid may influence reincarceration risk through a financial or health channel. We define subgroups that may be more responsive to these mediators using measures of financial need, substance use disorder treatment need, and mental health care need. Our measure of financial need takes a value of one if the individual's reponse to any of three COMPAS case management questions is "often": how often the inmate worried about financial survival prior to the incarceration, had trouble paying bills, or had barely enough money to get by. Case management questions are also the source for our categorical measure of substance use treatment need: unlikely, probable and highly probable. The DOC constructs these categories from a proprietary algorithm applied to a set of questions about substance use history and criminal activity. We implement two alternative definitions of mental health care need recognizing that there is no gold standard measure available in our data. The first definition is set to equal 1 if there is an affirmative response to either of two questions included in the COMPAS case management tool: having been assessed as having mental health needs during the current incarceration or a history of suicide attempt. This definition proxies for post-incarceration mental health care use to the extent that having a staff- or self-reported history of serious mental illness predicts having a future (or continued) mental illness that requires treatment. We refer to this first definition as mental health needs. The second definition of mental health care need is set equal to 1 if the individual receives a mental health prescription medication during the last 3 months of incarceration including a medication from the following classes: atypical antipsychotics, miscellaneous antipsychotics, antimanic agents, and selective serotonin reuptake inhibitors. This definition proxies for post-incarceration mental health care use to the degree that medication treatment for mental illness pre-release predicts having a future (or continued) mental illness that requires treatment. We refer to this definition of mental health care need as MH prescription use. Additional information about these measures is included in the Appendix.

5. EMPIRICAL MODEL & IDENTIFICATION

In general, reincarceration 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 are a plausibly exogenous determinant of Medicaid enrollment. We thus use the different policy regimes as instruments for Medicaid enrollment. We note that there is no plausible simultaneous control group for our study population, as the population faces unique dynamics of health, work, and program eligibility, and the data are limited to one state. Furthermore, the ways in which the policies were implemented limit the feasibility of a regression discontinuity in time (e.g., opportunity to enroll independently; inclusion of a phase-in period). We define the regimes as follows relative to date of release, and refer to Figure 1 for a visualization:

- 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 2017

The IV model is given by the following two equations:

(1) $Y_i = \alpha Medicaid_i + \boldsymbol{X}_i\beta + \mu_i$

(2) $Medicaid_i = \sum_{n=1}^{3}\left(\lambda_n Regime_{n(i)}\right) + \boldsymbol{X}_i\delta + \upsilon_i$

In the model, Y_i is the outcome of interest for release *i*, $Medicaid_i$ is an indicator for Medicaid enrollment, $Regime_{n(i)}$ is an indicator for whether release *i* was during regime n, and $\boldsymbol{X}_i$ is a vector of individual, release, and area-level characteristics. The coefficient α is the parameter of interest. Finally, μ_i and υ_i are error terms.

Because prisoners do not have control over the timing of their release from a facility and are not able to delay their release (should they want to) until a more favorable policy regime is in place, we argue that release date is as good as randomly assigned conditional on covariates. 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 differences are often 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 is that differences of 1 or larger could be problematic and differences of .25 or smaller suggest good balance (Imbens and Rubin, 2015); nearly all of the normalized differences in Table 1 (which compare Regime 0 to the other regimes) are less than .06, with balance supporting the randomization assumption. The only exception is for the indicator of a within-prison mental health prescription. This rate of mental health prescriptions is lower at the beginning of Regime 0, but increasing through the regime, for reasons that are unclear.

We include the release-level controls in the regression analyses to adjust for any observable heterogeneity of those released over time. The list of characteristics in $\boldsymbol{X}_i$ includes indicator variables for age groups (18-23, 24-35, 36-55, 55+), sex, race (American Indian/Alaska Native, Asian or Pacific Islander, Black, White), high school degree or greater, marital status (married/other), type of crime (violent, property, public order, and/or drug), an indicator for highly probable substance use treatment need, rurality of the county of conviction, and a continuous measure of months incarcerated. County of conviction serves as a proxy for county of release following prior research (Yang 2017b).

The exclusion restriction is that the timing of release (the regime) only affects the outcome (reincarceration) through Medicaid, 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 simultaneous time control group. To address this, we include in $\boldsymbol{X}_i$ control variables from the QWI for the employment to population ratio for men with low education levels at the time of release. We include fixed effects for correctional facilities, as Medicaid take-up rates varied by facility (Burns, Cook, Brown et al., 2021). We include controls for the calendar month of release to adjust for potential seasonality and

in models with quarterly outcomes (employment and earnings) we control for whether the release was in the first, second, or third month of the quarter.

Because the model is overidentified, we estimate it using GMM in Stata 17; specifically, we use the implementation in the *ivreghdfe* Stata package (Correia, 2018; StataCorp, 2021) which partials out controls and fixed effects. GMM is more efficient than alternatives like two stage least squares when there are more instruments than endogenous regressors and there is heteroskedasticity. We cluster standard errors at the individual level as models can include multiple releases per individual across regimes.

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

$$Y_i = \sum_{n=1}^{3}\left(\gamma_n Regime_{n(i)}\right) + \boldsymbol{X_i}\theta + \epsilon_i. \quad (3)$$

The differences in the policies may attract different sets of enrollees, which is not only inherently interesting from the perspective of understanding Medicaid take-up but also might imply heterogeneity in the results, which could be useful for external validity considerations. The IV framework provides an estimate of the local average treatment effect (LATE)—i.e., the average treatment effect on compliers.[6] In this context, we may be particularly interested in heterogeneity driven by the different policy regimes driving Medicaid take-up: voluntary enrollment, on one's own behalf, relative to an enrollment assistance process.

We describe the distribution of compliers' characteristics under the different regimes using the potential outcomes framework. Because we do not observe Medicaid enrollment for each release i under every regime, it is not possible to directly identify the compliers in each regime and calculate the distribution of characteristics for these groups. However, we can describe the distribution of complier

[6] Technically, with covariates, it is a weighted average of LATEs.

characteristics using the variation in the first stage across covariate groups (Angrist and Pischke, 2008); these concepts are also discussed in Katz et al. (2001), Abadie (2003), and Kowalski (2016).

Let M be a binary variable indicating Medicaid coverage and Y an observed outcome, such as reincarceration, wages, or employment. Let Y_M be the potential outcome of an individual in the state under Medicaid coverage ($M = 1$) and Y_U the potential outcome in the state without coverage ($M = 0$). The following equation relates the potential outcomes to the observed outcome:

$$Y = (1 - M) \times Y_U + M \times Y_M \quad (4)$$

An individual enrolls into Medicaid if the overall net benefit, B_M, is greater than or equal to zero. The net benefit, B_M, consists of the difference between the observed net benefit p and the unobserved net cost U_M:

$$B_M = p - U_M \quad (5)$$

For convenience, we follow the literature and normalize the distribution of the unobserved cost U_M as a uniform distribution between 0 and 1. The Medicaid policy change defined by the policy regimes affect the observed net benefit p. We can define the probability of enrolling in Medicaid under each regime as $p_n \equiv P(M = 1|R_n = 1)$, where R_n is an indicator of regime $n = 0, \ldots, 3$.

Individuals with low unobserved net costs, $0 \leq U_M \leq p_0$, select into Medicaid even under regime 0 ($M = 1$ and $R_0 = 1$), so they are always takers. Meanwhile, individuals with high unobserved costs, $p_n < U_M \leq 1$ for n = 1, 2 or 3, do not select into Medicaid even under regimes 1 to 3 ($M = 0$ and $R_n = 1$), they are never takers. Finally, compliers are defined as the individuals with intermediate costs, $p_0 < U_M \leq p_n$. That is, compliers select into Medicaid under regime n, but not under regime 0.

The first stage identifies the share of compliers under each regime 1 to 3—i.e., by definition $p_n - p_0$ is equal to $\Pr(M = 1|R_n = 1) - \Pr(M = 1|R_0 = 1)$. Note that an individual who is an always taker or never taker in a given regime could be a complier in another regime (or in another alternative policy as well) if there is a different selection mechanism into Medicaid. Thus, the analysis of characteristics of compliers is made by regime.

Let X_i be a characteristic with two possible values–e.g., one if high school graduate and zero otherwise. Using Bayes rule, we can see if compliers in regime n are more or less likely to be high school graduates than releases in a different regime with the following equation:

(6) $$\Pr(X_i = 1 | p_n > p_0) = \Pr(p_n > p_0 | X_i = 1) \,/\, \Pr(p_n > p_0)$$
$$= \frac{\mathrm{E}(M_i | R_n = 1, X_i = 1) - \mathrm{E}(M_i | R_0 = 1, X_i = 1)}{\mathrm{E}(M_i | R_n = 1) - \mathrm{E}(M_i | R_0 = 1)}$$

That is, the relative likelihood that a complier is a high school graduate is given by the ratio of the first stage for high school graduates to the overall first stage. We provide the ratios (focusing on the ratios between Regime 1 and Regime 0, and between Regime 3 and Regime 0) as a descriptive exercise to better understand heterogeneity in take-up under the different regimes. Note that we require the distribution of the unobserved net cost U_M, conditional on $\boldsymbol{X}$, to be the same under every regime in this interpretation.

6. RESULTS

Below, we describe the results of estimating the IV models in the full sample for the reincarceration, employment, and health care use outcomes. We then turn to considering mechanisms of substance use treatment, mental health treatment, and addressing financial concerns. We also discuss the characteristics of compliers under the different instruments. Finally, we explore heterogeneity by demographic and incarceration characteristics, including marital status, education, age, race, and type of conviction.

a. Reincarceration and Employment

Figure 1 illustrates the fraction of releases that were enrolled in Medicaid over time, binned by months with dotted lines indicating the timing of the policy changes. It provides clear time series evidence that the new Medicaid policies resulted in large increases in Medicaid enrollment at the time of release among formerly incarcerated adults. It also suggests that these changes, once implemented, had consistent effects on enrollment over time. This is the variation that we use in the first stage of the IV strategy.

Column (1) of Table 2 summarizes the results of the first stage estimation, represented in the empirical model by equation (2), for our preferred specification, which includes facility fixed effects although it is not sensitive to specification. The first stage F-statistic is quite large at 6,357, suggesting a strong instrument highly predictive of Medicaid enrollment, consistent with expectations based on Figure 1. The expanded availability of Medicaid to adults without dependent children with incomes below the poverty line (Regime 1) resulted in a 29.4 percentage point (p.p.) increase in Medicaid enrollment in the month of release. During the implementation of enrollment assistance (Regime 2), this increased to 47.2 p.p., and following full implementation of enrollment assistance it had increased to 60.2 p.p. (Regime 3). During the pre-period (Regime 0), average enrollment at the time of release was 7.9%. The policy-related increases thus represent a 372% increase in Medicaid enrollment in the month of release during Regime 1 and a 762% increase by Regime 3.

The results of OLS estimation of the effect of Medicaid enrollment on reincarceration within six months, the IV coefficient estimated with GMM, and the reduced form effects of the regimes are shown in Column (2) of Table 2. As noted, all models include facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, an indicator for highly probable substance use treatment need, duration of incarceration, type of crime, employment to population ratio, and calendar month of release.

The OLS result estimate does not suggest a relationship between Medicaid enrollment and reincarceration overall. However, the IV GMM results show that Medicaid enrollment is associated with a decline in the probability of reincarceration of 2.5 p.p., statistically significant at the 0.1% level. Statistically significant effects are also evident in the reduced form for Regime 1 and Regime 3, with a coefficient of increasing size across the regimes suggestive of a dose-response, as might be expected. Average reincarceration at 6 months in Regime 0 is 16.3%, so the implied effect size from the IV is a reduction in recidivism of 16%.

Although we chose to examine reincarceration at a fixed point following release (i.e., 6-months), we show the fraction of releases remaining in the community as a function of days from release by regime

in Figure 2. These descriptive findings help show that the exact measurement window used to define reincarceration is unlikely to particularly matter. Figure 2 also shows that a difference in the fraction remaining in the community emerges relatively quickly for enrollment assistance but takes longer to emerge for Medicaid expansion alone. This is consistent with the idea that enrollment assistance gets people connected to Medicaid sooner than Medicaid expansion alone, which requires more action on the part of the released individual.

We show the results of IV estimation for the outcomes of employment and earnings as measured in the UI wage data in the quarter of release in columns (3) and (4) of Table 2, respectively. These outcomes are not conditional on reincarceration. Like above, all models include facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, an indicator for highly probable substance use treatment need, duration of incarceration, type of crime, employment to population ratio, and calendar month of release. 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 to adjust for differences in time available to obtain employment and gain earnings post-release.

Because our instrument is a function of time, a concern is that different economic circumstances at the time of release could be driving the findings. Analytically, we address this concern by including control variables in our models for the employment to population ratio among low-education men in the county of conviction at the time of release. To further examine this possibility, we explore whether there are underlying differences in the likelihood of earnings by regime that may be due to economic conditions or unobserved person-level characteristics. Within each regime, we construct a balanced panel including quarterly measures of earnings from the UI wage data for each person-release, for the six quarters before and the six quarters after the release. We observe UI wage data for all sample members for this period regardless of incarceration status. That is, UI quarterly wages may be zero or positive when an individual is residing in the community for any portion of the quarter and are $0 when an individual is incarcerated for the full quarter. All sample members are incarcerated for some portion of the six-quarter, pre-release period and may also reside in the community for some portion of it (e.g., before their incarceration

episode begins). Similarly, all sample members reside in the community for some portion of the post-release period and may be incarcerated for some portion of it, if they return to prison.

Economic circumstances varied across regimes during the pre- and post-release periods and would have affected earnings among sample members in both periods. If economic conditions are driving our results, we would expect to see differentiation in the fraction of releases with any earnings across regimes during the pre-release period. More specifically, we would expect a larger fraction of releases with any pre-release earnings during the later regimes as macroeconomic conditions improved. We would likewise expect differentiation in the outcome across regimes in the pre-period if there were unobserved person-level characteristics related to employment and the timing of release. However, Figure 3 shows that prior to release, the fraction of releases with any earnings was highly similar across regimes and only begins to diverge at release, coincident with exposure to the policy regime. These findings provide suggestive evidence that underlying differences in employability or differences in economic circumstances at the time of release do not explain our finding that Medicaid coverage at the time of release improves employment outcomes.

In Column (3) of Table 2, we see from the OLS result that Medicaid enrollment is on average associated with being 3.6 percentage points more likely to be employed in the quarter of release. The GMM IV estimate suggests that Medicaid increases employment by 5.2 percentage points in the quarter, statistically different from zero at the 0.1% level. Relative to the pre-period average of 20.7 percentage points this effect represents a 25.1% increase in the probability of being employed. In the reduced form, this effect is most strongly evident in Regime 3.

Results for net earnings, which defines those not having positive UI earnings as having zero earnings, are in Column (4) of Table 2. Medicaid enrollment is slightly negatively correlated with earnings in the OLS (possibly since enrolling in Medicaid requires, mechanically, a lower income, although as noted they were slightly more likely to work overall). The IV results, however, suggest an increase in net earnings consistent with the IV employment effects of approximately $197 in the quarter of release. Similarly in the reduced form, this effect is most strongly evident in Regime 3. Relative to

baseline quarterly earnings of about $360 for first releases and similar for all releases, the relative increase is approximately 55%.

Together, these results suggest that Medicaid coverage reduces reincarceration and increases formal employment. This supports the idea that substitution of time use toward employment and away from crime and/or direct effects of health care treatment that increase employability dominate any potential work disincentives of Medicaid in this population. The effects on employment and earnings are more broadly evident than the reincarceration effects, and support the idea that increasing outside options for those released from the prison system created more attachment to the traditional economy.

b. Health Care Use

Table 3 reports the results for the health care use outcomes. As a reminder, we only observe health care use with Medicaid as the payer. We therefore might think of these results as upper bounds on the total change in health care use from gaining Medicaid, since it may substitute for care paid by other sources (e.g., private insurance, charity care, etc.). However, we anticipate that such crowd-out is likely to be minimal because in the era before ACA Medicaid expansions, only 4-6% of adults released from state prison had private insurance within 2 to 3 months after release (Mallik-Kane et al., 2018; Mallik-Kane and Visher, 2008), and there is limited availability of services for uninsured individuals even within publicly funded health centers (Seo et al., 2019; Friedmann et al., 2003; Gryczynski et al., 2011).

We also note that we do not observe whether the outpatient care obtained was therapeutic, diagnostic, or preventive in nature (with the exception of the OUD medication treatment outcome). Similarly, without further information about the content of acute care received in the emergency department and inpatient setting, we refrain from interpreting these increases as positive or negative indications of individuals' access to appropriate care. We separate results to examine some outcomes immediately post-release and examine others in the first six months post-release. Outcomes are not conditional on reincarceration. With the exception of a few Regime 2 reduced form estimates, all results in Table 3 are statistically different from zero at the 0.1% level.

Within the first 30 days of release during Regime 0, prior to Medicaid expansion, 5 percent of formerly incarcerated adults had a Medicaid-paid outpatient visit, .001 percent had an OUD related outpatient visit, and .003 percent had a SUD related to any SUD (Table 3, Columns 1-3). This changed drastically by the time of full implementation of enrollment assistance, when 24% had a Medicaid-paid outpatient visit, 1.3% had an OUD related outpatient visit, and 3.3% had an SUD related visit defined more broadly. Medicaid is strongly associated with all types of health care use in the OLS estimates. For example, having Medicaid is associated with being 24.4 percentage points more likely to have a Medicaid-paid outpatient visit in the first 30 days post-release (Column 1). The reduced form indicates a clear dose-response relationship across all three outcome measures. The IV estimate suggests that Medicaid increases outpatient visits in the first 30 days by 29.4 percentage points, which relative to the baseline is an increase of 588%, nearly six times as large. There are similarly dramatic relative increases in OUD visits and visits for any SUD in the first 30 days, with an increase of 1.6 percentage points for OUD visits (16 times larger) and an increase of 4.6 percentage points (15 times larger) for any SUD; however, overall visits indicated for these purposes are still low overall in absolute terms.

Within the first six months of release, we examine outpatient visits overall, for any SUD, for mental health, emergency visits, hospitalizations, and MOUD treatment (Columns 4-9 of Table 3). When interpreting these results, recall that some individuals released in Regime 0 would have been able to enroll in Medicaid beginning in April 2014 if they remained in the community at that time. We again observe a very strong correlation between having Medicaid and Medicaid-paid health care in the first six months in the OLS estimates. The reduced forms show strong effects across all regimes, with almost all (the exception is emergency visits) indicating a clear dose-response relationship.

Turning to the IV estimates, we see large absolute and relative increases in all outcomes. At baseline, 17.7% of the released had an outpatient visit paid by Medicaid in the first six months after release. Medicaid enrollment increased the probability of having an outpatient visit paid by Medicaid within the first six months by 47.7 percentage points (269%). The probability of any SUD related outpatient visit increased by 13.3 percentage points on a baseline of 2.7% for a relative increase of 493%.

Outpatient mental health visits increased 24.3 percentage points from a baseline of 8%, a relative increase of 529%. Emergency visits increased by 7.5 percentage points, a relative increase of 96% from the baseline of 7.8%. Only 1.8% of those released in the baseline period had a hospitalization paid by Medicaid within 6 months of release, which increased by 3.5 percentage points (twice as high) with Medicaid. Finally, MOUD treatment (a relatively rare outcome, with just 0.6% utilization in the baseline period) increased by 3 percentage points, a 5-fold increase.

Most population-based estimates of health care use among justice-involved adults in the U.S. derive from the National Survey on Drug Use and Health (NSDUH) (Frank, Linder, Becker et al., 2014; Winkelman, Choi, Davis, 2017; Hawks, Wang, Howell et al., 2020). This nationally representative household survey collects self-reported health care use paid by any source. However, it is complicated to compare NSDUH-based results to our own because of differences in the definition of justice-involvement and the outcome ascertainment period, both of which are more liberally defined in the NSDUH. Nonetheless, in the NSDUH study that aligns best with our study years, Hawks and colleagues (2020) assessed health care use in the past 12 months among adults on probation at any point during that year; 65% reported an outpatient visit; 40.5% reported an ED visit; and 11.4% reported a hospitalization; notably, more than 40% of the study population had an income >200% FPL and only 26% were uninsured, likely quite dissimilar from our study population. Frank and colleagues (2013) provide post-release health care use estimates that are more comparable to our own in terms of population and data; they link Rhode Island corrections data to the state's largest hospital system and find that 5.9% and 23.7% of adults released from state prison between 2007 and 2008 had an emergency department visit within 30-days and 1-year of their release respectively, when there was no Medicaid expansion available.

Overall, our results are consistent with a large increase in access to health care services due to Medicaid enrollment facilitated by Medicaid eligibility and enrollment assistance. Again, to the extent that we think substitution occurred from other types of care (private pay, private insurance, or charity care) these results represent an upper bound on the effect of Medicaid on health care services more generally, but the results are consistent with a large literature in a variety of populations showing that

Medicaid increases health care utilization. In addition, because such a large fraction (70%) of the recently released were enrolled in Medicaid in the month of release by Regime 3, the full implementation average likely provides a close to representative look at what health care utilization looks like among the recently released more broadly.

c. Mechanisms

In order to better understand what might be driving these declines in reincarceration, we consider heterogeneity along several theoretically motivated dimensions that we proxy for using measures that were collected during incarceration as described above. We use these measures to define subgroups that may be relatively more or less responsive to a hypothetical health care or financial channel and re-estimate our models by subgroup defined according to need for SUD treatment, MH care needs, and financial need.

Table 4 shows the results by likelihood of substance use treatment need. We separate the sample into subgroups defined by the case management instrument algorithm as unlikely to have a need for SUD treatment (Column 1, 20% of releases), probable to have a need for SUD treatment (Column 2, 19% of releases) and highly probable to have a need for SUD treatment (Column 3, 57% of releases). These delineations are supported by the ex-post utilization data; among those unlikely to have a need for SUD treatment, just 0.2% received MOUD treatment within 6 months of release, and 2% had an SUD outpatient visit, while among those highly probable, 2.6% received MOUD treatment within 6 months of release (making them 13 times more likely) and 11% had an SUD outpatient (more than 5 times as likely). If SUD treatment use drives the relationship between Medicaid and reincarceration, we would expect a larger magnitude of decrease in reincarceration among those subgroups with higher need for SUD care.

First stage results are very similar across the three groups, with the increase in Medicaid enrollment at release slightly larger for those highly probable for SUD treatment needs (Table 4). However, the IV coefficient for reincarceration within six months is clearly not driven by the highly probable group (Column 3 of Table 4), with a coefficient of -1.2 that is not statistically different from

zero, while in the unlikely group, reincarceration declines by 5.2 percentage points, statistically different from zero at the 1% level (Column 1 of Table 4). In other words, the declines in reincarceration observed in the full population are driven by the group unlikely to have SUD treatment needs, who also saw the smallest relative increase in SUD treatment from Medicaid enrollment (Columns 1-3 of Appendix Table 1) and had very low levels of SUD treatment overall. These results do not support the hypothesis that the effect of Medicaid on reincarceration is driven by SUD treatment. Columns 1-3 of Appendix Table 1 shows the IV results for the other outcomes and SUD related care clearly increased by much more at both 30 days and 6 months among the highly probable group.

We next turn to receipt of mental health care as a potential mechanism for the effect of Medicaid on reincarceration. If mental health treatment is an important mechanism driving the decline in reincarceration through Medicaid, we expect that reductions in reincarceration would be larger among those who need mental health care (i.e., our proxy for mental health care use). To test this hypothesis, we redefine our study population according to mental health care need, applying two alternative definitions of need, as previously described.

We first assess the overlap between the two definitions of mental health care need and the face validity of each definition (Table 5). There is only partial overlap in the membership of the resulting mental health care needs' subgroups suggesting the possibility that the two definitions are capturing somewhat different mental-health care related phenomena. For example, about half of individuals with mental health needs also had an MH prescription in the last 3 months of incarceration (Columns 5-6). Under either definition of mental health care need, the use of mental health care post-incarceration is more likely among those with a mental health care need suggesting reasonable face validity for both definitions. Specifically, among the 26% of the sample with mental health needs, 35% had a mental health related outpatient visit within the first six months after release (Column 2), while among the 74% with no mental health needs only 12% had a mental health related outpatient visit (Column 1). Among the 22% with a mental health prescription prior to release, 43% had a mental health related outpatient visit

within the first six months (Column 4), while among the 78% who did not have a prescription, only 11% had such a visit (Column 3).

In Table 5, the IV coefficient among those with no mental health needs suggests a decline in reincarceration of 2 percentage points that is statistically significant at the 5% level, which on a baseline of 16.1% is a reduction of 12%. Among those with mental health needs, the coefficient is more than twice as large at 4.7 percentage points and statistically significant at the 0.1% level, representing a 28% reduction on the slightly higher baseline reincarceration rate of 17.1%. This result suggests that treatment of mental health needs could be an important mechanism behind the decline in reincarceration due to Medicaid, although the still important decline among those without mental health needs implies it is unlikely to be the only mechanism.

However, among those who did and did not have a mental health prescription, results are more ambiguous (Table 5). Among those with no prescription for the mental health drugs, the IV coefficient suggests a 3.1 percentage point decline in reincarceration that is statistically significant at the 0.1% level (a 19% decline), but among those with a MH prescription, the magnitude is slightly smaller (2.9 percentage points, a 17% decline) and not statistically different from zero at standard levels. If we interpret these as similar estimates, this result would not support the hypothesis of mental health treatment as a primary mechanism.

To further examine this issue, we hypothesized that individuals who met the criteria of both mental health care need definitions may represent the most severely ill, and thus most in need of post-incarceration mental health care. We subdivided those with mental health needs into those with and without a mental health prescription prior to release (Columns 5-6 of Table 5). Among individuals with MH needs, those with a prerelease mental health prescription were much more likely to have a mental health outpatient visit within the first six months post-release compared to those who did not have a prescription (48% vs 22%) consistent with a greater need. The first stage is slightly larger for those with a prescription. The IV estimates show that the reduction in reincarceration is larger for those with no mental health prescription compared to those with a mental health prescription (6.2 percentage points/35% vs 3.5

percentage points/23%). This finding is not consistent with the hypothesis that receipt of mental health care explains the Medicaid-induced reduction in reincarceration. Overall, we consider the results presented in Table 5 to provide mixed evidence that receipt of mental health care is a main mechanism behind the result.

We are also able to consider the mechanism of easing of financial pressure (income effects) implying less of a need for criminal income or a lower stress level leading to changes in criminal behavior. We use a proxy for financial needs that is not directly dependent on health care utilization. While the value of Medicaid is likely to be higher among those who have medical needs, health care utilization increased substantially across all sample groups (for example, see the Appendix Table 1 results on outpatient care at six months). We stratify the sample into two mutually exclusive groups based on their answers to questions on the case management instrument asking how often the inmate worried about financial survival prior to the incarceration, had trouble paying bills, or had barely enough money to get by. If there are responses of "Often" to any one of these three measures, we classify the individual as having financial needs.

Table 6 shows the results of our analyses for these two subgroups. Among the 63% of individual releases defined as without financial needs (column 1), baseline reincarceration was lower at 15.2% compared to 18.9% of the 37% of releases defined as having financial needs. The first stage was slightly larger among those with financial needs. The IV coefficient for reincarceration at six months suggests a decline of 1.8 percentage points or 12% among those without financial needs compared to a coefficient of 4 percentage points or 21% among those with financial needs. Appendix Table 1 also shows a larger increase in employment among those with financial needs. Further, results in Appendix Table 1 show that increases in SUD treatment and mental health treatment were quite similar across these two groups, suggesting that the difference in reincarceration across those with and without financial needs is not driven by either SUD treatment or mental health treatment. This result is suggestive that easing of financial concerns is an important mechanism behind the results, independent of any substance use

disorder or mental health treatment needs, consistent with a large body of evidence on the financial benefits of Medicaid coverage in the general population.

d. Compliers in Different Regimes

In Figure 4, we show the results of our analysis of the ratios of the average complier characteristics in each regime with respect to the sample average. The figure shows the ratios calculated for Regime 1 relative to Regime 0 (indicated by circles) and Regime 3 relative to Regime 0 (indicated by triangles). A ratio of 1 indicates that compliers in the regime are equally likely to have the indicated characteristic, a ratio less than one that compliers are less likely to have the characteristic, and greater than one that compliers are more likely to have the characteristic.

In general, Figure 4 shows that compliers are less likely to be female, married, are older, less likely to be American Indian/Alaska Native, and had longer duration of incarcerations. They were less likely to have drug convictions, and more likely to have public order, property, or violent convictions. They were more likely to have a highly probable need for SUD treatment, more likely to have a mental health care need (i.e., MH prescription or mental health needs), and more likely to have financial needs.

Some major differences in compliers between Regimes 1 and 3 are also evident in Figure 4. Compliers under Medicaid expansion (Regime 1) are more likely to be married and older than compliers under full enrollment assistance (Regime 3). They are more likely to be Black and less likely to be White than those in Regime 3. Regime 1 compliers are less likely to have had an employment to population ratio higher than .5. Compliers under regime 1 are also less likely to have had drug convictions and more likely to have had violent convictions. They are more likely to be classified as having mental health needs or to have had a mental health prescription compared to complier in Regime 3. Broadly, these results suggest that compliers under Regime 1 had more indicators of health needs than compliers under Regime 3, consistent with enrollment assistance connecting a group with lower net benefits from health insurance to Medicaid coverage.

e. Summary of Other Subgroup Analyses

Appendix Table 2 includes the first stage results for specific subgroups of interest: marital status, education, age, race, and type of conviction. The major takeaway is that the increases in enrollment were very similar across all groups.

Appendix Table 3 includes an analysis of all outcomes for the demographic subgroups (marital status, education, age, and race), and Appendix Table 4 includes all outcomes for subgroups defined by type of conviction. The reincarceration results are most of interest, and are summarized in Figure 5. The size of reincarceration effects is similar for those who were married and unmarried, but because the overall reincarceration rate was lower for the married, it represents a larger relative increase for them. By education, the IV coefficient is larger for those with no high school (HS) degree, who are also among the most likely to be reincarcerated overall, than for those with at least HS.

Results differed substantially across age groups. There is a large gradient in average reincarceration by age, with older releasees less likely to be reincarcerated. The IV coefficient is essentially zero for the youngest group (18-23), and of largest relative size for those 24-35 (3.1 percentage points on a baseline of 18.3 percent), remaining important for those 36-55 (2.7 percentage points on a baseline of 13.6%) and 55+ (a similar point estimate, though not statistically different from zero at the 5% level). For race, we only show results for releases of Black and White individuals due to sample size related privacy concerns for the American Indian/Alaska Native and Asian/Pacific Islander groups. The effect size is dramatically larger for those who are Black (4.9 percentage points on a baseline of 23.5%); it is not statistically different from zero in the White subgroup. Among type of conviction, reincarceration results are largest for those with a violent conviction (a decline of 4.3 percentage points on a baseline of 18%) and are zero for public order crimes. Drug and property crimes have similar point estimates, with a bigger relative decline for drug crimes (2.8 percentage points on a baseline of 13% and 3 percentage points on a baseline of 18%).

7. CONCLUSION

Approximately 1.2 million individuals are incarcerated in state prisons in the United States (Carson 2020). Their return to the community from prison is characterized by financial hardship, unstable housing, acute health care events, and limited social support (Mallik-Kane and Visher, 2008; Western et al., 2015; Harding et al., 2013). Faced with these challenges, it is perhaps unsurprising that 17.5% of individuals are reincarcerated within 1 year and 36% within 3-years (Durose et al., 2014). Interrupting this cycle and supporting a sustained return to the community is a widely held goal among policymakers and advocates alike (National Reentry Resource Center, 2014; Subramanian et al., 2020). Identifying the policies and interventions that help individuals desist from criminal activity and thrive in their communities is central to achieving this objective. In this study we focused on one such policy, the provision of public health insurance, which may support desistance through both treatment and financial support mechanisms.

Using a natural experiment, we showed large increases in Medicaid enrollment at the time of release resulting from both Medicaid eligibility expansion to the larger population and a specific enrollment assistance program targeted those leaving state prison facilities. We also examined take-up of Medicaid under the different policies by observed characteristics to examine whether the population of compliers was different under voluntary independent enrollment and enrollment assistance, finding that those enrolling under voluntary enrollment had more indicators of health needs.

We examined the effects of Medicaid coverage upon release from state prison on reincarceration, and two channels by which Medicaid coverage may influence reincarceration, a financial and a health channel. Medicaid decreased reincarceration at six months by 2.5 percentage points, a 16% decrease. To put these results into context, the estimated impact of expanded Medicaid eligibility on recidivism (including rearrests, convictions or reincarceration for any type of crime) varies from no change to a 5% relative reduction (Wen et al., 2017b; Vogler 2022; He and Barkowski 2020). Suspension of Medicaid enrollment relative to termination upon prison admission was associated with a 12% relative reduction in the likelihood of reincarceration within one year (Gollu and Zapryanova, 2022). We would expect that if Medicaid has an impact on reincarceration, the effect of enrollment would exceed that of eligibility as we

see in our results. Somewhat in contrast with Jacome (2020) and Deshpande and Muller-Smith (2022)'s results on population-level charges and incarcerations among those near the age of 18, we do not find effects on reincarceration among the youngest ages in our sample (18-23); this may because reincarceration is a substantially different margin (more difficult to affect) than initial offense as discussed in the conceptual framework. Our strong evidence that Medicaid enrollment decreases individual recidivism adds to the evidence that post-release support can make a difference in desistance from crime.

We furthermore consider whether Medicaid enrollment affects employment and earnings in this population to estimate the degree to which the formerly incarcerated were increasingly (or decreasingly) attached to the labor market, and we find that they were 5.2 percentage points more likely to be employed on a baseline of 20.7%, for an increased likelihood of employment of 25%, and a net increase in quarterly earnings of almost $200. These effects on employment and earnings are more broadly evident than the reincarceration effects and support the idea that increasing outside options for those released from the prison system created more attachment to the traditional economy.

We also found evidence that Medicaid enrollment within the month of release from prison increased the likelihood of Medicaid-paid health care use across each of the outcomes measured within 30-days of release and within 6-months of release. These increases included outpatient care for any cause as well as mental health, SUD- and OUD-specific outpatient care. Medication for OUD likewise increased, an established efficacious treatment to prevent relapse and overdose (Johnson et al., 1992; Petitjean et al., 2001). The implied effect sizes, relative to baseline, were in most cases quite large. The likelihood of any inpatient or emergency department within 6-months of release also increased. With the exception of the medication for OUD outcome, we cannot discern whether the outpatient care obtained was therapeutic, diagnostic or preventive in nature. Similarly, without further information about the content of acute care received in the emergency department and inpatient setting, we refrain from interpreting these increases as positive or negative indications of individuals' access to appropriate care. Nonetheless, our findings demonstrate that Medicaid coverage facilitated access to care during a time of

heightened vulnerability including evidence-based care indicated for OUD, the substance responsible for most drug overdose deaths in the country (Hedegaard, Minino, Warner 2020).

Together, these results could be interpreted in several ways. It could be that by increasing options outside of crime, Medicaid makes desistance more attractive and time use shifts away from criminal activity; the increases in health care use may be purely incidental to reincarceration. Alternatively, the Medicaid-induced increase in use of treatment for SUDs and health care more generally, may enable desistance by affecting underlying symptoms that facilitated criminal behavior; the positive effects on employment may then be a function of both these treatment effects and time use. We test the potential explanatory mechanisms by which Medicaid coverage may influence reincarceration. Consistent with an important role for income effects, we show that reincarceration declines are larger among those who reported financial concerns pre-release, while those with financial concerns were much more likely to return to prison than those with no financial concerns. Medicaid coverage essentially closes the gap between the two groups.

Evidence that the Medicaid enrollment effect on reincarceration operates through a health channel is not supported for those with treatment needs for SUD and is mixed for those with mental health care needs. It is important to distinguish the role of SUD and mental health care as mediators between Medicaid and risk of reincarceration, and the potential direct effects of such care on risk of reincarceration. We do not examine the latter in this study, so we cannot conclude from our findings that treatment for SUDs and mental illness are unrelated to risk of reincarceration. Rather, in order for Medicaid's effect on reincarceration to operate through SUD or mental health treatment, two conditions must hold: 1) price is a barrier to this treatment use for some individuals in the sample such that treatment use will increase with Medicaid coverage; and 2) among this price sensitive subgroup, the marginal increase in this treatment use will have an independent effect on risk of reincarceration over and above all other observed factors. Our results support the first condition for treatment of SUDs and mental illness but do not support the second condition for individuals with SUD treatment needs and are mixed for those with mental health care needs.

The potential mediating role of mental health care in the relationship between Medicaid and reincarceration is not clear cut based on our findings. Our analytic approach to this inquiry used mental health care need as a proxy for mental health care use to avoid the selection effects that would ensue had we compared reincarceration outcomes among those with and without mental health care use. When mental health care need is defined according to a staff- and self-reported assessment ("mental health needs"), the Medicaid-induced reduction in the likelihood of reincarceration is relatively greater among those with mental health care needs, consistent with the health channel hypothesis. By contrast, the Medicaid effect on reincarceration was relatively larger among those *without* a mental health care need when need is defined based on receipt of a MH prescription during the last 3 months of incarceration. Moreover, when we restrict the analyses to only individuals with mental health needs, we find that the plausibly more severely ill set of individuals, those who also received a pre-release MH medication, experienced a smaller Medicaid-driven decline in reincarceration compared to those who did not. The sensitivity of our results to the definition of mental health care need has several implications for interpretation. Most importantly, we do not have an empirical or theoretical basis by which to assert that one definition of the need for mental health care is superior to another for our study's purposes; we tested for and demonstrated that each definition is strongly associated with post-incarceration mental health care use. We therefore do not privilege one set of findings over the another, and conclude that results are mixed. As to the potential explanations for this variation, we surmise that the measures are capturing different underlying constructs which reflect some combination of severity of illness, preferences for health care, and capacity to obtain and adhere to treatment, attributes that we do not observe. Our findings highlight the additional value that clinical and diagnostic measures of health from the incarceration episode can bring to better understanding the degree to which health care use mediates the Medicaid effect on reduce risk of reincarceration.

Our findings should be considered in light of the study's limitations. The specific features of this state's Medicaid program and prerelease Medicaid enrollment program may limit the generalizability of our findings to other states' prison populations. For example, the Medicaid income eligibility threshold

for most non-pregnant adults in Wisconsin is 100% of the federal poverty level (FPL) which is generally higher than other non-ACA expansion states and lower than the 138% FPL cut off in ACA expansion states. To the extent that the impact of Medicaid enrollment on the study's outcomes varies across the income distribution, the marginal effect of coverage may vary by state. This study lacks a contemporaneous comparison group and is thus subject to potential confounding particularly due to changes in economic conditions. We mitigate this possibility by controlling for local labor market conditions but recognize the possibility of residual confounding. With respect to our health care use outcomes, as noted we observe only health care use that is paid by Medicaid. Our results may overstate the effect of Medicaid on health care use if individuals who do not take up Medicaid obtain care paid by other sources (e.g., private insurance, charity care, etc.). Our data did not include clinical measures to identify the subgroups of interest we used to test whether the Medicaid effect on reincarceration operates through a health channel. While we demonstrated that our (non-clinical) definitions of SUD and mental health care treatment need had reasonable face validity based on post-incarceration health care use, the findings in our identified subgroups may not generalize to clinically defined populations. Additionally, we cannot rule out the possibility of bias in our results to the extent that there is regime-varying measurement error in our measures of SUD and mental health care need.

Because of the state-based and ACA-related Medicaid expansions, the large majority of adults leaving prison are now income eligible for Medicaid. This study's findings indicate that the value of Medicaid coverage for recently incarcerated adults may extend well beyond access to health care services. Further, it highlights the important role that facilitating enrollment, to ensure coverage before release, plays in distributing the benefits of Medicaid more widely to the population of adults leaving prison. Prerelease enrollment assistance is unevenly available by state and correctional setting suggesting an opportunity for intervention to support a successful reentry to the community. Overall, this evidence suggests that Medicaid is an important public policy tool for supporting adults leaving the prison system.

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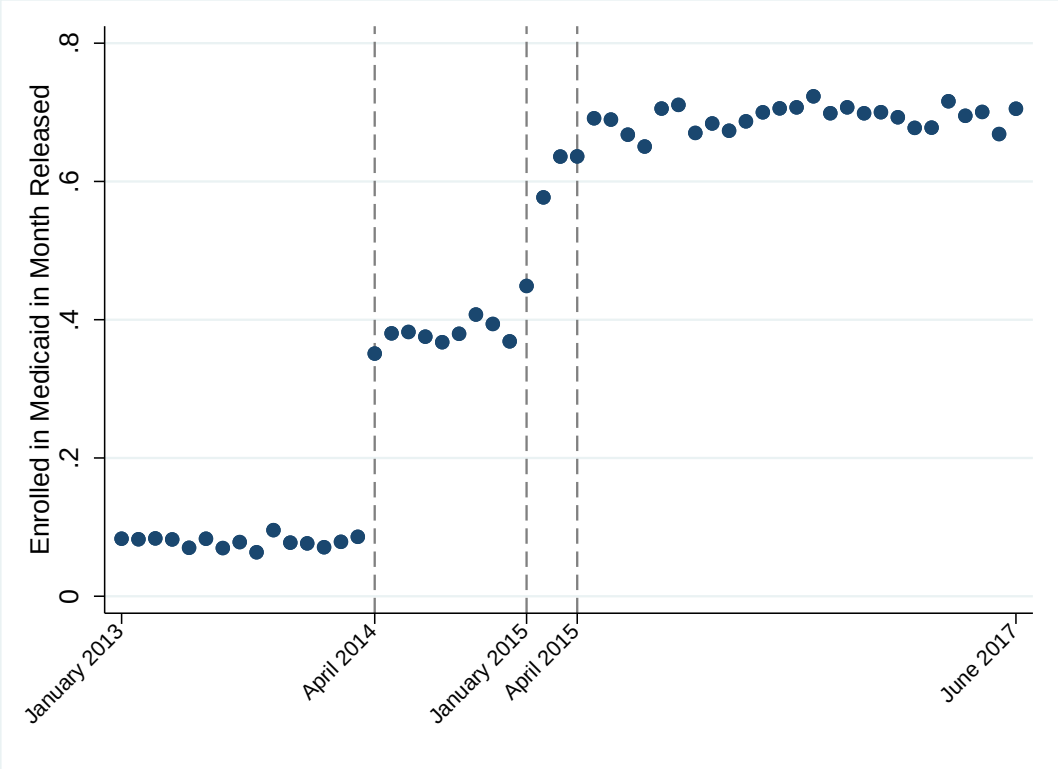
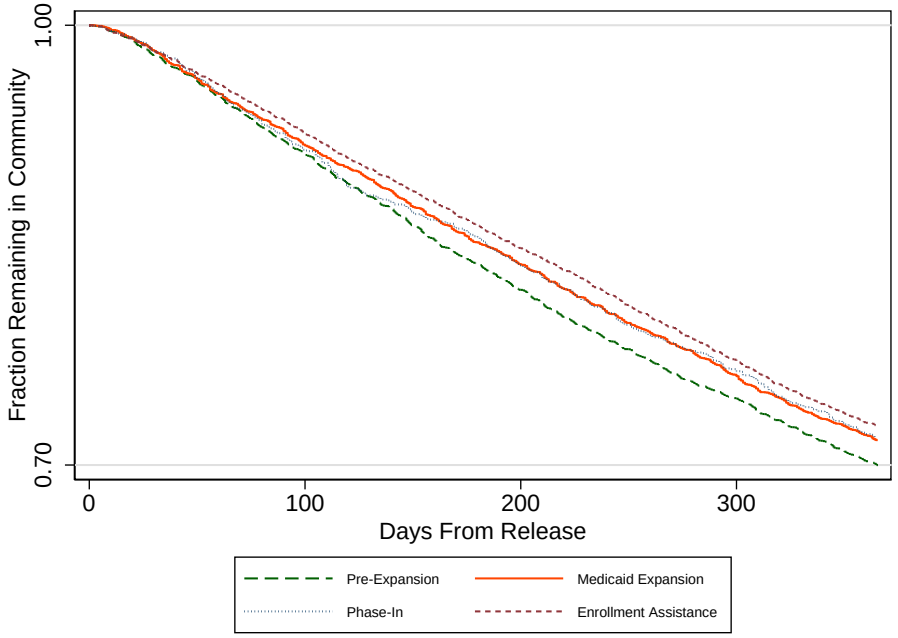
TABLES AND FIGURES

Figure 1. Fraction Enrolled In Medicaid in Month of Release



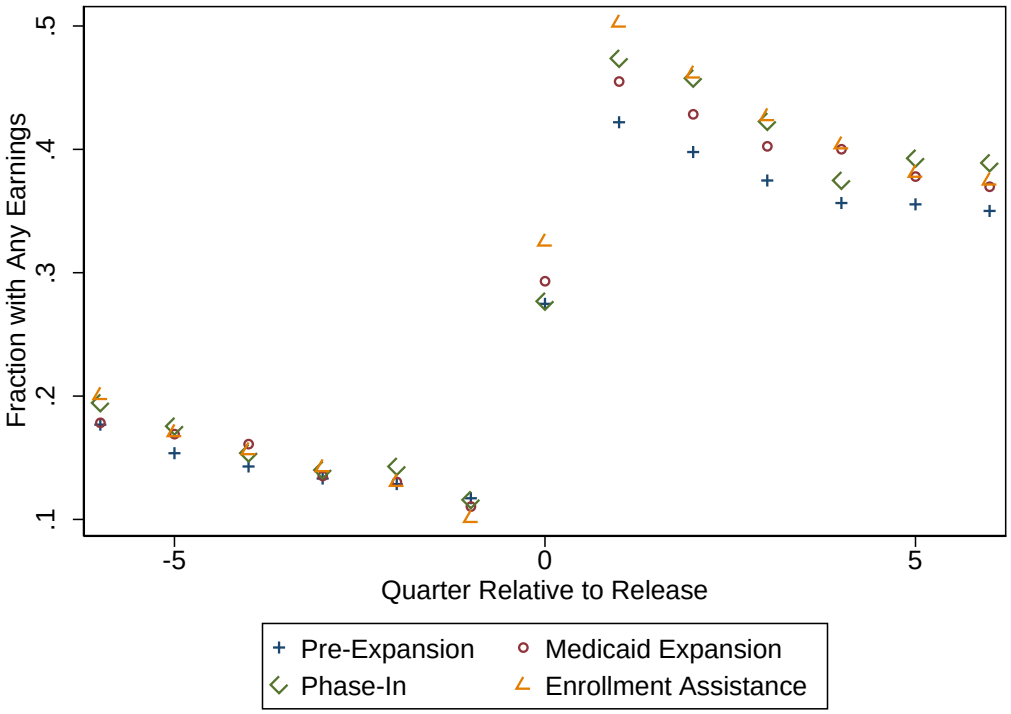
Source: Authors' calculations from Wisconsin administrative data. Notes: Figure shows fraction of releases with Medicaid enrollment in the month of their release, binned by month of release. Pre-expansion (regime 0) is January 2013-March 2014; expansion (regime 1) is April 2014-December 2014; phase-in of enrollment assistance (regime 2) is January 2015-March 2015; enrollment assistance (regime 3) is April 2015-June 2017. Bins do not cross regimes.

Figure 2. Fraction Remaining in Community During First Year



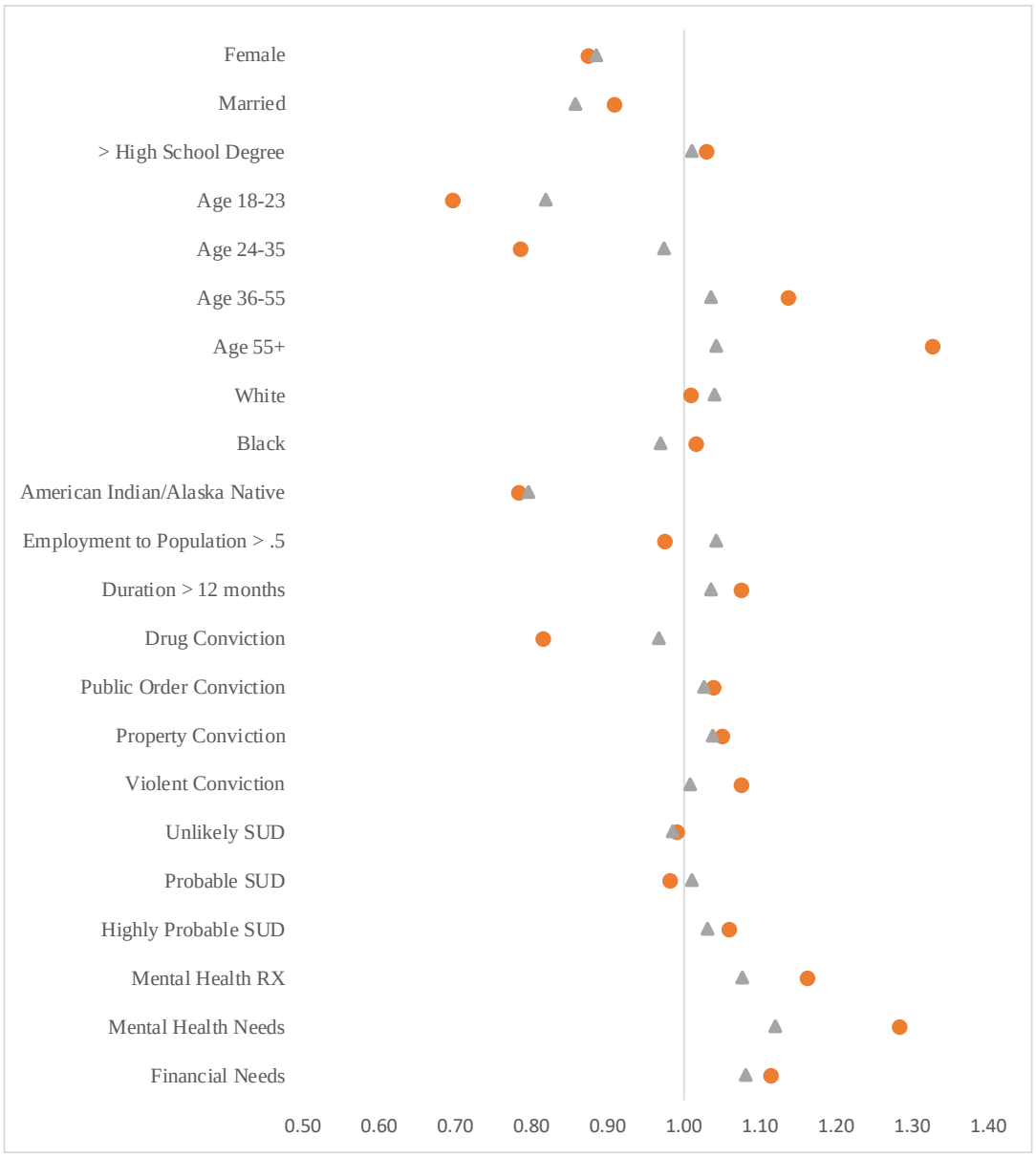
Source: Authors' calculations from Wisconsin administrative data. Notes: Figure shows Kaplan-Meier survival curves of the fraction of releases remaining in the community within the first year post-release by policy in place at the time of the release.

Figure 3. Any Earnings Before and After Release



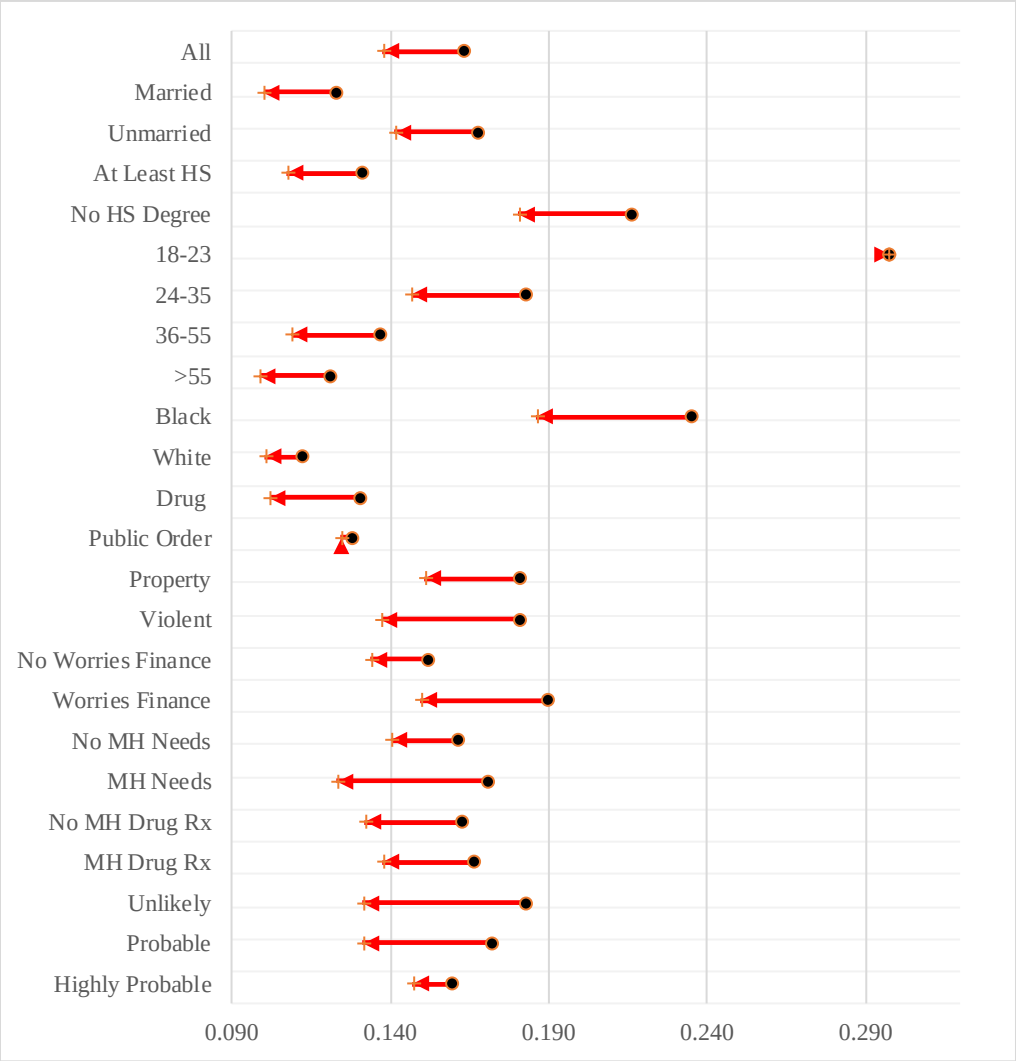
Source: Authors' calculations from Wisconsin administrative data. Notes: Figure shows fraction of release with any earnings during the calendar quarters immediately prior to and following their release dates. Calendar quarters differ by release date; some individuals were incarcerated during at least some of the time prior as sample included is balanced over relative time.

Figure 4: Characteristics of Compliers



Source: Authors' calculations from Wisconsin administrative data. Notes: Figure shows ratio of complier characteristics (equation 4). Ratios calculated for Regime 1 relative to Regime 0 (indicated by circles) and Regime 3 relative to Regime 0 (indicated by triangles). Regime definitions can be found in text and Figure 1 notes.

Figure 5. Heterogeneity in IV Estimates



Source: Authors' calculations from Wisconsin administrative data. Notes: Figure shows baseline (Regime 0) average (dot) and IV estimate (arrow) for groups as defined. Relevant estimates and standard errors available in Tables 2, 4-6, and Appendix Tables 3-4. Regime definitions can be found in text and Figure 1 notes.

Table 1. Summary of Release Characteristics and Normalized Balance Test

		Regime				Normalized Balance
Characteristic	Overall	0	1	2	3	Statistic
Female	9.1%	8.1%	8.0%	9.4%	10.0%	0.0504
Age 18-23	7.1%	7.2%	6.6%	6.3%	7.3%	-0.0049
Age 24-35	36.4%	36.3%	37.0%	35.3%	36.4%	0.0033
Age 36-55	46.1%	46.8%	46.1%	47.8%	45.4%	-0.0209
Age 55+	10.5%	9.7%	10.3%	10.6%	10.9%	0.0333
American Indian	4.3%	3.8%	4.3%	4.4%	4.5%	0.0334
Asian or Pacific Islander	0.9%	0.8%	0.8%	0.9%	0.9%	0.0108
Black	39.6%	41.9%	39.7%	39.4%	38.1%	-0.0670
White	55.3%	53.5%	55.1%	55.2%	56.4%	0.0501
High School Education	65.7%	64.0%	65.8%	64.1%	66.8%	0.0492
Married	9.7%	9.6%	9.3%	9.7%	9.8%	0.0039
Months Incarcerated	25.5	24.1	24.7	25.7	26.7	0.0624
Highly Probable SUD	57.5%	54.1%	55.0%	55.8%	60.6%	0.0936
Probable SUD	18.9%	18.4%	20.8%	21.3%	18.1%	0.0152
Unlikely SUD	20.1%	21.0%	20.7%	20.4%	19.4%	-0.0300
MH Needs	25.7%	22.9%	25.3%	27.7%	27.4%	0.0936
MH Drug Rx	22.1%	14.7%	23.1%	24.8%	25.8%	0.2625
Violent Crime	41.9%	42.0%	41.3%	43.5%	41.8%	-0.0041
Property Crime	32.6%	32.7%	33.2%	31.6%	32.4%	-0.0037
Public Order Crime	44.5%	42.8%	43.2%	42.9%	46.2%	0.0494
Drug Crime	27.3%	26.7%	26.6%	25.0%	28.1%	0.0183
Rural County	18.0%	16.9%	18.2%	17.9%	18.6%	0.0420
N (Releases)	38,508	11,059	6,777	2,113	18,559	

Source: Authors' calculations from Wisconsin administrative data. Notes: Sample includes first release per person per regime. Table shows average characteristics by regime and the results of a normalized balance test comparing Regime 0 to the other regimes. 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. A rule of thumb is that differences of 1 or larger could be problematic and differences of .25 or smaller suggest good balance (Imbens and Rubin, 2015). See text for further discussion. Regime definitions can be found in text and Figure 1 notes.

Table 2. Reincarceration and Employment

	Enrolled in Medicaid (First Stage) (1)	Reincarcerated within 6 months (2)	Employed in Quarter (3)	Earnings in Quarter (4)
IV Estimate		-0.0254***	0.0521***	196.7***
		(0.00692)	(0.00778)	(23.39)
Reduced Form				
Regime 1	0.294***	-0.0131*	0.00738	12.68
	(0.00667)	(0.00559)	(0.00635)	(18.83)
Regime 2	0.472***	-0.0141	0.0123	48.88
	(0.0113)	(0.00865)	(0.00901)	(28.16)
Regime 3	0.602***	-0.0160***	0.0316***	119.5***
	(0.00444)	(0.00427)	(0.00481)	(14.35)
OLS Estimate		-0.000255	0.0360***	-56.75***
		(0.00363)	(0.00412)	(11.46)
Pre-Period Avg.	0.079	0.163	0.207	360.1
Full Implementation Avg.	0.690	0.137	0.246	494.6

Notes: Authors' calculations from Wisconsin administrative data. N=38,508, first-stage F-statistic 6,357. All regressions include facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, an indicator for highly probable substance use treatment need, type of crime, employment to population ratio, and calendar month of release. Columns (3) and (4) additionally control for month of the quarter of the release. IV estimates from GMM models. Pre-period is the average during Regime 0; full implementation is Regime 3. Regime definitions can be found in text and Figure 1 notes. When multiplied by 100, the regression point estimates shown can be interpreted as the percentage point change in the outcome with a 1 unit change in the independent variable. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.

Table 3. Health Care Use

	First 30 Days			First Six Months					
	Outpatient Visit (1)	OUD Visit (2)	Any SUD Visit (3)	Outpatient Visit (4)	Any SUD Visit (5)	Outpatient Mental Health (6)	Emergency (7)	Hospitalization (8)	MOUD Treatment (9)
IV Estimate									
Medicaid	0.294***	0.0162***	0.0462***	0.477***	0.133***	0.243***	0.0751***	0.0354***	0.0304***
	(0.00595)	(0.00132)	(0.00227)	(0.00807)	(0.00449)	(0.00643)	(0.00575)	(0.00322)	(0.00217)
Reduced Form									
Regime 1	0.0997***	0.00491***	0.0179***	0.222***	0.0498***	0.113***	0.0881***	0.0160***	0.00899***
	(0.00496)	(0.00103)	(0.00193)	(0.00696)	(0.00371)	(0.00546)	(0.00516)	(0.00264)	(0.00167)
Regime 2	0.136***	0.00250	0.0189***	0.218***	0.0543***	0.117***	0.0390***	0.00992*	0.00320
	(0.00920)	(0.00174)	(0.00373)	(0.0116)	(0.00670)	(0.00949)	(0.00830)	(0.00445)	(0.00279)
Regime 3	0.177***	0.0111***	0.0277***	0.293***	0.0805***	0.147***	0.0471***	0.0219***	0.0204***
	(0.00380)	(0.000901)	(0.00147)	(0.00513)	(0.00281)	(0.00401)	(0.00350)	(0.00197)	(0.00140)
OLS Estimate									
Medicaid	0.244***	0.0133***	0.0357***	0.390***	0.0972***	0.197***	0.0631***	0.0284***	0.0234***
	(0.00382)	(0.000937)	(0.00159)	(0.00469)	(0.00288)	(0.00397)	(0.00346)	(0.00193)	(0.00143)
Pre-Period Avg.	0.050	0.001	0.003	0.177	0.027	0.080	0.078	0.018	0.006
Full Implementation Avg.	0.235	0.013	0.033	0.479	0.115	0.235	0.122	0.041	0.027

Notes: Authors' calculations from Wisconsin administrative data. All regressions include facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, an indicator for highly probable substance use treatment need, type of crime, employment to population ratio, and calendar month of release. IV estimates from GMM models. Pre-period is the average during Regime 0; full implementation is Regime 3. Regime definitions can be found in text and Figure 1 notes. Ns and first stage estimates, including F-statistic, available in Table 2. As discussed in text, all variables are measured as Medicaid-paid health care use, and unobserved for those not enrolled in Medicaid. When multiplied by 100, the regression point estimates shown can be interpreted as the percentage point change in the outcome with a 1 unit change in the independent variable. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.

Table 4. Heterogeneity by Likelihood of Substance Use Treatment Need

	Unlikely (1)	Probable (2)	Highly Probable (3)
Summary Statistics			
Fraction of releases (N)	20% (7754)	19% (7,266)	57% (22,134)
Fraction with MOUD treatment within 6 months (N)	0.2% (22)	1% (85)	2.6% (568)
Fraction with SUD Outpatient Visit within 6 months (N)	2% (152)	6% (420)	11% (2541)
Reincarcerated within 6 months, Regime 0	0.183	0.172	0.159
Reincarcerated within 6 months, Regime 3	0.159	0.145	0.129
First Stage Results			
Regime 1	0.290***	0.286***	0.312***
	(0.0147)	(0.0148)	(0.00908)
Regime 2	0.467***	0.449***	0.494***
	(0.0249)	(0.0246)	(0.0150)
Regime 3	0.592***	0.606***	0.624***
	(0.00992)	(0.0103)	(0.00582)
First Stage F-Statistic	1238.9	1190.5	3951.0
IV Coefficient Reincarcerated Within 6 months	-0.0512**	-0.0408*	-0.0119
	(0.0163)	(0.0165)	(0.00878)

Notes: Authors' calculations from Wisconsin administrative data. All regressions include facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, type of crime, employment to population ratio, and calendar month of release. IV estimates from GMM models. Regime definitions can be found in text and Figure 1 notes. When multiplied by 100, the first stage and IV regression point estimates shown can be interpreted as the percentage point change in the outcome with a 1 unit change in the independent variable. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.

Table 5. Heterogeneity by Mental Health Care Need

					MH Needs (N=9,904)	
	No MH Needs	MH Needs	No MH Drug Rx	MH Drug Rx	No MH Drug Rx	MH Drug Rx
	(1)	(2)	(3)	(4)	(5)	(6)
Summary Statistics						
Fraction of releases (N)	74% (28,604)	26% (9,904)	78% (30,002)	22% (8,506)	13% (4,939)	13% (4,965)
Fraction with MHOP Visit within 6 months (N)	12% (3,528)	35% (3,459)	11% (3,361)	43% (3,626)	22% (1,091)	48% (2,368)
Reincarcerated within 6 months, Regime 0	0.161	0.171	0.163	0.166	0.180	0.153
Reincarcerated within 6 months, Regime 3	0.136	0.140	0.134	0.145	0.143	0.137
First Stage Results						
Regime 1	0.266***	0.379***	0.288***	0.342***	0.368***	0.387***
	(0.00760)	(0.0138)	(0.00764)	(0.0154)	(0.0192)	(0.0205)
Regime 2	0.433***	0.577***	0.460***	0.544***	0.566***	0.586***
	(0.0133)	(0.0207)	(0.0132)	(0.0229)	(0.0305)	(0.0290)
Regime 3	0.574***	0.681***	0.597***	0.652***	0.656***	0.695***
	(0.00522)	(0.00848)	(0.00510)	(0.0104)	(0.0121)	(0.0134)
First Stage F-Statistic	4178.5	2220.6	4695.7	1355.8	1047.6	914.1
IV Coefficient Reincarcerated Within 6 months	-0.0204*	-0.0473***	-0.0306***	-0.0285	-0.0624***	-0.0351
	(0.00839)	(0.0124)	(0.00798)	(0.0149)	(0.0184)	(0.0184)

Notes: Authors' calculations from Wisconsin administrative data. All regressions include facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, type of crime, employment to population ratio, and calendar month of release. IV estimates from GMM models. Regime definitions can be found in text and Figure 1 notes. Columns 1-2 and 3-4 include the full study population divided according to different definitions of mental health care needs. Columns 5-6 include only the subgroup defined in Column 2. When multiplied by 100, the first stage and IV regression point estimates shown can be interpreted as the percentage point change in the outcome with a 1 unit change in the independent variable. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.

Table 6. Heterogeneity by Financial Circumstances

	No Financial Needs	Financial Needs
	(1)	(2)
Summary Statistics		
Fraction of all releases (N)	63% (24,410)	37% (14,098)
Reincarcerated within 6 months, Regime 0	0.152	0.189
Reincarcerated within 6 months, Regime 3	0.135	0.140
First Stage Results		
Regime 1	0.276***	0.328***
	(0.00831)	(0.0112)
Regime 2	0.451***	0.515***
	(0.0143)	(0.0183)
Regime 3	0.571***	0.654***
	(0.00565)	(0.00738)
First Stage F-Statistic	3553.3	2692.4
IV Coefficient Reincarcerated Within 6 months	-0.0177*	-0.0395***
	(0.00897)	(0.0114)

Notes: Notes: Authors' calculations from Wisconsin administrative data. All regressions include facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, type of crime, employment to population ratio, and calendar month of release. IV estimates from GMM models. Regime definitions can be found in text and Figure 1 notes. When multiplied by 100, the first stage and IV regression point estimates shown can be interpreted as the percentage point change in the outcome with a 1 unit change in the independent variable. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.

APPENDIX

Substance Use Treatment Need

We constructed a binary indicator of substance use treatment need from case management data collected by the Department of Corrections using the COMPAS instrument. 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.

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?

Mental Health Care Need

Our first definition of mental health care need is based on data obtained from the COMPAS case management tool. It takes on a value of 1 if there is an affirmative response to either of the questions below. It is otherwise set to 0. We refer to this definition in the presentation of results as, mental health needs.

The 2 binary questions from the COMPAS were collected on around the time of reentry from prison to the community. The first question was completed by a staff member, and the second question was self-reported.

1. Was inmate assessed as having mental health needs during the current incarceration?
2. Have you ever attempted suicide?

Our second definition of mental health care need is a binary measure for receipt of a prescription medication indicated for the treatment of mental illness during the last 3 months while incarcerated from the following drug classes: atypical antipsychotics, miscellaneous antipsychotics, antimanic agents, and selective serotonin reuptake inhibitors. We obtained all prescription medication claims from the Department of Corrections for the study population from January 2012 through June 2017. All medications dispensed to individuals while in a state correctional facility are included in the prescription claims database. We refer to this definition as MH prescription drug use.

Financial Needs Measure

We constructed a measure of financial needs based on data obtained from the COMPAS. This measure is based on an answer of "Often" to one or more of the following questions, to which possible responses were "Often," "Sometimes," or "Never":

1. Thinking of your financial situation prior to this incarceration, how often did you have barely enough money to get by?
2. Thinking of your financial situation prior to this incarceration, how often did you have trouble paying bills?
3. Thinking of your financial situation prior to this incarceration, how often did you worry about financial survival?

Measures of Health Care Use Post-Incarceration

We adopt the diagnosis and procedure codes published by the Medicaid Outcomes Distributed Research Network to define visits for opioid use disorder (OUD) and substance use disorders (SUD), as well as medications for OUD (Donohue, Jarlenski, Kim et al., 2021). An outpatient visit is considered OUD- or SUD-related based on the presence of one of the relevant diagnoses shown below in any position on the claim.

Opioid Use Disorder

- ICD-9: 304.0x, 305.5x
- ICD-10: F11.xxx

Substance Use Disorders

- ICD-9: 303-305, exclude Tobacco 3051; exclude remission codes (5th digit = `3')
- ICD-10: F10-F19, exclude Tobacco F17, exclude remission codes; F55, O355, o9931, O9932

Medications for Opioid Use Disorder

- A prescription claim for: buprenorphine, Naltrexone (oral), Injectable Naltrexone, or buprenorphine/Naloxone; *or*
- A HCPCS code for buprenorphine or buprenorphine/Naloxone, oral: J0571, J0573, J0574, J0575; methadone administration, H0020; Naltrexone (extended-release injectable): J2315.

Appendix Table 1. IV Results for Other Outcomes by Substance Use, Mental Health, and Financial Circumstances

	Substance Use Likelihood			Mental Health Care Needs				Financial Circumstance	
	Unlikely	Probable	Highly Probable	No MH Needs	MH Needs	No MH Drug Rx	MH Drug Rx	No Worries	Worries
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Employed in quarter of release	0.0530**	0.0376*	0.0591***	0.0504***	0.0563***	0.0545***	0.0775***	0.0456***	0.0652***
	(0.0178)	(0.0180)	(0.0100)	(0.00955)	(0.0133)	(0.00916)	(0.0150)	(0.0103)	(0.0121)
	0.224	*0.217*	*0.207*	*0.212*	*0.190*	*0.220*	*0.135*	*0.219*	*0.180*
Earnings in quarter of release	175.2**	179.8***	216.4***	224.7***	120.3**	216.6***	203.9***	217.2***	172.1***
	(54.03)	(53.32)	(29.68)	(29.07)	(37.67)	(28.61)	(33.81)	(33.43)	(28.89)
	414.2	*364.0*	*356.5*	*366.4*	*338.7*	*393.4*	*166.1*	*408.7*	*250.5*
Within 30 Days									
Any Outpatient Visit	0.258***	0.266***	0.315***	0.247***	0.411***	0.239***	0.415***	0.290***	0.297***
	(0.0126)	(0.0134)	(0.00793)	(0.00674)	(0.0121)	(0.00629)	(0.0161)	(0.00763)	(0.00988)
	0.040	*0.043*	*0.057*	*0.042*	*0.076*	*0.038*	*0.118*	*0.046*	*0.059*
Outpatient, OUD	0.000904	0.00751***	0.0230***	0.0153***	0.0179***	0.0143***	0.0252***	0.0147***	0.0189***
	(0.00102)	(0.00208)	(0.00202)	(0.00155)	(0.00263)	(0.00143)	(0.00383)	(0.00162)	(0.00243)
	0.000	*0.000*	*0.001*	*0.001*	*0.001*	*0.000*	*0.003*	*0.001*	*0.001*
Outpatient, SUD	0.00974***	0.0305***	0.0628***	0.0404***	0.0616***	0.0395***	0.0678***	0.0453***	0.0484***
	(0.00224)	(0.00397)	(0.00349)	(0.00262)	(0.00464)	(0.00242)	(0.00629)	(0.00289)	(0.00395)
	0.000	*0.001*	*0.005*	*0.003*	*0.004*	*0.002*	*0.010*	*0.002*	*0.005*
Within 6 Months									
Any Outpatient Visit	0.433***	0.467***	0.497***	0.456***	0.523***	0.458***	0.428***	0.496***	0.440***
	(0.0178)	(0.0189)	(0.0105)	(0.00950)	(0.0155)	(0.00904)	(0.0196)	(0.0105)	(0.0133)
	0.169	*0.163*	*0.191*	*0.151*	*0.264*	*0.146*	*0.356*	*0.162*	*0.209*
Outpatient, SUD	0.0322***	0.0908***	0.180***	0.128***	0.149***	0.130***	0.133***	0.132***	0.140***
	(0.00559)	(0.00926)	(0.00664)	(0.00520)	(0.00903)	(0.00478)	(0.0127)	(0.00572)	(0.00767)
	0.008	*0.021*	*0.037*	*0.023*	*0.037*	*0.019*	*0.073*	*0.024*	*0.033*
MOUD Treatment	0.00362*	0.0271***	0.0399***	0.0285***	0.0356***	0.0268***	0.0396***	0.0256***	0.0394***
	(0.00145)	(0.00413)	(0.00333)	(0.00257)	(0.00418)	(0.00223)	(0.00661)	(0.00273)	(0.00378)
	0.000	*0.002*	*0.009*	*0.006*	*0.006*	*0.004*	*0.016*	*0.006*	*0.006*

Outpatient, Mental Health	0.187***	0.210***	0.269***	0.189***	0.368***	0.164***	0.358***	0.234***	0.246***
	(0.0131)	(0.0144)	(0.00868)	(0.00680)	(0.0143)	(0.00634)	(0.0190)	(0.00811)	(0.0111)
	0.065	*0.068*	*0.095*	*0.054*	*0.169*	*0.053*	*0.238*	*0.068*	*0.107*
Any ED Visit	0.0687***	0.0676***	0.0823***	0.0720***	0.0756***	0.0684***	0.0320	0.0732***	0.0687***
	(0.0128)	(0.0135)	(0.00745)	(0.00628)	(0.0126)	(0.00600)	(0.0166)	(0.00722)	(0.00985)
	0.080	*0.080*	*0.079*	*0.061*	*0.134*	*0.062*	*0.172*	*0.070*	*0.096*
Any Hospitalization	0.0228***	0.0298***	0.0419***	0.0293***	0.0473***	0.0254***	0.0488***	0.0307***	0.0424***
	(0.00588)	(0.00733)	(0.00445)	(0.00352)	(0.00704)	(0.00318)	(0.00986)	(0.00408)	(0.00548)
	0.013	*0.018*	*0.021*	*0.015*	*0.029*	*0.014*	*0.046*	*0.018*	*0.020*

Source: Authors' estimates from Wisconsin administrative data. Notes: IV GMM estimates from a models that includes facility fixed effects and controls for (except when limited to that particular subsample) rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, type of crime, employment to population ratio, and calendar month of release; employment and earnings models control for fraction of quarter relative to release. Standard error in parantheses, Regime 0 average in italics. First stage and reincarceration results available in Tables 4-6. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.

Appendix Table 2. Medicaid Enrollment at Release (First Stage) by Demographics and Type of Conviction

	Regime 1	Regime 2	Regime 3	Regime 0 Average	Regime 3 Average	Observations	F-statistic
Marital Status							
Married	0.267***	0.421***	0.518***	0.095	0.624	3,719	383.7
	(0.0223)	(0.0370)	(0.0156)				
Unmarried	0.297***	0.478***	0.612***	0.077	0.698	34,789	6029.3
	(0.00701)	(0.0118)	(0.00463)				
Education							
> HS	0.304***	0.485***	0.614***	0.070	0.697	25,282	4451.3
	(0.00823)	(0.0140)	(0.00540)				
No HS	0.277***	0.451***	0.592***	0.092	0.687	11,467	1757.3
	(0.0123)	(0.0204)	(0.00830)				
Age							
18-23	0.199***	0.305***	0.484***	0.086	0.569	2,720	258.4
	(0.0247)	(0.0457)	(0.0176)				
24-35	0.237***	0.434***	0.589***	0.084	0.686	14,014	2115.9
	(0.0108)	(0.0191)	(0.00750)				
36-55	0.333***	0.519***	0.624***	0.079	0.714	17,747	3218.0
	(0.0100)	(0.0161)	(0.00649)				
>55	0.390***	0.490***	0.624***	0.052	0.688	4,027	784.3
	(0.0208)	(0.0340)	(0.0132)				
Race							
Black	0.295***	0.467***	0.582***	0.097	0.685	15,235	2203.9
	(0.0108)	(0.0178)	(0.00730)				
White	0.300***	0.486***	0.628***	0.066	0.708	21,291	4001.0
	(0.00890)	(0.0151)	(0.00582)				
Type of Conviction							
Drug	0.241***	0.436***	0.585***	0.088	0.692	10,499	1538.7
	(0.0128)	(0.0224)	(0.00874)				
Public Order	0.306***	0.472***	0.620***	0.069	0.699	17,147	3115.3
	(0.0101)	(0.0172)	(0.00651)				
Property	0.311***	0.471***	0.625***	0.081	0.717	12,558	2244.7
	(0.0116)	(0.0201)	(0.00772)				
Violent	0.315***	0.516***	0.607***	0.072	0.683	16,129	2827.4
	(0.0104)	(0.0168)	(0.00676)				

Notes: Estimates from a model that includes facility fixed effects and controls for rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, type of crime, employment to population ratio, and calendar month of release. * indicates p<0.05, ** p<0.01, and *** p<0.001.

Appendix Table 3. IV Results by Marital Status, Education, Age, and Race

	Marital Status		Education		Age				Race	
	Married	Unmarried	At Least HS	No HS Degree	18-23	24-35	36-55	>55	Black	White
Reincarcerated within 6 months	-0.0227	-0.0259***	-0.0233**	-0.0355*	0.0000351	-0.0306*	-0.0273**	-0.0218	-0.0490***	-0.0117
	(0.0230)	(0.00725)	(0.00780)	(0.0144)	(0.0410)	(0.0123)	(0.00920)	(0.0182)	(0.0132)	(0.00780)
	0.123	*0.167*	*0.131*	*0.216*	*0.297*	*0.183*	*0.136*	*0.121*	*0.235*	*0.112*
Employed in quarter of release	0.0612*	0.0511***	0.0495***	0.0587***	0.0817*	0.0604***	0.0468***	0.0389	0.0607***	0.0542***
	(0.0293)	(0.00805)	(0.00974)	(0.0136)	(0.0337)	(0.0135)	(0.0112)	(0.0213)	(0.0120)	(0.0105)
	0.205	*0.207*	*0.228*	*0.173*	*0.150*	*0.225*	*0.214*	*0.151*	*0.177*	*0.231*
Earnings in quarter of release	356.7***	179.5***	228.3***	140.7***	146.0**	132.1***	242.7***	214.4**	193.7***	216.3***
	(101.0)	(23.89)	(30.87)	(35.75)	(49.43)	(34.19)	(37.74)	(71.38)	(30.90)	(34.54)
	406.2	*355.2*	*418.0*	*263.5*	*130.7*	*352.1*	*415.4*	*291.8*	*256.1*	*450.7*
Within 30 Days										
Any Outpatient Visit	0.326***	0.291***	0.315***	0.243***	0.142***	0.253***	0.324***	0.377***	0.192***	0.360***
	(0.0234)	(0.00614)	(0.00730)	(0.0108)	(0.0204)	(0.00920)	(0.00886)	(0.0214)	(0.00892)	(0.00810)
	0.073	*0.048*	*0.049*	*0.049*	*0.027*	*0.034*	*0.056*	*0.097*	*0.044*	*0.055*
Outpatient, OUD	0.0101	0.0166***	0.0162***	0.0142***	0.00479	0.0217***	0.0158***	0.000306	0.00130*	0.0254***
	(0.00518)	(0.00135)	(0.00165)	(0.00205)	(0.00254)	(0.00254)	(0.00195)	(0.000607)	(0.000599)	(0.00215)
	0.003	*0.001*	*0.001*	*0.000*	*0.000*	*0.001*	*0.001*	*0.000*	*0.000*	*0.001*
Outpatient, SUD	0.0371***	0.0468***	0.0530***	0.0303***	0.00876**	0.0462***	0.0508***	0.0385***	0.0105***	0.0669***
	(0.00901)	(0.00234)	(0.00294)	(0.00356)	(0.00335)	(0.00365)	(0.00359)	(0.00640)	(0.00202)	(0.00352)
	0.008	*0.003*	*0.004*	*0.002*	*0.000*	*0.002*	*0.004*	*0.004*	*0.001*	*0.004*
Within 6 Months										
Any Outpatient Visit	0.478***	0.477***	0.503***	0.413***	0.338***	0.441***	0.515***	0.517***	0.372***	0.539***
	(0.0313)	(0.00834)	(0.00972)	(0.0153)	(0.0351)	(0.0132)	(0.0117)	(0.0262)	(0.0133)	(0.0104)
	0.230	*0.171*	*0.172*	*0.182*	*0.121*	*0.146*	*0.188*	*0.278*	*0.172*	*0.184*
Outpatient, SUD	0.134***	0.133***	0.150***	0.0907***	0.0402***	0.136***	0.140***	0.138***	0.0442***	0.181***
	(0.0172)	(0.00465)	(0.00568)	(0.00762)	(0.0117)	(0.00731)	(0.00678)	(0.0148)	(0.00460)	(0.00682)
	0.035	*0.026*	*0.028*	*0.023*	*0.010*	*0.021*	*0.031*	*0.036*	*0.010*	*0.039*
MOUD Treatment	0.0303**	0.0304***	0.0333***	0.0231***	0.00565	0.0426***	0.0275***	0.0151*	0.00678***	0.0449***
	(0.00928)	(0.00222)	(0.00267)	(0.00377)	(0.00593)	(0.00403)	(0.00303)	(0.00645)	(0.00184)	(0.00349)
	0.010	*0.005*	*0.005*	*0.006*	*0.004*	*0.006*	*0.006*	*0.007*	*0.002*	*0.009*
Outpatient, Mental Health	0.259***	0.242***	0.260***	0.194***	0.132***	0.228***	0.265***	0.251***	0.138***	0.305***

	(0.0254)	(0.00663)	(0.00784)	(0.0119)	(0.0216)	(0.0100)	(0.00968)	(0.0225)	(0.00889)	(0.00908)
	0.098	*0.078*	*0.076*	*0.084*	*0.035*	*0.058*	*0.094*	*0.126*	*0.055*	*0.101*
Any ED Visit	0.0610**	0.0768***	0.0646***	0.0949***	0.0885***	0.0701***	0.0792***	0.0640**	0.0953***	0.0491***
	(0.0227)	(0.00593)	(0.00674)	(0.0114)	(0.0249)	(0.00930)	(0.00830)	(0.0203)	(0.00997)	(0.00716)
	0.092	*0.076*	*0.070*	*0.089*	*0.062*	*0.066*	*0.081*	*0.117*	*0.085*	*0.075*
Any Hospitalization	0.0314*	0.0357***	0.0370***	0.0322***	0.0273*	0.0295***	0.0415***	0.0266	0.0205***	0.0437***
	(0.0132)	(0.00330)	(0.00386)	(0.00611)	(0.0109)	(0.00451)	(0.00478)	(0.0142)	(0.00494)	(0.00438)
	0.023	*0.018*	*0.017*	*0.020*	*0.009*	*0.011*	*0.019*	*0.051*	*0.018*	*0.019*

Source: Authors' estimates from Wisconsin administrative data. Notes: IV GMM estimates from a models that includes facility fixed effects and controls for (except when limited to that particular subsample) rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, type of crime, employment to population ratio, and calendar month of release; employment and earnings models control for fraction of quarter relative to release. Standard error in parantheses, Regime 0 average in italics. First stage and sample sizes available in Appendix Table 2. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.

Appendix Table 4. IV Results by Type of Conviction

	Type of Conviction			
	Drug	Public Order	Property	Violent
Reincarcerated within 6 months	-0.0284*	-0.00317	-0.0297*	-0.0432***
	(0.0126)	(0.00936)	(0.0122)	(0.0109)
	0.130	*0.127*	*0.180*	*0.181*
Employed in quarter of release	0.0442**	0.0611***	0.0437**	0.0632***
	(0.0156)	(0.0115)	(0.0133)	(0.0118)
	0.223	*0.211*	*0.211*	*0.202*
Earnings in quarter of release	251.9***	233.6***	135.2***	203.2***
	(43.57)	(36.36)	(37.03)	(35.59)
	368.3	*385.8*	*347.5*	*344.9*
Within 30 Days				
Any Outpatient Visit	0.309***	0.296***	0.308***	0.270***
	(0.0118)	(0.00888)	(0.0101)	(0.00887)
	0.044	*0.053*	*0.051*	*0.048*
Outpatient, OUD	0.0313***	0.0110***	0.0189***	0.00753***
	(0.00356)	(0.00168)	(0.00256)	(0.00127)
	0.002	*0.001*	*0.002*	*0.000*
Outpatient, SUD	0.0635***	0.0509***	0.0483***	0.0254***
	(0.00504)	(0.00367)	(0.00403)	(0.00261)
	0.004	*0.005*	*0.004*	*0.002*
Within 6 Months				
Any Outpatient Visit	0.491***	0.474***	0.486***	0.460***
	(0.0161)	(0.0120)	(0.0136)	(0.0124)
	0.180	*0.176*	*0.179*	*0.170*
Outpatient, SUD	0.168***	0.145***	0.139***	0.0821***
	(0.00981)	(0.00714)	(0.00793)	(0.00573)
	0.033	*0.034*	*0.031*	*0.019*
MOUD Treatment	0.0493***	0.0196***	0.0470***	0.0137***
	(0.00544)	(0.00306)	(0.00436)	(0.00232)
	0.009	*0.007*	*0.007*	*0.003*
Outpatient, Mental Health	0.255***	0.226***	0.268***	0.237***
	(0.0125)	(0.00957)	(0.0112)	(0.00976)
	0.068	*0.086*	*0.084*	*0.078*
Any ED Visit	0.0615***	0.0755***	0.0789***	0.0903***
	(0.0109)	(0.00832)	(0.0101)	(0.00882)
	0.069	*0.073*	*0.087*	*0.076*
Any Hospitalization	0.0328***	0.0305***	0.0402***	0.0378***
	(0.00584)	(0.00470)	(0.00578)	(0.00466)
	0.015	*0.020*	*0.020*	*0.015*

Source: Authors' estimates from Wisconsin administrative data. Notes: IV GMM estimates from a models that includes facility fixed effects and controls for (except when limited to that particular subsample) rurality of conviction county, age, sex, race, education, marital status, duration of incarceration, type of crime, employment to population ratio, and calendar month of release; employment and earnings models control for fraction of quarter relative to release. Standard error in parentheses, Regime 0 average in italics. First stage and sample sizes available in Appendix Table 2. * indicates $p<0.05$, ** $p<0.01$, and *** $p<0.001$.